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Environment, Food and Rural
Affairs Committee

Climate Change: looking forward

Ninth Report of Session 2004–2005

Oral and written evidence

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Environment, Food and Rural Affairs Committee

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Climate Change Solutions (memorandum)
Enerco Ltd (memorandum)

Oral evidence

Taken before the Environment, Food and Rural Affairs Committee

on Wednesday 8 December 2004

Members present:

Mr Michael Jack, in the Chair

Mr David Drew
Patrick Hall
Mr Mark Lazarowicz
Mr David Lepper

Mr Austin Mitchell
Alan Simpson
Paddy Tipping

Memorandum submitted by Sir David King, Government's Chief Scientific Adviser (U34)

INTRODUCTION

1. I welcome the Committee's interest in the critical issue of climate change. In my capacity as the Government's Chief Scientific Adviser my own involvement in the subject is well known and has been wide-ranging. This has included:

- Presenting climate change science and raising the awareness of climate change amongst the public, industry, Parliament and Governments worldwide.
- Focusing on the action required, including: (i) the energy innovation needed to achieve a radical shift to a low carbon economy, (ii) the establishment of the UK Energy Research Centre, (iii) UK participation in the International Thermonuclear Experimental Reactor (fusion) project, and (iv) steps to improve the energy performance of the built environment.
- Providing support to Defra, FCO and No 10 on international action, as well as through the network of international Science and Technology Attaches and the Global Science and Innovation Forum.

2. Based on the science, the key driver for policy at UK, G8 and EU levels is clear and, notwithstanding the often complex nature of climate change science, relatively simple. We must reduce greenhouse gas emissions from human activity to avoid the worst impacts of climate change, and for which carbon dioxide is the biggest contributor. There is a need for a step change in energy efficiency and for a radical shift from use of fossil fuels to low carbon energy generation. To achieve these ends, determined action is required on a global scale.

3. Climate change is not just an issue for the longer term, though it is certainly that, but one that requires action now. I therefore welcome that the highest priority will be attached to this by the Government for the UK's G8 and EU Presidencies, and I will personally support fully those aspects of the UK programme where I have a contribution to make.

4. I firmly believe, and have stated publicly many times, that climate change is the biggest single global challenge that we face. Our success or failure in taking the steps necessary to tackle it now, and over the next couple of decades, will play out for centuries to come. If unchecked, and if we fail to adapt, it has the potential to be catastrophic.

5. I have been closely involved in the development of the Government's G8 Presidency plans, work that has been led by Defra. As the Prime Minister has recently announced, early on under our Presidency the UK's world-leading Hadley Centre will host an international meeting to review the latest climate change science. I see this as a key event that will help to establish the state of the science while waiting for the Fourth Assessment report from the IPCC. In particular, I believe it will be helpful to highlight the increasing evidence that anthropogenic emissions are causing climate change, and to achieve greater clarity on the impact of current emissions trajectories, including their potential cost in both economic and human terms. The meeting will brief the UK's Presidency for the purpose of informing the G8 summit how current science is developing our understanding of anthropogenically induced global warming and its impacts.

6. The Government also intends to convene an international meeting of Energy Research Institutions. This will be an opportunity for a global review of the energy technologies likely to help us to achieve a low carbon future, and the scope for enhanced international co-operation and action to bring this about.

7. Linking with the other key theme of the UK's G8 Presidency—Africa—the Prime Minister has commissioned a study of Africa in relation to climate change, to review what information is available and to evaluate the adequacy of existing data to inform policy decisions. The position in Africa is very different from the more advanced developing countries where there is patchy but growing appreciation of the climate

problem and its impacts. Much less scientific work has been carried out on the impacts of climate change on Africa and there is much we simply do not know. The study can add considerable value by identifying these knowledge gaps and what needs to be done to plug them.

UK CLIMATE CHANGE PROGRAMME—REVIEW

8. The UK Government has led the world in setting a bold plan and targets for reducing greenhouse gas emissions. This includes the aim to have reduced carbon dioxide emissions by 60% below 1990 levels between 1990 and 2050. The review of the UK's Climate Change Programme I believe is a key step in assessing whether we are on track towards our goals; and, if not, what we can and must do about it.

9. If the UK is to retain its position of leadership on climate change then it is clearly crucial to our credibility that we stay on track towards our domestic goals. Indeed, given that the UK contributes just 2% to global CO₂ emissions, the UK's programme can only make sense if set in the context of moves towards wider international action.

10. But I would not underestimate the scale of the challenge. The UK's goals are ambitious—but at the same time I believe necessary. Indeed, since the climate change programme was developed, the science has moved on. In particular, the assessment that a relatively “safe” level of carbon dioxide in the atmosphere—equating to a 20°C global average temperature rise—would be around 550 parts per million (ppm) now looks to have been optimistic. The latest assessment published by the IPCC suggests that a limit closer to 450 ppm is likely to be necessary.

11. There is more science to be done to achieve international agreement on what constitutes “dangerous climate change” and related stabilisation levels. I hope that the climate science conference referred to above will help progress this. Nonetheless, I believe that in reviewing the UK's climate change programme the significant shift in scientific opinion that has taken place on this issue will need to be factored in.

7 October 2004

Witness: Professor Sir David King, Government's Chief Scientific Adviser, examined

Q1 Chairman: Good afternoon, ladies and gentlemen, and welcome to the further evidence session on climate change. We welcome as our first witness this afternoon Professor Sir David King, the Government's Chief Scientific Adviser, somebody who we have had the pleasure of hearing from on a number of occasions. As I say, by popular acclaim, Sir David, we invite you back, but little did we know that you were going to appear on the very day the Government dominated the news headlines telling us this morning perhaps what had been thought about and known to some people but which now is explicit, that the United Kingdom is not going to achieve the Government's targets in terms of cutting back on carbon dioxide emissions. I suppose we should be unsurprised to note that there were some commentators this morning on the media who were questioning, in fact, whether we were going to be able to achieve our Kyoto target, although the Prime Minister said, when pushed on that in the House recently, we were going to meet it. It will be very interesting to know how you feel today as somebody who has been a strong advocate of reductions in CO₂ to be facing the fact that the Government of the day is not going to make its own target. What do we make of that?

Professor Sir David King: That sounded rather like a political question being addressed to a chief scientific adviser.

Q2 Chairman: Let me put it into more scientific terms. You have been monitoring this area very carefully. Are you surprised that we have to admit now that we are not going to do it? What are the factors that have led us into this situation and what does it mean for the future?

Professor Sir David King: Perhaps I could answer your question by just putting some facts down and then addressing the issues from the review which has just been published by Defra today to which you are referring. First of all, some of the commentators have misunderstood a very important point. The basket of greenhouse gases is one number, carbon dioxide emissions are another. These two have been conflated in some of the reports, so if we could just clarify on the basket of emissions, we are down 14% on 1990. We are required by the Kyoto Agreement to reach 12.56% by 2010. On the basket of emissions, we have already reached the target set by Kyoto. The issue then is: what about carbon dioxide emissions? Between 1990 and 2002 our carbon dioxide emission reduction was, I believe, 8.7% and it has now gone to 7%. Over the period from 2002 to the present we have seen carbon dioxide emissions rise so that the target for carbon dioxide emissions is below what we would like it to be. We are not achieving on the carbon dioxide emissions target. First of all, in terms of the question you are asking me, I do not think that there is an issue about meeting the Kyoto target. The issue is about whether or not we would meet the Government's more ambitious target by 2010; that, frankly, looks difficult and that is what Margaret Beckett was saying this morning.

Q3 Chairman: What are the main drivers for this situation? As I understand it, the Government had the beneficial effects as far as electricity generation was concerned from the substantial move to gas, but, if you take gas out of the equation, what does the rest of the picture look like?

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Professor Sir David King: The switch from coal to gas is responsible for roughly 30% of our reduction; the other 70% has come from other measures. If I could deal just first of all with the rise over the year 2002 to the present, that has come largely from two factors: one is from the utilities switching to a greater dependence on coal and using less gas, so there was a move to more coal dependence by the utilities; secondly, we have reduced imports of electricity. Of course, when we look at overall global emissions, we have to look at the emissions that we generated in the country that generated the electricity. That is the reason why the two have gone up. That other 70% reduction is very largely attributable to energy efficiency gains that have come through the system. I think that the climate change levy of the various policies that have been put into place since 1997 have been coming through the system, but, before we get too pessimistic about meeting targets, I do not think we should expect anything but lumpiness as we move forward. In other words, utilities are free to switch from one supply source to another. What we need to do is to have a fiscal process and to have a proper set of incentives in place to see that over the longer period of time we do have the right form of behaviour coming through.

Q4 Chairman: The implication of your answer is that what we have at the moment is a less than perfect solution because I was intrigued in the Government's document, *The Essentials Of Life*—I think we are going to re-christen our Committee "The Essentials of Life Committee", that sounds rather good—they say that, and I quote: "We are launching extensive consultation on the review at the same time as this strategy". I thought we were pretty clear about what we had to do to meet the various targets, Kyoto and our own self-imposed target. In terms of the methodology, which we will probe in detail a little later in our questioning, again the move towards renewable energy, the dash for gas, and so on and so forth, everything seems to be fairly clear. We have a climate change levy in place, emissions trading is all there, why do we have to have another review?

Professor Sir David King: This is a review that was there to establish what progress was being made or, as I understand it, what difficulties were still in place, but I do think, Chairman, that your questions are directed more properly on this matter to the department concerned.

Q5 Chairman: The reason I am asking you the question is you give advice to the Government. You have studied this thing in immense detail. If you thought that the Government was going off track or not doing something scientific which it ought to be doing, you would give them advice no doubt in your own spontaneous way. I was intrigued as to why, because it says: "We are launching an extensive consultation on the review". I thought we had a pretty clear idea of the nuts and bolts of what was Britain's climate change package, if you like. I did not understand why we had to go and have another consultation about it. You said a moment ago that

what we needed was a package, for example, of good fiscal measures that would be required. The implication that somehow what we have is not quite delivering, could you address the question, an implication of your response, and secondly, answer my question as to whether you think we need a root and branch review or whether we have to make what we have in the pipeline work better?

Professor Sir David King: Let me address the very important question of whether or not things are being put into place that in the longer term will deliver the targets. It seems to me I would be absolutely amazed if these were already biting because what we are setting in place is targets which are fiscal in nature which will bring on board the right kind of behaviour. For example, inventors are being directed at: here is an opportunity because there is a new kind of behaviour required to emerge for inventors to come in, for researchers to come in with new low carbon technology devices, *et cetera*. These will take a while to play through into the system. In the shorter term, benefits can also come through in energy efficiency gains in every sphere of our usage of energy. For example, in the design of buildings and, again, the targets on building design are there. They are being pushed through by improved regulatory behaviour. That again is going to take a time to come through. New buildings going up will be the more efficient energy user buildings of the future, but getting to old buildings and refitting them out so that they are more energy efficient is going to take quite a while.

Q6 Chairman: Can I bring you back to the question that came from what you said? We need an improved fiscal regime; let me ask you a direct question from that. Do you think the climate change levy is working? How much carbon, for example, has been saved? Do you know as a result of the climate change levy to date?

Professor Sir David King: No, I do not.

Q7 Chairman: Does anybody?

Professor Sir David King: I could find out and put in a written reply to your question if that answer is known. Let me rather direct your question at the whole range of things that are being put into place in order to meet the targets which provide opportunities for business, each of which will only come through if business thinks that this is a long term process. The fact that we are going into international emissions trading now means that that long term process is ensured not only through the UK's emissions trading, and we were one of the first in the world to get off the ground on that, and/or European emissions trading, but that is going international. There is now a new trade in carbon dioxide. I believe London will become the financial centre for that new market. Our inventors, our technologists, our companies will be prepared therefore to make long-term investments, but it is long term.

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Q8 Chairman: Just to ask you a couple of concluding comments and then pass to Mr Simpson and Mr Tipping as well. People say that the problem of greenhouse gases, climate change is the most severe problem we face today. Perhaps you could tell us the answer why. That, if you like, opens up the fact that there is still a lot of conjecture within science seemingly about the speed, the process of change for some who would seem to be in denial almost that anything is happening at all. Perhaps you might bring us up to date on those two points.

Professor Sir David King: Short answer or long answer, Chairman?

Q9 Chairman: I am going to say short because my two colleagues and others may want to come and tease out some of these things in more detail later on. Give us the short version.

Professor Sir David King: In brief, the science of understanding the greenhouse effect began in 1826 with the great French mathematician Fourier publishing what we now understand is, if you like, the duvet effect of our atmosphere on maintaining heat and the temperature difference between night and day being relatively small, and so on. The fact is that our atmosphere absorbs some of the energy that comes in from the sun and re-radiates it back to us, so that maintains a higher global temperature than it would otherwise be. As we add greenhouse gases—these are essentially carbon dioxide, methane, NO_x gases—then the effect is that the duvet cover gets thickened and we feel a higher temperature. Carbon dioxide levels are 379 parts per million today. We have now from data going back 900,000 years, ice core data 750,000 years, ocean sediment data 900,000 years. We know from each of the glacial, interglacial cycles over that period that carbon dioxide levels in glacial periods were 200 parts per million and in the warm interglacial periods 270. Our warm period was 270 until the industrial period and now it is rising at 1.84 parts per million per annum and we are at 379. This is higher than our global atmosphere has had on record and likely for 50 million years. The consequences of that can be calculated and computed. Certainly our own Hadley Centre is amongst the world leaders, but there are four or five independent computer models, vast models, of our global system around the world all indicating that we are headed for impacts to our climate system over the next 30 years which are virtually independent, and I stress this, of what we do in terms of carbon dioxide emissions. For the next 30 years because of the enormous climate system, it has a lot more inertia than even the social and political system, that climate system will take 30 years to play out the effects of changing carbon dioxide levels over the last hundred years. That is going to be a temperature rise of another 0.6 or so degrees centigrade. After that, the impacts will get more and more severe depending on how much more carbon dioxide we put up. Any abatement of effect by reducing carbon dioxide is going to play through in the time of our grandchildren; that is the difficult political issue. If you look at the impacts that we would like to avoid, and this is where a lot of the

current science is, in other words, what are the major impacts that whatever happens we should avoid, then the melting of the ice sheet on Greenland has become the focus of attention. If the ice sheet on Greenland goes, sea levels will rise six and a half metres and London would be under water. That is a long-term process, but what scientists clearly understand is that if we reach a global temperature, which is about two to two and a half degrees centigrade above the pre-industrial level—and we are already 0.6, 0.7 above that—irreversible melting of Greenland ice sheet will begin. These are the long-term effects that the scientists are examining in great detail. You mentioned naysayers; there are climate change sceptics and lobbyists. I have to say, Chairman, that I find it rather difficult to distinguish between these two. The science community, thousands of scientists who contribute to our understanding of the global climate system, is focusing its attention on these more advanced problems. What is the effect of increased cloud cover as the temperature goes up? What are the effects of aerosols? There are a whole range of challenges. The challenge is no longer: is carbon dioxide of concern to us; is it causing global warming? That bit we fully understand, but the challenges are moving on to understand what the true impacts will be. My emphasis is on two factors: we must reduce emissions for the long-term sake of our system; in the short term, we must focus on dealing with the impacts. In our own country, and I have talked to you about this before, the great impacts are going to come from increased intensity of rainfall, flooding and coastal attack.

Q10 Alan Simpson: The resumé from Fourier onwards was fascinating. What troubled me were the things you were saying before that which were really about incentives. The troubling part of it was that it is very easy to see lots of fragments that are thrown out as incentives without there being a coherent strategy. As I was listening, I was reminded of a different approach, that well-known scientist Modali of Chicago who said that if you grab them by the balls their hearts and minds will follow. Rather than offering incentives and hoping, is not the scientific scenario that you depict one that says we just have to change the rules? Business will change its practices when Government changes the rules. That is what happened when we introduced the Clean Air Act. Governments had exhorted industry for decades to try and clean up their act. It was not until they were obliged to do so that the nature of air pollution changed. Are we not faced with the same issues here? If we want houses to be more energy efficient, why do we not require that each new property that is built to generate a proportion of its own energy? If there are puddles of flash flooding, why do we not say it has to be a planning duty that each new building and car park has to have its own soakaway or reservoir facilities to deal with this? Why do you duck the issues of obligations?

Professor Sir David King: I wish it were me who was ducking them. It is not quite that simple.

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Q11 Chairman: Why do we duck it, not coming back for the things that we have a duty to do?

Professor Sir David King: It is a very good question. I think first of all that the Office of the Deputy Prime Minister is looking at Building Regulations as a dynamic process. In other words, Building Regulations will be improved next year, but that is a continuing process. We have to move towards the kind of system that you describe, but I do think we have to do this realistically. I have been advising Government long enough now that I realise that there is a real world that can only change at a certain rate. I would like to emphasise this: our objective as a Government is, I believe, to demonstrate that we can cope with carbon dioxide reductions and lead the world in doing this and at the same time have a really quite remarkable growth in our GDP. In other words, we are growing our GDP at a substantial rate, but we are reducing emissions. That is an important fact to demonstrate to the rest of the world that meeting the carbon emissions reductions requirements in order to stabilise the world's emissions is not something that will hamper your economic growth. It is right that the tensions that you are really referring to are between economic growth and reducing emissions, and will continue into the future. We have to find the right pathway through, but your question was very good because you are focusing on win-win situations. If you put a wind turbine on the roof of your house, the capital cost of that will repay in terms of the lower running cost of your house. There is an interesting problem that the private sector in particular tends to occupy buildings on a relatively short-term scale. So payback times of more than five years are looked at askance from that point of view, but it is a good question.

Q12 Paddy Tipping: You talked to us earlier on about recent trends in carbon emissions in the UK that have gone down. Now they are going up largely because the burning of fossil fuels is on the increase again. One of the sectors I do not think you touched on so far is the transport sector. If there is an area of policy where perhaps we are not making much gain, I suspect it is the transport sector. Could you give us a bit of a commentary about what you think is happening there?

Professor Sir David King: Yes. I think the other country that is leading in terms of the carbon emissions targets is Germany and precisely the same problem, if you like, is occurring there where, as better behaviour emerges in the built environment and in utility production of energy, transport is remaining as the growing problem area. I do believe that it is going to take quite a while to bring this into line with the anticipated reductions. There are two areas of transport that are really quite separate: one is ground and one is air. In terms of ground transport, I think we are very pleased to see the emergence of the hybrid engine to replace the straightforward combustion engine, which I am very happy to say I arrived here in a car driven by a hybrid engine. The Government car service is now beginning to change its fleet to hybrid engine driven

cars, at least as an option. Sixty-eight miles per gallon in London from a car that is delivering a top speed of 106 miles an hour (not in London). We will, I am sure, see the hybrid engine come in very substantially in the future. I am convinced that that will then be coupled with a very significant reduction in carbon dioxide emissions. Again, it is a win win. The fuel costs for the driver are substantially reduced. Of course, I am very pleased that in London the congestion charge on cars has not been applied to hybrid engine driven cars. That is another fiscal process that can bring on the right sort of behaviour. With air travel, we have, of course, a bigger problem and there the problem is that there is no tax on the fuel that the aircraft use. The reason given usually is that this requires international agreement. We do have international agreements on very many things, such as fishing. I think it means that international agreements are possible in this area as well. Certainly I am very pleased that Britain is backing the introduction of aircraft carbon dioxide production into the emissions trading process. We have pushed it in Europe and we will continue to push for it on the international scene. Air travel is exacerbated in this sense by the push for very cheap travel—and I suspect we are all guilty of this particular form of travel—and the practice there is for very rapid turnaround at airports. Many of us will travel on these flights precisely because they often get in early and the timing is very good, but the way they achieve that is to fill up with fuel in the morning and then travel with a very heavy plane through most of their flights. This is a very expensive way of using fuel. It is also, of course, very bad for the environment and that is where fiscal process, Chairman, is simply not coming into play to get the right behaviour at the moment.

Q13 Paddy Tipping: You take an overview of Government scientific advice. I suspect in the Department of Transport climate change is not high on the agenda. Do you think it is?

Professor Sir David King: I think climate change is now high on the agenda right across Government. As a matter of fact this comes from Number 10, for example, there is a Clean Vehicle Group. I sit on that group looking at exactly this problem and bringing biofuels on. No, I do not think any department is escaping the rigours of the climate change agenda.

Q14 Paddy Tipping: Finally, you mentioned biofuels. It has been on the agenda for a long time. Why are we not using it more frequently in the UK?

Professor Sir David King: The idea is to ramp up the percentage of biofuel in the petrol that you fill your car with; that is already happening and will continue to happen, but let me quickly say—

Q15 Paddy Tipping: Let me challenge you: you say that is happening. I am not entirely sure it is; is it?

Professor Sir David King: Let me come back to you on the current percentage of biofuels in fuel. Let me say at once that I believe if we look at this as a global problem, as we have to, that there are very significant limits on what biofuels can produce

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globally. The other major problem facing us globally is clean water provision. Each of these problems is generated by our global population. We are now at 6.2 billion and we are likely to plateau out at about 10 billion provided there are no major disasters. Clean water provision to provide the food that we require is not going to meet that global population demand at its present rate beyond about 2040. A further demand to provide energy through clean water, as you would need with biofuels, would only exacerbate that problem.

Q16 Mr Lepper: Sir David, you said just now that the push within Government was coming from Number 10 and influencing, as you see it, all Government departments. The Prime Minister has obviously made it clear that during the UK's Presidency of the G8 next year climate change is going to be a priority issue. I think we kick off with the conference in February at the Hadley Centre to review the latest climate change science. Is that going to be, do you believe, more than just a sort of showplace reviewing the state of science, or is the hope, the aim that it might come up with some policy strategy initiatives that are going to inform not only that year of the Presidency but the G8 from then on?

Professor Sir David King: It was the Prime Minister's desire that the discussions that ensue during the G8 Presidency year on climate change should be informed by science. It was, therefore, his request that we put right up early in the year a meeting to evaluate the current state of climate change science. This is a meeting that is not intended in any way to overtake or supplant the activity of the Intergovernmental Panel on Climate Change which continues its own work at its own pace. The meeting to be held in the Hadley Centre from 1 to 3 February will have the senior scientific players from around the world at it. I believe those scientists feel that is a very good opportunity to review together the current state of climate change science. As a matter of fact, since the Intergovernmental panel last reported in 2001, climate change science has really moved on in leaps and bounds. Virtually weekly, Chairman. In the journals *Nature* and *Science*, there are very important papers in this area being published. I think the scientific community sees this as a marvellous opportunity to review the science. The intention is not for us in the British Government to put a heavy hand on that conference. It is rather to see that the scientists can set out the scientific arena as they see it today. What we are not, therefore, anticipating is any policy directives to come from the scientific conference itself, but rather a clear statement of where the science is at the moment so that the politicians can take it from there.

Q17 Mr Lepper: That has clarified that for me, thank you. You said that the speed of understanding of science by scientists increases rapidly. You also talked about the importance of the international panel but said that it will continue "at its own pace". I was a little worried by that "at its own pace". Is

there that suggestion that the political discussions at international level are lagging behind the speed of accumulation of scientific understanding?

Professor Sir David King: The Intergovernmental Panel on Climate Change is an Intergovernmental group of scientists; that is not a political grouping. The COP meeting taking place in Brazil this week is a meeting of officials from governments. That continues under the United Nations Framework on Climate Change which will continue to meet on a regular basis, certainly more than once a year, but the scientists will only next report I think in 2007. They make a very detailed report. The report of the scientific community published in 2001 is many hundreds of pages long and it does represent the work of thousands of scientists.

Q18 Mr Lepper: Is science currently looking at not only mitigating the effects of climate change, which is what we usually talk about, but also adapting to the effects of climate change? Is the balance right in the way in which both the scientific community and the public generally think about the issue of climate change: mitigation, adaptation?

Professor Sir David King: I am very glad you have posed that question in that clear form because I think that it is quite right that we focus attention on mitigation because carbon dioxide reductions are going to be key to the long-term behaviour of our planetary climate system. In the shorter term, adaptation measures are vital for almost every country round the world. It is often said that countries like Russia will benefit from the climate change, the warming of the climate. The melting of the permafrost creates massive problems for built environment on the permafrost. As a matter of fact, the Alaskan pipeline is already beginning to suffer from the melting of the permafrost in the Alaska-Canada region. The climate change impacts region by region around the world are quite severe. Because these impacts begin to take effect rather slowly I think countries are being slow to respond to them. If I can just dwell on the hot summer of 2003: I am one of those who stresses that we must not associate each extreme event with climate change, so in the case of Boscastle, I do not know if that would have happened with or without climate change. The summer of 2003 is the biggest natural disaster that central Europe has seen probably since 1500 or maybe longer. Currently, we estimate over 30,000 deaths can be associated with that very hot summer we experienced in Europe. It is certainly the hottest on record by a long way, by such a long way that when you take the data we have going back to 1864, that summer of 2003 stands—excuse me the mathematical term—5.2 standard deviations away from the mean of that period, which means that it is a 1 in 1,000 year event. That is only if you take 1864 to the present time as static. Now there have been two very detailed statistical analyses of that summer published which show that, however, with warming of the climate the extremity of that temperature rise, half of it can be attributable to the baseline increase and half to an extreme event. We can say with 90% confidence that half of the severity is attributable to

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climate change. Then extrapolate forward and by the time you get to about 2045, that will be a typical summer in Europe. That event which would have been a 1 in 1,000 year rises to a 1 in 100 and actually happens and in perhaps 35, 40 years' time will become an average summer, by which time we will not be going off skiing in the Alps.

Q19 Mr Lepper: Can I ask you one final thing? We talk and you have talked now about global warming and about climate change in that sense. We have had some evidence from the Biosciences Federation which talks about research which could indicate that changes in ocean currents could cause Europe to freeze. What is the status of that theorising at the moment? What is the likelihood of it happening? Are the two scenarios that seem to be global warming and global cooling incompatible or are they part of the same issue?

Professor Sir David King: They are certainly not incompatible, and it is certainly not going to happen *The Day After Tomorrow*. If I can for a moment, Chairman—I realise my children tell me I am inclined to give lectures so you must stop me—but if we take the ocean over the equator as being hot by virtue of receiving much more solar energy and the fact that it has a movement up towards the northern pole, so that ocean surface water that is hot moves up to the northern pole. As it gets up there, it is cooled down and as it cools because it is saline, salty, it drops below the hot current and can actually flow back underneath it. We have this thermohaline circulation current which is the world's biggest heat conveyor. It is conveying heat from the tropical regions up into the northern region. Our temperature is, therefore, maybe 25 degrees centigrade higher than it would otherwise be. A corollary, by the way, is that equatorial temperatures are, therefore, lower, so there is a balance. It depends on the salinity of the water. What happened eight and a half thousand years ago, and this is why we have some knowledge of this, was that over Canada there was an ice dam formed that was literally damming up over Canada a great pool of fresh water. During the warming from the last ice age, that ice suddenly broke, the dam broke and the water flowed into the North Atlantic. The salinity rapidly changed and it switched off the thermohaline current. In that period the global warming was arrested and then climbed up again in Europe. That is exactly what the scientists are raising as a possibility of happening as we lose Arctic ice. We have lost at least 40% of Arctic ice so far over the last 50 years. As that goes, because ice itself is non-saline, the salinity of the oceans changes and that threatens the thermohaline current. The probability of that happening, the probability of it switching off is probably low. The probability of slowing down the circulation may not be so low. There is some evidence coming through now that there is some slowing down. The overall timescale of the event—and this is why I referred to the film *The Day After Tomorrow*—it will not happen in two weeks. It is something that if it happens, it may happen over a three-decade period. There is another interesting

question which is: if we have the rest of the globe warming up and we are then losing the thermohaline current keeping us warmer, we may end up with a climate in balance.¹ There is no clear indicator that we would actually go into a mini ice age, but because the rest of the globe is warming up, we may not suffer. Having said that, my final point is that the areas around the equatorial region will warm up more as a result of switching off the thermohaline current. All the focus is not on what happens in the north, which is where we are, but actually Africa, which is already set to suffer twice the average temperature change for the globe.

Q20 Patrick Hall: Sir David, you talk about two things we have to do now: one is to deal with the immediate impact; the second one is to reduce emissions for long-term effect. This Committee took evidence on water pricing recently and Ofwat and others were subjected to a similar question in which I participated. There was no denial of global warming climate change from the water industry and from Ofwat, but what was said was that there was insufficient evidence now to justify a step change in investment that would be needed, for example, with the sewerage system to be able to take the increased frequency and intensity of heavy rain episodes. That is the view I think, I am recalling fairly, of not only Ofwat but possibly the Environment Agency as well and certainly the water industry. I suppose I am putting you in a position of judging another industry; that is not quite the intention. Would you say that there is sufficient evidence now of the impact of climate change?

Professor Sir David King: I have already mentioned the summer of 2003 as the kind of event that we would not have seen happen with that severity without the underlying climate change. If we look at the UK—and I am in danger of repeating what I said to this Committee before—one of the indicators of climate change is the usage of the Thames Barrier where we see that it was first used in 1982. Its use was anticipated to be once every two or three years. It is now used on average six times a year. That is increasing on a growth curve that is correlated with these climate change events. All of these are indicators that these factors are playing through into the climate system already. One of the important events is increased intensity of rainfall and our drainage and sewerage systems were not designed for these more intense rainfall systems. I set up a foresight programme which engaged 92 scientists over 18 months. It was an in-depth analysis of the kind that no other country has managed to date looking at the potential impacts of climate change

¹ *Footnote inserted by witness:* The latest publications by the IPCC state that all models show a weakening in the Gulf Stream but none predict it to shut down by 2100. Deliberately switching off the RHC in climate models leads to a cooling in the UK, but the level varies depending on the models used. An average figure published by the IPCC shows UK temperatures falling by 1-3 degrees centigrade over a decade. The more probable outcome is that any reduction in average temperatures in North-West Europe due to a weakening of the THC will be more than offset by global warming.

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on our systems for the next 80 years. That indicates very clearly that the impacts will be severe unless we begin to invest now in modernising and upgrading these facilities. One of the factors that was surprising to many people about our report: they anticipated that the biggest problems would be the coastline where you get a double whammy from coastal attack and from fluvial flooding. As bad as a potential increase in risk was for our major Victorian cities because of the factor that you mentioned. We feel that our Foresight programme does signal that increased investment is required, but that it can be spread over many years. It does not have to impact immediately as long as planning begins now and can begin to be implemented. In September of this year in London, as you probably know, it was decided after a flash flood to spill 250,000 tonnes of sewage into the Thames. That is the kind of event that can only be avoided by quite a big investment in the future.

Q21 Mr Lazarowicz: Sir David, if I could ask you a supplementary on the issue of the changes in the ocean currents which we were discussing, changes in the ocean currents leading to global cooling. Without going into too much technical detail, what are the kind of signs you might expect to see that this was indeed occurring, to what extent are we seeing those signs now and, if we were to see those signs, what we could do about it or would it be too late at that stage?

Professor Sir David King: Signs of the—?

Q22 Mr Lazarowicz: Changes in the ocean currents on the lines that you were outlining earlier to my colleague here.

Professor Sir David King: I think there is only one way to answer that question. It is exactly the same answer I would give if I was asked about the Greenland ice sheet beginning to melt irreversibly. If we start seeing it melting, it is a bit late. I think the answer to the question is: we have a global climate system and we can treat it experimentally but at our own cost. We can test it by raising carbon dioxide levels to see if it responds the way the scientists are predicting or we could avoid doing that.

Q23 Mr Drew: If we could look at the paper that you presented to us, which I have to say is a great benefit and majorly concise which sums up the main issues. Understandably, you highlight the UK Government's role as per the EU Presidency and the G8 next year. If I can take the second of those first: you talk about what we, as a country, intend to do by highlighting our concern for Africa. Obviously climate change is a specific issue with regard to Africa which you have just mentioned. It is nice of us to highlight that, but in a way we have to be very careful we do not patronise the Africans by telling them this is their problem as well as our problem, when the reality is they see the problems of conflict, certainly of underdevelopment, poverty as being well in advance of this. What would your message be

to those African governments who have yet to see this as a specific issue which they have to address even if we would want them to address it?

Professor Sir David King: I will take your question re Africa, but if I just treat the international situation first of all. It is very important in terms of this global problem that we bring all countries into the international process. At the moment, the only game in town is the Kyoto Agreement. Therefore, it is important that we engage with all countries in that agreement. What I am keen to see is that in that discussion we take into account, all of us, jointly, not preaching to anyone, but take into account the local circumstances, whether economic or in terms of local climate. The African continent situation is that their carbon dioxide emissions per person are lowest globally at around 1 tonne per person of carbon dioxide per annum. The United States is at 21 tonnes per annum per person. I think that it behoves us, therefore, in discussions with Africa not to focus on their need to reduce carbon emissions, but rather to focus on the need to prepare for the increased impacts that climate change will have on their countries and for us to be offering through North-South capacity building exercises assistance in that process. In other words, I would bring African countries into the discussion by indicating to them that we would be prepared to work with them on using scientists and engineers to see what impacts there will be for their societies from climate change, just as we have done this for the British Isles to advise our Government: we could offer that. We are already offering this to other countries. We are talking to China and India about implementing our programme to investigate what needs to be done in their countries. I think this is a way of bringing these countries into the discussion.

Q24 Mr Drew: If we could just look at the issue of how it could be done and we have these two terms: adaptation and mitigation. I will be quite interested to hear what your definitions are of those two and how this is something that has to be addressed by looking at maybe the role of EU and what we should be doing as part of EU.

Professor Sir David King: If we did not have a Thames Barrier, adaptation would be to put up a Thames Barrier. The Thames Barrier was designed for a 1 in 2,000 year event. Because of the changes in our climate system it will probably be a 1 in 1,000 event that it would sustain by 2030. Looking forward for the UK, adaptation means seeing what kind of retrofitting needs to be done to the Thames Barrier to keep it at 1 in 2,000 into the future and maintain the safety of London; that is one way of adapting. Another way of adapting for the UK is to declare regions of our countryside as potential flood plains which could be used in the case of flash floods in a city for run-off water to be taken allowing the cities to be kept free of floods, but this means that those flood plain areas would not be designated for building permission. That is what I would describe as adaptation. Mitigation: quite simply reducing the basket of greenhouse gas emissions.

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Q25 Mr Drew: If we could move on to the role of our Presidency of the EU, and clearly mitigation and adaptation will be something that we will have to work through with the EU. The countries that have as yet failed to sign up to Kyoto, if my list is correct, the US, Australia, Liechtenstein and Monaco. I was tempted to say how are we going to deal with Liechtenstein and Monaco, but we will put that to one side for the moment. What is the pressure that the EU brings to bear to deal with the US and Australia, given that there could be a response of an African regime to say: why are we bothered about this? The main country in the world with the highest level of greenhouse emissions is not serious about this. The reality is we know the Americans have their own attitudes towards compliance, which is not nearly as bad as is sometimes pointed out, but we still have Kyoto as our main flag behind these remarks. It is pretty important that we all march in the same direction. What would you be saying via the Prime Minister through the EU to the way in which we should be addressing this with the Americans in particular?

Professor Sir David King: Can I first of all address the situation with Russia because I can then refer to a situation you might have asked me about, but we have seen a change there. I think it would be fair to say that the UK, acting with its European partners, worked very hard with Russia on ratifying the Kyoto Protocol over a long period through this year. I was one of the players in that process; it was not a straightforward question of persuading them at every front. I think people realised that membership of the World Trade Organisation was involved in the discussions, so bringing other matters into play was significant. The net outcome is that we have Russia on board ratifying the Protocol, so from 16 February the Protocol comes into play and we move into global emissions trading; that is now the new situation. As I said before, I believe the financial centre for that new trading is going to be London. That, in itself, is a matter that has not gone unnoticed in the United States, the fact that the trading centre will be in London; it is a big commodity. The United States is a country with 4% of the world's population, 25% of the world's emissions, it could be a slightly higher figure, but it is of that order. Quite clearly what is required in international agreement, in bringing China and India on board, let alone Africa, is going to be that the United States is also an international player on that scene. As we move forward with Kyoto coming into play, I do think that we are going to see those three big players—China, India and the United States—talking to each other about the actions that will be required. They are all in very different situations, but each of them is a substantial carbon dioxide emitter in total, not per person but in total, and India and China are growing very rapidly, but I do think that process will have to move together to avoid the problem that you raise. Africa, I would say, is somewhat different because I would focus more on the need for capacity building, the need to avoid the major impacts of climate change.

Q26 Mr Drew: The last question is: we heard what the Secretary of State had to say today and the subtext to that was that we are going to become much more serious with regard to energy efficiency. Clearly, you have been briefing and assisting in how we take that forward. If we look at the UK's approach within the wider international context, how can we move towards really serious energy efficiency mechanisms and see a much more rapid reduction in the use of fossil fuels? What sort of keynote points would you be saying, besides what the Secretary of State has glossed over, shall we say, today?

Professor Sir David King: I think 50% of our emissions come from the built environment, 25% from transport and 25% from industry; that is the overall breakdown. From that you can see why the focus is on the built environment for energy improvements. The efficiency there is the big win-win payback. The 25% in transport is the rising figure I would say, for the reasons we discussed earlier. That is where technological innovation is most likely to come into play and it is going to take some time. We have the hybrid engine coming in now. There is the possibility of hydrogen fuel cells coming into play some years down the road. I think that we are going to see big changes in our transport sector. Everyone knows that the average car is quite a long time on the road, so once again there is a time lag in that process. There are very big potential gains to be had in combined heat and power systems. Quite simply, if you generate electricity at a power station you throw 60% of the energy away in the form of heat and the rest in electricity. You then put it back into houses and convert that into heat. If you have a combined heat and power system you generate electricity and heat where you need the heat; there is where a very big saving can be made. We have roughly 5% of our energy on the grid from combined heat and power. Best practice: Denmark, 50%; that is the sort of aim that I think we should have.

Q27 Mr Mitchell: Are the intentions of the UK's own climate change programme realistic?

Professor Sir David King: Is the intention to reduce emissions by 60% by 2050 realistic? I think it is realistic in the terms of: is it doable? I am not going to give the answer you are expecting. Is it realistic in terms of is it ambitious enough? I am not sure because it could be that if we want to avoid these major impacts threatening the thermohaline circulation, the Greenland ice sheet melting, that we may have to increase that target perhaps to 80% by 2050. I think that my only question of realism is: what is actually going to turn out to be enough?

Q28 Mr Mitchell: Realistic even in terms of emissions from aviation, for instance?

Professor Sir David King: I think in terms of aviation, it is going to be critically important to see that aviation fuel is included in emissions trading. In other words, I think you have to internalise the external costs of CO₂ emissions in order to provide the fiscal lever for good behaviour in that arena.

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Q29 Mr Mitchell: Basically, are you saying it is realistic in terms of what the world is doing but not realistic in terms of what it needs to do?

Professor Sir David King: It is realistic in terms that, globally, governments need to recognise the importance of this issue. Once that is recognised and there is an agreement that we need to deal with and are all sitting around a table, we can begin to tackle it. One of the criticisms of the Kyoto process that is often made is that it will not reduce emissions enough to tackle the problem. That is not the point of the Kyoto process; it is a fiscal process. It is a cap and trade mechanism which can be tightened. Once we have agreement, sitting around a table and discussing what level of emission we should aim to not go beyond, then we can sit down and reset targets as we progress through the next few decades.

Q30 Mr Mitchell: Of course, that is not rectifying the damage already done.

Professor Sir David King: The only way we can rectify the damage already done would be to put up carbon dioxide scrubbers in the atmosphere.

Q31 Mr Mitchell: Can we do that?

Professor Sir David King: There is a scientist from America, Wallace Broecker, who is very keen to demonstrate that we can do that. He has generated large scrubbers that stand perhaps as high as the ceiling in this room and about a metre wide and he reckons if we had about 1 million of these placed around the United States we would begin to be scrubbing carbon dioxide out of the atmosphere. That is not a lot, but the problem is that, having captured the carbon dioxide, you then have to store it, and that problem has not been solved.

Q32 Mr Mitchell: I have a great interest in scrubbers actually, which are aesthetically pleasing, as windmills!

Professor Sir David King: Yes, he set some up in the park in New York to demonstrate that they were aesthetically quite pleasing.

Q33 Mr Mitchell: Politicians are very good at preaching and warning of the dangers to come. What does the Government need to do get and keep this on track?

Professor Sir David King: To get the UK on track?

Q34 Mr Mitchell: Yes?

Professor Sir David King: Your question is: how does the UK stay on track in order to provide this leadership role.

Q35 Mr Mitchell: When it comes to hard measures, what does the Government have to do apart from preach?

Professor Sir David King: I do not think that I see my colleagues preaching. I do see them acting on this issue, but that is not for me to say. What I think is required is—and I come back to fiscal process, to regulatory process—right across the board, whether we are talking about use of vehicles on roads, in the air, generation of electricity by utilities, use of energy

by industrial companies, the private sector, the way in which individuals behave in our society, in other words, is it really necessary to drive SUVs around London? There are choices that we all make.

Q36 Mr Mitchell: It manifestly is not, but people are going to go on doing it so long as it gives them a kind of macho sensitivity, are they not? So government at some stage is going to have to take measures that hurt. It is no use just saying, “Do it this way, do it that way”, and just preaching to us. When is it going to begin to inconvenience people? When does it need to begin to inconvenience people?

Professor Sir David King: Once again, we come back to saying that I believe economic measures are what will bring about most of the changes that are required. I do not believe we should be preaching at people—I now understand what you meant—to say, “Behave better”, but, if it is economically advantageous, for example, congestion charges not being applied to cars with hybrid engines, it is precisely that sort of thing. If you are coming into London on a regular basis, it is quite a big cost difference, and then you discover your petrol charges have gone down as well.

Q37 Chairman: Before I bring Mr Simpson in, can I ask you about something that has been niggling at the back of my mind, a term which is often used. You talked at the outset about part of the reason why the energy generating sector had contributed to an increase in CO₂ emissions by the greater use of coal. A phrase that is often used here is “clean coal technology”, as if magically we can dissipate coal as a generator of carbon dioxide. Would you explain just explain to me what this clean coal is?

Professor Sir David King: There are two sides to clean coal technology. One is less noxious fumes. Sulphur dioxide NO_x is nothing to do with greenhouse gas emissions of the kind we have been discussing here. We have been focusing this on carbon dioxide emissions. You burn coal, you get carbon dioxide. Clean coal power stations are, however, much more efficient at producing electricity per ton of coal—you do reduce the amount of emissions per kilowatt hour of energy that is produced—so clean coal technology is a help. One of the important aspects of pushing for clean coal technology, for example, as China builds more and more coal-burning power stations, we are encouraging the building of power stations that use clean coal technology, because these power stations can be retrofitted for carbon capture and storage once the storage capability has been developed by the technologists. In other words, if at some point 10 or 20 years down the road carbon capture and storage becomes a useful technology, then it can be retrofitted on a clean coal power station. It is a good form of behaviour, but at the same time, one has to stress, at this point in time we do not have a clear technology for carbon capture.

Q38 Alan Simpson: For one moment there, Chairman, I was tempted to feel virtuous listening to Sir David when he talked about the need to go into

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an increased use of combined heat and power in the sense of changing individual conduct in the way we approach energy! That is pretty much what I am doing with a derelict building in the middle of Nottingham which will generate more energy than it consumes on a renewable basis; but I have to say from that experience, Sir David, if this was being done on the back of market incentives I would not have even begun to go there. So to presume that we have anything like a framework that incentivises that shift does not square with my experience, let alone my analysis. What worries me, however, is that I am not even convinced that we can get there just on incentives. One of the great paradoxes is that we might need to push into this idea of changing market rules rather than just fiscal incentives. If you go round the energy companies and talk about their business plans today, they all still talk about selling more consumption or having a larger share of consumption. Ask them how they approach the selling of less consumption and you just meet blank faces. I am just wondering whether, in fact, there is not a case for a much more radical rethink of the nature of energy markets. Why is it that we say to energy companies that they are not allowed to take part in a trading market that sells home warmth?

Professor Sir David King: Sells home?

Q39 Alan Simpson: Home warmth, so that you sell the non-consumption of energy against thermal efficiency gains rather than the consumption of energy. Given the scale of the scientific analysis and the consequence, do we not need a paradigm shift in the way we think about the nature of markets for non-consumption rather than slowing down damaging consumption?

Professor Sir David King: I think you and I are going to find a large degree of agreement on this. The kind of fiscal processes that I am pressing for are, however, a vital part of that whole process. If I have understood what you are saying, the mere fact that more people are discussing this as an issue, that it is appearing in the media as an issue now on a frequent basis, is already coming through into people's thinking on how they should operate within this energy consuming world of ours. I hesitate to say anything that would be interpreted as preaching, but I do think that it is a changing culture that will emerge simply by people becoming more aware of the consequences of continuing as we did before. The kind of macho behaviour that Mr Mitchell referred to I recognise, and, of course, we all do, and in a way the high energy consumption indicator of your profound ability to stand with a large footprint on this earth is part of that process (a rather male sort of picture, I know), but I think that changing that as the ideal image is what would accompany this kind of discussion, but I do think we need the fiscal process as well.

Q40 Alan Simpson: I am not disputing that, it is just that it seems to me that I am having difficulty pushing you beyond fiscal processes. For instance, it

seems to me that one of the realities that we have to face in government is that probably 80% of the population today will live their lives in 80% of the existing housing stock today, so what we do in terms of new building standards is in the other percentage; it is what we do with the existing stock. We know, for instance that the least thermally efficient properties are the privately rented, multiple-occupancy properties in relation to which we are beginning to introduce an approach to licensing. Does it not make sense to then say you have to set thermal efficiency standards that would apply to the right to have a licence? Would it not mean, in addition to that, that in the same way that we have energy-ratings for white goods that you have energy-ratings as part of a property portfolio so that, at the very least, people are able to judge the thermal efficiency of properties they are renting or leasing or buying? Have we not got to go into that—that sets the measurement of our improvements in thermal efficiency—if we want to demonstrate thermal efficiency gains?

Professor Sir David King: It is all a question of leading and having the public with you in this route. I think any government would be concerned about stepping out too far from where the public want to be at any point in time, and so I think that, as this whole issue becomes more of an issue of public concern, there will be more acceptance of the kind of measure that you are talking about.

Q41 Chairman: Can I conclude with one final request, if you are able to help us? The question of transport and aviation has been a theme that has woven its way through a number of our exchanges and you have also put a strong emphasis on the need to further develop fiscal measures as a way of achieving some of the objectives to which you have referred. What we are lacking is an indication of some of the elasticities that are involved in air travel. If there is any work that you know of to which you might be able to direct us to give us a better understanding of the economics of air travel and the trade-offs that would occur if by whatever fiscal measure you chose you put the price of it up, that would be exceedingly helpful to us.

Professor Sir David King: There is a good challenge. Can I correct one point I apparently mistakenly made earlier on, which is that I referred to the COP 10 meeting that is taking place now as being in Brazil. It is not. It is in Buenos Aires in Argentina.

Q42 Chairman: We were just off, but you have saved us going to the wrong place. It is very kind of you to save us that difficult journey. On behalf of the Committee can I thank you, as always, for the clarity and candour of what you have said. If there are any further thoughts in addition to the ones that we have specifically asked for that you would like to contribute in the light of our questioning, we would, as always, be delighted to hear from you. Thank you very much indeed for coming and answering our questions.

Professor Sir David King: Thank you.

Supplementary memorandum submitted by Sir David King (U34a)

QUESTION

Mr. Michael Jack:

1. Do think the Climate Change Levy is working? How much carbon, for example, has been saved by the Levy to date?

ANSWER

When the Climate Change Programme was published in 1990, the Levy package as a whole was forecast to save at least 5 million tonnes of carbon (MtC) per year by 2010. This included savings of at least 2.5 MtC from the Climate Change Agreements CCAs. The Government commissioned an independent study of the effects of the CCL by Cambridge Econometrics in 2003. It hopes to be in a position to release final results at Budget 2005.

In relation to the CCAs, in 2002, the first target period, the total of the absolute savings in carbon emissions from each CCA sector compared to its baseline was around 4.5 MtC per annum. These figures are dependent on changes in industrial activity and for 2002 take into account a significant drop in output in the steel industry. Although a large fraction of these savings (over 2.5 MtC) was achieved in the steel sector (mainly through reductions in production) many other sectors also achieved savings beyond their targets for the first and later milestones, and many have already achieved their 2010 targets. The total absolute savings from the other sectors combined was 1.9 MtC per annum. These targets are currently being reviewed to ensure that they continue to represent the potential for cost effective energy savings taking account of any changes in technical and market conditions.

QUESTION

Mr. Michael Jack:

2. Is there any work that you know of to which you might be able to direct us to give us a better understanding of the economics of air travel and the trade-offs that would occur if by whatever fiscal measure you chose you put the price of it up?

ANSWER

Hard evidence is difficult to get with problems in fares data meaning that from air traffic forecasts in the Department for Transport (DfT) they were only able to derive robust estimates for some market segments. Previously the DfT have tended to rely on estimates from the literature, which are subject to a range, when looking at the impact of outside developments or policy scenarios.

DfT used an overall estimate of -0.8 until the late 1990s, but rounded it up subsequently partly for reasons of arithmetical simplicity but also because of changes in the structure of the airline industry, principally the emergence of No Frills Carriers (NFCs), which were indicating a higher passenger responsiveness to lower fares by both business and leisure passengers.

In all the analysis of the impact of alternative assumptions and policy scenarios carried out in the Future of Air Transport White Paper and the preceding consultation documents, the DfT assumed a fare elasticity of -1 (so that a 10% increase in air fares would result in a similar reduction in passenger demand). See for example paragraph 11 of Annex A of the White Paper which considers the impact on demand of measures to cover external costs. (BELOW—

http://www.dft.gov.uk/stellent/groups/dft_aviation/documents/page/dft_aviation_031507.hcsp)

“As the Government has a policy commitment for aviation to pay for its environmental impacts, modelling takes account of the effects of an economic instrument, such as a permit trading scheme, on future demand. An economic instrument would reduce the demand for flights, as the cost base for the industry would be increased. In *“Air Traffic Forecasts for the United Kingdom 2000”*, we calculated that a notional 100% fuel tax would lead to a 10% increase in airline costs (assuming fuel costs were 10% of airline costs)—and a 10% increase in air fares, assuming the increased costs were passed through in full to passengers. This would then have the effect of reducing demand by 10%.

12. Since the national forecasts were published in May 2000, there appear to be factors at work leading to airline costs—and hence air fares—declining faster than was previously forecast; and their effect is sufficient to offset the fall in demand expected from the impact of any economic instruments. These factors are:

the “no-frills” sector: The no frills sector (such as EasyJet and Ryanair) is expected to capture more of the mainstream domestic and short-haul markets. These airlines, with substantial lower costs and fares than traditional airlines, will contribute a large stimulus on the UK aviation market.

greater competitive pressure: It is expected that to ensure commercial survival, the cost base of the traditional scheduled airlines will need to be cut. The pressure to cut costs stems from the competitive threat of the NFCs.

liberalisation: In long-haul markets, it is expected that the liberalisation of current regulatory restrictions will represent an important cost driver. It is also believed that increased airline competition resulting from additional airport capacity will put downward pressure on costs.”

January 2005

Memorandum submitted by the Tyndall Centre for Climate Change Research (U8)

The Tyndall Centre brings together scientists, economists, engineers and social scientists, who together are developing sustainable responses to climate change through trans-disciplinary research and dialogue on both a national and international level—not just within the research community, but also with business leaders, policy advisors, the media and the public in general.

The Tyndall Centre welcomes the opportunity to submit evidence and would like to be kept informed of the development of the inquiry and the committee’s responses to it.

1. The forthcoming review of the UK Climate Change Programme during 2004–05, looking particularly at what new policies might be needed to keep the United Kingdom on track in reducing all greenhouse gas emissions.

EXECUTIVE SUMMARY

We welcome the forthcoming review of the UK Climate Change Programme, but stress that in its current state the Programme is seriously off course and the UK will not meet its carbon reduction emission targets of 20% by 2020, let alone the 60% by 2050. We suggest a significant overhaul of the Programme, especially in the areas of transport (including aviation and freight), renewable energy, energy efficiency, energy consumption, agriculture, building and construction. We propose the use of Domestic Tradable Quotas (DTQs) as a “cap and trade” scheme for greenhouse gas emissions.

We acknowledge the key role that the UK Government will play in 2005 as Chair of the G8 and as President of the European Council in driving forward the Kyoto and post-Kyoto agendas. We urge the Government to use this opportunity to re-engage the USA and Russia in dialogue towards ratification of the Kyoto protocol.

1.1 Aviation

The Aviation White Paper, “The Future of Air Transport”, fails to give proper attention to the way in which projected air traffic expansion will more than double carbon dioxide emissions from UK flights by 2030, to 65–77 million tonnes. It is clear from the White Paper that DfT expects emissions reductions in other sectors, domestically and in Europe, to compensate for aviation growth. However, our analysis broadly concurs with that of the Environmental Audit Committee, raising serious doubts about the feasibility of reconciling the Energy White Paper target of a 60% reduction in CO₂ emissions with projected aviation growth. Neither will European Emissions Trading allow aviation growth and effective, long-term climate change targets to be reconciled. It is important that this is widely understood, before excessive new airport infrastructure is constructed, and before Government opts to explicitly exclude international aviation from the Energy White Paper target. This would very seriously weaken the potential effectiveness of the target and set back policy progress. An urgent review of aviation growth projections and infrastructure requirements in the light of raised ticket prices is recommended.

1.1.1 European Emissions Trading

The aviation industry and DfT appear to believe that bringing aircraft emissions within the European Emissions Trading Scheme will allow the UK aviation industry to grow by providing a larger market within which aviation can buy emissions credits (ie permission to emit). However, if the aircraft emissions of other European countries increase at rates similar to those projected for the UK (as average medium-term Eurocontrol traffic forecasts imply), while at the same time European countries also contract their economy-wide CO₂ emissions to meet effective long term target climate change targets (as they must if the UK’s efforts are to have any meaningful effect), then the same problem will arise on a European scale.

1.1.2 The scale of the problem

Our analysis of projected UK aviation emissions relative to the Energy White Paper target shows that UK aviation emissions in 2030 would equate to 92% of the UK's 2050 domestic target, and 57% of a 2030 value consistent with the 2050 target. There is every reason to believe that the aviation emissions of other European nations would also form substantial fractions of their emissions totals. While the Environmental Audit Committee has used a marginally lower emissions uplift factor and has notionally accepted DfT's claim of a 15% improvement in fuel efficiency by 2015, to give somewhat lower values (66% and 45% respectively), the result is debatable, as the emissions uplift factor used to account for the extra warming effects of emissions at high altitude currently excludes cirrus effects, due to scientific uncertainty about the extent of additional cirrus cover due to aviation. (On average, cirrus warms the Earth by trapping reflected solar radiation.)

While it is theoretically possible that the UK would use about half of its effective carbon budget on one economic sector in 2030, this seems unlikely.¹ If aviation were now brought into a European Emissions Trading Scheme with a contracting upper cap consistent with a 2050 550ppmv-based target, air ticket prices would rapidly rise as airlines passed on the cost of emissions credits, and aviation demand would fall back. However, if we allow new runways and terminals to be constructed on the basis of demand projections that ignore the climate implications, it will be politically difficult to prevent their use.

In terms of climate policy, there is no effective short or medium term substitute for including UK international aviation emissions, voluntarily allocated on a 50:50 destination/origin split or similar, as part of the UK's energy White Paper target. While the International Civil Aviation Organisation (ICAO) is investigating international emissions trading for aviation, it favours an open (multi-sector) international system, which would take many years to agree and in the medium term would be unlikely to be consistent with stringent climate change targets because of the required international consensus on the targets. Domestically and internationally, we are at a critical stage in international climate policy. The UK cannot reconcile a near-trebling of air passengers (by 2030) with any effective post-Kyoto climate policy.

1.2 Tyndall aviation research on a contraction and convergence climate regime

Drawn from the 22nd report of the Royal Commission on Environmental Pollution (RCEP), the 60% CO₂ reduction target of the Energy White paper is based on a contraction and convergence (C&C) approach to climate policy. C&C has increasing international support and offers a basis for an inclusive and effective post-Kyoto climate policy regime.

C&C entails selecting a target global atmospheric concentration of CO₂ (RCEP assumed 550ppmv) and a date by which this should be achieved (eg 2050). Emissions trajectories that meet these conditions are then identified for all countries, in such a way that by the target date there is per capita equity in emissions.

Tyndall (North) researchers have assessed The Global Commons Institute model "CCOptions", which allows different emissions trajectories to be output as the date and target CO₂ concentration are varied. They have found the model a useful approximation of more complex global climate models.

The next stage is to relate the European implications of contraction and convergence, per nation, to projected European aviation emissions. We expect this to confirm that a European Emissions Trading System will not resolve the clash between the need to reduce CO₂ emissions, and projected growth in aviation.

1.3 Domestic Tradable Quotas

Domestic Tradable Quotas (DTQs) are a proposed "cap and trade" scheme for greenhouse gas emissions from energy use under which emissions rights are allocated to energy end users: individuals, firms and other organizations. A government implementing a DTQs scheme establishes the maximum quantity of greenhouse gases that it can emit from energy use during any given year. This carbon budget is reduced year on year in line with nationally and internationally agreed emissions reduction targets.

Each carbon budget is divided into carbon units, with, for example, 1 carbon unit representing 1 kg of carbon dioxide. A proportion of these units is allocated, free and on an equal per capita basis, to all adult individuals.² Under the original DTQs proposal carbon units were allocated to firms and other organizations through a government-regulated auction. Whilst in our view, auction of rights is the preferable method of allocation, allocation by grandfathering³ would be necessary for the DTQs proposal to be compatible with the EU emissions trading scheme.

¹ It will be even less plausible if the atmospheric concentration of carbon dioxide assumed to be safe by the Royal commission on Environmental Pollution and hence DTI in the Energy White Paper (550 parts per million) turns out to be too high to avoid dangerous climate change, which may be the case.

² This would be equal to the proportion of total emissions from energy use resulting from citizens' direct purchase of fuel and electricity (in the UK around 40%) over a nominated period prior to the introduction of the scheme.

³ Where each emission permit is based on the levels of emissions prior to scheme inception.

All fuels and electricity are assigned a carbon rating based on the quantity of greenhouse gases (measured in carbon units) emitted by the combustion of a unit of each fuel and by the generation of a unit of electricity. When citizens and organizations purchase fuel or electricity, they surrender the number of carbon units corresponding to their purchase to the retailer. For accounting purposes, these units are passed up the supply chain and on reaching the primary energy producer are surrendered back to government. There is a national market in carbon units in which individuals and organisations with surplus units may offer them for sale to those wishing to purchase additional units.

Central to the DTQ scheme is a computer database in which the carbon unit account for all citizens and organisations is held, and in which all carbon unit transactions, be they issuing, surrendering, buying or selling, are recorded. All transactions are conducted electronically. For example, a customer purchasing petrol would simply have their “smart card” swiped by the petrol station attendant, thereby transferring the relevant number of carbon units from their carbon unit account to that of the company owning the petrol station. For those purchasers of fuel and electricity without carbon units to surrender at the point of sale—for example, foreign visitors and individuals who have used all their units—the relevant number of carbon units are simply purchased electronically on the national market by the fuel or electricity seller on behalf of the purchaser. The purchaser then pays the seller for these units and surrenders them in the usual manner.

1.4 *Technology policy*

The UK’s renewables policies, are fundamentally inadequate to realise the very large investments required in new, low Carbon energy technologies and energy efficiency programmes that are necessary to meet the 60% reduction target. There is no indication of a large scale adoption of distributed CHP, or of solar power, or of energy efficiency measures. The wind energy programme is gaining pace, but is still not of a scale to meet the UK’s intermediate goals of 10% reduction by 2010 and 20% by 2020.

It should be emphasised that in the area of energy demand and supply, together with energy efficiency measures, the technologies required are already available. The policy problem is to persuade, and to provide regulations and economic incentives to industry and households to take up these technologies on a mass scale. The construction industry is a particular problem; 50% of GHGs come from buildings, but the UK continues to build houses and offices that are of a low standard in terms of energy use and energy efficiency.

It is imperative that the UK government and other governments provide massive support for “clean” energy technologies, without which GHG stabilisation at acceptable levels will be impossible. The incorporation into new homes and other buildings of micro heat and power generation systems based on a combination of solar, wind and other sources should be made mandatory. Market and regulatory/tax mechanisms should be introduced to encourage individuals and businesses to take more responsibility for energy efficiency. This will be more successful if it is based on “positive” incentives to reduce energy use (eg tax reductions for efficiency) rather than negative, punitive policies that add additional tax burdens to individual households and businesses. Grants should be available that cover the full installation costs of domestic micro-power systems, rather than a proportion of the cost as is currently the case.

Motor vehicles are continuing to increase GHG emissions at a rapid rate. The growth in road transport far exceeds the projected increases in efficiency for conventional petrol and diesel powered vehicles. Therefore, stronger policies are required to encourage low-carbon power systems, such as petrol/battery hybrids or fuel cell vehicles. Patterns of settlement, work, leisure and transport should be examined—the current growth of private car use, for example, is unsustainable. Transport policies should reduce dependence on private car use by improving public transport. Issues of transport associated with the distance between homes and work places should also be examined. Could future planning reduce the distances people travel between home and work by rethinking urban development?

Commercial, particularly food, distribution, is another area where emissions could be reduced. Many foodstuffs are transported to distribution and food processing centres before being redistributed to point-of-sale outlets closer to the original sources. Incentives for a more decentralised and efficient distribution system that reduces “food miles” could reduce GHG emissions and possibly also traffic congestion. Greater emphasis on local food production, compatible with current social trends towards the consumption of local, often organic, produce, could improve efficiency of national food production systems.

1.5 *Agriculture and land use*

Agriculture is an important emitter of carbon. Exposure of soil organic matter through ploughing and soil erosion causes mineralization of soil organic carbon (SOC). In fact it is thought to have contributed the equivalent to about a third of the increase in the atmospheric C pool since 1850, making it a significant driver of climate change.

It is thought that about 75% of this could be sequestered back through improved management practices in agriculture. These practices could also improve soil structure, decreasing runoff and improve water infiltration; this will both improve water availability and reduce the risk of flooding. Both are helpful adaptation, as well as mitigation, strategies, both in the United Kingdom and elsewhere.

Under the Kyoto Protocol, the significance of agriculture as a carbon sink is implicit in Article 3.4 (additional land use, land use change, and forestry activities). Moreover some trading of emissions credits from agriculture has already begun outside the Kyoto framework, particularly in the United States. The importance of agriculture as a carbon sink is widely recognised.

However, current agricultural and trade policy in the EU conspires to encourage emissions from agriculture.

1.5.1 Subsidised agriculture and climate change

The UK has argued strongly for reform of the EU's Common Agricultural Policy (CAP). But it needs to redouble its efforts.

Producer subsidies can encourage unsustainable practices such as monocropping of cereals, which increases runoff and erosion; it can also deplete organic matter, which compounds this by damaging the soil structure. Over the last 20 years or so, agricultural soils in the European Union have lost organic matter at a rate that has serious implications for productivity as well as climate change. In England and Wales, the percentage of soils with less than 3.6% organic matter content rose from 35% to 42% between 1980 and 1995 (European Commission, 2000). This causes water to run off rather than pass through the soil to the crop's root zone, and further exacerbates flooding risk, both locally and on a broader scale. There is evidence of such deteriorating soil structure in Britain (DEFRA, 2002).

1.5.2 Flooding and erosion

In the South Downs, there were 60 incidents of flooding of property caused by runoff from agricultural land between 1976 and 1993. There may be insufficient appreciation of the link between such runoff and the major flooding in South-East England in 2000 (*ibid*). Retention and sequestration of carbon in agriculture is therefore highly synergistic with other environmental goals including flood protection, pollution control (from agricultural chemicals) and agricultural productivity. Reform of the Common Agricultural Policy (CAP) is an important first step towards realising this potential.

Meanwhile, similar erosion is taking place in Southern Europe for the opposite reason—because farmers are trying to take advantage of subsidies by packing as many olive trees onto their land as possible—as much as 80 million MT of soil are lost from olive groves in Andalusia alone (Pohl, 2001). EU policy is therefore causing soil erosion in both member states and developing countries.

When soil is eroded by wind or water, the organic matter in it—which is largely composed of organic carbon—is exposed to the air and mineralises. The organic carbon is thus converted to CO₂. The annual increase in the atmospheric carbon pool is about 3.3 Pg C a year (IPCC, 2001). So soil erosion may be responsible for about a third of the GHGs emitted.⁴

1.5.3 How can the UK help?

The UK can press for removal of all subsidies that have perverse outcomes, not just export subsidies. But second, it can advocate a change in emphasis from producer subsidies to payment for environmental services, such as offering farmers a viable price for a carbon “crop”. Farmers in Britain would be well-placed to sequester carbon, as the levels of soil organic matter are potentially higher in less arid environments.

The CAP should be reformed by diverting agricultural subsidies from production support to payment for environmental services. Britain should lead the way in this, through:

- Appropriate modification and administration of set-aside.
- Advocating the switching of resources from producer support to better management practices.
- Building a framework through which farmers can certify and perhaps trade emissions credits earned from sustainable management practices.
- Through better management practices (BMPs) on land that remains in production, to increase soil organic matter and thus carbon, and improve soil structure (reducing runoff and therefore erodibility and flood risk).

The former could include tying set-aside specifically to carbon sequestration. This would prevent farmers from moving set-aside around their farms, enabling reversion to grassland or woody encroachment—both important sequestration processes. Given that carbon is likely to have a growing cash value as countries work to meet their Kyoto commitments, there may even be net gains from using set-aside payments for this purpose.

⁴ Of course not all soil erosion is anthropogenic—that is, the result of human activity. On the other hand, the estimates given here assume that only about 20% of the organic matter translocated by soil erosion is mineralised; another estimate puts it at around 70% (Lal, 2003; Jacinthe and Lal, 2001). The extent to which anthropogenic soil erosion contributes to climate change is hard to quantify, but it is reasonable to assume that it has a significant impact.

BMPs could also include biofuels production. It has recently been argued that if 10% of Europe's agricultural land were managed for biofuels in combination with woodland regeneration, the reduction in emissions would equal the EU's entire Kyoto commitment (Pretty et al, 2003). Biofuels should be approached with caution; their economics of biofuels are contested (Gielen et al, 2002), and it is not yet clear how much energy they could really provide. There could also be perverse effects (see for example the UKPIA's evidence to the Committee, 31 March 2003—although this is scarcely neutral; see also sections 14–44 of the Committee's 17th Report, 29 October 2003). Displacement of food production could also have unpredictable effects. But there is potential.

2. THE ROLE THAT THE GOVERNMENT WILL PLAY IN 2005 AS CHAIR OF THE G8 AND AS PRESIDENT OF THE EUROPEAN COUNCIL IN DRIVING FORWARD THE KYOTO AND POST-KYOTO AGENDAS

Formal negotiations will start on a second commitment period at the SBSSTA (Subsidiary Body for Technical, Technological and Scientific Advice), a subsidiary body of the IPCC (Intergovernmental Panel on Climate Change) in 2005. We believe that Tony Blair and the UK Government have an historic opportunity to provide global leadership on these key issues, and present both Russia and the USA with the undisputable case for ratification of the Kyoto Protocol and establish the path towards a post Kyoto framework.

The priority should be to ensure that the UK plays a constructive role in the negotiations and that crucially, it injects creative and far-sighted suggestions for an architecture that would genuinely address the concerns of developing countries, and as far as possible the concerns of the US and others who have not yet ratified.

It is also important at this time to take bold action on the adoption of a target for stabilisation (the ultimate objective of the convention)—the UK has an adopted target of a 2°C temperature rise. The UK should adopt this target (or a similar concentration-based target of 450–550 ppm) and make it clear that this is what the international climate regime should be trying to achieve.

Recently there have been signs of a debate within Europe over the burden of economic costs of meeting emission reduction commitments. Here the committee should be aware of the following:

A key intellectual debate in the academic community is the question of just how much emissions reductions will cost, and whether current economic and Integrated Assessment Models⁵ predict excessively high estimates of the long-term costs of GHG mitigation. Recent advances in the field of technology modelling and technology policy suggest that when models attempt to fully incorporate eg the fact that a new low-carbon energy technology may become much cheaper as its uptake increases, the predicted costs of mitigation can decrease drastically. Hence, this active area of academic research should be properly incorporated into the political discourse on what is possible both within Europe and in a second commitment period.

We believe that there were too many compromises made to the EU Renewables Directive for member state interest (Eg UK's non binding target of 10% by 2010). The UK should ensure that frameworks are established to allow renewables targets to be compatible with climate policy. We need to examine what mix of renewable energy and technological innovation is needed to reach emission reductions post 2010 under various policy scenarios. The Tyndall centre is actively researching in this area.

Various attempts are being made to engage with eg Russia on diplomatic and scientific levels over the issue of climate change. Areas where efforts can be maintained include to: to encourage constructive engagement between UK and EU scientists and scientists from countries who have not yet ratified; for the UK to send out a very strong signal that it will meet its commitments under the protocol whether it actually enters into force or not. In terms of the US, the UK's current approach of building bridges where possible is appropriate.

There are many proposals on the table but it seems likely that the way forward must be through differentiated categories of commitments, where eg: (most) developed countries signed up to quantitative emission reduction targets; a second group of countries sign up to carbon-intensity based targets; and a third group of countries (mainly the official Least Developed Countries) don't make any emission reduction commitment but have adequate access to compensation funds (for adaptation to the negative impacts of climate change for example).

Serious pressure, including trade sanctions, should be put on countries that refuse to ratify the Kyoto protocol and future agreements to limit GHG emissions until they do so. The UK needs to play a role in finding a way forward on a workable architecture. This might be a leadership role or it might also be to play

⁵ For more information on Tyndall's IAM, see: http://www.tyndall.ac.uk/research/theme1/summary_it1_31.shtml

a constructive role in supporting an emerging developing country-led proposal, as in the case of the UK Overseas Territories (UKOT's). These are small low-lying island states, particularly at risk from the impacts of climate change. The UKOT's have fallen through the gap (FCO-DFID-CPACC) in terms of preparedness for climate change. Also they do not receive any of the adaptation funds available to other countries as they are UK territories.

CPACC⁶ does not extend to the UKOT's and FCO-DFID have not organised between themselves who is responsible to pay for the extension of the CPACC lessons to the OT's. The territories would like to extend the convention to their islands, but are unsure about their obligations to mitigate if it is extended.

The UK might also learn from the experience of allocating commitments within the EU—there is in effect a North-South divide within Europe, and the agreed allocation of GHG emission reduction commitments cannot be separated from the massive amounts of finance that has been put into eg the Cohesion Funds (for Spain, Portugal, Greece and Ireland).

2.1 *Adaptation: high impact policy*

The types of adaptations that will enable the UK and other countries to confront climate change will vary considerably across geographic regions, economic activities and population groups. This “context specificity” means that adaptation is more likely to be successful if strategies are developed at the local level. The role of central government should therefore be to encourage meaningful, inclusive, devolved decision-making, and provide what support it can for local initiatives.

Adaptation and mitigation are intimately linked—the less emphasis is placed on mitigation, the more difficult adaptation will be. Adaptation may be impossible in the face of rapid and large-magnitude climate change associated with rapid increases in atmospheric GHG emissions.

Policies should recognise that adaptation is often reactive and somewhat ad hoc in nature—it is much easier to ensure mitigation through policy than to guarantee adaptation; mitigation is ultimately a technical issue (issues such as market penetration notwithstanding), whereas adaptation is much more of a behavioural one. Adaptation can be pursued through vulnerability reduction based on the mapping of climate hazards and social vulnerability to identify “hotspots” of high climate risk. Assessments of climate hazard based for example on a combination of future climate projections and assessments of local geographical factors (topography, geomorphology etc) could be incorporated into the planning process, identifying potentially high risk areas where industry, infrastructure and settlements might be particularly exposed to the physical manifestations of future climate change (eg flooding, high winds, drought-induced subsidence etc).

30 September 2004

Witnesses: **Ms Sarah Wynne**, Tyndall Centre HQ, University of East Anglia, **Dr Alice Bows**, Tyndall Centre North, University of Manchester, and **Dr Kevin Anderson**, Tyndall Centre North, University of Manchester, Tyndall Centre for Climate Change Research, examined.

Q43 Chairman: Can I welcome representatives from the Tyndall Centre for Climate Change Research, Ms Sarah Wynne, you come from the University of East Anglia?

Ms Wynne: Yes.

Q44 Chairman: Do you have an official title or just a person from the University of East Anglia?

Ms Wynne: I am actually not a doctor. I have not found a way to finalise my PhD yet, so I am just a research associate.

Q45 Chairman: Excellent. You are very welcome. I hope, Dr Alice Bows, you are alright to be called Doctor?

Dr Bows: Yes.

Chairman: You are from the Tyndall Centre North in the University of Manchester, and you are joined by your colleague, Dr Kevin Anderson, who is also from the Tyndall Centre North in the University of Manchester. You are all very welcome. I would like to invite Austin Mitchell to start our questioning.

Q46 Mr Mitchell: I was interested in the argument about the enhanced effects of aviation because of radiative forcing. What is the science behind the contribution of aviation to climate change, or your assessment of it?

Dr Bows: Basically aviation, because of its nature, it gives out its emissions at altitude; so as well as omitting carbon dioxide, which has an effect on the climate, it emits water vapour, soot and nitrous oxides, sulphur oxides and all sorts of things up in the atmosphere. The atmosphere has certain conditions. Sometimes you see contrails forming behind planes—the white lines you see behind the planes—and they are caused by soot or water vapour, and these are actually very high up in the atmosphere and they cause a warming. The evidence also shows that these can lead to the formation of cirrus clouds, which also cause warming. Different types of cloud cause different types of warming or cooling, and clouds that are very high up cause warming. The issue is that as well as what is called radiative forcing from carbon dioxide you get

⁶ <http://www.cpacc.org/> Caribbean Planning for Adaptation to Climate Change

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additional radiative forcing from cirrus clouds and contrails up in the atmosphere, and overall that means that aviation has a contribution that is between two and four times that of carbon dioxide alone.

Q47 Mr Mitchell: The effect of carbon emissions is heightened in aviation?

Dr Bows: Yes, that is right. It is not the effect of the carbon emissions that is heightened; it is the additional effects that are much more significant for aviation than for any other industry because of where they are emitted, basically.

Q48 Mr Mitchell: Given that and the projection that aviation from the UK is going to double the carbon dioxide emissions from UK flights by 2030, are our climate change goals attainable?

Dr Bows: They do not appear to be particularly attainable with that sort of level of growth. You would have to curb growth in some way. Some work that we are doing at the moment indicates that we might need, as David King was saying, a higher target for emissions cuts by 2050. If you continue with aviation growth at current levels, it might be that aviation will have used up pretty much the whole limit of carbon emissions by that sort of time.

Q49 Mr Mitchell: What is the potential for saving on both sets of effects? Is it possible to get more fuel-efficient planes or planes that do not produce the contrail effect, or will there be a decline in aviation because the fuel price goes up and all the EasyJets go out of business because nobody can afford to fly any more?

Dr Bows: There are two issues: looking at the carbon dioxide and then looking at the contrails. Contrails could be avoided, for example, by flying planes at different altitudes. Also, on some days you will not get contrails at all—it does not matter what altitude the plane is flying at—just because of the atmospheric conditions. It would require a new air-traffic management system, I imagine, to direct planes either in different altitudes or away from different parts of the atmosphere, but that is something that is feasible. Also the thing about contrails is that they only last for hours, and cirrus clouds might only last for a day or so, if that (so these are things that could be taken away pretty quickly), but the issue of carbon dioxide is much more serious in the sense that it lasts for 100 years. At the moment the current efficiency gains that you might get from technology (improving engines, etcetera) and also from the management of aircraft (for example, stopping them circling so much and making more direct routes and that kind of thing) the IPCC estimate could reduce carbon emission about 1% per year, but if you are increasing at 3% or 4%, which is what it seems to be—all the indications show that is what the current growth levels are going to be increasing it by—then you are still increasing the carbon emissions by a large amount every year. The third thing that you could do is fill the planes up more (the load factor, the amount of people on the aircraft). If the planes are

full and there are less flights than before because there are more people on the planes, obviously that will have an effect on the carbon emissions.

Q50 Chairman: Have you tested any of this out in reality? Have you actually done any analysis to find out the number of spare places flying about? Have you reviewed any of your operational hypotheses with, for example, the Civil Aviation Authority to see if they are realistic or—turn it round the other way—what are the barriers to progress? You have put some very interesting suggestions to the Committee, but I notice in your written evidence there is no discussion, and I appreciate that you are constrained by what you can write, but as to what is, if you like, the difference between the feasible and the theoretical. The other thing I notice is that your centre brings together, amongst other people, scientists and economists but in your evidence to date, and, indeed, in paragraph 1.1, there is no economic analysis to discuss the elasticities involved in the fiscal measures of which the Chief Scientist spoke earlier; in other words, what kinds of things are going to turn people off flying?

Q51 Mr Mitchell: Besides all the spare seats are filled by airline staff on cheapies!

Dr Bows: One thing is involving aviation in the Emissions Trading Scheme, because at the moment they are pushing heavily for international aviation to be included. That is likely to have some sort of effect on price, I imagine.

Q52 Chairman: How is it? I am sorry to interrupt you. We are trying to get at the facts. You said that ought to have some kind of effect. Part of the work of a centre like this is to find out what that effect would be. Have you actually done any economic modelling? If we make a recommendation in our report about this area, it is nice to draw on some information that is available. Have you actually got any?

Dr Anderson: No, we have not any modelling. You would have to use one of the Cambridge or the Oxford economic models to give that sort of analysis.

Q53 Chairman: Does that kind of information exist?

Dr Anderson: I think there has been some provisional work in aviation in looking at elasticities of demand, but one of the problems recently, of course, has been the rocketing of low-cost airlines. We have not a lot of historical data as to the implications or the repercussions of modifying that price threshold for that type of aviation and aviation which, of course, is far more susceptible to fuel prices than the traditional scheduled airlines because they pare down all those costs. That is an analysis that needs to be done, but I think also we have to bear in mind that trying to forecast economics for the medium to long term is going to be a difficult thing indeed, and you do it as a sort of *ceteris paribus*, or are you aware that the rest of the industry is changing as well? The economics will be changing

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across the board in relation to carbon. We could try to do these heroic economic models, but I think we would be pulling the wool over our own eyes to believe that is what is necessarily going to happen.

Chairman: In policy terms you have got to have some analysis to inform you about what is, if you like, the model that is most likely to have the best effect; otherwise you can pluck ideas out of the sky but it may not be realistic. Anyway, Paddy Tipping.

Q54 Paddy Tipping: You are pretty pessimistic about renewables in your written evidence. You said they are “fundamentally inadequate to realise the very large investments required in new, low carbon energy technologies and energy efficiency programmes that are necessary to meet the 60% reduction target”, and then you say, “but there are technologies that would enable us to meet these targets.” Can you tell us a bit about the technologies?

Ms Wynne: Sure. I think the point to stress is that there are a large number of technologies that are available, they are viable from an engineering point of view, they are there and they work. However, if we are talking about electricity generation, I think photo-voltaic, biomass, tidal and wave energy and also wind are probably the four most interesting ones. The sorts of barriers that they are up against are twofold. There are institutional constraints, things like wind and people not wanting a wind turbine in their back yard, and land use problems. There is also, of course, the problem of cost, and some of these technologies are simply more expensive than their traditional fossil-fuel alternatives. The problem that we are up against now is how to make these technologies compatible, because they are there and they are ready for use, but as they are now they are at the bottom of the S curve, and they have a few niche applications—

Q55 Chairman: You used a term there, the bottom of the S curve. S is like that. Tell me about the S curve?

Ms Wynne: If you had a letter S and you stretched it out, and if you think about the development of a technology: if on your horizontal axis there was time in years and on the vertical axis there is—we will keep it easy—say, the percentage of demand that is met by a particular technology as time progresses. The development of a technology is not a linear occurrence, it is not sort of, “If I invest X dollars or X pounds in technology I will have X return.” Initially you may not get much happening; you will be quite low as far as the percentage of demand that is being met by the technology. However, if you invest a significant amount of money, eventually you will get a big return and it will be bumped to the top of this S curve, it will be fully developed and there will be many market applications and things like that. So the problem is getting a technology from the early development stages to a wider market application. What usually needs to happen there is for some sort of policy or innovation incentive to bump that technology forward, as it were.

Q56 Paddy Tipping: Would you explain this a bit more for me? We have got wind technology at the moment—that is the renewable that is most in use. There are constraints, because people do not like them, but it is also very expensive; but there are other technologies that are coming on board that if we put the money into could give us some pay-back, get us to the top of the S curve. Which ones are they? Where should we be focused?

Ms Wynne: Which technologies?

Q57 Paddy Tipping: Yes?

Ms Wynne: As far as the UK is concerned there is great potential for wave and tidal technologies. I am coming at this from a mathematical background; I am not an engineer. If you want much more detailed information about the technologies I can find out for you. I think wave and tidal has enormous potential, but the problem is it is in the very early development stages right now, barely out of lab conditions, so that is a good one for potential. Off-shore wind, there is also a good deal of technical potential for the UK. Biomass has applications in both transport and electricity generation. I think those are the ones to initially focus on, but I want to make the point again that we do not necessarily want to invest money in one or two winning technologies, but to keep the market open for this potential, for innovation and let the market choose what the best path is to take, because sometimes we get in trouble if we pick, say, “This is the one”, and put all our money there.

Q58 Paddy Tipping: Again in your evidence you made a point which David King made which was that 50% of emissions are coming from the built environment. Clearly from these statements, I suspect you think this is a scenario where we ought to make some progress. How do we make that progress?

Ms Wynne: I will pass that to my colleagues, because they are doing some interesting work with the 40% options.

Dr Anderson: Technically there are many options. I do not think we have to be looking for considerable innovation there. We have been aware of these technological options for many years. It is how we implement those options. I do not mean to make what might be seen as a trite comment, but we are here in a very modern building, sat beneath halogen bulbs, which are very inefficient. I notice in the toilet here there were no movement sensors. So that is costing the tax-payer £100 a year just to keep the eight 40 watt light bulbs in your toilets behind here. This is a modern building. We are here discussing energy efficiency and the technologies which are really very poor, and that leads us straightaway to point towards: how to do we bring these things about? Clearly it is not being brought about by voluntary agreements, and, for all the good will in the world, we are not moving towards the 60% target let alone the 75% target that perhaps we may need.

Q59 Chairman: You have just got yourself a job. We will send you off round the building.

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Dr Anderson: You can try the older part in the House of Commons. There is a lot more to do there. Clearly there are many things that need to be done. We require policies with teeth. I noticed earlier Austin Mitchell used the word “hurt”. “When will these policies hurt?” The hurt is a matter of choice: we hurt one way or we hurt another. I do not think it is a matter that we chose policies that hurt.

Q60 Mr Mitchell: One man’s hurt is another man’s grief.

Dr Anderson: Certainly; yes. Certainly the policies we need will have to have some teeth and certainly some people will have to change their behaviour. By definition that is going to have to happen. We will have to change our behaviour both in terms of how we utilise energy, both as industry and as domestic consumers, and, furthermore, how we use the technologies, and what technologies we are prepared to purchase and whether there is a premium on those technologies. Of course the premium is only what we pay for the price of the technology; it could well be that has lots of other savings further down the line. Again, in terms of costs, we often have to turn these things on their head and perhaps stand back a bit from where we normally look. You referred earlier to the high costs of some of the renewables. Perhaps they are high costs, but what do we compare them with? Do we compare them with fossil fuels? What are the costs of security for fossil fuels? We are all aware of one or two incidents that we are involved in at the moment in maintaining fossil-fuel security. These are high costs that some of the renewables would not by definition have. The gas-lights in Siberia, I would guess, will have very high security costs, probably far higher than maintaining off-shore wind-turbines or a biomass that has indigenously grown. We need to really stand back and look at the costs, not the environmental costs, but some of the real security costs, in a more holistic sense.

Q61 Mr Mitchell: You were talking about improving the building, this particular building. There is no real cost in that. There is no hurt there. It is just better design, is it not?

Dr Anderson: Better policies. The design is there, we just need the policies that say you cannot sell or purchase these types of light-bulbs. Why are B&Q selling more of these? It is because everyone is fitting them in their kitchens and using far more energy than they were before. Fit 10 of these and take out one of the old incandescent light-bulbs. This is a regressive step, not a positive step. We clearly need policies that require people, and I would not say by force, so that in five years you phase out the sales of this type of light-bulb, in five years you phase out incandescent light-bulbs, in 10 years you have a fuel economy constraint on your cars. Even in California now—and Gray Davis was going to do it before—Arnold Swartzenegger is thinking of carrying on and having a minimum fuel economy for his cars. I think it is about 21 miles to the gallon, so I would not recommend it, but it is an example.

Q62 Mr Mitchell: There has been some discussion today about carbon sequestration. Has that got potential? Can it be made to work?

Dr Anderson: It can certainly be made to work. If we cannot be bothered, as I think we are probably unlikely to be, to respond to the cheap and easy demand solutions that are available to us, we will have to look for other options, high-tech, high-cost, high-impact options like carbon sequestration. Most of the supply options are always like that. Certainly the technology is there for sequestration, for carbon capture and storage. We are already doing it. In Norway they have been doing it since 1997 at, I think, about a million tons per annum.

Q63 Mr Mitchell: Would you explain what they are doing in Norway?

Dr Anderson: In Norway it is a particularly unusual example, in the sense that there is a tax on the carbon dioxide emissions from off-shore oil platforms and it was cheaper for one of their platforms to take the carbon dioxide that was coming up with the gas and inject it back down the reservoir. The scope for carbon capture and storage is quite significant in the UK, and worldwide it is certainly significant. Technically there are some problems that need to be overcome, but they are not ones that we will not be able to deal with. In terms of efficiency, it is going to add a considerable reduction to the efficiency of the system, probably a 10 to 15% reduction in efficiency. If you bear in mind what David King said in terms of 60% of the energy goes up the chimney anyway, you only get 40% useful out, you lose 8% in transmission, you lose 15% in carbon capture and storage and then you start to think that James Watt was not quite so bad, and his steam engine had about 3 or 4% efficiency. We are 100 or so years on and we have not improved our net efficiency much more.

Q64 Mr Mitchell: Is your message to us to do the simple things, the easy things first?

Dr Anderson: Without a doubt we should be going for the demand options. They are not sexy, they are not big, you cannot wander round them and go and visit the engineers that are doing them in the same way that you can with small domestic or household light-bulb appliances, but, in my view, that is where the real solutions lie; it is certainly where the low hanging fruit is. There is no reason why we cannot be moving in that direction now whilst we look towards some of these more far-sighted options, some of the renewables, carbon capture and storage, for example?

Q65 Chairman: Can I follow on that line of inquiry. Some time ago Sheffield Hallam University produced a chart, a graph, which attempted to show where the public got the best value for money for the use of the tax-payers’ pound; and I think in CO₂ savings, if my memory serves me correctly, loft insulation came out as number one best buy. It has also been said that in comparison with other energy saving techniques, renewable energy is bad value for money in terms of the amount of public pounds going into things like wind energy. Do you know of

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any work that enables you to make a rational comparison as to where public investment should go to achieve the best effect and the best value in terms of CO₂ and other gas emissions, reductions thereof?

Dr Anderson: There are a number of attempts already at doing that. I do not have them with me here, but I can get those to you without any difficulty. In fact the Government has done a number of these itself, I believe.

Q66 Chairman: It would be very helpful to us because, if you like, you have put a menu before us, but in public policy terms you have to make some choices, and it would be nice to know whether we are making the best use of our investment in that area at the present time. In your evidence you have discussed the concept of domestic tradable quotas. Do I gather from that that we would all be allocated our own carbon quota, a bit like having a ration-book walking around and we could spend so much in the way of our own little quota and then we would have to go and buy it from a person like Mr Simpson, who is incredibly energy efficient in everything he does? Is that how it works?

Dr Anderson: Put very simply, that certainly is the case. My colleague and myself have been working on this for several years, and about a year or so ago we were still considered to be complete mavericks in the energy policy field, but now this is an option that is being seriously considered. It is as you have broadly explained. You would look at the carbon emissions budget for the UK, which we have in relation to the targets which the government has set, you look at those targets, you divide those annually and then you split that amongst the adults in society, to use the poll tax rhetoric, the Duke and the dustman get the same allocation. Alan Simpson, I am pleased to hear, a more frugal user of energy, will no doubt have surplus units that he can sell to the more profligate members around this table, including ourselves here. So there would be a market that would help us incentivise more efficient behaviour. Furthermore, if you look at the Energy White Paper, roughly 10% of households are in a position of fuel poverty and a smaller number in what is called vulnerable fuel poverty, and it would certainly aid those people in fuel poverty as well because they would by definition be lower users.

Chairman: I do not want us to spend the rest of our limited time discussing it, but I can see, given the enormous range of variables in that equation, an administrative nightmare. What you have described is the energy equivalent of the social security system.

Q67 Mr Mitchell: It assumes that all households have equal energy efficiency.

Dr Anderson: No, it does not.

Q68 Mr Mitchell: If you happen to be living in an older house, rather than the house Alan is building in Nottingham, we will need a lot more?

Dr Anderson: That may well be the case. Again that incentivises the move to more modern houses, but you have to bear in mind that you would allocate out initially. You would not have a 60% reduction on day one. You are only talking about a 1¼% reduction, in emissions per annum to reach the 60% target if it is a growing economy. When you look at that, about 60% of the population would be better off in year one; their allocation would exceed their current emissions. I think the very important comparison to make is not with the norm but is with what is the alternative? We all saw what happened with the fuel protest. There was a 2p rise in Brent crude, which was put down to be a tax in the end, and the country ground to a halt. That was, I would guess, an administrative nightmare. Is the idea of everyone having a little swipe card—it could be Mr Blunkett's ID card with a carbon bit superimposed on it—any more complex than trying to deal with the complex iterations and the rebate scheme you would require for fuel poverty people than trying to reduce emissions by 60% using a carbon tax?

Chairman: I will put that down as stimulating thinking. I have just had a message on my electronic pager that tells me that in a few moments we may all have to disappear to vote. Therefore, I do not want our final set of witness, the Biosciences Federation, to escape without a little questioning. I am sorry to bring matters to a slightly premature halt. There is one question about biofuels that I would like to write to you about, because we would like to explore that. Can we thank you for your excellent and very interesting written evidence and stimulating replies.

Q69 Alan Simpson: Can I ask, if they are writing to us, whether they can give some thought to whether there is a compelling case for changing energy markets so that we sell less consumption or non-consumption rather than increased consumption? It is particularly important, given the discussions about the rural areas and whether the extension of the gas network and the huge capital cost makes any sense at all if the industry were required to deliver non-consumption or renewable consumption?

Dr Anderson: You may know that Edison did that 100 or so years ago with light. He never sold electricity, he sold light. He actually did that service provision 100 or so years ago.

Alan Simpson: I would like to hear a bit more about it.

Chairman: Bring on Edison. Thank you very much indeed for coming to see us.

Memorandum submitted by the Biosciences Federation (U28)

The following organisations from within the Biosciences Federation have contributed specific (or specialist) advice in the course of this response:

British Ecological Society
British Society of Soil Science
Institute of Biology

INTRODUCTION

1. The Biosciences Federation was founded in 2002 in order to create a single authority within the life sciences that decision-makers are able to consult for opinion and information to assist the formulation of public policy. It brings together the strengths of 33 member organisations, including the Institute of Biology, which represents 45 additional affiliated societies (see Appendix [not printed]). The organisations that have already joined the Biosciences Federation represent a cumulative membership of some 60,000 bioscientists and cover the whole spectrum from physiology and neuroscience, biochemistry and microbiology to ecology and agriculture. The Biosciences Federation is a registered charity (No 1103894).

SUMMARY OF RESPONSE

2. This response's principal points include:

- (i) The single biggest achievement that the UK Government could achieve as Chair of G8 and President of the European Council in 2005 is to facilitate an agreement for tackling climate change between all the major industrial nations (paragraph 4).
- (ii) UK policies have yet to make a significant impact on UK carbon emissions. The forthcoming review of the Climate Change Programme should assess current policies and ensure co-ordination between different policy areas, including activities in the devolved administrations (paragraphs 5–7).
- (iii) The Programme should also consider more deeply UK policies for coping and adapting to impending changes in climate, particularly with regards to impacts on biodiversity and ecosystems (paragraphs 8–10).
- (iv) Effective communication and dialogue with the public on climate change is the only way the Government will obtain 'buy in' from the nation to help tackle the issue. The Government should raise awareness of ways in which everyone can increase energy efficiency and provide incentives to do so (paragraph 11, 19).
- (v) A more holistic programme to increase the use of renewable energy sources is required in the UK, including more co-ordinated R&D and greater financial support from the Government (paragraphs 12–16).
- (vi) The potential for biological sources, such as ethanol and biodiesel, to help meet the demand for transport fuels is currently a glaring omission from the Programme (paragraph 17).
- (vii) The issues surrounding nuclear power need to be tackled head-on and we would strongly advocate a review of the nuclear option as part of the autumn review of the Programme (paragraph 18).
- (viii) Policies relating to emissions and carbon sequestration in agriculture and land use should be updated in the light of new research and evidence. The potential of soil as a carbon sink is currently undervalued and needs further research (paragraphs 20–23).
- (ix) Increasing recycling rates should be considered as a priority in the Programme (paragraph 24).

GENERAL

3. The Biosciences Federation welcomes the Committee's inquiry into the policies of the UK Government to address the challenge of climate change. We agree with the Prime Minister that climate change is "the world's greatest environmental challenge". The UK Climate Change Programme, published in 2001, is a firm public commitment to reducing greenhouse gas emissions and adapting to future changes in climate, and sets an example within the international community. The Government's review of the Programme this autumn will be a timely and important assessment of the success of the Programme so far.

G8 AND THE EUROPEAN COUNCIL

4. The single biggest achievement that the UK Government could achieve as Chair of G8 and President of the European Council in 2005 is to facilitate an agreement for tackling climate change between all the major industrial nations, including relevant developing countries and the USA. The USA, which is responsible for over a third of the world's CO₂ emissions, pulled out of the Kyoto Protocol in March 2001 on the grounds that it does not take into account emissions from developing countries that it states will soon

match their own emissions. But, the Programme itself admits that developing countries will not take on legally binding targets until developed countries (ie the USA) have demonstrated that they are taking serious action to cut their emissions. All efforts to cope with problems associated with global warming, including the UK Climate Change Programme, are undermined by a lack of international consensus.

CLIMATE CHANGE PROGRAMME REVIEW

Impact

5. The forthcoming review of the UK Climate Change Programme should firstly evaluate whether current policies are having a significant impact on UK carbon emissions. The Commons Environmental Audit Committee recently reported: “The policy instruments the Government has put in place have yet to make a significant impact on the UK carbon emissions trajectory. The Government’s latest forecasts indicate that carbon emissions will fall only to around 140 MtC by 2010—some 8 MtC more than the target. This carbon gap could be much greater if the policy instruments in place and planned fail to deliver the reductions envisaged.”⁷

6. The Programme review should consider the mechanisms required to ensure co-ordination between policies. Reducing greenhouse gas emissions in one sector by increasing them in another (or elsewhere in the world) is not a net gain.

7. In the UK, many activities producing greenhouse gas emissions are the responsibility of the devolved administrations. The Scottish Climate Change Programme was published alongside the UK one and will also be reviewed this autumn. The devolved administrations should work in partnership with the UK Government to tackle climate change since they retain responsibility for policy levers such as taxation. The comments in this response therefore also apply to the climate change strategies of the devolved administrations.

Adaptation

8. On a world scale, emissions are likely to be dominated by activities in other countries over which the UK has little control. The Programme should consider more deeply UK policies for coping and adapting to the changes in climate that will inevitably happen in the coming decades as a consequence. We note, however, the extreme difficulties in predicting climate change. Trends of hotter summers, wetter winters, increasingly frequent extreme weather conditions and climate-induced rises in sea level have been forecasted. Alternatively, research is indicating that changes to the ocean currents could cause Europe to freeze. Such changes will have significant impacts on water use demands, flooding frequency, agriculture, forestry, wildlife, health, buildings and the economy. The effect of population increases should also be considered: the more people there are in the UK, Europe, or on the planet, the more energy will be needed. The Programme states: “The Government and the devolved administrations have already started to respond to the threat of climate change, building adaptation into many of their policies.” In reviewing the Programme, Section 3 “Adapting to the Impacts of Climate Change in the UK” should be updated with progress in this area and expanded with further measures to predict, cope with and prepare for the consequences of climate change.

9. Of particular concern, there is likely to be a substantial impact on biodiversity with large changes in the structure of natural biological communities. Large numbers of animals and plants (eg coral reefs, polar bears, invertebrates and migratory birds, eg the Scottish crossbill and mountain ringlet) will be unable to cope with the speed of climate change. There is a need to monitor biodiversity and to attempt some remediation, for example, by creating new areas of marsh to help control flooding. The biodiversity research agenda needs to be holistic, considering the entire ecosystem, its biodiversity, processes and services. Research should involve biologists, meteorologists, physical geographers, quaternary geologists and remote sensing and computer modelling experts in order to attempt to understand the affects of climate change on biodiversity, and should also consider the dual effects of other global change phenomena, such as nitrogen deposition and land use change. We should conserve biodiversity because: it is integral to the efficient functioning of Earth’s ecosystem and regulates natural processes that protect our planet; it provides the raw material of food, clothing and medicines; it enhances our quality of life by adding variety to our surroundings; it helps shape our culture and inspires our poets, painters, writers and composers; and it is a heritage we should not deny to the next generation.⁸

10. The proposed Integrated Agency for real land management, which will bring together English Nature, the Rural Development Service and some responsibilities of the Countryside Agency, should have responsibility for assessing and managing adaptation to climatic change. It is unlikely that the current system of site-based conservation will be sufficient to meet national, EU and international conservation targets under known climate scenarios. It is, therefore, important that the new Integrated Agency takes

⁷ The Environmental Audit Committee Tenth Report of Session 2003–04. Budget 2004 and Energy. August 2004. Available at: <http://www.publications.parliament.uk/pa/cm200304/cmselect/cmenvaud/490/49002.htm>

⁸ NI Environment and Heritage Service. See: <http://www.ehsni.gov.uk/natural/biodiversity/whybio.shtml>

landscape-scale action for biodiversity conservation. Furthermore, the Integrated Agency needs to have a strong science base to understand changes to terrestrial, freshwater and marine environments due to climate change.

Communication

11. The Programme aims to “help people to understand why we need to tackle climate change”. This is vital for the success of the Programme and more effort in this area is required. Awareness of the consequences of climate change needs to be raised in order to motivate people to take action in their daily lives. This is a challenge, however, due to the complexity of climatic effects and the uncertainties surrounding the extent and cause of the phenomenon. The Government should accept that the “deficit” approach of “helping people understand” the science in the hope that it will gain their support is outdated, and the Programme needs to be amended accordingly. Science policy issues should be debated in a transparent and open forum, with information publicly available and vested interests declared. Listening to people’s concerns about this issue, and understanding the reasons for their behaviour, is the only way in which Government policy can realistically hope to get ‘buy in’ from the nation to help tackle climate change.

Low Carbon Energy—Electricity

12. The Programme has excellent aspirations to move towards a low carbon economy but we are not convinced the Government has made much headway in this direction. The 2003 Energy White Paper recommended that 20% of the UK’s electricity needs to be generated by renewable energy by 2020 in order to reduce CO₂ emissions.⁹ But earlier this year the Sustainable Energy Policy Network (set up to implement the White Paper) reported that Britain’s CO₂ emissions have risen by 1.4% while the proportion of electricity generated from renewable sources has fallen from 3% to 2.9%.

13. A more holistic programme to support renewable energy is required in the UK. There is a need for more co-ordinated R&D and greater financial support from the Government. The Treasury cannot expect industry to provide investment in renewable energy unless it has a long-term strategy itself.

14. Biofuels potentially have an important role to play in the reduction of greenhouse gas emissions. Development of the sector would bring a new source of income to rural areas and, depending on the impacts of CAP reform, land is available for this purpose. However, biofuel crops have failed to become a commercial success in the UK because of insufficient start up support and a lack of financial incentive for the customer (eg tax breaks). The May 2004 report of the Royal Commission on Environmental Pollution (RCEP) “Biomass as a Renewable Energy Source” is highly critical of the Government’s confused policies on biofuels and biomass.¹⁰ The report says that current policies fail to provide the leadership and incentives necessary to start a large-scale bioenergy sector in the UK. A workshop on biofuels was held by the Institute of Biology and the British Crop Protection Council in 2002 to consider the technologies available, research priorities and barriers to commercialisation. The resulting report was also critical of the Government’s biofuels strategy.¹¹

15. Wind power is poised to make a significant contribution to the UK electricity supply, but several issues remain that need to be tackled. There is concern that environmentally sensitive areas will be disrupted to develop wind farms and that the carbon loss resulting from excavation will not be accounted for. At present, the siting of wind farms is based on a model that predicts where there is likely to be most wind. This does not take into account the option of developing wind farms on sites that are already spoiled by industrial development.

16. Solar and tidal/wave energy has received less Government attention. Yet Britain has the greatest tidal range in the world. The so-called Severn barrage could potentially supply up to a quarter of present UK electricity requirements. Solar energy has great potential with the development of modern photovoltaic tiles for roofing. Unfortunately, the Government has failed to support such developments and companies have gone to Germany and Holland to develop their products. Householders should be encouraged, through Government grants, to look at the solar option when considering re-roofing.

Low Carbon Energy—Transport

17. The growth of CO₂ emissions from transport is a serious issue and the use of renewable fuels should be explored. The potential for biological sources to help meet the demand for transport fuels is currently a glaring omission from the Programme. Ethanol, which can be derived from a number of plant sources and can be blended with petrol, and biodiesel, from oilseed rape, can be used in vehicles engines without any need for modification. The Programme should place more emphasis on developing and promoting these

⁹ Energy White Paper “Our Energy Future—Creating a Low Carbon Economy”. February 2003. Available at: <http://www.dti.gov.uk/energy/whitepaper/index.shtml>

¹⁰ Royal Commission on Environmental Pollution. Biomass as a renewable energy source. May 2004. Available at: <http://www.rcep.org.uk/energycrops.htm>

¹¹ Fuelling the Future 3: Biofuels. A report on the February 2002 workshop and questionnaire. Institute of Biology and British Crop Protection Council. Available at www.iob.org

options. We welcome the Government's proposals (currently in consultation) to implement the EU Biofuels Directive by introducing some form of regulatory mandate or obligation to use biofuels and increasing fuel duty incentives¹² (petrol is still at least 10% cheaper than four years ago in real terms). Generating hydrogen from plant sources and using it to run vehicles is another low carbon option, but this is currently far from economically feasible and requires further research. Problems such as compressing enough hydrogen into fuel tanks and making fuel cells affordable may take many years to solve.

The Nuclear Option

18. The issues surrounding nuclear power need to be tackled head-on and we would strongly advocate a review of the nuclear option as part of the autumn review of the Programme. The Programme refers to nuclear power numerous times, but generally only in relation to the impact of decommissioning power plants on emission figures. The Programme suggests that nuclear power is still an option even if there is likely to be a possible 30-year gap in rolling out a fusion option.

Energy efficiency

19. More than half of the emissions reductions in the Programme are expected to come from increased energy efficiency. The Energy White Paper estimated an increase in energy efficiency in the home could reduce CO₂ emissions by 5 million tonnes. Therefore, policies to increase energy efficiency should be considered as a highly important part of the Programme and should be given particular attention in the autumn review. It should be recognised that communication and understanding the reasons for individual and organisational behaviour are vital for increasing energy efficiency. For example, encouraging people to use their cars less frequently, share rides or use public transport could be just as effective as developing low-carbon fuels. Unfortunately, the current low confidence in public transport (particularly train services) and high value given to personal independence and mobility makes this an extremely difficult challenge. The development of an effective public transport system should be a priority. Other potential initiatives include promoting local farm produce to cut "transport miles", subsidising the insulation of all homes and providing more effective heating boilers. The Government should raise awareness of ways in which everyone can reduce greenhouse gas emissions and provide incentives to do so (see Communication). Saving £24 per year on energy bills is not an incentive (Chapter 6, para 9).

Agriculture, Forestry and Land Use

20. Policies in the Programme relating to emissions and carbon sequestration in agriculture and other land uses should be updated in light of new research and evidence. For example, Defra is funding a project (led by CEH Edinburgh) to quantify the UK stocks of carbon in soils and vegetation and to assess possible changes due to land use change. This project is assembling the best available sets of data on soil types, land use and climate and combining them with the best-validated models currently available. It is also identifying gaps in knowledge where further research is needed, especially in relation to the influence of other nutrients, such as nitrogen, on carbon sequestration. An increasing body of evidence indicates that carbon storage in soil is strongly influenced by nitrogen availability, and this influence can be both positive and negative depending on context.¹³ Numerous individual research projects are presently underway in the UK and overseas that cast light on some of the factors that control carbon sequestration in both agricultural and natural soils.¹⁴

21. The Programme acknowledges that soil can remove carbon but it undervalues its potential as a carbon sink. Soil is the basis of farm (and forest) production and its condition (and stored carbon) has deteriorated hugely over the last thirty or so years. There is a small but significant potential for biological sequestration of carbon in UK soils as a contribution to greenhouse gas mitigation, although this should not be regarded as an alternative to cutting emissions. A recent meeting of the British Society of Soil Science

¹² Department for Transport. Towards a UK Strategy for Biofuels—Public Consultation. April 2004. Available at: http://www.dft.gov.uk/stellent/groups/dft_roads/documents/page/dft_roads_028393.hcsp

¹³ Mack MC *et al.* Ecosystem carbon storage in arctic tundra reduced by long-term nutrient fertilization. *Nature* 2004; 431: 440–443; Neff JC *et al.* Soil carbon turnover in alpine meadows accelerated by nitrogen additions. *Nature* 2002; 419: 915–917.

¹⁴ Freeman *et al.* Export of dissolved organic carbon from peatlands under elevated carbon dioxide levels. *Nature* 2004; 430: 195–198; Beedlow PA *et al.* (2004) Rising atmospheric CO₂ and carbon sequestration in forests. *Frontiers in Ecology and the Environment* 2004; 2: 3–5–322.

reported that soils with low carbon content, such as those used for arable purposes for many years, have the greatest potential for sequestration. Strategies include establishing forests on former arable sites or expanding field margins. It is crucial that soils with high carbon content, such as soils of forests and peatlands, should have minimum disturbance to maintain the carbon stock.¹⁵

22. It is desirable to increase forest cover as this will cause sequestration of carbon in trees and soil organic matter, as well as providing additional environmental benefits such as provision of wildlife habitats. However, it is necessary to consider the full lifecycle of forests and forest products and the context-dependent ways that forestry can influence soil carbon cycling; for example, there is accumulating evidence that establishing forests on certain soils can cause considerable release of CO₂ due to priming of soil microbes, leading to enhanced decomposition of old organic carbon, and through changes in drainage conditions and disturbance. In some cases this could be larger than the amount of carbon sequestered in trees. Also, for sequestration to be effective the carbon must be locked up for a long period of time (ie decades). This requirement will be met if timber from a forest is used for construction purposes but not if it is pulped for making paper.

23. The Programme aims to reduce fertiliser use, but there are other important factors influencing nitrous oxide (N₂O) emissions that should be considered, for example, land use (arable crops vs. grassland), management factors (timing of fertiliser or manure application) and the conditions of the soil (application to wet or compacted soil is likely to increase emissions). The overall costs and benefits of land use practices also should be weighed up; for example, some practices may favour carbon sequestration but increase N₂O emissions, outweighing the carbon benefit. It is also important to consider associated impacts on the net emission of other potent greenhouse gases, such as methane (CH₄) and nitrous oxide (N₂O). This is especially the case for no-tillage agriculture; whilst promoting soil carbon storage, this practice also potentially increases emissions of N₂O to the atmosphere, due to increased denitrification in compacted, low porosity soils.¹⁶

Waste

24. Increasing recycling rates, especially of plastics, should be considered as a priority in the Programme. Reducing waste production and recycling reduces the amount of waste sent to landfill, reduces the need for extraction and processing of raw materials, and displaces the use of fossil fuels when energy is produced from waste. As the UK only recycles 14.5% of its waste, we very much welcome the recently launched £10 million awareness raising initiative supported by Defra. Some EU countries recycle over half of their municipal waste, including Austria (58%), Germany (53%) and the Netherlands (59%).¹⁷ In Norway, every household divides its waste into glass, paper, plastic, metal and compostable material for collection at the doorstep; a similar scheme is being introduced in France. Ensuring that kerbside collection is cost-effective is a challenge for local authorities.¹⁸

1 October 2004

¹⁵ Soil Use and Management 2004: 20 (Supplement: Soils as Carbon Sinks); 210–270. See also: The Royal Society. The role of land carbon sinks in mitigating global climate change. Policy Document 10/01, July 2001.

¹⁶ Smith KA & Conen F. Impacts of land management on fluxes of trace greenhouse gases. *Soil Use and Management* 2004; 20: 255–263.

¹⁷ Department for Environment, Food and Rural Affairs. Municipal Waste Management in the EU 2001. February 2003. Available at: www.defra.gov.uk/environment/statistics/waste/kf/wrkf08.htm

¹⁸ See: Meeting Statutory Recycling Targets through Cost Effective Kerbside Expansion. A step-by-step guide for local authorities. June 2004. Available at: <http://technology.open.ac.uk/iws/costeffectivekerbsidereport.pdf>

Witnesses: Professor David Powlson, Rothamsted Research, British Society of Soil Science, *Professor Alastair Fitter*, University of York, President of the British Ecological Society, and *Dr Ausilio Bauen*, Imperial College, Biosciences Federation, examined.

Q70 Chairman: Gentlemen, you are very welcome indeed. For the record, from the Biosciences Federation we have Professor David Powlson from the Rothamsted Research Institute and the British Society of Soil Science—I think in my days at University I must have read one of your books about soil, that is why I have got an allotment—Professor Alastair Fitter from the University of York and the President of the British Ecological Society and Dr Ausilio Bauen from Imperial College. You are all very welcome indeed. I apologise in advance that we are a little bit time constrained, because there is likely to be a vote some time in the next 20, 25 minutes or thereabouts. Would you give us a couple

of minutes on the effects of climate change on UK biodiversity? What are the key things that you think we should be aware of?

Professor Fitter: Our inability to predict what is going to happen, I think, is the big problem.

Q71 Chairman: It happens to politicians all the time.

Professor Fitter: You are used to that, I realise that, but scientists like to have greater certainty, and we do not like the situation when we do not have it. We have some pretty good indicators of what is going on. There are some marked changes already taking place even though the really significant climate

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change is perhaps only 10 to 15 years old. Even at that time we can see marked changes in natural systems. The obvious changes are in timing of events, which in themselves are curious rather than anything else, but they are the canary in the mine; basically they are telling us that the natural world has noticed what is going on, and they give us real cause for concern for the longer term implications. We are already seeing changes in range boundaries, so species are moving north, and that means eventually they hit buffers, because if you hit the north coast or the top of a mountain, or whatever, you cannot go any further. The big problem is (a) we do not know exactly what will happen, and that is very common in these things, obviously, but (b) we do know that different species respond in quite different ways, and that means that there can be a disruptive effect within communities so that some things will profit, some will suffer. There will be big changes in the way that communities are constructed, and that will have implications for the way in which they function, and that means that the way the global ecosystem serves us to keep the world ticking will change, and that is a real concern. The compounding problem is that this is all happening against a background of an extraordinarily human affected environment anyway. We have extremely fragmented habitats so that parts of the habitat which are suitable for a species may be separated by large areas which are unsuitable from the next possible patch. You can imagine that if climate change makes the first patch unsuitable it will make it very hard for that species to get to another possible island which is a refuge, as it were.

Q72 Mr Mitchell: The Watership Down syndrome?

Professor Fitter: Absolutely. What a perfect scenario to capture that. You are absolutely right. It is exactly that. We also have other insults taking place, such as nitrogen deposition and other forms of pollution, slow erosion, etcetera, you name it. Think of something nasty and we are doing it to the environment in various ways, and that is making it even more likely that species will find it difficult to respond effectively to adapt to climate change. The final real complication is that when this last happened, which is about 12,000 years ago, when climate warmed dramatically, we know exactly what did happen. We have a wonderful fossil record telling us, and there was a steady progress of species responding to this, migrating across Europe as the ice retreated. We are going through the same process now of rapid warming, but the problem is we now have huge numbers of species in situ which are not native to this country. Gardens hold something like 10 times as many species as there are native plants in Britain. There is a reservoir of species waiting to escape and invade natural communities, and some of them have done so already, and some of them are very serious problems already, and that will be a continuing complication. Just to put it in context, in the US it is estimated that invasive species cost the economy well over \$100 billion a year.

Q73 Chairman: What are they, in case I have got any in my back garden?

Professor Fitter: You will have, for example, Japanese knotweed somewhere near you; you will have Himalayan balsam too, but think of the new pests that are coming in: sudden oak death, New Zealand flatworm. There are lots of these things which are appearing now. These are brought about by the fact that we are very good at moving species across the globe—from New Zealand, for example, to here—which could never possibly have got here otherwise. In the last model we have, which is the post glacial situation, when the ice retreated and everything warmed up, everything was migrating under its own steam, but we have short-circuited that entire process now. We are saying if anything wants to grow here, “Come on, we will bring you here, you can have a free ride and see how you do.” Some of them will do hopelessly, and they will not survive, but others—and we can not predict which—unfortunately, will become serious pests.

Q74 Chairman: You mention the word adaptation. In policy terms of you giving advice to the Government, what should they do? Should they concentrate on adaptation or mitigation as a strategy, or are you going to say we have got to do a bit of everything?

Professor Fitter: You have obviously got to do both. It would be crazy to do one or the other. We have no option but to accept that over the next 30 years or so, whatever is an appropriate timescale, but let us take that sort of timescale, there is going to be a major change taking place enforced upon the biodiversity of the UK, and we have to allow the natural communities in the UK to adapt to that. We also have to mitigate those effects longer term, but in that relatively short term what we need are policies which allow some of those negative impacts which are synergistic with climate change to be minimised, because climate change is going to happen anyway. We want to reduce nitrogen depositions, we want to reduce habitat fragmentation, we want to reduce the problem of invasive species, and so on and so forth, all those things. If you like, that is the mitigation which allows the systems to adapt.

Q75 Patrick Hall: Are we assuming that climate change means a reduction of biodiversity in Europe.

Professor Fitter: It could mean an increase, but it might be rather an alarming increase. The probability is that it will result ultimately in a reduction, but it may not. We cannot predict that. It will probably produce reductions in some places but not in others.

Q76 Alan Simpson: I wanted to move to the issue of transport, carbon emissions from the fuels that we use and the significance of biofuels. I am not sure how long ago it was now, but the Committee went to look at some of this in relation to Brazil, and it was quite a humbling experience, I think, for us to realise that Brazil has been running the entirety of its public transport system on biofuels since 1930. They took us through some very interesting calculations that

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showed that there was more carbon absorbed in the growing of sugar cane than was generated in the cutting, processing and then consumption as fuel, so they had a net carbon gain equation. I am just wondering if you have done any calculations on the significance of biofuels in the UK, because we cannot run on a presumption that suddenly we will all grow sugar cane. In a sense we as a community are getting very different messages about the significance of biofuels, one part saying you start to displace traditional agriculture and you have a significant amount of cost; you look at the costs in terms of agro-chemicals that go into the scale of production and you have a massive additional hit. In fact, it is not even an economic proposition. We would be better off going for short crop coppicing. Somewhere, as the non-scientists, we have got to do some serious number-crunching. Have you done any of this work?

Dr Bauen: Yes, we have actually done some of this work, and we have looked at other situations in Brazil and elsewhere in the world. You are correct when you say that sugar cane is, first of all, a very efficient crop. It has very high yields. In southern Brazil it reaches something like one hundred tons per hectare, which is an extremely high yield. Secondly, when the ethanol is produced at the processing plant it uses the left over fibre after the pressing of the cane to provide energy to the process. So it is practically an entirely renewable energy process. That is why you get something like 90% reductions in carbon emissions when you substitute gasoline with ethanol in Brazil. As you say, some people may claim that you get a benefit because you are storing carbon somewhere in the system, in the soil, for example. That could be replicated in tropical countries with other species. If we go to the UK, a temperate climate, the situation is slightly different because of the crops, the products we can grow. The two principal options in the UK for the production of biofuels today are bio-diesel from rape seed and bio-ethanol from wheat grain principally, possibly to some extent from sugar beet. Both of these options are from crops that have lower yields compared to cane. Also, the crops require a certain amount of fertiliser, which requires energy and has emissions to the atmosphere as well, and the process to produce the fuels is fairly energy intense. It depends how they are fuelled.² Clearly a renewable energy to the system will affect the carbon balance. But if we look at what the carbon balance for the biofuels produced in the UK is we could say that for bio-diesel—if you were to substitute fossil-diesel you would get a reduction of up to about 60%. The range in the evaluations we have done is between 40 and 60% in terms of emissions reduction. For bio-ethanol, because the process is more energy intensive, depending on the technologies used, the carbon emission reduction compared to gasoline is somewhere between 20 and 50%. Several reports and work have been done in the UK on this. Recently the Low Carbon Vehicle Partnership produced a report on bio-ethanol from wheat which shows you can go

up to 50% or more reductions in emissions. Compared to Brazilian ethanol the reductions in emissions are lower. Is there a need to go a biofuel route in the UK given that the emission reductions are lower? Is there a potential for that? I think there are several things that you need to consider. Biomass can also be used and grown for producing electricity and heat. Probably in the short term the biggest benefit in terms of carbon reductions will be from substituting heating oil—where there is no gas connection for heating purposes—and substituting coal-generated electricity possibly through coal firing. You could use probably a variety of residues and wastes from agriculture and from the forestry sector to fuel the heat and electricity sector. If you used energy crops for the electricity sector, you could get 90 to 95% emissions reduction compared to a fossil alternative. But if you wanted to go the energy crop route to supplying, for example, wood-chips for heat and for electricity, then you would have to grow a short rotation coppice. Short rotation coppice is a new crop. It is less established. Yields are making progress but are still not commercially viable. There is a need to develop this route, but for heat and electricity what you want to do is dedicate your residues and your wastes to this route for heat and electricity. If in the short-term there is also a need to decarbonise the electricity sector. If you take the Government targets, for example, in the UK climate change programme, going to 60% reductions will essentially mean doing some back-up table calculations entirely decarbonising the energy supply sector, and the business and the domestic sector practically, if you want to achieve that 60%. Is that feasible? Probably at some stage transport will have to be tackled. You can improve efficiency through vehicles—that is the first thing to do. Then you can also have an input in terms of renewable fuels and that is something that will be probably necessary, because if you introduce high efficiency vehicles what will happen is, because there is a trend in growth in CO₂ emissions from transport, the high efficiency vehicles will only help you stabilise the emissions from the sector rather than reduce them. If you want to lower them you need a renewable fuel input.³

Q77 Chairman: It seems you could short-circuit a lot of this very complex description you have been giving us by building more nuclear power stations and making better batteries?

Dr Bauen: These are alternatives as well. You could entirely decarbonise the electricity sector through a nuclear route. You can significantly reduce emissions from the energy supply sector, practically reduce them to zero, if you built sufficient power plants. Will that be viable? Will that be acceptable? To what extent? Most likely it will not be enough to tackle also, let us say, the heating demand. You could have a system in the future that is all electric: electric for driving appliances, etcetera, electric

² Footnote by witness: The impact of the process depends on how the energy is provided.

³ Footnote by witness: This can be achieved in the short-term through the bio-diesel and bio-ethanol routes mentioned.

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heating and electric vehicles⁴. Also, with regard to electric vehicles, what appears to be the case is that batteries have not delivered in terms of costs, have not delivered in terms of range, in particular to be able to let us say satisfy customer demands and long distances especially. That is why I think I advocate the hybrid route, the diesel hybrid route in particular, is a fundamental development. Biofuels would only be able to supply a fraction of the fuels that we need in this country. Optimistically, about a third, if you consider energy crops and all other residues and wastes, and that is including also efficiency gains in vehicles. The efficiency gains will be fundamental; they will have to be obtained through some form of electric drive tank in any case. But decarbonisation options in the electricity sector and batteries in the transport sector will not be able to provide us with the full answer to achieving ambitious carbon reductions. Just going back to one point in terms of biofuels, if we were to use one million hectares, which is less than about 20% of arable land in the UK, we could produce roughly 5% of our road transport energy needs based on current crops and technologies, I would say that we are talking about roughly a 2½% emission reduction based on commercial biofuels. One thing that is very important is that there is technology development in the biofuels sector, and that in order to expand the resource base, a biomass resourced base to take advantage of that, you have to go towards lignocellulosic biofuel production routes; so you need to be able to use, for example, not only the wheat grain but the wheat straw, and this requires enzymatic processes that are now pre-commercial in the US and being developed. The other one is a route that allows you to produce synthetic diesel using residues and wastes and energy crops such as short rotation coppice—it is a gasification process followed by a gas to liquid process, a process which is commonly used in the energy/oil industry. If you want to be able to get more out of biomass you will eventually have to innovate, and I think we are moving along this curve. That also allows much better emission reductions.

Q78 Chairman: Professor Powlson wanted to come in.

Professor Powlson: Could I add to that. In terms of land use, we need to remember, of course, that in the UK and throughout the EU about 10% of arable land is set aside at the moment; so that is a potential use, if you like. We have done some simple calculations. If you use not quite all but 80% of current set aside land in this country and grew biomass crops in it—we were thinking of electricity generation, not liquid fuels, and this could be coppice willows, and so on, or miscanthus, which is a big grass that looks very much like sugar cane, which gives a very big yield and needs very small inputs, very interestingly—if you use that area of land, or a bit less than current set aside, you could provide, with current technology, about 3% of the country's electricity. There are huge ways in which you could

increase that. If you started using extra land, partly because things like sugar beet might not become profitable in the future, there is some grass land that is potentially available and you brought in other wastes, and so on, you could get to 12%.

Q79 Chairman: Let me ask you a practical question. You have got land set aside scattered everywhere and you have to produce 3% of the nation's electricity at possibly one or two points on the map?

Professor Powlson: No. I do not think going to one or two points is the way to do it. You could go for a few big stations or lots of small ones, and many people who know much more about that end of things than I do seem to think that many small ones is the way that makes sense.

Q80 Alan Simpson: That is helpful, because the idea of micro energy systems, as much as micro energy markets, is a whole untapped or unexplored area of greenness. It is the post bigness era. What I was intrigued about, though, is in a sense the pathway through the green exchanges. In a sense it was the Chairman who brought us back to the notion that you could pursue a carbon emissions reduction agenda that was not remotely the same as ecological footprinting. If we went entirely nuclear it could be carbon free, but it would be one hell of a stump on the eco-systems for centuries to come. What I was interested about is the connection between the two of you, because it takes us into a much more complex set of analysis. At another point you talked about soil sequestration; and it seems to me that there is an immediate trade-off: if we wanted to produce biofuels, whatever the intensification of the current agricultural system, it would automatically have a counter effect, from what you are saying, on the soil's ability to sequester it. Is that not the case?

Professor Powlson: No, if you go the liquid biofuels route and grow rape seed or wheat, and the like, and make ethanol or biodiesel, that is exactly what we are doing now, so that is sort of neutral in terms of soil, if you like. If you go the route of growing perennial crops like short rotation coppice of willow or miscanthus, which are perennial crops, all of the admittedly small amount of evidence that we have on them so far suggests that those are going to sequester additional carbon in the soil. They are plants that put a lot of organic matter through their roots into the soil, and, because they are perennial, they are not ploughed up every year, so you appear to retain more carbon in the soil. It is a bit like converting arable wheat fields into grass. We think that going that route is, in a small modest way, beneficial in terms of sequestration.

Q81 Alan Simpson: Can I ask you to set that against the comments from both the Tyndall Centre and the Soil Association about agricultural policy and the impact on carbon emissions and carbon sequestration by the soil? One suggests that the current agriculture and trade policy of the EU conspires to encourage emissions from agriculture, and the Soil Association say that there is evidence that past and ongoing declines in soil carbon levels

⁴ *Footnote by witness:* However, heating demand is currently strongly dependent on natural gas.

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is due to changes in agricultural practice. I want you to take us into that area, because it is important, I think, for us to talk about the capacity of nature to absorb and use carbon and also how some of our current practices have worked to minimise or to undermine that process?

Professor Powlson: I will try. A soil which is under woodland or grass, which the whole of the UK was under trees more or less at one time in the past, will have a large amount of carbon in the organic matter in the soil. When you chop those down or plough them up and go into arable agriculture growing wheat or whatever, the inputs from those plants are less than the inputs from the grass or the trees. Therefore the balance between inputs and outputs for the carbon in soil goes down, so the stock of carbon in soil, it is true, probably since the Second World War in this country, has gone down because a lot of former grassland has been ploughed and gone into arable cropping so that has been a net release of carbon from our soil. That is completely true. In principle, you could reverse that by putting it all back into grassland or trees, but then you would not do any farming. There are, of course, middle ways where you can put some of it back into those things, and again we do have as a starting point our set aside land. You cannot use the same land twice, of course. You have to make choices. In principle, you could start by saying, "Let us put some of our set aside into biofuels, some of it into new forests, and we have the new National Forest in the Midlands area"—those sort of schemes should be very beneficial in terms of sequestering carbon both in the trees, but probably in the soil in the more longer term, and they have other amenity and wildlife habitat benefits as well; so there is a win-win if you do that sort of land use change.

Q82 Mr Mitchell: On balance, is agriculture a net emitter or a net sequestrator?

Professor Powlson: Most agriculture will be a net emitter at present. You cannot get away from that. You can do things to decrease it. I should say, though, that agriculture can be an emitter because of all sorts of things—using fuel in tractors, and so on, you are manufacturing fertiliser and the like. The soil itself often will get to equilibrium and be in balance with inputs and outputs, so it is zero.

Professor Fitter: It is worth adding that globally soil is still absorbing a fair quantity of carbon, several thousand million tons of it. Can I add another thing in terms of the use of land? Another of the reasons why land has lost carbon from stores is drainage on a large scale. Drainage also is a major antagonist of biodiversity in many areas of land; so there is another win-win to be got there if we could reduce land drainage. Obviously for productive agriculture it is important; but if you are not going for productive agriculture, you can gain on soil carbon sequestration and you can gain in diversity terms.

Professor Powlson: Can I indeed agree and add to that. I have been talking about agricultural soils, ones that have got low in carbon because they have been in arable production. There is some potential

to increase them, either through taking them out of agriculture, or a smaller potential through changes in management within agriculture. There is potential there and we have got figures on how much it is, but soils which are peaty or have been under grass for a very long time have got a huge stock of carbon in them. They will probably not go up much; the danger is they will go down; and drainage can do that; even planting trees on wet peats in Scotland is very likely to be causing a net release of carbon. So with those high carbon stock soils, you want to just preserve them and make sure they do not become a source, but with the ones that are low, you might be able to make them into a slightly bigger sink.

Q83 Chairman: Moving from the land to paragraph 16 in your evidence, you talk about solar and tidal wave energy and you say that this has received less government attention. You also say, "Unfortunately the Government has failed to support such development and companies have gone to Germany and Holland to develop their products." Why the lack of take up? Why the lack of interest?

Dr Bauen: You are talking about bio-energy generally and the use of land.

Q84 Chairman: I am talking specifically about paragraph 16 of your paper which was about solar and tidal wave energy. You say that this has received less government attention, and you say that those who wish to develop this technology have gone elsewhere?

Professor Fitter: What you are receiving is evidence from the Biosciences Federation. We represent, and I can be corrected, but of the order of 30 different organisations who have all contributed to this submission. We can supply you with the evidence, unless Dr Bauen you have got it at your fingertips.

Dr Bauen: I think investment in renewable energy technology in the UK has not been not at the level of other countries, and in other countries it has been, in parallel, stimulated by very strong uptake through procurement programmes. I think that has been the case typically for wind and solar in the past. When we talk about wave and tidal, we are talking about earlier stage technologies today. I think there has been a realisation in the last few years in the UK that innovation in these areas is fundamental, and I think very important steps have been made, in particular with regard to wave and tidal. There are research programmes, but also the Carbon Trust accelerator programme, for example, which is supporting the development of companies and their technologies. So I think there has been progress, but I think historically the track record is not very good.

Q85 Alan Simpson: Would you send us the details of more effective uptake policies in terms of solar or renewable energies. I think that would be very helpful to us. Earlier on in today's session I asked whether this breakthrough in terms of the way energy markets work would be helped if we had a new building and planning obligation that said every

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new building that now goes up, whether domestic or commercial, has to generate 25% of its own energy consumption.

Dr Bauen: The building sector, I think, in the UK has also been neglected compared with other countries like Switzerland or other countries which have stronger norms. Also some countries today are starting to implement efficiency obligations and efficiency certificates which they call “white certificate”. I think this is possibly also an interesting option to look at and to pursue. Their implementation may be more complex than for a renewables obligation, and I think some countries have started implementing that, such as Italy, so it is something worth looking at. With regard to solar wave and tidal, I will refer you to a colleague of mine who has better expertise. That is not my area.

Chairman: Mr Mitchell wants a tiny postscript.

Q86 Mr Mitchell: The problem is enormous. Methane makes more of a contribution to global warming than CO₂, and cows fart a lot. What is the contribution of agriculture and forestry to methane emissions and what can be done about it?

Professor Fitter: Methane, molecule for molecule, is a bigger contributor to global warming, but not actually in terms of its contribution at present.

Professor Powlson: I have got some figures from a colleague at a sister institute.

Q87 Mr Mitchell: I keep seeing figures that cows are a bigger threat than cars?

Professor Powlson: No, not bigger. Apparently around 30% of UK methane emissions do come from agriculture, I understand. Most of the rest is from leakages from gas pipes and disused coalmines, I think. Methane does come from ruminant animals. Apparently, I am told, more from the front end than the back end, so it is burping more than farting, I am reliably informed! Things can be done about this in terms of the feed mix that you give to animals and trying to alter the microbes in the ruminant, and work is actively going on to find ways of feeding them so that you get less methane per litre of milk or per pound of meat.

Q88 Chairman: Right.

Professor Fitter: The concentration of methane in the atmosphere is tiny compared to that of CO₂. At the moment CO₂ is the problem, not methane.

Professor Powlson: But per molecule it is very powerful.

Chairman: As you can see, we do get down to the basics in this Committee! Thank you very much for the benefit of your evidence, both written and oral, and we look forward to your further contribution: you are going to send us some other information. Thank you very much indeed.

Supplementary memorandum submitted by the Biosciences Federation (U28a)

The Environment, Food and Rural Affairs Committee has asked the Biosciences Federation for supplementary information on (1) the reasons for lack of uptake of solar power in the UK, and (2) details of more effective uptake policies.

1. At the end of 2003 the UK was generating less than 6 mega watts (0.1 watts per capita) of solar power, while Germany was generating over 400 mega watts (5 watts per capita) and Japan over 800 mega watts (6.7 watts per capita)¹⁹. Much of the current output from UK photovoltaic solar cell manufacturers is exported to Germany where the market for solar technology is strong. While the Biosciences Federation welcomes the extension of the Photovoltaic Major Demonstration Project, we hope that a successor programme will be put in place to encourage growth in solar technology in the UK. Even with Department for Trade and Industry subsidy schemes, grid-connected domestic systems are expensive and “payback”, in terms of cost-effectiveness, can only be achieved in the very long-term. While it is ultimately desirable to have an economically sustainable renewables industry, it is essential that heavy initial subsidies are given by the Government to encourage research and development and public interest in the technology.

2. Japan, Germany and USA account for 85% of the total photovoltaic solar cell capacity in the International Energy Agency’s Photovoltaic Power Systems Programme countries. These countries receive continuing generous levels of grant or tariff support for projects that concentrate on grid-connected installations in the urban environment. Support for a solar photovoltaic ordinance has been growing across Europe since the success of the Barcelona solar thermal ordinance adopted in 2001. This requires all large residential buildings in Barcelona to source 60% of their hot water requirements from solar thermal technologies. In its first year of operation, the solar thermal ordinance saw installation rates quadruple in Barcelona, and it has now been adopted by other major Spanish cities including Madrid and Seville. Here in London, the London Plan and the Mayor’s Energy Strategy launched in February 2004 require developers to integrate renewable energy technologies including solar photovoltaic in all major new developments referable to the Mayor where feasible. The Mayor’s Energy Strategy sets targets to 2010 of 250 major solar photovoltaic installations, 7,000 solar photovoltaic installations on homes, 500 small wind turbines on public and commercial buildings and 20,000 domestic solar thermal installations.

25 January 2005

¹⁹ International Energy Agency Report T1-13: Trends in Photovoltaic Applications 1992–2003.

Wednesday 12 January 2005

Members present:

Mr Michael Jack, in the Chair

Ms Candy Atherton	Diana Organ
Mr David Drew	Joan Ruddock
Patrick Hall	David Taylor
Mr Mark Lazarowicz	Paddy Tipping
Mr David Lepper	Mr Bill Wiggin
Mr Austin Mitchell	

Memorandum submitted by BAA plc (U5)

BAA is the world's leading airports operator. In the UK, BAA owns, develops and operates seven airports: Heathrow, Gatwick, Stansted, Southampton, Edinburgh, Glasgow and Aberdeen. Overseas we either manage contracts at, or have interests in, airports in the USA, Australia, Italy, and Oman.

BAA's submission will focus primarily on aviation and climate change, which is where BAA's expertise and efforts can add most value to the debate on policy development.

1. EXECUTIVE SUMMARY

1.1 BAA believes in the long-term responsible and sustainable growth of aviation. BAA has two sets of interests in climate change policy: in addition to being a major player within the aviation industry, we also have substantial energy interests, as one of the UK's top 20 consumers of industrial energy.

1.2 BAA supports the UK Government's leadership position on climate change and recognises the importance of effective international action to address this issue. We support the delivery of targets adopted by Governments within the framework of the Kyoto Protocol, and favour the mainstreaming of all aviation within EU public policy on climate change, noting that at present only climate change emissions by airports and domestic air transport are included within the Kyoto targets; international air transport emissions are not currently included.

1.3 BAA supports the UK Government's Air Transport White Paper commitments both to responsible expansion and to addressing aviation's climate change impact through linking intra-EU flights with the EU Emissions Trading Scheme by 2008, a declared priority for the UK Government's 2005 EU presidency.

1.4 While aviation's current climate impact is significant (11% of the UK's total climate impact), it is nevertheless still smaller than the climate impact arising from other sectors of the economy, such as power generation (29% of UK's total climate impact in 2000). However, BAA supports the precautionary approach to climate change policy, and accepts the responsibility of aviation—like all industries—to address its climate change impacts.

1.5 BAA believes that industrial climate change impacts are most effectively dealt with by harnessing market mechanisms and corporate self-interest, where possible, since these are powerful drivers and are likely to produce faster, better results than blunt regulation. BAA rejects policy approaches for aviation which are aimed simply at reducing demand by raising the cost of flying through taxes and charges, the revenue from which simply flows to Government and is not hypothecated to addressing the impacts. We believe the right approach, as in all industries, is to target the impacts of the activity, rather than the activity itself. We recognise that the consequence of a regime of smart, well-targeted instruments for aviation may be higher costs and reduced demand.

1.6 The UK aviation industry, most notably BAA and BA, has led the EU debate on aviation's climate change impacts and obligations, and BAA believes that industry co-operation should be built on by policy-makers and Governments. BAA believes that the debate is moving in the right direction in the EU, but that there is weak global political will to tackle this issue, so BAA believes that the Government should focus on the wider international arena through the G8 concurrently with addressing aviation within the UK and EU.

1.7 BAA believes EU-level action can provide an effective interim policy response, as a first step towards the development of more co-ordinated global frameworks. We believe that the EU is an appropriate level for action, since unilateral action by individual EU Member States would raise market distortion and competitiveness issues.

1.8 BAA will be participating in the EU Emissions Trading Scheme from January 2005, since domestic airport emissions arising from substantial power use (energy infrastructure in excess of 20 megawatts) are included in the Scheme.

1.9 We believe that partial integration of intra-EU flights with an environmentally-credible EU Emissions Trading Scheme (where airlines can buy EU emissions allowances from the open EU market, but not sell to that market) is deliverable by 2008, and that full integration (where both buying and selling are allowed) is achievable by 2013.

1.10 We accept the IPCC assessment that aviation's total climate impact is some 2.7 times that due to CO₂ alone, due mainly to the climate-warming effects of NO_x and water vapour emissions (contrails) in the atmosphere and to cirrus cloud enhancement effects. We further accept that aviation should address these total climate change impacts. However, we urge a smart, targeted approach to this, which may require a mix of measures, to avoid unintended consequences of a measure adopted to tackle one impact (CO₂) leading to increases in another (NO_x), where there is a known technological trade-off.

1.11 For the 2008–12 phase, the allocation methodology linking aviation with EU emissions trading should therefore be on the basis of both aircraft CO₂ and NO_x emissions. It is not yet possible to effectively differentiate aircraft operations in terms of the en-route climate impacts of aviation contrails and cirrus cloud enhancement, or yet to resolve these impacts. We believe that the long-term future of aviation and the potential to reduce aviation's climate change impacts will therefore be best served by a programme of international research, funded by the aviation industry, to find climate solutions within the sector.

1.12 This is consistent with BAA's belief that all industries should meet the external costs of their activities—but only once. Therefore, once smart, effective policy instruments (such as the EU Emissions Trading Scheme), which are targeted at reducing aviation's specific impacts, enter into force and cover aviation's external costs over time, the existing blunt instruments, such as the UK Air Passenger Duty (APD), should be phased out, as they are currently intended to capture some or all of aviation's external costs. This approach could also work to address the climate impact of long-haul flights. For example, reduced rates of UK Air Passenger Duty (APD) could be applied to airlines agreeing, on a voluntary basis, to link their long-haul flights with the EU emissions trading scheme to deliver specific climate change targets.

2. BAA AND THE CLIMATE CHANGE DEBATE

2.1 BAA is the world's leading airports operator. We believe in the long-term responsible and sustainable growth of aviation. Our position in the industry—planning airport infrastructure developments over 30-year time horizons—requires us to take a long-term view.

2.2 BAA has two sets of interests in EU climate change policy. In addition to being a major player within the aviation industry, we also have substantial energy interests, as one of the UK's top 20 consumers of industrial energy.

2.3 BAA supports the UK Government's leadership position on climate change and recognises the importance of effective EU and international action to address this issue. We support the delivery of targets adopted by Governments within the framework of the Kyoto Protocol, and favour the mainstreaming of all aviation within public policy on climate change, noting that at present only climate change emissions by airports and domestic air transport are included within the Kyoto targets; international air transport emissions are not currently included. While aviation is perceived as receiving special treatment, we believe there remains a material risk that national governments, or the EU, may seek to apply blunt taxation to reduce demand, and curb the growth of aviation's emissions, thereby putting at risk the substantial economic and social benefits that aviation brings.

2.4 BAA is committed to making a significant contribution to reducing greenhouse gas emissions arising from energy use at our seven UK airports, through a new CO₂ strategy announced in July 2003. Our aim is to reduce absolute CO₂ emissions from energy consumption by 15% by 2010, compared to 1990 levels. This objective is particularly challenging in the face of passenger numbers rising substantially over the same period. The strategy is set to save 110,000 tonnes of CO₂ every year. This objective represents a step change in targets from the company's previous commitment of a 5% reduction on 1990 levels.

2.5 We believe that airports are on the public frontline on all of aviation's negative impacts—principally climate change, local air quality, noise, and surface access congestion. While we do not fly the planes, we firmly believe that unless we take aviation's negative impacts seriously, and deliver performance improvements, airports will not be allowed to grow. BAA therefore accepts its responsibility to lead change within the industry, talking with our airline customers, our communities, and our other stakeholders.

2.6 During 2003, therefore, BAA led a process of engagement with Government, airlines, aerospace manufacturers and environmental NGOs to inform and develop our thinking on a smart approach to addressing aviation's climate impact, as an alternative to increasing blunt taxation. Building on this dialogue, we updated our public policy position on aviation and climate change in October 2003.¹

¹ "Aviation and climate change: A BAA perspective", October 2003. The position can be downloaded by clicking on "Aviation and climate change seminar" within: http://www.baa.co.uk/main/corporate/sustainable_development_frame.html

3. AVIATION AND CLIMATE CHANGE: A BAA PERSPECTIVE

Climate change in context: sustainable development and aviation

3.1 BAA believes the debate on aviation and climate change needs to be seen in the wider framework of UK, EU and international commitments to sustainable development. Like many companies, we work within the UK Government's policy approach, which entails meeting four objectives at the same time:

- maintenance of high and stable levels of economic growth and employment;
- social progress which recognises the needs of everyone;
- prudent use of natural resources; and
- effective protection of the environment.

3.2 BAA believes that responsible air transport and airport growth should take place only where it is in accordance with these sustainability objectives. BAA further accepts that there are certain known environmental limits, such as the earth's capacity to handle greenhouse gases, which demand a clear and specific response.

3.3 However, in keeping with the emphasis placed by a sustainable development framework on policy integration, BAA believes the debate on aviation needs to recognise both the realities of environmental limits and aviation's socio-economic benefits. Economically, aviation plays a crucial role in promoting the high-knowledge and high-value-added industries, such as electronics, pharmaceuticals, insurance, and finance.

3.4 Socially, air travel is a facilitator—for people to visit friends and family scattered around the world, to seek new cultural experiences, to learn, to visit parts of the world inaccessible to their parents or grandparents. Sustainable development rightly places emphasis on improving quality of life for all. In this context, the fact that aviation is now accessible to most people, at least in the more prosperous countries, is both significant and welcome.

3.5 BAA regards the emphasis placed by a sustainable development framework on policy integration as fundamental, and we therefore reject approaches to tackling aviation's environmental impacts, including greenhouse gas emissions, which are aimed simply at reducing demand by raising the cost of flying through taxes and charges. However, we do recognise that the consequence of a regime of smart, well-targeted instruments may be higher costs and reduced demand. We believe this approach—of targeting the impacts of the activity rather than the activity itself—is the right approach.

Climate change and aviation: the overall challenge

3.6 BAA supports the UK Government's leadership position on climate change. We note the commitment of the UK and Swedish Governments to a target of 60% CO₂ emissions reductions against 1990 levels by 2050. Moreover, BAA notes the EU's publicly stated long-term climate change policy objective:

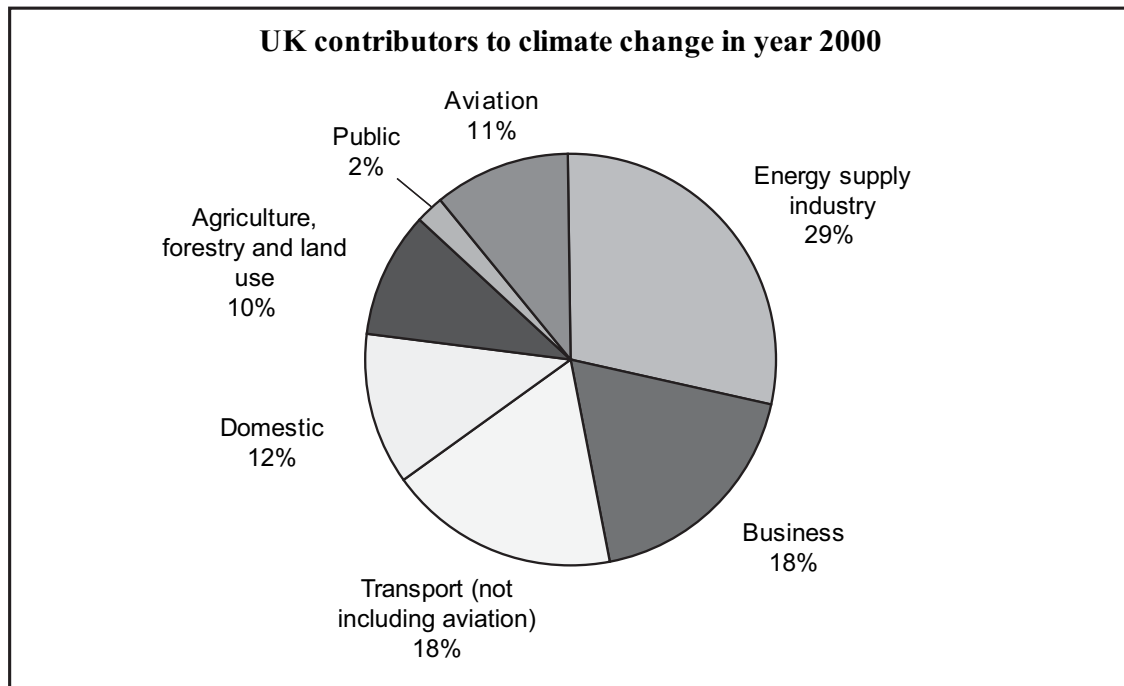
“a long-term objective of a maximum global temperature increase of 2° Celsius over pre-industrial levels . . . In the longer term this is likely to require a global reduction in emissions of greenhouse gases by 70% as compared to 1990, as identified by the Intergovernmental Panel on Climate Change (IPCC)”²

3.7 Globally, the IPCC analysis on aviation indicates that aviation is responsible for approximately 3.5% of total human radiative forcing, or climate change impact³. For the UK, in the year 2000, aviation's total climate impact amounted to about 11% of the UK's total climate impact. Thus, while aviation's current climate impact is significant, it is nevertheless still smaller than the climate impact arising from other sectors of the economy, such as power generation (29% of UK's total climate impact in 2000)⁴.

² Article 2, the 6th EU Community Environment Action Programme, adopted in co-decision in 2002.

³ Based on 1992 data. IPCC (1999) *Aviation and the global atmosphere*. Cambridge University Press.

⁴ 2000 figures, based on: *Climate change: The UK Programme*, Defra, February 2001 and *Aviation and Global Warming*, DfT, January 2004.



3.8 However, BAA recognises that aviation's climate impact is set to grow, and grow significantly, while a UK economy-wide total reduces in line with the requirements of the earth's global environmental capacity, and that in line with the precautionary principle, aviation must accept its responsibility to address the climate effects of this growth. In addition, as recognised by Governments at the Johannesburg Sustainable Development Summit, the priority to meet key human development needs such as clean water, food, and sanitation (in both developed and developing countries) will rightly use up a significant proportion of the earth's environmental capacity.

3.9 BAA believes there is a powerful economic and social case for aviation to take up some of the remaining capacity, given the absence of short-term technological solutions within the aviation sector, compared with the availability of solutions in other sectors of society. Importantly, this would only be permissible by users of aviation paying for emissions reductions (clean development) in other economic sectors—in developed countries, in transition economies, or in developing countries.⁵

Solutions to aviation's climate change impacts

3.10 BAA believes that effectively addressing climate change requires action at all levels—local, regional, national, EU and international. While climate change is a global problem and unified global action is the ideal, BAA recognises that regional political and trade blocs such as the EU have a key role in shaping public policy on climate change, and BAA is pleased that the EU is engaging seriously and constructively on the issue of aviation and climate change. In particular, EU-level action can provide an effective interim policy response prior to the development of more co-ordinated global frameworks.

3.11 BAA supports the EU Emissions Trading Scheme, and points out that domestic airport emissions arising from substantial power use (energy infrastructure in excess of 20 megawatts) are already included in the first phase of the EU Emissions Trading Scheme from January 2005. To meet our obligations under the EU Emissions Trading Scheme, BAA has therefore registered three sites: the two Gatwick terminal buildings and the Heathrow central boiler house, which supplies Terminals 1, 2 and 3. In addition, we would like to register a fourth site (Terminal 5) for entry into the scheme during 2005–06. The EU Emissions Trading Scheme does not apply to our other sites, as the energy plants are below the threshold of 20 megawatts.

3.12 BAA very strongly supports the UK Government's objective to try to extend the EU Emissions Trading Scheme, by linking intra-EU flights within the scheme by 2008, and we welcome the Government's intention to make this a priority for the UK's EU presidency in 2005. We believe that this will help to bring aviation within the club of climate-responsible industries. We believe that all intra-EU flights should be linked with the EU Emissions Trading Scheme, irrespective of the nationality of the airline (including EU

⁵ The Kyoto Protocol (KP) provides for three "flexibility mechanisms", to assist Annex B countries (those taking on legally binding emissions reduction targets) to deliver against their targets. These flexibility mechanisms are: Joint Implementation (article 6 of the KP), the Clean Development Mechanism (article 12 of the KP), and Emissions Trading (article 17 of the KP). It is recognised that the JI and CDM mechanisms will help facilitate clean development in transition economies and developing countries.

and non-EU airlines). The full legal allocation of international aviation's climate change impact to country governments should therefore be urgently addressed, so there is clarity over which countries are responsible for which aviation emissions.

3.13 BAA believes that partial integration of intra-EU flights with EU emissions trading (where airlines can buy EU emissions allowances from the open EU market but not sell to that market) is deliverable by 2008, and that full integration (both buying and selling) is achievable by 2013.

3.14 BAA believes that an environmentally-credible emissions trading scheme should embrace a number of key principles, and these should guide EU public policy on addressing aviation's climate change impacts. These principles include deliverability, environmental effectiveness, economic efficiency and equity.

3.15 BAA believes that linking intra-EU flights with EU emissions trading must be seen as a first step towards including all aviation within a global system of open emissions trading. Parallel pressure should therefore be brought by EU member states on the US, Russia, and other non-EU regions across the whole climate change agenda, including on aviation. BAA welcomes the UK Government's declared intention to use its Presidency of the G8 to press for further international progress on the climate change agenda, and hopes that this will lead to non-EU nations taking a more constructive, international approach to resolving the issue of aviation's climate change impacts.

3.16 *The Future of Air Transport* White Paper highlighted:

“The Intergovernmental Panel on Climate Change report Aviation and the Global Atmosphere included a central estimate that the impact of aviation emissions was 2.7 times the impact of CO₂ alone” [due mainly to the climate-warming effects of NO_x and water vapour emissions (contrails) in the atmosphere and cirrus cloud enhancement effects] . . . “A decision would be needed on how the extra impact of aviation should be taken into account when designing the sector's participation in the trading regime”⁶.

3.17 To the maximum extent practicable, BAA would like to see the allocation methodology take a smart, targeted approach and not adopt an allocation methodology based simply on multiplying CO₂ emissions by a radiative forcing factor of 2.7. We believe that a CO₂ x 2.7 approach could send perverse incentives to the aviation industry to reduce CO₂ at the expense of other non-CO₂ climate impacts. For instance, there is a known trade-off between CO₂ and NO_x, and it would be perverse to encourage an increase in NO_x in order to achieve reductions in CO₂. In addition to this being a problem from a climate change perspective, it could also compromise progress towards the delivery of EU public policy objectives on NO_x and local air quality.

3.18 BAA has therefore suggested that, for the 2008–12 phase, aviation should be linked with EU emissions trading on the basis of both aircraft CO₂ and NO_x emissions. Provided airlines were prevented from selling Aviation Allowance Units into the open EU trading market, the targeting of both CO₂ and NO_x would not compromise the EU Emissions Trading Scheme's compatibility with the Kyoto Protocol. It should be noted that this is true even though NO_x is not yet legally designated as a greenhouse gas within the Kyoto Protocol basket.

3.19 From 2013, BAA would also like to see aviation's contrail and cirrus impacts directly, separately, and fully integrated into EU emissions trading. The legal designation of aviation's non-CO₂ impacts should be prioritised as a step towards enabling the direct, separate, and full integration of aviation's CO₂ and non-CO₂ impacts within emissions trading. However, while it is possible to differentiate aircraft in terms of CO₂ and NO_x emissions performance, further scientific research is necessary in order to move towards differentiating aircraft operations in terms of contrails and cirrus effects. Without advances in scientific understanding, contrail and cirrus impacts could only be incorporated within EU emissions trading on the basis of an averaged “per kilometre” impact. BAA would therefore welcome international research, funded by the aviation industry, to develop a predictive system capable of assessing, to a reasonable degree of accuracy, the CO₂, NO_x, contrail and cirrus impact of any given flight.

3.20 We strongly oppose alternative policy instruments of blunt taxes and charges, where the revenue raised flows into the public purse for general government expenditure and is not exclusively and entirely hypothecated to purchasing emissions reductions in other parts of the economy. Such instruments offer limited positive environmental benefit, impact negatively on competitiveness, and essentially act to tax away demand and the positive benefits that aviation brings.

CONCLUSIONS

3.21 Aviation has a small, but significant and growing impact on climate change, and this must be addressed.

3.22 Aviation should be brought within the mainstream of industry and climate change policy within the UK and the EU, as quickly as practicable. The most effective way of achieving this is for intra-EU flights to be linked with the EU Emissions Trading Scheme from 2008.

⁶ Paragraph 8, Annex B, *The Future of Air Transport*, Department for Transport, 16 December 2003.

3.23 EU policy to address aviation's climate change impacts is a welcome and necessary first step to global solutions, but the UK Government and the EU must rigorously pursue this agenda internationally through the G8 and other bodies.

23 September 2004

Witnesses: Mr Mike Clasper CBE, Chief Executive, Mr Stephen Hardwick, Director of Public Affairs and Mr Matthew Gorman, Group Sustainability Manager, BAA plc, examined.

Q89 Chairman: Could I call the meeting to order and welcome our first group of witnesses from the British Airports Authority: Mr Mike Clasper, their chief executive, Mr Stephen Hardwick their director of public affairs and Mr Matthew Gorman, the group sustainability manager. Gentlemen, you are welcome and thank you for your written evidence. I looked with interest at your evidence and I am grateful for its succinctness, but one thing which struck me about it, particularly in the context of BAA being a major user of energy, never mind about the aviation aspects which we will come onto in a moment, was that you were long on supportive statements about the need to reduce energy, in fact you point out that you have doubled your own internal target in terms of energy reduction and that in itself is very impressive, but you are very short on telling us how this is going to be achieved. Perhaps you could deal with my intrigue as to what programmes you are actually going to adopt, because you do not actually mention any of those in the evidence.

Mr Clasper: Obviously we felt that the Committee's major interest was in the whole area of climate change from the airline activity rather than the airport activity, but we are basically doing three or four things which we think will allow us to achieve our targets of reduction. The first area is that we have a lot of old estate, some of you probably travel through it, called Heathrow and Gatwick. We are going through a capital replacement programme of a lot of that equipment, probably adding up to about £15 million in which we are taking out old equipment and putting in much more energy efficient equipment, particularly in things like air-conditioning and heating. The second thing is that we are planning to use an existing CHP plant at Heathrow to fuel Terminal 5 which will add to our efficiency. We are in partnership with the Carbon Trust who are helping us to design more energy efficient buildings from the outset. Probably the final area where we have had quite a lot of success over the last three years is that we have had quite considerable growth in passengers and new facilities and yet over the last three years we have had zero growth in our energy usage. There has been some very basic stuff like sub-metering. Traditionally we had a meter for the whole site almost and therefore you did not actually know where you were using energy and therefore where to target reduction. We have probably put hundreds of meters in our Heathrow estate for example, so that we can understand where the energy is being used on a zone basis and then just encourage the basic sort of, I do not want to make it as simple as this, but the turn-out-the-light type of activity which produces conservation through behaviour and therefore

partly through our successes and partly through a belief that we should try and do better, we have dramatically upped our own internal CO₂ target.

Q90 Chairman: You are quite right in saying that one of the principal areas of concern to the Committee is the fact that transport is a weak link sector in terms of meeting greenhouse gas emission targets and also the fact that aviation is as yet an uncontrolled area in this. One of the problems though is clearly, you cannot just look at it on a national basis: it is international. The United States is not a signatory of the Kyoto Protocol, other serious players are. From your contacts with the world of aviation, other international airport operators, what sense do you get that there is an international mood that aviation should be brought into this whole process? The only show in town from the evidence supplied seems to be some kind of emissions trading arrangement specially tailored for the needs of the aviation industry, but if that is not done on a global basis then it seems to me to be a rather limp stick.

Mr Clasper: A little bit of history; I want to be reasonably brief. Probably four or five years ago, the aviation industry, partly because international aviation emissions were excluded from the Kyoto Protocol, as you are probably well aware, was not really talking of it as an issue. Two or three years ago, we and British Airways in particular started to see the fact that, despite not being part of the Kyoto Protocol, we needed to start addressing the issue. Our view is that the best way of attacking the issue is not actually to have specialised activity specific to aviation, but almost to mainstream aviation into, as you rightly say, the start of the EU Emissions Trading Scheme (EU ETS) in 2008. British Airways and ourselves were relatively lone voices two to three years ago. Today, we have just seen both Rod Eddington write saying that he was supportive of joining the EU Emissions Trading Scheme and Virgin, similarly supportive. Our expectation is that we have literally just gone through a policy committee of the collection of European airports where the recommendation will be that they will support aviation moving into the EU Emissions Trading Scheme. I think that is a step of leadership for the world. I think that it is much more likely that the US will come along eventually if it is a market mechanism driven solution like emissions trading. We already know that the international ICAO body has accepted that emissions trading is the right sort of way of addressing the issue. We have gone from almost nowhere to a position of leading within the UK and now leading within Europe and I think that is probably the only way that will eventually get

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America involved, but you are more aware than I am of the fact that getting America involved in this issue is very difficult on a broader scale than just airlines.

Q91 Chairman: Just before I hand over the questioning to other colleagues, I had a look at the websites for Boeing and Airbus this morning to see what they were saying about reductions in terms of fuel usage. Boeing sort of say “Give us any problem in the world and we’ll fix it”, they seem to be very optimistic about it, Airbus talk about different types of construction of aircraft with the aim of reducing all-up weight as a way of reducing fuel usage. How do we deal with the paradox that if you go into emissions trading, it is effectively adding a price in some way to the cost of air travel in the hope that you will damp down the usage. However, there does seem to be a tremendous demand pressure: more people want to fly, cheap airlines are encouraging a tremendous growth in the use of the aeroplane as a transport medium, both within the United Kingdom and in the rest of the world, particularly in terms of Europe. There seems to be a danger that whatever technological improvements the airline manufacturers and engine makers may be able to make over quite a long time period, will be cancelled out by an almost insatiable demand to travel. What should we do about the insatiable demand and do you think that it does block out the technology contribution?

Mr Clasper: I do not like to answer in three parts, because I know you like brevity, but there are three elements to what you have just asked. The first one is that there is a tremendous inherent driver for fuel efficiency that is in the basic cost of the fuel that would encourage innovation and you are right, aircraft manufacturers are working on composite technologies instead of aluminium to reduce wear etcetera, flying patterns and so on, which will be further encouraged by the cost of carbon on top of the basic cost of fuel. That is the first point. The second point is that it is not just the burning of carbon, but it is also some of the upper atmosphere effects. Those upper atmosphere effects, unlike carbon, are not a law of physics given. You need a lot of energy to get a plane in the air, but once you are in the air it is possible actually to influence dramatically the upper atmosphere effects, but it requires long-term scientific understanding and technology investment to be able to achieve that. If we go down this route, there is a real possibility that we can get, not just continuous improvement, but actually step change in the climate change effect of any given flight. The third point I would make is that there is tremendous demand for air travel for all of the social and economic benefits that it creates in a global world and we do want to make sure that any measures in this sort of area, mainstream aviation, do not cause a distortion of economic activity. To price away the demand to solve the problem would require a level of pricing that would dramatically distort the market. Therefore, you are right, as a pure demand measure, there is almost nothing that

is going to solve the problem and that is why a smart set of policy instruments is a much better way than some crude taxation process.

Q92 Joan Ruddock: You are suggesting the distortion of a market, but is the cheap airline industry in itself not a distortion of a market?

Mr Clasper: You would only say the market was distorted if there were some form of mass subsidy and you could argue, I will use as an example, that the American market at the moment is distorted by the fact that a lot of US airlines are in Chapter 11 and some of those processes are a distortion of the normal economic effect. If you look at the low cost airlines, the reason that they are able to offer these low prices is not a distortion caused by subsidy; it is the efficiency of their operational practices which has allowed them to offer these lower prices. Now, what I do agree with is that if there is an external cost, like the one we are talking about now, that should also play in the equation, but it should play in the equation in a way which is mainstreamed with the rest of the economy. I would argue, and do argue, and some of my airline business partners might not agree with me, that that external cost should come into aviation and it should come into it in a market efficient form like emissions trading. I will not affect the fundamental shift that has occurred in the aviation industry through outstanding efficiency and operational practices. The flights would still be cheap but not very cheap.

Q93 David Taylor: The existing environment market, through which aviation flies is seriously distorted at the moment is it not? You are a polluter that is not paying at all.

Mr Clasper: Not paying at all for what?

Q94 David Taylor: For the climate change and other effects that you are creating and the social and environmental issues that they have.

Mr Clasper: I do not know how you would describe that we are not paying in any different way that any other—

Q95 David Taylor: It is a largely tax free zone over alternative forms of transport.

Mr Clasper: Well no, versus other alternative forms of transport, aviation is the only one within the UK, and we could get you actual numerical data on this, I do not have it with me, aviation is the only form of transport in the UK that is actually a net contributor to the exchequer. All other forms of public transport in the UK are net subsidised by the exchequer.

Q96 David Taylor: I am dubious about that, but we are not here to argue the toss on that. Flights up to say 1,000 kilometres, which could easily in many circumstances be provided by high speed rail links within the UK and within Europe are surely an example of an alternative that would have a much less damaging environmental effect than the alternative flights which your airports—

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Mr Clasper: I do not know how long we want to go down this track, but if you were to look at the way that rail travel is subsidised within the UK relative to air travel, you would find that already there is a very strong subsidy to encourage those 1,000 kilometres rail travel. For example, we are a total private sector company. There is not a single aspect of the infrastructure that aviation uses that is not paid for by the passenger, not a single aspect. The whole of Terminal Five which is being built for £4.2 billion will be paid for by the passenger.

Q97 David Taylor: Your environmental costs are paid for by the taxpayer, and the taxpayer and the passenger are not necessarily coincidental groups.

Mr Clasper: I would agree with the fact that the whole of the economy has to take a look at its external costs and wherever possible internalise them. What I am advocating very strongly, and I am proud that BAA has led, is that that approach should be mainstreamed in the EU Emissions Trading Scheme. As far as I understand it, the climate does not understand the difference between CO₂ from a power station versus CO₂ from an airline. Therefore by mainstreaming it, we are then paying our external costs and that then needs to be brought into the pricing equation. I think it is very important that we all understand though, that versus other forms of public transport, aviation is not subsidised in the UK, it is a positive contributor to the exchequer and therefore provided these external costs of CO₂ are internalised for everybody, including the rail industry, then any distortion of the choice will be eliminated.

Q98 David Taylor: I think aviation tends to overstate its contribution to the economy, and understate its costs to the environment. We will have to move on from that. Thirteen months ago, Alistair Darling launched the White Paper on the future of air transport in the chamber just a few yards away and that anticipated almost a tripling of passenger numbers between 2000 and 2030. Set against that sort of backdrop, you are still suggesting that you can achieve a 15% reduction in CO₂ emissions. How on earth are you going to do that?

Mr Clasper: We made a commitment that by 2010, we will have reduced our emissions by 15% over 1990, which is where the whole thing has been benchmarked. That does assume that over that time period our business in the UK, the number of passengers that we serve, will grow by four to 5% a year. We are fairly confident of that target. I do not like setting targets in an important area like this that you know you can make for sure, but we do have the programmes and investment plans that we think will deliver that sort of efficiency.

Mr Hardwick: And there is one element that Mike missed out in his earlier summary and that is that we are sourcing 20% of our energy from renewable sources. That is part of our commitment to reducing our emissions.

Q99 David Taylor: These are the airports themselves, we are not talking about aviation generally?

Mr Hardwick: The airports.

Mr Clasper: We are talking about the point the Chairman raised, that was the airports themselves, not the airlines.

Q100 David Taylor: The White Paper to which I just referred, paragraph 8 annex B, came up with the figure which you will all recognise that the impact of aviation emissions is 2.7 times the impact of CO₂ alone. You seem to accept that. Do you want to comment on that?

Mr Clasper: What I definitely accept, I think the whole aviation industry accepts, is that there is an additional effect beyond the CO₂ itself. It is of the order of what you have just described, but I think one of the things that one must do is, having accepted that, recognise that the impacts are very different sorts of impact. For example, a large part of that additional impact is water vapour.

Q101 David Taylor: Are we talking about contrails?

Mr Clasper: Yes, contrails, cloud formations that can actually be avoided by the way the plane flies depending on climate condition and topography. So there are potential solutions which could actually eliminate or dramatically reduce it, but it would require a much more sophisticated air traffic control system. Another one of the impacts is NO_x. There are certain engine technologies which are available today and will be available in the future which would have a dramatically lower NO_x effect at high altitude compared with certain existing technologies whereas, as I said earlier, a tonne of CO₂ is a tonne of CO₂ and therefore what you need is targeted policy instruments to tackle those different effects. Using a crude multiplier will produce distortion, some of which may actually be counter-productive.

Q102 David Taylor: I fully accept that. I am not at all sure that contrails can be effectively tackled in that way by altered altitude of flight. Yes, technically, but the organisational consequences of that are quite difficult, because at East Midlands airport in the northern part of North West Leicestershire, which, as you well know is the largest night freight airport in the country in terms of dedicated aircraft, has had all sort of problems trying to renegotiate and consult on altered flight paths to cater for the enormous increases, particularly in freight flights, but also in passenger flights, which are anticipated by the White Paper. So talking about reducing contrails in that way is perhaps a little bit academic. That is just an observation.

Mr Clasper: May I come back on that because I do have something reasonably valuable to add to that?

Q103 Chairman: Very briefly, because there are a couple of tax questions we want to ask you.

Mr Clasper: The core of this is the altitude that the plane flies at and the core of this is not in climb, but in cruise. There is a project which I think we all

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should be supporting which is a big review and new technology for 2020, the European programme on a single sky; it is called the SESAME Programme and one of our directors involved in that. I would encourage everybody who can to encourage that work to build in the concept of the environmental performance in flight which would then allow, not the path, but the height of the path to be handled that way. Maybe I am a born optimist, but I think that is capable of technological solution and would be a significant part of aviation's climate change.

Chairman: It may be helpful if you could drop the Committee a little line just to expand on that point. Mr Mitchell is going to ask you a question about tax and Candy will follow that up. Just before you launch, may I park a question with you? Aircraft are effectively long-life assets. Do we need to change the tax regime to encourage a quicker turnover, so that new technology can be introduced more quickly? If you could park that one, Mr Mitchell will add another fiscal point.

Q104 Mr Mitchell: Your point about being the least subsidised form of transport is pure sophistry surely. It is worthwhile subsidising railways and public transport because use of them has a less damaging effect on the environment than using cars.

Mr Clasper: Yes, so does a public aviation flight.

Q105 Mr Mitchell: So does a bicycle, but when it comes to aviation, you are uniquely privileged in the sense that the privilege is the fuel tax regime.

Mr Clasper: I should like to come back with the data, but if you accept, which maybe you do not, that aviation, as I understand it, is public transport, then if you look at the net contribution to the exchequer versus subsidy from the exchequer in the UK, there is not even a doubt that aviation is not subsidised whilst, for reasons other than environment, buses and rail are subsidised. I do not think you can argue that; the land take of rail is higher, the noise of rail is similar. I think there are public policy reasons why you might want to subsidise rail and I am not saying it should not be subsidised, but at least I think we should be on a clear understanding of what we mean by the word "subsidy" relative to other forms of public transport.

Q106 Mr Mitchell: Let us take it just on subsidy, because we are talking about carbon emissions and their effect on the environment and the problem therefore is whether the market has to be changed, you do not want interference in the market, because of the effects of aviation on carbon emissions and on the environment generally. We have just been dealing with the contrails, or as I used to call it, the tail scraping the sky, but you have a more substantial and damaging effect on carbon emissions than most other industries and certainly other forms of transport. Aviation represents 11% of the UK's total climate impact and it is calculated that it will represent 33% by 2050. Therefore, you are going to

have to be penalised in some way if we are going to deal with this trend of carbon emissions and their effect on the environment.

Mr Clasper: All I am saying is that I do agree that that external cost should be internalised and I think it should be done in the same way as with the rest of the economy and I am a personal advocate of doing it through the EU emissions scheme because I think market forces and self-interest are more likely to drive innovation than pure taxation that is not hypothecated. You may not agree with that, but I stand here as a representative of a company which, along with British Airways, has been campaigning for the aviation industry to accept this for three years and that campaign is now working. We are volunteering to be part of Kyoto having been legally excluded from it.

Q107 Ms Atherton: You ended very appropriately on the scheme. Can you expand a bit more about how as a company you are participating?

Mr Clasper: Because we have three sites where we are a generator, by this definition of sites of 20 megawatts, we have three sites where we will register them like any other generator. It is helpful to us in a way in that we are participating in this in three sorts of ways: one in a general energy efficiency way with the commitment; secondly as a live generator, although I know behind me are some people who generate a lot more than 20 megawatts; thirdly, in this context of aviation where we do not fly the planes, but we do believe our industry needs to produce a responsible policy response.

Q108 Ms Atherton: Now I am not a scientist, so if I get this wrong, you will have to help me. In your evidence, you suggest that some of the policies to reduce carbons will actually create more problems with nitrogen. Can you explain that to me as a non-scientist?

Mr Clasper: I can only assert as a non-scientist to a non-scientist that in the main the new technologies can both deliver CO₂ and NO_x reductions. However, there is a triangle of three objectives against any individual technology: carbon, NO_x and noise, to go back to a point made earlier. In that triangle, you are always optimising two to the detriment of a third. You can then use technology to move the bar, so that it is not as bad, but you are always playing a game of optimising between them. It is to do with the efficiency of burn, the speed with which the plane gets up in the air, because the faster it gets up in the air the sooner they reduce noise in the flight path and therefore that is why you get into this situation of having to choose two at the expense of the third. I am not sure that helped a lot.

Ms Atherton: No, it helped a lot actually.

Q109 Chairman: And my point about tax and depreciation of assets?

Mr Clasper: The more that the carbon emissions market is real and liquid, the more it is an extra encouragement to move to the new technology. It is very interesting, going back to the point on the low cost airlines. One of the reasons that they are such a

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success operationally is they are starting with a new fleet which is much more fuel efficient than the old fleet. Were you able to do more to encourage the sun-setting of the older planes, there is no doubt it would have a benefit, because the fleet life is a problem in addressing these issues. It takes 20 years for a new technology really to have a big impact across the whole fleet. It is an interesting thought, but I must admit I do not have any obvious answers to it.

Q110 Joan Ruddock: You have talked a lot about new technology with regard to the actual hardware and how you are going to try to reduce and everything, but what about the actual effects of aviation on climate change itself. I understand that you propose that the aviation industry should be funding this internationally. Is there encouraged co-operation between people internationally? How do you raise that money, how is it done and if you do it, how do you share the fruits of that research?

Mr Clasper: In the areas that are clear like carbon, then I do not think it applies, I think you just mainstream it. Clearly, an area like the water vapour area that I have just talked about is only aviation and we would recommend, although some of my business partners would disagree with this; some form of fiscal measure that stopped the free-rider principle and got the whole power of the aviation industry alongside government working on establishing this science that we talked about because there is still uncertainty in it and then working towards potential solutions. The solutions on the water vapour for example are almost certainly going to be air traffic control driven and all airlines would benefit from it, rather than actually driven by the airlines themselves.

Q111 Joan Ruddock: Are you saying you know enough about the science, you know enough about what aviation is doing in respect of climate change? I thought there were areas where further research was required.

Mr Clasper: We do not know enough about the details of it. We know enough to say that there are effects beyond carbon. It is by getting a greater understanding of the science of that, that some of these solutions . . . At the moment we are not certain about the extent to which taking a particular track through the sky would reduce it. What we do know is that certain tracks create it and certain do not. The people who really know what they are talking about also know that it is a combination of daily climate and topography. Therefore there is a way of solving this, but it is only at that sort of conceptual level. Turning that into a real solution that can be built into a European air traffic control system in 2020 is going to take money and research effort and any policy instruments that would encourage that, we, wanting to have a responsible industry, would say that is the right thing to do and we want to avoid the free rider. For example, British Airways, who are in the vanguard of this in terms of airlines, are measuring, or trying to measure, their individual

flight emissions. They are a lone company at the moment, and that in a sense hardly seems fair given the scope and scale of the global aviation industry.

Q112 Joan Ruddock: Are you really saying there is not enough cooperation to make this happen?

Mr Clasper: There is not enough co-operation in a joined-up policy between government and airlines and so on around, we are talking one particular issue, a very important issue, this water vapour issue. More policy instruments from government could force joined-upness.

Q113 Joan Ruddock: Would it not have to be an EU initiative to make sense of that?

Mr Clasper: We have talked about getting America to look at Kyoto seriously being well beyond any individual industry as far as I can see, so I think the start point for this should be at EU level. We have a great opportunity in the EU, in that the EU is already funding a big study of a better air traffic control system in 2020. Pushing for the environmental aspects of that project to be given a higher priority than if we did not push would be a smart thing against this whole issue that we are talking here today.

Q114 Mr Lazarowicz: Can I just be clear about your position on the use of fiscal instruments? As I understand it, you are against measures which result in increases in taxes and charges because you say they will distort the market; I think that was one of the reasons you were indicating you were against that. But surely, if aviation is brought into the emissions trading scheme, that is going to have an effect on prices and demand as well.

Mr Clasper: Yes, it will.

Q115 Mr Lazarowicz: If it is going to make a difference, surely, there is going to be a substantial impact if such a scheme is going to work for aviation.

Mr Hardwick: We are perfectly prepared to pay the cost of the environmental impact of the industry. Our view is that taxation is the wrong place to start, because you are monetising the cost and then giving the money to the exchequer and the impact remains the same. A charge is slightly better if the revenue from the charge is hypothecated into mitigating the impact and a market mechanism which targets the impact directly through trading or some other measure delivers both the internalisation of the cost and the output of the reduced environmental impact. We accept the demand consequences of the additional costs involved in meeting our environmental obligations. What we do not accept is using taxation to price behaviour as a proxy for dealing with the impact itself which is why, across a range of different measures, we would rather target the specific impacts with a measure which is most appropriate instead of counting the cost of all those impacts, writing a cheque and giving it to the exchequer.

Mr Gorman: An impact on demand may be a consequence but it should not be a tool essentially.

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Mr Clasper: There is another important driver in here which is that the price sensitivity of the total aviation market is relatively low because of its tremendous value to its users, but the price sensitivity between individual airlines is very high. I know that I am going to fly to New York, I have to, I get a whole load of benefits from that, I will pay, I am not saying what it takes, but almost what it takes. However, when I choose which airlines to travel with, I will make a choice which might be because of a £10 difference. If you do it the way that we are talking about, that is not a blunt taxation, but is a policy instrument against the effect, then what it means is that if you adopt a lower cost carbon technology you get a structural price advantage in the marketplace, which drives people to your business and causes the other guy to buy new technology. If you take the example of the low-cost airlines, they have bought fuel efficient new aircraft, they have a structural advantage, they are gaining market share, they cause the other guy to look around and make a change. So you have a thing here whereby if you do it this way, you will get behaviour change in the industry and you will start helping to reduce, mitigate and even solve the problem. If it is just writing a cheque, as Steve says, everybody gets on with their business and writes the cheque. Nobody bothers to put the energy in, like we are here today, talking about innovation and technological solution.

Q116 Mr Lazarowicz: I accept that the Emissions Trading Scheme is probably theoretically the most comprehensive way of addressing these issues, but surely it is not beyond the wit of man or the wit of the Treasury to devise schemes of charging which are designed to have the most beneficial environmental consequences. You can do things with tax which will have at least some tendency to push ministers in an environmentally more sustainable direction.

Mr Clasper: Let me give you example from history. APD was introduced, Air Passenger Duty, which probably roughly is about one billion pounds to the Treasury and we can give you the exact numbers. At the time—the Treasury sometimes changes over time the purpose of the taxes—it was originally introduced as an environmental measure to affect demand. It had demand effect for, we guess, six to 12 months, and then it had disappeared, yet it probably reflects roughly today the early payments that the UK aviation industry would need to do, if the cost of carbon was in the range of seven to 10. So what you have here is that the level of taxation to make the problem go away would not be anywhere near the scale of the external cost. It would have to be dramatically above the external cost to make the demand go away. Then you are distorting the economy, because the taxation levels would have to be enormous.

Q117 Chairman: May I just ask you a question which follows on from what you were saying and I apologise for interrupting? I am trying to understand how you structure an emissions tax for the airlines, because you have just said that in the

biggest growth sector many of the low cost airlines are already at the best technological solution because they bought the most modern aircraft. Then you look at other airlines which will have a range of aircraft from the most efficient to less efficient. I am not certain how you structure the emissions trading arrangements, when you might have quite a slug at the industry which cannot actually get any better. How do you structure it to encourage things, when for the major growth area, you cannot actually get them to emit any less other than by simply making fewer journeys?

Mr Clasper: With the technology that exists today you cannot get the most efficient aircraft to emit less unless you have fewer journeys. You are absolutely right. I think what we are talking about here is that you have aviation as part of the whole of the economy that is trying to tackle this problem and whether the allowances go from a low cost airline to encourage one of the other airlines to sunset some of their equipment, the very point you were making earlier, or whether they go to encourage, at the margin, a lower emission energy generation project is up to the market. The economy solves the problem in a way that does not distort the development of the economy.

Q118 Chairman: But you do have distortions, because, in the nicest sense, airlines would probably have shorter journeys if they could fly in straight lines. But they cannot, because the air traffic control arrangements get them flying from here to there to wherever.

Mr Clasper: You make another very good point. If the cost of carbon is high, then it is an encouragement to find operational ways of solving that. I am not going to say it is going to make a huge difference, but one of the things about the whole air traffic control system currently is when people are in a stack and that is pretty energy inefficient. Is there enough momentum to solve that? There is some. Would there be more if the cost of carbon were in the equation? Yes there would. There is another way which, by using a market mechanism like this, would work. However, if you are going to pay £10, which is the current situation, to get on the plane and it does not matter how far it flies, how it flies, what technology it uses, are you going to get any serious activity to reduce, mitigate and solve impacts? No. I guess that is fundamentally the point that I am making.

Q119 Mr Lazarowicz: Without being too theoretical, presumably, you could easily conceive a system where the taxation was varied to take into account the aircraft type, the type or length of the journey or the number of passengers. That is probably something we cannot pursue here. In practice, what you are effectively saying is that because it is some time off perhaps before we can get an ETS scheme working for the aviation, in the meantime you are not prepared to accept alternative measures such as ones which come from our taxes or charges. Effectively what your position is doing is

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arguing for things to be left as they are for some time in the future and you will be escaping the consequences of your activity for some years.

Mr Hardwick: We are talking about three years away: 2008, which is the government's objective for bringing EU aviation into the EU Emissions Trading Scheme is three years. That is not a very long timescale in a 50-year Kyoto-type scenario where we are looking at where we are going to be in 2050. We already have a taxation arrangement through air passenger duty which is covering maybe 60% of the UK aviation industry's environmental costs. The problem with interim arrangements is that they tend to become permanent and we are trying to bring a coalition of aviation industry, airlines, airports, within the UK and across Europe for this bigger win than short-term gain through a domestic fiscal measure. One of the big problems that we have encountered and that British Airways has encountered in other countries is the fear of this alternative fiscal measure. For instance, in Germany

the German Government has traditionally been in favour of taxation, so the German airlines and airports have been nervous about volunteering for emissions trading because they think they will get hit twice. I think three years is not too long to wait to bring in a better economic instrument that will capture the costs and start to deal with the impacts. There is one other thing I wanted to add on to what Mike said earlier about charges. We are not against charging, if it is smart charging. We ourselves vary our airport charges for noise: noisier aircraft pay a premium, quieter aircraft get a discount and for NO_x, the dirtier aircraft have to pay more than the cleaner aircraft. So if you use charging in a clever way, and we do it in a way which is revenue neutral so it spreads the load among the airlines, then that is a perfectly valid way of using a fiscal instrument.

Chairman: Gentlemen, you have given us some very interesting food for thought. You are very kindly going to supply us with one or two additional pieces of information and thank you very much for coming to give evidence to us this afternoon.

Supplementary memorandum submitted by BAA plc (U5a)

When BAA gave evidence before the Committee on 12 January, we promised to provide you with further detail on the EU SESAME air traffic management research project.

SESAME builds upon the Single European Sky initiative and seeks to define the vision for air traffic Systems for the year 2020.

The first phase of the project is a two-year scoping study, which will define the roadmap to enable aviation to get from where it is today, in air traffic system terms, to where it needs to be in 2020. The main driver for the project is the need to increase capacity to manage the forecast growth in demand.

The study phase is to be fully funded by the European Commission, from the TEN-T budget and the total cost is estimated to be around €60m. This figure includes cash and payment in-kind from Eurocontrol, which is coordinating the tendering for the project on the European Commission's behalf

BAA, BA, easyJet and NATS are all involved in a major international consortium bidding for the study contract. The draft documents that we have seen from Eurocontrol, which describe the current thinking on the required scope of works, include the following key objectives:

- define European air transport system performance up to 2020
- identify globally interoperable and harmonised solutions
- produce the detailed research and technology
- establish a detailed phased implementation plan
- propose the legislative, financial and regulatory framework

Although "enabling the sustained development of air transport and aviation" is discussed in the documents, environmental issues do not feature very highly, nor are they specifically referred to under the heading of "Deliverables".

BAA has therefore raised this issue with our other prospective consortium members and this will be discussed at the next consortium management meeting.

As Mike Clasper said when we gave evidence last week, we believe that this study, and the detailed work that will follow, should give more priority to potential environmental improvements as part of air traffic management, especially in terms of using air traffic systems to avoid the creation of condensation trails by aircraft in flight. Any pressure that the Committee can bring to bear on the European Commission to ensure that the important environmental elements of the study are given more weight will be very welcome.

On a separate matter, I am sure that you will be interested to hear that on 19 January the Board of ACI Europe, the trade association representing 450 airports across 45 European countries, formally approved a public policy position supporting long-term commitments to resolving aviation's climate change impacts. This position includes a specific call for aviation's carbon dioxide emissions to be included in the EU Emissions Trading Scheme from 2008. While individual companies, such as BAA, BA and Virgin, are

already publicly committed to such a policy, this is the first time that a representative aviation industry body has publicly agreed to it. This effectively means that the whole EU airports industry now supports the UK Government's aim to bring aviation into the EU ETS. I attach a copy of ACI Europe's position paper⁷.

30 January 2005

Memorandum submitted by the Association of Electricity Producers (U29)

1. The Association of Electricity Producers (AEP) is the UK trade association representing electricity generators. It has some 100 members ranging from small firms to large, well-known PLCs. Between them they embrace nearly every generating technology used in the UK, including not only conventional large-scale generation but a variety of technologies, some of them innovative. Contact details for the Association are given at the end of this paper. The Association is keen to engage with the Government in shaping future Climate change policy and welcomes the opportunity to contribute to the Committee's inquiry into the UK Climate Change Programme (CCP), as follows.

KEY POINTS

2. We would like to emphasise the following key points at the outset of our submission:
 - Within the draft UK National Allocation Plan, the Power Generation Sector has been singled out to shoulder the major burden of emissions reductions for the UK in Phase 1 of the EU Emissions Trading Scheme (EUETS).
 - The assumptions, projections and data on which policy decisions are based, and the procedures for the allocation of allowances under the EUETS, must be transparent.
 - Electricity prices will have to rise if the Government's ambitions on climate change are to be achieved.
 - We support the Government's use of market-based mechanisms in its climate change strategy.
 - The Government should ensure that industry in the UK is not disadvantaged in relation to other Member States whose National Allocation Plans under the EUETS are more liberal.
 - Government needs to create a business climate that will encourage significant future investment in the Power Generation Sector.
 - We must have a clear, early indication of how the Government expects to manage Phase 2 of the EUETS; the Power Generation Sector has long lead times for investment and cannot flourish when it is constrained by a lack of certainty beyond the short term.

ENGAGING ALL SECTORS IN DELIVERING CLIMATE CHANGE POLICY OBJECTIVES

3. The Power Generation Sector has made the largest contribution to the reduction in CO₂ emissions since 1990, as shown in the table below.

<i>Annual CO₂ emissions (MtCO₂)</i>	<i>1990</i>	<i>2002</i>	<i>2010 (UK NAP, May 2004)</i>
Power Stations	198.5	158.2	139
Other Sectors	406.3	392.8	377
UK total	604.8	551	516

Even so, the Power Generation Sector continues to be a primary focus of current policy instruments. The Government has chosen to place the major burden of CO₂ emission reductions for Phase 1 (2005–07) of the EUETS on the Sector, but it needs to make it clear to all industry sectors that, from 2008, carbon reductions will have to be shared more equitably.

CHARTING PROGRESS TOWARDS THE UK'S 2010 TARGET

4. It is becoming increasingly clear that there is a significant gap between forecast emissions of CO₂ in 2010 and the Government's goal of a 20% reduction based on 1990 emissions. The Association has discussed the Updated Energy Projections for the Power Generation Sector with DTI and Defra and has identified some shortcomings in demand forecasting and the factors used to convert fuel consumption into CO₂ emissions. Both of these could result in an upward revision of emissions, but it remains unclear how Government intends to address the issues. Given the importance of future energy and emissions projections in assessing the likely impacts of both current and future Climate Change Programme measures, it is

⁷ Not printed

essential that the underpinning data and assumptions are transparent. Government needs to make more information available and engage in more constructive dialogue with industry if the projections are to be seen as credible.

THE EFFECT ON ELECTRICITY PRICES

5. Future electricity prices will be determined by a range of factors including supply/demand balance and fuel prices as well as the implementation of the Large Combustion Plant Directive (LCPD) and the EUETS. Carbon is only one of the contributing factors. The value of allowances under the EUETS is yet to be determined and the extent to which this is passed through into final electricity prices in the UK will be determined by the individual decisions of the companies operating in the market. Nonetheless the implementation of the EUETS must be expected to lead to some price increases.

6. However, it is the supply/demand balance that is the most critical factor in shaping future electricity prices. With continuing growth in demand and increasing environmental constraints on older plant limiting supply, the point at which investment in new power stations is needed will be brought forward. Prices will have to rise from the levels of recent years to encourage new power stations to be built.

CLIMATE CHANGE POLICY INSTRUMENTS

7. The EUETS will be the climate change policy instrument with the greatest impact on the energy sector over the next decade. The Association supports the use of such market-based instruments provided that they are designed to ensure the creation of an efficient and liquid international market in allowances and the delivery of carbon reductions at least cost across the sectors involved. However, the arrangements for Phase 1 have grown increasingly complex and the lack of a harmonised approach across the EU to the fundamental market rules may threaten the realisation of a truly single market in carbon. The Government should ensure that industry in the UK is not disadvantaged in relation to other Member States whose approach to CO₂ allowance allocation is more liberal.

8. The lack of clarity in the UK and within other Member States about the arrangements for the implementation of Phase 2 (2008–12) of the EUETS can serve only to delay investment that is needed now to meet Kyoto requirements. The requirement to develop National Allocation Plans for Phase 2 by September 2006 is too late to provide investor confidence. The Government should aim to secure clarity on the rules underpinning Phase 2 at an early stage, to encourage future investment in the Power Generation Sector.

9. The Renewables Obligation (RO) is another market-based policy instrument that the Association supports. The long-term stability of the RO mechanism is fundamental to maintaining investor confidence and this has been aided by the proposed extension of the Government target to 15.4% by 2015–16. It is important that investor confidence in the RO is not undermined by the forthcoming review by DTI in 2005–06.

10. The Government needs to continue to address obstacles to the growth of the renewable energy industry that are beyond the scope of the RO mechanism such as planning, connection to distribution or transmission networks, financing, rates, disproportionate regulation and public opinion.

11. The promotion of emerging renewables technologies such as wave and tidal stream is also important if these are to play their part in the longer term.

EU AND INTERNATIONAL CLIMATE CHANGE POLICY

12. With its role as Chair of the G8 and President of the European Council in 2005, the UK Government has an important role to play in taking forward the Kyoto and post-Kyoto agendas.

13. Both the UK and the EU as a whole would benefit from early clarification of the rules for Phase 2 of the EUETS and the delivery of an efficient and liquid market in allowances. Full access to the international project mechanisms must also be secured to enable carbon reductions to be achieved at least cost. The UK should also seek to ensure that all sectors play their part in reducing emissions, including the transport sector.

14. For the period beyond 2012 it is essential that UK and EU climate change policies are seen in the wider global context. The competitiveness of UK and European industry remains a priority. All leading industrialised nations need to play their part in tackling the challenge of climate change. It is essential that the USA and Russia are fully engaged and that those countries with rapidly increasing emissions such as India and China also play their part. Consequently, the context for UK and EU climate change policies beyond 2012 must centre on achieving a new international agreement. This must be a priority for the UK and the EU over the next few years.

Memorandum submitted by the UK Business Council for Sustainable Energy (U36)

INTRODUCTION

The UK Business Council for Sustainable Energy welcomes this opportunity to submit memorandum to the Committee's inquiry into the UK Climate Change Programme and commends the Committee for undertaking the inquiry at a crucial time in the development of the UK's climate policy.

The UK Business Council for Sustainable Energy was formally launched in January 2002. Its mission is to create and sustain a framework for high level policy engagement across the energy sector on climate change, sustainable development and the transition to the wider use of sustainable energy. It is one of an emerging number of similar Councils with others being in the United States of America and Australia.

The UK Council brings together major energy businesses focused on the delivery of sustainable energy technologies and services including renewable energy, energy efficiency and energy efficient technologies such as combined heat and power (CHP). The Council is working to build a broad consensus on many of the issues surrounding the development of sustainable energy in the UK. Business supporters of the Council include: RWE npower, E.ON UK, Scottish Power, Scottish and Southern Energy, United Utilities, EDF Energy, Centrica, Shell UK, BP and National Grid Transco.

PROGRESS TOWARDS THE UK'S TARGETS

It is becoming clear that there is a significant gap between forecast emissions of CO₂ in 2010 and the Government's goal of a 20% reduction based on 1990 emissions. Recent Department of Trade and Industry (DTI) projections suggest that with current Climate Change Programme (CCP) measures plus the additional reductions expected from the EU Emissions Trading Scheme the overall level of CO₂ emission reductions will be 15.2% by 2010.

Identifying the measures needed to bring the programme back on track to meet the 20% reduction goal will be a key part of the Government's review of the Climate Change Programme. The Council believes that more needs to be done in a number of areas to bring the programme back on track.

Looking forward achievement of the UK's longer-term climate change targets will require considerable investment by industry. Within the electricity sector the lead-time for these investments is typically three to five years, with payback periods often in excess of 15 years. Government needs to make early decisions about the future direction of climate and energy policy to enable the necessary investment planning by industry.

ENGAGING ALL SECTORS

To avoid the damaging effects of climate change, it is vital that the UK's long-term ambitions on climate change are realised. It therefore becomes increasingly important that other sectors become as fully engaged as the energy sector currently is. In particular action needs to be taken to ensure that the transport sector (including aviation) is playing its part in delivering emission reductions. At present, the gains made in the last few years from the power sector are being largely negated by rising emissions in the transport sector.

We welcome the Government's intention to explore options for bringing aviation into the EU Emissions Trading Scheme, but more must be done to engage the road transport sector. This is not an area where the Council has expertise but we are aware of the work being done to promote the use of bio-fuels, which would appear to present a good opportunity to make substantial emissions reductions from the use of transport fuels.

COMMUNICATION

The Council believes that whilst there is a general awareness of climate change amongst the population more needs to be done to communicate the need to take action. Delivering the Government's climate change targets will need the engagement of individuals, be it supporting the development of a local renewable energy development, purchasing various energy efficiency measures for their homes, or being prepared to change their behaviour in other ways.

More needs to be done to ensure that there is positive messaging and reinforcement of the Climate Change Programme and Energy White Paper targets. The Government needs to work more closely with industry to ensure more positive and co-ordinated messages are delivered.

EMISSIONS TRADING

The EU Emissions Trading Scheme (EU ETS) is likely to be the climate change policy instrument with the greatest impact on the energy sector over the next decade. The Council fully supports the introduction of EU-wide emissions trading as an effective means of delivering emission reductions.

The emergence of the EU ETS is already having an impact on the energy sector as it develops the strategies and systems to respond. However we shouldn't be expecting the scheme to be doing too much too soon. The first phase of the scheme should be viewed as a learning phase, but in the knowledge that the 2nd phase will be much tougher than the first.

The success of the trading scheme depends on the long-term signal it sends to industry. Currently we only know the rules around which the first phase will operate (2005–07). This is too short a time-period to make a real influence on industry's investment decisions. Decisions need to be made quickly about the structure of the 2nd and subsequent phases if the trading scheme is to make a meaningful contribution to the Government's targets.

RENEWABLES

The development of renewable energy is a key part of the Climate Change Programme. This is being driven by the Renewable Obligation (RO), a market based instrument that is giving a real incentive to invest—as evidenced by the hundred's of millions of pounds being allocated to renewables development by a number of players in the energy sector. This level of investment must be maintained if the government's targets for renewables development are going to be achieved. This requires long-term confidence in the renewables market. The recent announcement to raise the target to 15.4% by 2015 has helped to bolster confidence in the market and the need to maintain this confidence must be considered throughout both the Climate Change Programme review and the forthcoming review of the Renewables Obligation.

The current market favours wind as the most cost-effective technology and there are concerns about the ability of other technologies to reach the same level of commercialisation. The Government needs to ensure that there are adequate resources going into the development of other renewable technologies.

Planning still remains a significant challenge to delivering new renewables capacity at the rate needed to meet the Government's target. The first two years of the Obligation have seen a significant increase in the number of planning consents granted. However we are concerned about the ability of an increasingly influential vocal minority to frustrate the planning process, despite strong evidence that the majority of the public generally support new renewables projects.

As outlined above Government needs to work more closely with industry to ensure that there is more positive messaging about the benefits of renewables.

The Council is working with a number of large energy users who, for a range of reasons, want to purchase renewable electricity from the market. The lack of transparency and clarity as to the content of "green electricity" tariffs has made this purchasing decision difficult. The existence of this additional demand for renewable energy should, if developed in the right way, help in achieving the governments target for renewable energy—through for example providing sites for generation that might not otherwise be developed. More needs to be done to make information available to these companies as to the options available to them.

COMBINED HEAT AND POWER

The Government has continually recommitted to its target to achieve 10GWe of CHP in the UK by 2010. However the UK has yet to achieve its interim target of 5GWe by 2001. Indeed at present CHP capacity is actually falling, despite the potential the Government itself has highlighted to make much wider use of this high efficiency technology.

To achieve this the Government will need to counter the effects of the New Electricity Trading Arrangements (NETA) that it introduced. This means it will need to fully deliver on all the measures for CHP it set out in its 2003 Energy White Paper (some of which were dropped by the time of its 2004 CHP strategy), but also introduce innovative new measures designed to secure the favourable market conditions for CHP that Ministers committed to previously.

Without such measures, investor confidence in other Government commitments (such as that to develop renewables) will be weakened. The message will be conveyed that when the Government acts to alter markets (such as NETA) it is not sufficiently committed to its own public policy goals to put in place appropriate compensatory mechanisms designed to secure them.

ENERGY EFFICIENCY

Energy Efficiency is expected to contribute a significant proportion both to the current Climate Change Programme and to the Energy White Paper—which indicated a doubling of the level of energy efficiency to that expected from the current programme. The Council believes that meeting these targets will need the introduction of additional policies to really drive the incentive to invest

The lack of consumer demand for energy efficiency is a particular barrier. The Council believes that overcoming this barrier requires a combination of education, communication, regulation and fiscal incentives. Tighter building regulations and appliance standards have an important role to play to ensure consumers make the right choices and the Government can play a significant role through its own procurement policy.

The Council also believes that fiscal incentives such as stamp duty rebates—linked to the energy efficiency rating of a property—could be a useful means of increasing the uptake of energy efficiency in the domestic sector.

The main policy instrument for delivering energy efficiency improvement in the domestic sector is the Energy Efficiency Commitment (EEC). The first phase (EEC1) ran from 2002–05 and Government is currently consulting on the design of the second phase of the scheme (EEC2) to run from 2005–08. EEC2 represents a doubling in financial commitment and a significant increase in carbon saved compared with EEC1, and there are concerns regarding the capacity available to achieve this in practice and the impact on the affordability of energy. It will also result in costs to each consumer of around £10–12 per fuel per annum, roughly three times the level of EEC1.

The indications are that delivering the necessary energy efficiency improvements through the current EEC structure is going to become more difficult and more expensive. As currently structured the EEC provides little commercial incentive for the levels of investment in energy efficiency that are generated in the renewables market. The Council believes that by re-thinking the design of the current EEC a greater investment incentive could be introduced. This could involve designing the EEC to look more like the renewables obligation or introducing some form of white certificates market. Changing the way that energy efficiency is delivered would open the door for the development of new energy efficiency packages and energy service offerings.

However, EEC can only function effectively if there is effective consumer demand. This is why the Council has welcomed the initial incentives the Chancellor has put in place. However these are as yet limited, and much more will need to be done to build a self-sustaining market.

EEC also plays a role in delivering the Governments fuel poverty objectives, through the requirement for 50% of the energy efficiency investment to take place in the “Priority Group.” The Council believes that this merging of objectives results in less efficient delivery of either policy goal and we believe there is a case for separating the fuel poverty objectives and energy efficiency objectives. This would mean that effort could then be focussed on solving fuel poverty through a more targeted programme and allow for more flexibility in the design of an energy efficiency programme.

Action also needs to be taken outside the domestic sector, in particular the commercial and service sector. There are no specific measures aimed at improving energy efficiency in this sector, yet it is one of the fastest growing, in terms of energy use and must be addressed.

Implementation of the Energy Performance in Buildings Directive will result in all buildings requiring an energy efficiency rating be displayed. This will help to draw attention to energy use in the sector, but needs to be linked with incentives, such as reductions in business rates, to encourage the improvement of commercial buildings. There is also a need to look at the enforcement regime for existing buildings, as many do not meet the current building regulation standards.

EU AND INTERNATIONAL CLIMATE CHANGE POLICY

With its role as Chair of the G8 and President of the European Council in 2005, the UK Government has an important role to play in taking forward the Kyoto and post-Kyoto agendas.

The Council supports a clear long-term approach to emissions reductions which is consistent with the level of effort for climate protection, but under which new targets should be achievable, and sustainable.

For the period beyond 2012 it is essential that UK and EU climate change policies are seen in the wider global context. The UK should look to pursue international leadership, based on sound domestic action, on this agenda through its G8 and EU Presidencies.

With the Kyoto Protocol now likely to be ratified by Russia, its subsequent entry into force will trigger the discussions on the post-2012, second commitment period. It is important that major emitting countries are fully engaged, including those countries with increasing energy demand and emissions, such as India and China—this will be central to achieving the Prime Minister’s goal to cut emissions by 60% by 2050.

Clear and early signals as to the long-term direction of emission reduction policy will help business to plan and make the investments necessary to achieve deeper emissions cuts. In general, policies that stimulate significant and efficient investment over a long period are most likely to deliver the desired outcome in the shortest possible time.

The context for UK and EU climate change policies beyond 2012 must centre on achieving a renewed international consensus on the scale, direction and timeframe for global emissions reductions. We believe this should build upon the Kyoto Protocol architecture in order to build confidence and stability in new low carbon investments.

Lastly we support the Prime Minister's three pronged approach to climate change under his G8 Presidency. The Council has conveyed its willingness to help forge a strong business voice with respect to the low carbon technology agenda the Prime Minister intends to advance. Investment by energy businesses and other players, will be essential for delivering outcomes on the ground.

CONCLUSION

The Council welcomes this opportunity to submit evidence to the Committee.

We believe that sustained, innovative and effective action is needed to tackle climate change.

The UK has had an outstanding record to date. The challenge is now to see this through for the long-term, and build towards the major carbon reductions that the Royal Commission on Environmental Pollution has so clearly indicated are needed.

8 October 2004

Witnesses: Mr David Porter, Chief Executive, Dr John McElroy, RWE npower; Chairman of the AEP Environment Committee and Mr Andy Limbrick, Head of Environment, Association of Electricity Producers (AEP) and Mr David Green, Chief Executive and Ms Kirsty Hamilton, International Policy Advisor, Business Council for Sustainable Energy (BCSE), examined.

Chairman: Right, ladies and gentlemen, we move to our next group of witnesses who effectively are on the production side of energy. May I just say that I do appreciate that several of you are here and the one thing that we are always short of on the Committee is time, so I am going to make an appeal to everybody, including me, to try and keep our questions crisp and our replies of equivalence. It may well be that there are points that are put to one witness that others would wish to comment on, if you just raise a finger, a pen or in some way indicate to me that you might want to come in in addition to whoever has been asked to respond to the question, I will do my best to bring you in. So with those points, may I formally welcome on behalf of the Association of Electricity Producers, Mr David Porter their chief executive, Dr John McElroy, who is with RWE npower and chairman of the AEP Environment Committee. You have a very important title there; it is quite the longest one I have seen for some time. You are accompanied at the end of the table by Mr Andy Limbrick, who is your head of environment. From the Business Council for Sustainable Energy we welcome David Green, chief executive and Kirsty Hamilton who is their international policy advisor and Mr Paddy Tipping will commence our questions.

Q120 Paddy Tipping: Can we just take stock of where we are at the moment? I think my old friend John Prescott would say that the reduction in carbon emissions since 1990 has been largely on the back of the generating industry and the table that you kindly produced shows that quite significantly. What I wanted then to go on to say was that you then

project those emissions forward from 158.2 million tonnes of carbon to 139 million tonnes of carbon by 2010. Is that achievable?

Mr Porter: I will ask Dr McElroy to comment in a moment Mr Chairman, but you made the point almost for us, that we have, as an industry, borne the burden of reductions so far and I was most encouraged to hear the previous witnesses talking about their willingness to get involved in this as well. We have often, as an association, pointed to transport as a sector that probably could do more. John would you like to add to that?

Dr McElroy: I would have to start by saying that the projections which are referred to in the Association's submission are those of the DTI and are not those of the electricity industry. At the moment, the gap between DTI's forecast of CO₂ emissions in 2010 versus the government's target of 20% is to 60% which means a significant gap exists and, the point you made yourself, the UK electricity industry has already contributed significantly to those CO₂ emission reductions and at the moment is the only sector in the EU Emissions Trading Scheme in the UK that has been asked to make further reductions in the next three years. Therefore, I would have to say that things are getting tight for the electricity sector already and within the EU Emissions Trading Scheme, it is going to be important that other sectors start to play their part as well. In the wider context, then you are talking about the issues of the transport sector and we have already heard some of the comments from the aviation sector and the domestic sector in how they can play in to contributing to achieving the overall government ambition.

Q121 Paddy Tipping: Okay, let us just stick with that for a minute. You have just told me that of those

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projections the 139 million tonnes is a DTI projection. Are we going to meet them?

Dr McElroy: I would have to say that those DTI projections are based on some fairly heroic assumptions.

Q122 Paddy Tipping: Explain that.

Dr McElroy: The assumptions are effectively that we will go from a position at the moment where our electricity demand is rising year on year at a level of about 1.5% per annum and effectively that would have to be turned around to achieve something around -0.2% reduction to achieve the DTI's 139 million tonnes. The other thing which the DTI numbers say is that there is no need for any new investment in capacity within the electricity sector between now and 2010 that demand can be met effectively with the existing capability. I would have to say that that seems to us to be somewhat ambitious.

Q123 Paddy Tipping: If you were to meet the target, what would you need to do?

Dr McElroy: The important point here is that we are engaged not in a UK Emissions Trading Scheme, we are engaged in a European Emissions Trading Scheme. Therefore all of this is about encouraging investment to reduce carbon emissions in the most efficient way across Europe. Therefore the options open to us in the UK are either to invest in new plant, if that is the most cost effective way of addressing the issue, or if others can do it more effectively, to buy allowances in the market. The whole point is that what we want to see is market liquidity encouraged and efficient investment is the best way of creating that liquidity, but the answer is not entirely obvious at the moment, because it is very early days in the scheme.

Mr Porter: What is obvious, it is fair to say, is that investment will not play a part in the first phase of the scheme.

Dr McElroy: Absolutely right.

Q124 Paddy Tipping: Because there is uncertainty about future marketplace and the regulation and the rest of it, people are not prepared to invest. You need to have a long-term investment climate.

Dr McElroy: That is one part. The simple fact is that the lead time on investment in the UK electricity sector is typically three to four years, so major investment cannot come into play in the first phase of the scheme. I think a lot of the perception was that early reductions could come from coal to gas switch and the current fact is that in the market, gas prices have risen very steeply. If we are looking at winter prices next year versus coal prices for winter next year, the economics of gas switching do not tally with the current price that we are seeing in the emissions trading market. Therefore under those circumstances, if the allowances are available to buy at that price, that is what the market would do.

Q125 Paddy Tipping: I will not get into price rises because that would detract us, but can you just tell me this in simple terms. The expectation is a 20% reduction by 2010, a 60% reduction by 2050. These are wildly optimistic figures are they not?

Dr McElroy: The government itself has done a lot of analysis on this area. A lot of work was done underpinning the Energy White Paper which showed that even if the electricity sector become carbon neutral, it would be impossible for the UK to achieve its 60% target. This comes back to the point we were making earlier, that we must find ways of engaging other sectors and what we want to do is to do that in the most cost effective and most efficient way.

Q126 Paddy Tipping: I am broadly sympathetic to the industry as you know, but there are people who are more hawkish than I who would say "Hang on you lads. This is like a game of poker. You're telling us, this isn't possible to do, you're telling us it is hard, because there won't be such demands made of you later on in the cycle". What is the answer to that?

Mr Porter: Some of those hawkish people have given us a lot of grief in the last few months.

Q127 Paddy Tipping: Could we have some names on the table?

Mr Porter: I think you will be seeing some of them next week. An error that the government made last year in calculating the "business as usual" situation for emissions played into the hands of the people who want to hit at the power industry. Roughly a year ago the government had quite seriously underestimated the "business as usual" level. As an industry we had already accepted that we would take a cut against "business as usual" and when they published their figures, unfortunately, they were wrong and they were much higher than they should have been and that led to a lot of difficulty. We had to argue with the government, quite sensibly, that they had got their calculations wrong and while that was going on, the hawkish people portrayed us as really trying to avoid our responsibilities. We are not: we actually want to help the government achieve its environmental objectives and in fact I can say with a certain amount of pride that the Association put the idea of a cap-and-trade approach to this on the agenda as long as 10 years ago. I have to say as well that we were probably a little bit ahead of our time there.

Mr Green: You introduced us all at the outset saying we broadly represent energy suppliers. It is important that one actually looks beyond the industry as energy suppliers, because the Prime Minister has made clear, and it is something that the Business Council strongly supported, that the government is firmly committed to the drive to a 60% and that the government is firmly committed to its 20% target. What is clear from the work that has been done as far on the climate change review is that on current policies alone, we will not get to the 20% target, we will only get to 14%. That therefore begs the question as to what additional policies are going to be put in place. The other thing it would be

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worthwhile sharing with the Committee is that the forecasting exercises that are done by the DTI, for example on renewables, are essentially political exercises and the DTI's energy model would not, of its very nature, deliver an outcome of a 10% renewables target. That is an external factor imposed on the model to achieve a given goal and in relation to the field that I have worked in for some years, combined heat and power (CHP), the DTI's model assumes the government will not meet its target. Now, if you were to put in place measures which would meet that target, it would then help industry to achieve the 50% of its carbon savings which it is estimated could come from CHP. That is not just the industry; that is the manufacturing industry. So there is a range of measures which could be put in place to get us to that 20% target, but they are probably measures, as John has said, which are outwith the electricity sector, apart from the fact that it is the electricity and gas sectors which have been heavy investors and are heavy investors in both renewables and energy efficient technologies. A whole swathe of measures could be put in place to ramp up general delivery of energy efficiency in commercial buildings, industrial, etcetera. It is probably in those sectors and in the transport sector, and a sub-set of that is the aeronautics sector, where significant savings could be achieved with a much more determined effort.

Paddy Tipping: We will come to CHP in a bit and there may be a chance to talk about other policy models. You had just better tell us where we are on the EU Emissions Trading Scheme, because I do not quite understand where the government is in relation to this. They made a bid, they submitted it to the Commission who are now threatening legal action. Could you just explain this in simple terms?

Q128 Chairman: May I add a point to that as well? In your evidence you say that you do not think the process is transparent. I am not quite certain why, after all this sort of proselytising you have been doing about it, you still cannot see the wood for the trees.

Mr Porter: I will ask Dr McElroy to comment in a moment, Chairman, but with your permission, may I just correct something that I said earlier. I think, as I played it back in my mind, I said that the government's initial allocation to us was higher than it should have been, in fact I meant it was lower than it should have been.

Dr McElroy: In terms of the transparency regarding the Emissions Trading Scheme, we saw the draft national allocation plan last January and we have had subsequent discussions. The important thing is that the draft national allocation plan set everything out down to the lowest level, so every installation in the UK knew what was proposed at that stage. We have not seen any update of that since January last year. We have seen a lot of discussion about what the total cut might be, we have some idea of what the cuts for the other sectors within the trading scheme might be, but the government has now taken the view that they will allocate to them first and whatever is left in the pot after that will go to the

electricity sector. So, until we really understand what everyone else is getting, we cannot actually understand what is going to be left for us. The original intention was that allocation would be finalised in autumn last year, we were then given a date of 5 January this year. Just shortly before Christmas, we were given a date of 7 February, with the ongoing debate with the Commission on which we have no direct information.

Q129 Paddy Tipping: Tell us what you know, because I only know what I have read in the newspapers. It does not make any sense. Just explain this.

Dr McElroy: All we know is what the government actually told us back in October, which was that they had identified this gap because of their revisions to the projections, they have decided as a result of that, that they need to increase the total allocation to the UK by something of the order of 18 million tonnes a year; I do not have the specific figure. They are going to give the electricity sector about a third of that which compares with the original shortfall, which was identified once the errors were spotted, which was around 20 million tonnes. They have obviously gone to the Commission to negotiate on that basis, but we await the outcome. We understand that relationships are difficult.

Q130 Paddy Tipping: I was just going to say that. The Commission are saying "You have to prove your case" and the British Government are saying "We'll see you in court".

Dr McElroy: I could not possibly comment on that because we are not party to those discussions. We can only read the press, just as you do.

Mr Porter: We might add, that we thought that being given our allocations in the autumn of last year was quite late enough for a scheme that began on the 1 January. We have now been in the scheme for 11 days without the necessary knowledge of the allocations.

Q131 Chairman: Let me pursue some of the technological arguments. You indicated in your opening comments that the move towards gas generation of electricity had certainly assisted us in terms of reducing CO₂ outputs from the energy sector, but we have something of a paradox in that over the foreseeable future—and my colleague Mr Drew is going to question you more closely on nuclear energy in a few moments—we have the nuclear sector declining as a proportion of our energy mix. We have, again as you indicated to us earlier, a rising demand for electricity. The third factor we have is some perversities in the pricing where the obvious move would be to go and build some more gas power to replace the nuclear that is disappearing and hope that somewhere along the line renewables might be able to fill in behind there to keep the whole show on the road. You then just said to us earlier on that the price of gas, particularly in the short term, does not encourage any further investment in that direction. So against that background, question number one: what actually do

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you think within our known technology is the potential for further savings of greenhouse gas emissions from the electricity generating sector? Given current technology, how much more can we get out of you?

Mr Porter: May I give a fairly general answer and then perhaps pass it to John for a more detailed one. The other factor here is price and in one sense, you can have nearly anything you want if you are prepared to pay for it and of course, as an industry, we have right in our sights the environmental objectives and we cannot ever forget them. At the same time, we are given competitiveness objectives, fuel poverty objectives and almost above all, security of supply objectives. That is the context within which we work.

Q132 Chairman: Who gives you security of supply objectives? They were the missing words in the Energy White Paper and only in the latest government strategy document, which appeared a couple of months ago, do we actually see the word “security” creep in as a sort of bit player.

Mr Porter: For some time, the government has had three legs to its energy policy as far as our industry is concerned: one is competitiveness, one is reducing carbon emissions and the other one is maintaining security of supply. We take that very seriously because we know that we would be very firmly in the spotlight should that lead to any difficulties.

Q133 Chairman: So putting 70% of your eggs into one basket is called “security of supply” is it?

Mr Porter: I suspect that you are alluding to the take-up of gas for electricity production.

Q134 Chairman: I am.

Mr Porter: We have not reached that level yet, but if it is any comfort to the Committee, although the competitive market that we are required to work in does drive us in that direction, it has slowed a little bit recently with the rise in gas prices, but, having said that, there have one or two very recent announcements about new gas-fired projects. The industry nevertheless is just as aware as the informed public are that there are question marks against becoming that dependent on gas.

Q135 Chairman: Anyway, to come to my specific technical point, Dr McElroy, would you like to give us a specific answer to my question?

Dr McElroy: At the moment the options essentially open to us are investment in renewables.

Q136 Chairman: Let me hammer you right down. In terms of the parts of the generating system that produce CO₂, how much more is there that one could take out of you in terms of improving the efficiency, reducing the greenhouse gas transmission from your sector?

Dr McElroy: In terms of existing plant, those changes would be incremental. There are obviously investments that could be made to achieve some improvement in the efficiency of existing plant and I would say that the EU Emissions Trading Scheme

will drive some of those investments and make them economic, but that is limited. If you really want to get a step-change in efficiency on the plant and the reduction of CO₂ emissions, then you are talking about building new plants. At the moment, in terms of fossil plant, the only plant which is close to the market at all is higher efficiency CCTG plant and linked with that, there is the CHP element which David previously mentioned and whether that has any advantages in the market, particularly a carbon market. At the moment, anything in the way of new coal is out of the market, as is nuclear.

Q137 Chairman: I will tell you the reason why I asked the question and it follows on from what Mr Tipping was saying. In response to his line of enquiry, you pointed out to us that the government’s estimates are an act of political fiction, these numbers were created for some purpose and they did not reflect the true energy consumption situation, therefore by definition did not represent the true emissions position. I think you also said at the beginning of your evidence that you were pleased that aviation might be called upon to shoulder some of the burden. If we are to understand whether policy is right, what we have to know is whether you have the potential of dealing with the shortfall in meeting the government targets or whether in fact meeting that target is properly allocated amongst all the sectors. So are you able to put a number on your potential for us? If we say X million tonnes of carbon dioxide emissions which have to be dealt with, how much of that X can you account for?

Mr Porter: I think John said earlier that we could get to a point where we were carbon neutral and that possibly would not be enough. Is that part of the answer?

Dr McElroy: It is part of the answer in the longer term. At the end of day, the only mechanism available in the short term is to switch to gas. Effectively, at the moment we have somewhere around 120 terawatt hours of coal-fired generation in the UK which is responsible for just over 100 million tonnes of CO₂ emissions a year. Gas-fired generation gas emissions are pro rata about 40% of those of coal.

Q138 Chairman: That would still lead you to an even more unbalanced energy portfolio would it not?

Dr McElroy: Yes. This comes back to the issue that David raised, that the decision on the part of government is how it is going to balance affordability versus security of supply versus its environmental ambitions.

Chairman: Could I ask you to reflect and perhaps let us have a supplementary paper? Perhaps you might just be able to quantify for us what you think is the target of CO₂ emissions that we have to deal with, particularly to bring us back onto the government’s target, how much of that you think you could contribute and, ballpark figure, what has to be dealt with by the rest. I will move onto David Drew.

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Q139 Mr Drew: The Chairman has already mentioned what is left out the equation which is what we do with nuclear. There does seem to be some warming—no pun intended—to the view that there is a role for nuclear, maybe not immediately but somebody has to talk reality into what was the fudge in the last White Paper over how we do have much more control over security of supply. I just wonder what your views would be on that.

Mr Porter: There are quite warm feelings towards nuclear power within the Association. I should say that we are an association which represents all the commercial generating technologies and we are most certainly not anti-nuclear. We have, these days, five companies within the Association which have nuclear power interests: that is the two well-known British ones, one French one and two German ones. So we are not an anti-nuclear organisation and in fact, we are beginning to do some work now on our own position on where nuclear ought to fit in the fuel mix. This is a rather tricky thing to do because, although people around the table in the Association recognise the carbon benefits of nuclear power and they recognise the security benefits of nuclear power, the difficulty is how to bring nuclear into the marketplace in an environment which is so commercially driven. We do not have the answer to that at the moment, but if people want to pursue nuclear, that has to be addressed.

Q140 Mr Drew: What do you need, particularly in terms of a clearer strategy from government, as the signal for rather more than some outline research to see what are the commercial realities, the planning obligations and the political necessities of moving in this direction which some of us see as not just inevitable, but long overdue?

Mr Porter: I think the nuclear industry would answer that, at least partly, by saying that they need the political strategy for the disposal of waste dealing with rather more quickly than it has been; that has been dragging on a bit. I ought also to say that if the answers for nuclear power were readily available, we would have heard them by now.

Q141 Mr Lazarowicz: Another element in the energy mix is the renewables sector. In respect of that, a couple of points; it has been suggested by WWF, and I think others, that the Renewables Obligation (RO) should be extended to 20% by 2020 along the line of the level in the Energy White Paper. How far do you agree with that aim, and if you do not, what would your alternative target be?

Mr Porter: We are always more comfortable when the government, which has quite a big hand in a liberalised industry, is clear and consistent about its policy towards energy. As an association, we are actually looking slightly shorter term with renewables. We accepted very readily the 10%, in fact we put that idea forward before the government did and we have more recently accepted the 15% by 2015. The renewables industry is fortunate in the sense that it does have these rather more firm targets out there. They seem to acknowledge that the industry is one with long investment horizons and

big capital requirements and it is probably fair to say that we would like, in a sense, rather more of that sort of thing for the rest of the industry.

Q142 Mr Lazarowicz: Does that mean you do not agree with the target, but you do not object to it either?

Mr Porter: Exactly. We have no objection to the 2015 target for renewables.

Q143 Mr Lazarowicz: The idea is that the Renewables Obligation should be 20% by 2020.

Mr Porter: Twenty per cent by 2020. We do not have a firm policy on that, but, equally, there has been no objection in the Association to it and bear in mind we represent all the different technologies.

Mr Green: Just setting aside for a moment the issue of the target, and I would share a lot of the views that my colleagues from the AEP have outlined, the more important thing that we tried to bring out in our submission is the technologies which are covered because of the way in which the RO is structured. It tends at the moment to drive companies towards one particular suite of technologies. A case has been made by the Royal Commission on Environmental Pollution for trying to find ways, and it may be done inside the Renewables Obligation, it may be done outside the Renewables Obligation, but in terms of delivering the overall target of 20%, trying to find a broader suite of technologies which could be supported. One area that the Business Council has certainly taken an interest in, and indeed our Chairman John Roberts is on the government's task force on this, is the potential for biomass. For those people here who are constitutional anoraks such as myself, the Energy Act is entirely focused on electricity and completely misses out heat and its dimension. One of the issues that the Royal Commission on Environmental Pollution has raised is that if you were to reconfigure thinking, so you focused on waste heat, particularly the potential for renewable heat, you might actually broaden the suite of technologies that would enable you to get the 20% target and perhaps do it in a way that could also help revitalise rural communities and other communities which are looking for new markets, for example for agricultural waste products. We certainly hope that the taskforce which has been set up, which involves Sir Ben Gill former president of the NFU and our chairman and a former chief economist at the DTI, will produce over the next few months some creative answers in this area which might help broaden a suite of technologies which are supported by the government, whether it is within the Renewables Obligation or by other mechanisms.

Q144 Joan Ruddock: I was going to ask about whether the current UK climate change plan actually addressed the issue of renewables and the importance of investment adequately. I think there is perhaps a bit of an answer there.

Mr Green: The current plan is effectively the climate change strategy that was adopted just after the change of government in the formal communication to the UN in 1998–99. What we are in at the moment

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is the review of the climate change programme (CCP). It was clear from the Secretary of State's early comments that the initial evaluation is that the measures we currently have in place are not going to deliver the 20% target which the government adopted; hence my comments earlier about the need for new measures in a number of sectors. Yes, I am sure there is more that can be done in the electricity sector. There is similarly a lot more that needs to be done in a range of other sectors and quite frankly, having come back from a week's walk in Austria and seen the potential even a country like Austria has to do a lot more in energy efficiency, I came back wondering why we are so pathetic in this country on these issues.

Q145 Chairman: May I ask you for some guidance, as a sort of sub-debate from Joan's question, on micro schemes? Some people have suggested that instead of the large-scale generation that we addressed a few moments ago, micro schemes might be more efficient. Can you just give me a 30-second introduction to micro schemes and whether we ought to be looking at that?

Mr Green: Micro schemes as a family of technologies would include small-scale solar photovoltaics, the conversion of solar energy into electricity, would include small biomass schemes, would include small-scale CHP schemes, small-scale fuel cells; it is a generic term covering a number of different technologies. There are some exciting developments going on in this field, E.ON UK have committed to a programme to install quite a large number of micro CHP schemes and there is a field trial going on at the moment to see the extent to which they will actually save carbon. There is undoubtedly more potential to use solar photovoltaics across the UK, be it in industrial buildings or in commercial buildings. It is a pity, for example, that the government is not using its own power of procurement to do these things because the new Home Office building that you will all shortly be seeing rising 100 yards away is not going to be a shining paragon of solar. It will have energy efficiency measures built in, but it is those sorts of things that can be used to do much more to drive forward that market. Finally, bearing in mind the timescale, if I could just for a moment take off my hat as chief executive of the Business Council, I also chair the Mayor of London's London energy partnership. The Mayor is committed to setting up a climate change agency and at the centre of that is going to be a strategy for adopting a very distributive model for energy supply in London which, from the calculations that his staff have done will show a significant potential in London to have a much more distributive model of energy supply which would also relieve pressure on power imports into London and would hopefully over time make London's energy supply more secure, having more local sources of generation. As a London MP you will probably particularly interested in this.

Q146 Joan Ruddock: I would indeed and I have a personal interest in it, as you know. I thought Mr Porter was looking a bit sceptical during that response and I would just like to invite him to make some comment, particularly on the micro schemes but also about energy efficiency. Why have we got to make an assumption that the domestic consumption just goes up and up? Why can we not do what other countries in Europe have done so well?

Mr Porter: We have seen it happening for a long time and people who use electricity appear to want it to do more and more for them.

Q147 Joan Ruddock: But it can be done more efficiently; you know that and we know that.

Mr Porter: Absolutely, but in my lifetime, I have seen many, many government sponsored energy efficiency schemes come along and fade away and be replaced.

The Committee suspended from 4.32pm to 4.52pm for a division in the House

Joan Ruddock: I was simply asking why domestic energy requirements are just going up and assumed to be constantly increasing and why we could not do the energy efficiency measures other European countries have done so successfully?

Q148 Chairman: One of the problems is that as soon as you say that everybody leaps on the band wagon and says "Ah, future building regulations". We are going to get better but the emphasis on the existing stock of buildings is very poor. We fall back on what I might call the domestic standpoint, a diet of yet more insulation in the loft and draft exclusion, but we have not really gone beyond that. You might like to incorporate a comment on that in response to Joan's point.

Mr Porter: I mentioned that there had been many energy efficiency measures over the last few decades. It is very difficult to argue that one should not go for energy efficiency. It clearly makes sense, but it requires incentives to be built in to make anything substantial happen. It was also suggested that I looked sceptical when we discussed micro-production of electricity. I am sure that was a misunderstanding. I shall keep my eyebrows more firmly under control at select committees in future. The position is that it is fair to say that the jury is out on the effectiveness of very small-scale production. A trial is going ahead, but it is that; it is a trial. If the implication was that the existing producers of electricity would probably look upon that sort of thing with fear, I would say that is probably not the case and if they were convinced it was going to be practical and efficient, they would be into that business. In fact one of our larger members is involved in that now. However, we need time to see just how efficient that type of production actually can become.

Q149 Joan Ruddock: May I follow that up because again you seem to dismiss the energy efficiency as a hopeless lost cause and say there need to be incentives. Presumably your industry could keep up its income by charging more for people who are

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using less. Your business does not have to be affected in the long term, because people and their machines become more efficient and therefore use less energy because you have a price mechanism to deal with that. Why is your industry not more proactive? Why do you dismiss energy efficiency, given its environmental gains which we all know are so enormous?

Mr Porter: I would not like you to think that we dismiss energy efficiency. In fact, energy efficient is key in one sense to what our members do. The competitive market has driven power stations to become more and more efficient. I know that is not the point that you are making, you are looking at the domestic side.

Q150 Joan Ruddock: You are relying on the domestic demand continuing to increase.

Mr Porter: We operate in a competitive marketplace. It is so competitive that some of our members actually go bust and that is the context and it is not true to say that we can simply go on charging people anything that we want. I will ask John McElroy to add to that, if I may.

Dr McElroy: I think the issue on energy efficiency is that it has to be done by a mix of measures. Effectively, energy costs in this country are relatively low; most of us in this room do not over-analyse our electricity or our gas bills. Until we have incentives which encourage us to look at the issue much more seriously, then it sits at the bottom of the pile, rather than at the top of the pile. Whilst I know the issue of building regulations was raised, it is quite an important aspect for new buildings coming on and possibly also in relation to upgrading existing buildings. I think other issues, which I am sure David can cover in more detail, such as stamp duty, such as fiscal incentives in relation to installing energy efficiency devices, all have their part to play and also education of the consumer is absolutely core to all of this. So, it is not going to be solved by any single policy measure: it needs a basket of targeted measures and education to really drive it up the agenda. At the end of the day, you would need a very strong price signal, if you were going to drive it that way. Price signal on its own is not going to do it.

Mr Green: I would agree with what Mrs Ruddock said. There is significant potential for more energy efficiency. The Business Council very recently organised a meeting which was lead by Mark Clare, Chief Executive of British Gas with Lord Whitty, the then energy minister, to discuss the next stage of the energy efficiency commitment. What was interesting was that there was no doubting the firm commitment at the highest level in the companies to energy efficiency, very keen to get on with the job, but frustrated at the lack of an holistic approach across government in that at the moment, the drive from government for energy efficiency is very strongly focused on increasing the energy efficiency commitment, and that has cost implications for all of us and for poor consumers in particular, when what many of us feel is that there needs to be a much bigger suite of measures, so you need some demand for measures that encourage us all to use energy

more efficiently in our homes by, for example, changes to the VAT regime so that we could buy more energy efficient appliances and they are recognised, changes in the way in which white goods are monitored for energy efficiency, so that when we buy new appliances for our homes they are not necessarily bigger, but they are more energy efficient. That can be done through a range of EU regulations, most of which have not been revisited for five or six years and can be revisited again. There are more things that can be done with building regulations etcetera. As you have rightly said Chairman, and I am sure you know from your past political experience, one of the difficulties is that energy efficiency tends to be a bit like apple pie and motherhood. Everybody thinks it is great, but it is so great it is actually diffuse across government. So yes, the department you shadow has formal responsibility for it, but if you actually think about it, you have Defra with the formal policy custody for it, most of the levers to deliver lie to a certain extent with the DTI, but, certainly when it comes to housing stock, also with ODPM, when it comes to tax measures with Treasury and when it comes to executive arms to deliver, you have the Carbon Trust, you have the Energy Saving Trust, you have other bodies which hang off those. It is not that there are not enough people doing it, it is that they need to be more focused and more driven so things really do happen. The message I would suggest from other countries is that what they have had is a much more focused drive, it has really harnessed industry to get out there and deliver. It has happened in other sectors where consumer markets have been transformed; the telecoms market. You could argue that similar efforts and liberalised markets could make a real difference in energy efficiency. One only has to look at one's own home to think about the number of energy using appliances we now all have in the home that we did not have 10 years ago. Most of those could have been, at the time of being introduced to the market, regulated in a way that was not heavy-handed regulation but made sure that when they came into our homes, they were more energy efficient. So instead of buying a digital TV box that consumes huge amounts of power, it was a low energy digital TV box or instead of buying a computer that is not particularly energy efficient, the ones you buy are all energy efficient. There are all things that can be done. It happens in America, it happens in Australia.

Q151 Chairman: You have made a lovely apple-pie-and-motherhood statement. You have just told us everything and I am sitting here looking at a printout from the Energy White Paper with this box that says energy efficiency savings at 2010 and it has this great list of things which can be done in the home and that is great. But it comes down to who is going to accept responsibility for driving the policy forward. Who ought to be driving it? Who ought to be talking to the manufacturers of washing machines, because some of them are now plastering the front of them with this kind of information, but who ought to be getting hold of this and saying "right, we are going

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to drive this policy forward”? What you said in your statement is that here are all the potentials, but it also says it is not happening as fast as it should be. Who should be getting hold of it and making it happen? Where does the buck stop?

Mr Green: In the current Whitehall framework we have—and it may change after election, that is not in our gift, I do not know—in the current framework I would argue that the department you shadow, Defra, are the key department and they really need to have the resources at their disposal to drive this forward.

Q152 Mr Lepper: Mr Green in a way has answered the question I was going to ask and that was your view of the connections and the liaison between government departments on this issue. In a sense, you have dealt with that already. Do you feel there are, whether they are working or not, mechanisms in place between government departments to drive this forward? I take the point you have made about Defra as the lead department, but are there mechanisms there to bring government departments together on these issues and they are not being used properly or are they simply not there?

Mr Green: I am not a civil servant, so I do not know. All I would say, and I think I probably speak for all my colleagues, and they could probably all give you apocryphal stories of complete lack of co-ordination, is that we would probably all like to see much stronger co-ordination and leadership on energy efficiency, both within Defra and between Defra and other departments. Now those mechanisms may exist or it may just be a lot of full e-mail boxes between different government departments.

Q153 Mr Lepper: Or a bit of both. People ought to know whether that exists or not and if you are not aware, then—

Mr Green: We spend an awful lot of time, John, David, all of us, on actually informing the different government departments about what we understand is happening in other parts of the system.

Q154 Mr Lepper: Individually?

Mr Green: Individually. We are happy to do that because we want to make things happen. One could argue that if you had a better machinery of government in this area, the delivery would be much stronger.

Q155 Mr Lepper: You mentioned your recent experience of a visit to Austria and I think there are similar councils for sustainable energy to yours in Australia and in the US. Not necessarily now, but perhaps in some other information you give to us, are there examples there of how government departments co-ordinate, work together, on driving forward, for instance, energy efficiency programmes particularly in relation to the domestic consumer which you feel might be helpful to us?

Mr Green: I can certainly give you a note, but the key thing one has to recognise is that the two other countries are both federal structures, so a lot of

delivery is actually not so much at national level but at state level where you tend to find co-ordination can be slightly easier because you have one functional tier to deal with. If it would be helpful, Chairman, I can certainly provide you with a brief note without going into too much detail.

Chairman: That would be very helpful.

Q156 Mr Mitchell: I thought David Green’s answer on this question of energy efficiency in the household was much more imaginative and interesting than that of the producers who effectively said their business is to go on producing electricity as much as possible and if there is going to be any pressure to energy efficiency in the home, it will come from the pressure of the eternal escalation of prices. You demonstrated a degree of interest which bordered on total apathy.

Dr McElroy: I think that is contrary to what I actually said.

Q157 Mr Mitchell: You were not saying anything specific.

Dr McElroy: I said that price signals on their own would not drive the delivery of energy efficiency and that what was needed was a range of measures including fiscal incentives, regulatory measures such as building regulations or appliance standards and also the need to educate and engage the consumer.

Q158 Mr Mitchell: In other words, somebody else should do it not you.

Dr McElroy: We have a part to play in it, but we cannot deliver it on our own; we can deliver it in partnership.

Q159 Mr Mitchell: Why can you not think more imaginatively like, for instance, reducing the charges, or charging people on the basis of their success in reducing consumption by solar panels or other kinds of measures you can introduce? The more you reduce, the less you pay or charge more on those who do not do anything. It does need something, an approach like that, but you wanted to leave it to other people.

Mr Porter: I ought to point out Chairman that the generating industry is composed of a range of different types of company. Some of them are large vertically integrated companies with power stations and retail businesses, but the majority of generating businesses of course are free-standing, power production only businesses.

Q160 Mr Mitchell: They just want to flog more and more electricity.

Mr Porter: They indeed have an interest in selling electricity. We cannot help that. It applies to a number of gas-fired stations, it runs right the way through the technologies through to small family businesses. We have members who actually produce electricity as a secondary business to their farm. It is fair to say that they do not have an interest in the customer cutting his demand. The issue at the moment faces the large vertically integrated ones,

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who not only produce electricity through power stations, but also have retail businesses and millions of customers.

Q161 Patrick Hall: Can I just go back to something on renewables before turning to combined heat and power, just one point to David Green? I think he said earlier something about the Renewables Obligation adjusting the market to make it favour wind power. Why is that? Why can we not have a market in which a range of different renewable sources or generators is favoured?

Mr Green: When the government introduced the Renewables Obligation, it was a market-based mechanism so it incentivises Business Council members, David's members, John's company and others, it incentivises those companies to hunt out the lowest cost way of delivering renewables into the marketplace to achieve their legal obligations under the Utilities Act. At the moment—it could change—the lowest-cost technology in the marketplace is onshore wind which is why, although in theory the Renewables Obligation is technology neutral, the way in which the cost of the technology actually operates drives the companies towards onshore wind. There are other technologies which have been used. John's company has two small hydro schemes for example, at Windsor Castle; there are other companies developing and deploying some other quite innovative technologies but the vast bulk of the market is a drive towards wind, because that is the lowest-cost technology at the moment. That could change over time. As capital grants come in they bring down the cost of technology and other things become more cost competitive, but at the moment, onshore wind is the lowest cost option. That may well be, to be fair, a point you might want to pick up with my colleagues at the RPA because they have a much more detailed knowledge of that than I have.

Q162 Patrick Hall: Turning to combined heat and power, I think it is fair to say that the public's awareness of and understanding of this is perhaps not what it should be and that includes of course, the advantages and disadvantages of combined heat and power, never mind understanding exactly what it is. Could I ask David to explain what it is and how it works?

Mr Green: Just to say that if you actually want to see a scheme, I should be more than happy to arrange for you to go to the boiler room of the House of Commons, the main building, where there are two CHP systems, or, no doubt, if you signed the Official Secrets Act, you could go to see the secret boiler room underneath the Ministry of Defence where CHP is keeping the Prime Minister's lights on. So there are schemes very close to you. Essentially what it is, according to the DTI energy statistics, is that the average efficiency of a UK power station, traditionally coal, is about 34%, whereas the average efficiency of the new generation of case combined cycle plant is about 48%. The efficiency tends to be on the lower side of that, although, as David Porter has said, it has improved dramatically over the last 10 years, because by and large, and you only have to go

past a power station to see it, heat is dissipated into the atmosphere. If you design a power plant as a CHP plant, you capture and use that heat where you can do it. You cannot always do it for various reasons, but where you can on an industrial site or near a large urban area, you can do that. By capturing and using that heat, it increases efficiency from an average of 72% to 90%

Q163 Patrick Hall: Does that mean therefore that combined heat and power is just a method of using the heat and is entirely separate from the method used to generate the electricity? So you could have combined heat and power attached to coal or nuclear or gas.

Mr Green: You could have it attached to anything which is a cost-effective fuel source. Traditionally CHP was coal fired and in the last 10 to 15 years, it has been gas fired. There are methane fired CHP systems in Britain, there are geo-thermal-fired CHP systems, there are systems burning straw waste. You can use anything that it is cost effective to combust in a CHP system, although about 90% of CHP systems are gas fired.

Q164 Patrick Hall: How come it is cited in the context of tackling CO₂ emissions then, because it could be attached to a generator that is belting out CO₂?

Mr Green: All power plants at the moment produce CO₂ unless they are using it a carbon neutral source. The big advantage for CHP, which is why it reduces carbon emissions fairly substantially, is because whatever the fuel input source is, it is burning that fuel about three times more efficiently and therefore you are getting less CO₂ produced per megawatt of output. Broadly speaking, according to the DTI energy statistics, every one megawatt of CHP that is produced in the UK is reducing the UK's CO₂ emissions by between 700 and 900 tonnes of carbon per year. This is why you get a substantial improvement in emissions from CHP plant, particularly where it is gas fired or biomass fired.

Q165 Patrick Hall: Does that mean that by definition it is only limited in its scope in the sort of distance that it can serve? In other words, has it got to be just a district system?

Mr Green: It depends. Europe's largest CHP system has just been opened in Immingham by Conoco and that actually serves one very large petrochemical site. The system in Whitehall serves 26 buildings. It depends on the heat demand in the area, because CHP is, by and large, not driven by the requirements for electricity. It is, by and large, driven by the demands for heat, or in some cases cooling.

Q166 Patrick Hall: So it is not a substitute for the traditional large power station.

Mr Green: Not necessarily. Quite a few large power stations have CHP output. Other countries have had a different model of developing their power generation industry. For example, in Denmark, where they have had a lot of municipally driven CHP systems, about 40% of their power consumption for

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the whole country is from CHP; in the Netherlands it is about 60% from CHP, they have had a different model of development.

Q167 Patrick Hall: I am fascinated to know how micro CHP can work, even one that operates within a single block of flats or one's individual house?

Mr Green: The technology for an individual house is still being developed, as my colleague, David Porter, mentioned. There are field trials going on for domestic CHP schemes at the moment, but there are blocks of flats already which have CHP systems in and indeed blocks of flats that are looking at CHP systems. In quite a few of the constituencies of members of this Committee, there are CHP systems operating in swimming pools and leisure centres. You have probably all been to them and do not even know they have CHP because it is just a grey box in the basement. It is actually operating on 1,500 sites around the UK. The difficulty has been, since the market conditions changed dramatically in 1997 and in 2000 with the introduction of NETA, the output of CHP schemes, because the market has changed so fundamentally, has gone down by about 50% and there have been no major new CHP schemes since that time.

Q168 Patrick Hall: That was going to be my next point. The UK is falling behind its own modest targets and as you said in your evidence, capacity is actually falling. What is the picture overseas and how can we learn from that if it is a favourable picture?

Mr Green: It is broadly favourable. It may be one of the ironies of public policy that when President Reagan launched his energy strategy he did so at

one of the US's largest co-generation plants and the US has quite an ambitious co-generation target and so have the Netherlands and Denmark, as indeed have other countries. If it would be helpful, Chairman, in view of the time, to give any more information on this, I should be more than happy to do so, because I get a sense that the Chairman is looking at the clock.

Q169 Patrick Hall: What he is wanting to do is go to the boiler room and see it for himself.

Mr Green: I am sure we can arrange that.

Chairman: I think we are going to have to draw our session, interesting as it is, to a conclusion because we have one other set of witnesses that I want to get through before colleagues have to go. It would be very helpful to have that information. Mark, you have a bursting postscript.

Q170 Mr Lazarowicz: Something which you might be able to supply in writing. You have told us quite enthusiastically about some of the measures that can be taken by domestic consumers in relation to energy efficiency. I should be interested to know a bit more about your suggestions as to what the commercial consumer can do in the field of energy efficiency to improve the current position.

Mr Green: I might have to give you a separate note; I would need to look into that a little more.

Chairman: One final question to you, which you do not have to answer now. We have heard a lot of information from both groups, but perhaps you could just jot down on the back of the proverbial envelope or postcard, the one thing that the government should be doing that would help to get it back on track to meeting the target that it set itself. With that, may I thank you very much indeed for coming and also for your written evidence. It was much appreciated.

Supplementary memorandum submitted by the Association of Electricity Producers (U29a)

Supplementary questions arising from oral evidence given to EFRA Committee Inquiry "Climate Change—Looking Forward"

Q 138. *Perhaps you might just be able to quantify for us what you think is the target of CO₂ emissions that we have to deal with, particularly to bring us back onto the government's target, how much of that you think you could contribute and, ballpark figure, what has to be dealt with by the rest.*

A. In its Consultation Paper on the UK Climate Change Programme Review, the Government suggests that CO₂ reductions of 14% from 1990 levels will be achieved by 2010, thus falling short of the national goal of 20%. The 14% reduction assumes full delivery of policy measures; a figure of 12% would probably be more realistic.

Switching from coal to gas, growth in renewables generation and the building of new nuclear capacity all offer the prospect of reduced CO₂ emissions in the electricity sector in the longer term. However, none of these options offers the potential to put UK CO₂ emissions back on target by 2010. This is because a) based on current forward prices for coal and gas, the price of CO₂ allowances would need to rise above €20 per tonne to drive the decision to switch, b) it would take more than a decade for sufficient new gas-fired, renewable or nuclear generation to be brought on line and c) it would run counter to policies that have already encouraged operators to invest heavily in other technologies, such as FGD. The Updated Energy Projections published by DTI in November 2004 show a reduction of coal-fired generation from 116 TWh to 90 TWh between 2005 and 2010; even that may prove to be ambitious if gas prices remain high.

These observations suggest that there is no merit in a knee-jerk reaction to the failure to reach the national goal for CO₂ reductions in 2010. Instead, the Government should focus on measures that are consistent with achieving its long-term objectives for climate change mitigation. It is clear from the above that this will require the engagement of other sectors, including transport and domestic (households).

Q 170. *One final question to you, which you do not have to answer now. We have heard a lot of information from both groups, but perhaps you could just jot down on the back of the proverbial envelope or postcard, the one thing that the government should be doing that would help to get it back on track to meeting the target that it set itself.*

A. The Government needs to look beyond seeking short-term emission reductions from the Power Generation Sector towards the implementation of a broad suite of measures that will encourage other sectors to contribute to moving towards the UK's long-term goal of 60% reduction of CO₂ emissions by 2050. Government must develop a better understanding of what is both technically and economically achievable across all sectors if it is to develop a credible and coherent policy framework.

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Memorandum submitted by the Renewable Power Association (U41)

What new policies might be needed to keep the United Kingdom on track in reducing all greenhouse gas emissions?

Renewable energy is a vital component of policies needed to reduce greenhouse gas emissions. There are many other actions that can and should be taken to reduce greenhouse gas emissions and, in comparison to many other policy areas, renewable electricity generation is very well served. Although this is very welcome, it does have some downsides. Being almost the only tangible support measure featured in the Government's Energy White Paper, results in disproportionate expectations of what the Renewables Obligation can deliver.

In terms of expectations, Sustainable energy tends to be distilled down to meaning renewables, and renewables tends to be distilled to wind power. Wind energy is the renewable in the firing line⁸, and is carrying the expectations of delivering a sustainable energy future.

Although being fortunate in having a policy to deliver the renewable electricity target the RPA believes that there are a number of measures that need to be taken to improve it, and to help those technologies that are currently not able to benefit from the RO move towards participating in that market. These recommendations are covered below, under the heading boosting renewable electricity generation.

However, renewable energy is more than just electricity production. Other measures should be taken to boost the contribution of renewables to the heat and transport sectors. The RPA puts forward proposals for these sectors under the headings renewable heat and renewable transport.

To put all this in context, the first section of this evidence quantifies the emissions savings benefits of renewable energy.

EMISSIONS SAVINGS FROM RENEWABLE

Savings from renewable electricity generation

Every unit of electricity that is generated from a renewable energy source results in a direct saving of greenhouse gases that would have been produced had that unit of electricity been generated by non-renewable plant.

Quantifying emissions savings can be undertaken at differing levels of detail and the answers are somewhat dependent on the question being asked or scenario being investigated. There is also a time dimension, as the balance of different types of generation changes, improvements in efficiency occur made or the operational regimes change.

In a marginal, real-time scenario, renewable generation can be assumed to be displacing emissions from coal fired plant, as it is coal fired plant that typically provides load-following capability. In other words if renewable output is ramped up, then coal fired plant output is ramped down (and visa versa). Nuclear tends to stay on baseload whenever it is generating, and therefore is not used to respond to different levels of supply and demand on the electricity network. The economics of gas-fired plant tend to dictate that this plant either operates at full load (eg closed circuit gas turbines—higher capital costs, lower gas prices) or for peaking

⁸ See Philip Wolfe, keynote speech at RPA annual conference, www.r-p-a.org.uk/content/images/articles/Wolfe%20Speech.pdf

(eg open cycle gas turbines—lower capital costs, higher gas prices). This pattern can clearly be seen in the NGT Seven Year Statements⁹. In this scenario, every MWh of renewable generation saves almost one tonne of carbon dioxide emission, 12 kilos of oxides of nitrogen (NO_x) and four kilos of oxides of sulphur (SO_x).

If a longer term view is taken, then renewables could be either be regarded as leading to the premature closure of existing capacity, in which case the above emissions savings figures are relevant. Alternatively renewables could be regarded as avoiding the need to build new capacity from other generation sources, and therefore avoiding the associated emissions that would have been produced if that capacity, rather than the renewables had been generating. In this context gas fired capacity is the most likely new plant to be built. Therefore in this comparison, renewables can be regarded as saving 440 kilos of CO₂ and 0.5kg of NO_x per MWh.

When there is no specific scenario being investigated, the average emissions from the whole of UK electricity generation are often used. This is often referred to as the average plant mix. Here renewables save just over half a tonne of CO₂/MWh.

These figures are summarised in the table below.

Type	CO ₂	NO _x	SO _x	Most appropriate context
Coal	952	11.8	4.3	Marginal, real-time emissions savings, or longer term view if based on premature closure of coal-fired plant
Gas	446	0.5	—	Longer term view, based on avoided new gas capacity
Average	514	1.2	2.4	General, non-specific scenario

Sources:

CO₂ data from page 26, Energy Trends March 2004, special feature on *Carbon dioxide emissions and energy consumption in the UK*.

NO_x and SO_x averages derived from *Chapter 12 Complete Energy Sector Indicators* “Energy and the environment¹⁰”.

There is often confusion about emissions savings from biomass, as CO₂ is produced when biomass is burned and therefore people find it difficult to distinguish it from fossil fuel combustion. However, electricity generated from biomass is carbon-neutral, and so the savings described above apply. This is because the carbon that is emitted when biomass is combusted is absorbed by other forms of biomass at the same rate. For example with a biomass power station that uses energy crops as fuel, a stock of energy crops is grown and the rate of absorption of CO₂ in the growing crop, is the same as the rate of CO₂ being emitted by the power station.

Life cycle emissions from renewables

The emissions involved in manufacturing the renewable generating station and in transporting fuel (if relevant) can be taken into account. Generally these considerations have relatively little impact on the overall figures¹¹.

A recent World Energy Council report¹² quantified these figures, and they are summarised in the table below. For the sake of comparison, the WEC figures for coal, nuclear and gas are also given.

<i>Estimate of life cycle CO₂ emissions</i>	<i>Lifecycle gCO₂/kWh</i>
Nuclear	3–40
Hydro	4–120
Onshore wind	6.9–14.5
Offshore wind	22
PV	12.5–104
Gas	398–499
Coal	800 to 1,372

The Biomass section of the DTI innovation review also contains some estimates of carbon dioxide emissions from fuel production¹³.

⁹ See Demand Profiles (Figs 5.3a-d) which give indication how generation was actually used to meet demand (in typical days). Page 151 of Seven Year Statement. www.nationalgrid.com/uk/library/documents/sys_04/pdfdownloads/wholesys.pdf

¹⁰ www.dti.gov.uk/energy/inform/energy_indicators/ind12_2004.pdf

¹¹ For example, see slide 18, E4TECH Biomass for Heat and Power in the UK, www.dti.gov.uk/energy/renewables/policy/e4techbiomass.pdf

¹² “Comparison of Energy Systems using Life Cycle Assessment” World Energy Council, London, 2004, as reported by www.geni.org/globalenergy/library/media—coverage/RefocusWeekly/lifecycle-assessment-shows-favourable-impact-of-renewables/index.shtml

¹³ As above.

<i>Fuel</i>	<i>gCO₂/kWh</i>
Straw	23–38
Miscanthus	18–30
Willow	38–48
CCGT	387

Emissions savings from renewable heat production

Solar thermal used for domestic water heating usually displaces either electricity or gas, and on this basis, quantifying emissions is very straightforward. Natural gas, when used for heat production emits 224g CO₂/KWh_{th}. If a house with a solar thermal panel otherwise heats water by electric immersion heater, then greater savings are achieved. It would be most appropriate to use the average plant mix, in this context, thus savings are 514g CO₂/kWh_{th}.

Similar savings are achieved from heat production from biomass, again depending the form of heating that is being displaced. The table below can be used, to show savings.

<i>Heating source displaced by biomass</i>	<i>Emission saving, g/kWhth or Kg/MWth</i>
Natural Gas	224.4
Kerosene	287
Diesel Oil	296
LPG	252
Coal	432
Indicative off-grid mix	321

Emissions savings from the use of renewable transport fuels

Although more efficient use of renewables may be achieved through direct use as electricity rather than road fuels applications, it is a complex issue, and readers are referred to the Concaawe report¹⁴.

Boosting renewable electricity production

Government support for renewable electricity production comprises three tiers:

- The Renewables Obligation for “mature” technologies, supported by:
- capital grants for “near-term” technologies; and
- RD&D funding for early-stage and emergent technologies.

The Renewables Obligation (RO) is a “market-based” mechanism. It doesn’t select technologies—the cheapest is expected to come to the fore. This should keep the overall costs down. The RO is a unique policy measure, and is being watched with interest by other European member states. It is also seen by other sectors of the sustainable energy industry as “the only show in town” and many would like to see such a measure adopted for their sector. We feel that the lessons that are being learned from the RO are therefore important and of a wide interest.

We have been very actively involved in working with DTI on various amendments that have been made to the RO, and the Government has recently finished taking evidence from a consultation on Terms of Reference for a statutory review of the RO to be conducted next year. The submissions made by the RPA to various consultations on the RO are available on our website¹⁵, and we do not propose to go into detail here. We summarise the key themes below.

¹⁴ Well-To-Wheels Analysis Of Future Automotive Fuels And Powertrains In The European Context. January 2004. Available from <http://ies.jrc.cec.eu.int/Download/eh>.

¹⁵ RPA responds to DTI consultation on Terms of Reference for the Renewables Obligation Review www.r-p-a.org.uk/article_default_view.fcm?articleid=1032
RPA response to Renewables Obligation Amendment Order. www.r-p-a.org.uk/article_default_view.fcm?articleid=732.
Response to pre-consultation enquiry from DTI

KEY RECOMMENDATIONS FOR RO

Investor confidence is paramount.

Avoid political tinkering, particularly in questions over eligibility for ROCs. Government must not adversely affect the balance between supply and demand of ROCs. If it increases what is eligible under the RO, it must increase the Quota to match.

Keep the quotas rising. The RPA lobbied hard about the damaging impact on investment of the quotas reaching a plateau at 10.4% y 2010, and Government's swift action to increase in the quotas to 15.4% by 2015 was very welcome. The RPA believes the quotas will always need to be rising, ideally at least 15 years into the future in order that investors can have confidence that ROCs will hold their value.

Improvements to the ROC market are required. Improvements to the efficacy of the ROC market boost investor confidence as well as improving the prospects for meeting renewables targets. The RPA has made a number of suggestions in this area.

The RO quota and the renewable electricity target are not the same thing.

The quota acts as a ceiling on the level of renewables deployment; therefore it is essential that the quota is set higher than the target to be achieved.

Barriers to deployment still need to be addressed

Gaining planning consent remains a major hurdle to achieving renewables targets.

SUPPORT FOR TRANSITIONAL TECHNOLOGIES

The DTI accepts that the market-based RO does not respond to the different levels of maturity of different renewables technologies. Additional interim measures are needed to assist those less mature resources to make the transition into the RO.

The existing programme of capital grants, which is intended to support this group of renewable resources, is only partly effective.

For example of the £63 million announced in April for the support of 11 bio-energy electricity generation projects 2003 to totalling 160MW, one is under construction, three are looking hopeful and the remainder look either unlikely to proceed or need additional assistance.

In general the RPA believes that revenue based support measures are generally more effective than capital grants. Lack of success with respect to grant programmes can be attributed to:

- The somewhat arbitrary nature of the selection process, requiring Government to “pick winners”.
- The fact that grants do not reward successful project completion.
- The financial community's perception of capital grants as a form of quasi-equity, rather than revenue support, which can also leverage project finance.
- The fact that for some technologies the primary requirement is for ongoing support for the duration of the project, rather than for the initial capital cost. This applies particularly for biomass, where assistance is required for the cost of the fuel.

The RPA believes that an improved system to support transitional technologies could be implemented. The main element would be a long term Power Purchase Agreement with a secure counter-party. This would offer the triple benefits of rewarding output, enhancing “bankability” to bring in additional funding, and preparing the generators for the output-based income stream they will experience under the RO. The RPA proposal for supporting transitional technologies can be found on our website¹⁶.

SUPPORT FOR EARLY STAGE TECHNOLOGIES

The RPA supports the Government's approach of providing support for research, development and demonstration of emerging technologies and believe, for example, that the recent R&D spending on wave and tidal technology has been effective.

¹⁶ RPA's proposed support mechanism to enable emerging renewable energy sources to enter the Renewables Obligation. www.r-p-a.org.uk/article_default_view.fcm?section=1&articleid=860

RENEWABLE HEAT

Energy for heat makes up approximately a third of the UK's demand for energy. The Government recognises the contribution of renewable heating systems to the UK's climate change programme, but has not introduced a dedicated policy to support this low cost and proven carbon abatement option.

The RPA believes there is a case for extending the concept of the renewable obligation to create a separate obligation for renewable heat, creating a similar incentive for the heat industry to that operating within the electricity industry. This idea was similarly conveyed in the Royal Commission on Environmental Pollution's report on biomass as a renewable energy source¹⁷, and strongly recommended in a research study produced for Defra¹⁸.

The RPA has been working with other organisations on a proposal for such an obligation. This can be found on the RPA website¹⁹.

RENEWABLE TRANSPORT

Renewables can also make a contribution towards reducing emissions from the transport sector. Biodiesel and bioethanol can be used in blends of up to 5% in any vehicle without the need for engine or other vehicle modification.

In its report of July 2004 to the European Commission on the Biofuels Directive the government stated that it is "seriously considering the possibility of introducing a renewable transport fuel obligation (RTFO) for the road fuel sector, drawing on the experience of the Renewables Obligation that applies to licensed electricity suppliers".

Work remains to determine exactly how such an obligation might work and whether it is the most effective mechanism, and Defra has undertaken a consultation. In light of its knowledge of the Renewables Obligation, and the Association's strong views on the measures required to increase its efficacy, the RPA is looking forward to contributing to the debate as it evolves.

13 October 2004

¹⁷ Biomass as a Renewable Energy Source, RCEP, May 2004.
<http://www.rcep.org.uk/biomass/Biomass%20Report.pdf>

¹⁸ Possible support mechanisms for biomass-generated heat. Ilex Energy Consulting, Dec 2003.
<http://www.defra.gov.uk/farm/acu/research/reports/biomass-heat.pdf>

¹⁹ Proposal for a Renewable Heat Obligation. http://www.r-p-a.org.uk/article_default_view.fcm?section=1&articleid=946

Witnesses: Ms Gaynor Hartnell, Director of Policy, Mr Phillip Cozens, Shanks Waste Services Ltd, Major Project Development Manager, Mr John Strawson, Renewable Energy Growers Ltd and Mr Mark Candlish, Slough Heat and Power Ltd, Renewable Power Association (RPA), examined.

Q171 Chairman: Our final set of witnesses. I am sorry we are little behind schedule, but votes have not helped. May I welcome members of the Renewable Power Association. Gaynor Hartnell, director of policy; Mr Phillip Cozens from Shanks Waste Services, major project development manager; Mr Mark Candlish from the Slough Heat and Power Limited—you must have been getting quite excited in the last exchanges—and Mr John Strawson from Renewable Energy Growers Limited. It is quite useful to have just a word or two to take stock. How are we doing with renewables? The impression I get is that you are not meeting your targets in rolling out particularly wind energy as fast as you would like. Perhaps you could also include in this overview, a word about the economics. Some people from the more conventional areas of power generation feel that you are getting favoured nation treatment by getting rather generous subsidies to get you off the ground. Have a go at those two propositions by way of starting.

Ms Hartnell: I will kick off with those ones. As to how we are doing with the Renewables Obligation, it is a fairly recently introduced policy, it is a market-based mechanism and is very novel. It was introduced with the objective of government saying

what it wanted in terms of an overall renewable electricity target and then not wanting to have a role in deciding what the portfolio of renewable energy sources that made up that target would be; it wanted to let the market decide. I think early evidence is showing that the Renewables Obligation is really starting to work now. We have engaged the interest of the larger energy companies: those who comment on investment interest say that the UK is a very attractive market now in Europe. You mentioned that it was primarily wind energy which was making progress and I would not disagree with you there. Because it encourages the cheapest renewables to come forward, we find that at the moment, the ones that have the resource to increase capacity are onshore wind, which has a very large resource in this country, landfill gas, which is limited in the extent of its resource but is very cost effective and is coming forward, a certain amount of co-firing and there is a certain amount of hydro, but wind is definitely coming to the fore and it was government's intention to let the market decide.

Q172 Chairman: What about the question of the subsidisation of it?

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Ms Hartnell: Was the question about whether excessive profits were being made, along that line?

Q173 Chairman: No. I think there are some people who feel, that in terms of the money that is put in, you are getting a sort of favoured nation treatment. In other words, renewables certainly could never stand on their own two feet without having an additional payment made. Certainly the money that you get per kilowatt hour generated, means that your generation costs, taking them all into account, would be much more expensive than the existing “conventional systems”.

Ms Hartnell: The way that the government has introduced its mechanism is that it has said it is going to allocate a certain amount of money and then that is independent in a way of how much renewable electricity we get. The nearer we get to the target, the less money will be going to renewable generators. It has a kind of in-built mechanism to speed up development if it is lagging too far behind target. I would not disagree that there are other areas of sustainable energy which really should also be rewarded as well and at the moment, renewable electricity is almost unique in having a policy to deliver. The White Paper has set out wanting to achieve 60% targets by 2050. Really it should be joined by other mechanisms.

Q174 Chairman: Help me to understand. In terms of straightforward government money, how much government, DTI, money, goes into renewables?

Ms Hartnell: I believe it is about £350 million. The majority of it is energy payers’ money, but that money I referred to is going towards R&D, capital grants and other investments.

Q175 Chairman: So £350 million. On an annual basis or declining?

Ms Hartnell: No, that is over three years. I should not have omitted that!

Q176 Chairman: Over three years. Right. It would be helpful if you could just provide us, not to go into detail now, but with a breakdown of the amount of money that is going in. The reason I ask the question is that some time ago, if my memory serves me correctly, Sheffield Hallam University did an analysis to show where, for the expenditure of a pound of the public’s money, you got the best reduction in CO₂ and the best reduction seemed to come from loft insulation. Renewables, particularly in the area I was interested in, biofuels and renewable miscanthus and timbers, seem to come round down at the bottom of the scale in terms of the pound to CO₂ saving. How do you see that spectrum operating? Are you good value for money or not? Mr Strawson is waving his pen. Do you want to come in on that?

Mr Strawson: I would if I may. You started touching on biofuels and to that end we as farmers can start providing and I have been tasked for the last three years, ever since the demise of the ARBRE power station, with finding a market for the crops that we as farmers have in the ground. So I am acutely aware of the economics of how we are, as a price of fuel, to

compete with fossil fuels also. The study to which you referred from the university may indeed at the moment be correct, but we have been growing energy crops now for four years and within that time have managed to halve the cost of production and therefore we have halved the cost of the fuel to the marketplace in four years of planting for ARBRE which was just a small power station. If we could just have the inspiration now and a market to use up the crops that we planted for the ARBRE, and then develop more plantings, which Defra are very much behind us on, then the cost of the fuel, which is already half the cost of oil at \$50 a barrel, though it is twice the cost of coal to a power station; already half the cost of oil you have to remember and that in the absence of subsidy, so we are getting there.

Chairman: We are going to have a bit more of a detailed go at your area shortly. I do not want to hog the questions, so I shall pass to Joan Ruddock.

Q177 Joan Ruddock: We are on a very interesting point. What has been said initially and what David Green was alluding to in his evidence earlier was the fact that the market has been driven to onshore wind as the cheapest option in terms of development. Is that correct? That means that this remarkable halving of the cost of the biofuels within four years is not getting a fair reward for the progress which has been made. Given that you have a market-driven system, is this going to be the way that things are going to continue? If not, what is it that will make things change?

Ms Hartnell: That is indeed the way that it is working. Now the Renewable Power Association does not disagree with the basic philosophy there of allowing the cheapest technologies to come forward, but we do believe very strongly that there needs to be diversity in the long run; you cannot expect onshore wind alone to deal with our renewable energy targets. For that reason we advocate there be a policy which enables those technologies which are further away from commercialisation a chance to compete within the Renewables Obligation framework, when their prices have come down. They need some form of transitional support to help them become commercial enough to play in that game and we did send in a proposed mechanism to help do that. The fundamental thing is that we do not think that the Renewables Obligation should be tweaked in order to deliver diversity. There should be separate mechanisms to do that. As we mentioned, the Renewables Obligation is market-based mechanism and my colleagues can tell you, from the “coalface” as it were, how important it is that once the government puts rules in place, it does not interfere with them, because they make investment decisions on the basis of those rules. So we agree diversity is important and that is why we have put forward a mechanism which we believe can deliver diversity without undermining the fundamental Renewables Obligation operation.

Q178 Joan Ruddock: We presumably do not have any details of this and we perhaps ought to know that so that I do not pursue the question, because we

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have a problem with time. I think we do need to know what that mechanism is, because it is very pertinent. I suspect most of us are going to conclude that we need diversity and what you are all saying is that we are not getting diversity, we really have the simple market mechanisms. Developing wind power is the cheapest. Is that the same as saying that wind farms are the most economic source of renewable energy per unit?

Ms Hartnell: I would not say that wind energy is necessarily the cheapest; it is the one that is being delivered most rapidly at the moment, it has the resource to grow. Landfill gas is cheap, energy from waste—

Q179 Joan Ruddock: Sorry, but you did say that the cheapest technology should come to the fore.

Ms Hartnell: All right, yes. I did say also that it was onshore wind, landfill gas, some hydro and some co-firing of biomass which were basically making the progress under the Renewables Obligation at the moment.

Q180 Joan Ruddock: A wind farm, as we understood it, was the lead.

Ms Hartnell: It has the greatest capacity to grow. Landfill gas, for example, is limited by the size of the landfill gas resource. With wind, you do not need to worry about the size of the resource, you need to worry about how much you can actually take onto the system; it is not resource limited.

Q181 Joan Ruddock: Let me ask the question again then. Is it the most economic source of renewable energy per unit of electricity generated?

Mr Candlish: Of renewable energy?

Q182 Joan Ruddock: Yes.

Mr Candlish: At the moment, yes. To set the context of that, onshore wind in particular has taken the greatest advantage of the grant systems available for the last 15 years and so is the most advanced. I think it would be unfair to say that that does not mean there are any other developments in other technology sectors, but the rules that have changed in co-firing and so on have created a great deal of uncertainty for the sort of entrepreneurs who are trying to develop biomass-fired power stations for instance. We commissioned a 10 megawatt energy from waste plant which was combined heat and power as well. That project took 10 years from conception to completion and when you get rule changes coming out every year in a market in which there are currently no developers in the UK and a very uncertain economic background, I think it would be harsh to say that that is representative of the potential of that technology to deliver. Onshore wind could make the economics successful under the schemes which preceded the Renewables Obligation. Under the Renewables Obligation, contracts are not currently available to enable these longer lead time projects to emerge.

Mr Cozens: I think it is also important to understand that under the Renewables Obligation as it is currently written, there are certain technologies

which are proscribed effectively as potentially contributing to renewable energy. I talk particularly about energy from waste, for example. To obtain energy from waste and qualify for a Renewables Obligation certificate, you must go through a qualifying technology which is prohibitively difficult. What we do see is a strand of opportunity within the energy sector which is not amenable; we cannot get to it because of the rock mechanism that we currently have. There is a locked up resource that we are not exploiting.

Q183 Joan Ruddock: So you are saying that are lots of stumbling blocks to creating diversity in the renewables field.

Mr Cozens: Yes, there are and I feel that many of them are self-inflicted in policy terms.

Q184 Joan Ruddock: What does that mean?

Mr Cozens: For example, within the Renewables Obligation, we see a qualifying technology as the route to being able to get energy from waste; you must go through gasification or pyrolysis or one of these processes. That is too much of a stumbling block really; the value is in the fuel not in the conversion technology. I would argue that a more rational approach would look at the value of the resource as a resource, waste biomass, rather than the means by which you turn it into power. The market ought to be able to determine that.

Q185 Mr Lazarowicz: I appreciate that this answer will vary considerably from one type of power generation to another, but I get the impression from what you are saying that the biggest single stumbling block to the development of other renewable power technologies is the Renewables Obligation and the way it is structured combined with the lack of the kind of mechanism that you are going to tell us about which would encourage presumably a stability of market for technologies other than wind power. Is that fair or have I over-simplified too far?

Mr Candlish: The Renewables Obligation is, in many ways, the right mechanism and certainly from an operator and developer's point of view, we would like to see as little change to it as possible. It is trying to introduce new technology to this country on the sort of scale which this country has not developed on before. We are talking about a large raft of smaller-scale projects and using technologies that we currently do not have a significant presence to develop. To get that sort of emerging market to work needs entrepreneurs and risk-takers, because the power industry is littered with the companies who tried it first and who went bankrupt. The large vertically-integrated players who administer the Renewables Obligation, who effectively collect the funds, will not take those sorts of risks; they will not invest in unproven small-scale technologies. The problem is: how do they engage the entrepreneurs into the market to take those risks? That is a fundamental issue that the RO needs to address: the big companies need to be hungrier to engage these entrepreneurs to go out and take the risks and do these early projects. We are looking at a

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development time of maybe 10 to 20 years to help these industries to emerge; they are not going to appear overnight. With a lot of the things here, when we talk about wave power and so on, we are talking about leading the world in these sorts of developments. Things like biomass have been already successfully done, as I believe you have heard already, in Scandinavian countries, so they are more proven technologies but with no real development base in the UK.

Q186 Mr Lazarowicz: Do we really lead the world in wave power? Yes, we are at the cutting edge in some respects to take one example, but my understanding is that there are other countries in Europe like Portugal and so on who are also very heavily involved in this area, probably in advance of what we are doing. How come they do it and we do not?

Ms Hartnell: In Portugal they have introduced a kind of “market pull” mechanism to encourage developers actually to build wave energy devices and put them in the sea. We have invested more in the research and development and indeed we are leading the world in terms of the device developers and this is true in tidal stream as well. We really do have a very strong advantage. We would like to see a “market pull” mechanism of the kind I have described in the proposal we have made, to enable them to build on that success. The longer it is left with us not having that kind of mechanism, the more risk there is that those technology developers will move overseas.

Q187 Mr Lepper: I am just wondering what thoughts you have about encouraging domestic take-up of renewable energy. We have talked a lot about production and earlier we talked about encouraging the domestic interest in energy efficiency schemes. What about take-up of renewable energy from the home owner’s point of view?

Ms Hartnell: That is certainly something that has great potential to deliver carbon savings. There was mention of building regulations earlier. The ODPM Part L regulations consultations have really pointed out the advantages that can be realised from that. We have a capital grant programme at the moment, for the domestic scale, but the funds are due to run out fairly shortly and there is talk of replacing that with a technology-blind mechanism which would be for energy efficiency and renewables. Building regulations play a role, education plays a role, we just do need to bring these things out and get on with the job.

Q188 Mr Lepper: Is there more the government could be doing?

Ms Hartnell: There is. There is a Private Member’s Bill which is being tabled today in the House of Commons on stamp duty rebates for households which have invested in energy efficiency measures and those could easily apply to renewable energy equipment as well and indeed we shall be encouraging them to see that opportunity. There are many fiscal measures; the VAT regime at the moment is not helpful. John I know has been

involved in trying, indeed with some success, to get households and small schemes to take up biomass projects.

Mr Strawson: Yes, we have supplied a number of boilers more to the school size rather than domestic size, but we have one or two of our own members and also our own house is heated by a biomass boiler. Actually the advantage and the reason why we can sell that as working is because the fuel, in domestic terms, is actually the cheapest form of fuel. Woodchips from energy crop or forests are actually the cheapest form in energy value on that level. So already the market is an advantage for us. If there were some government forces to help that along, because the initial capital cost is the hindrance with household biomass boilers in that they are very reliable, they are very automated, but they are four to 10 times the cost, depending on what size you are looking at . . . There are capital grant schemes in place, but they are so complicated. If somebody identifies they have a market and they want to put a boiler in, you cannot budget on getting any grant and you might not know for six months whether you have the grant or not. What you need to do on that level is to look to countries like Austria, which has a very easy grant system. You can budget on getting the grant, a 50% capital grant on the boiler if you are primary producer, thereby being able to pay yourself back at the forest a decent return for the woodchip. Other people can get grants, but only probably at a level of 25% if they are not a primary producer. In Austria it works at that level and in the large CHP and power station and district heating size, I would suggest you look at Scandinavia. Their systems in there are very simple again, but they rely on fossil fuel taxes in the main to make it worthwhile. While I am on, Mr Chairman, you asked earlier whether wind is the cheapest. I agree that probably at the moment, it is the simplest, it is the easiest. It is less bureaucratic for an energy company to start producing renewables, because they do not have to worry about buying produce from a supply body and they know they can just get the electricity on the meter and they do not have to go through lots of hoops. It is the simplest: I would not say it is the cheapest. Offshore possibly, yes, is the cheapest but onshore I would say is not. If you look again to Scandinavia, and that is the reason I thought this, in Denmark for instance, it is saturated with wind and they only have the same amount of forest area as we in the UK at 10%, but 70% of their renewables, and they produce nearly 30% of their power from renewables, comes from biomass and not from wind, even though they are saturated by wind. So, let us please concentrate more on biomass. We have had the failing of ARBRE, we are working hard, we are nearly there. In the next few weeks you will start to see co-firing material going to two major power stations in the UK which we have got up, dependent on whether the processing machinery works through the commissioning, but that should now happen in the next weeks. Let us see some more emphasis please, not so much on wind but do not forget biomass is a big player.

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Q189 Mr Drew: As far as I understand it, talking to the farmers who wish to grow various materials which would be useful to you, the biggest problem has been the stability in the marketplace, which obviously government could help overcome by making it clear that any subvention would be there for a period of time. In terms of looking at things like single farm payments, how much work have you done to see how you can stack up a variety of different means by which payments can be accommodated to ensure that there is a good return even if the price does not edge up, which obviously one would hope for producers, it would do.

Mr Strawson: The decoupled single farm payments opened the door to now supplying whatever crop we believe there is a market for. We do not now have to grow wheat or oil seeds to claim subsidy. We as farmers can now grow anything where we believe there is a market and that is a fantastic opportunity which coincides with the impetus behind renewables; that is one reason why we think farmers can really embrace it. We think there could be extra help with certain crops which offer an extra environmental benefit. For instance, willow is not particularly monoculture in its normal thought-of way and its biodiversity is far greater, plus it is giving carbon savings. We feel we ought to be eligible for some entry level scheme type payment that Defra is working on and that would be another big impetus through Defra which could give us an extra payment specific for an environmental crop like willow as against miscanthus. There is a lot of tinkering yet that we could still work on and I believe we should be doing, but basically we are about there. The Renewables Obligation is now a big driver which is beginning to work, we believe that is now having an effect on the marketplace. Our problem is that you need to be providing the power stations with the sustainability of the ROCs, so they can budget on it in the long term and they can, in turn, hand long-term contracts to us. It is the long-term contracts that we need to plant a long-term crop.

Q190 David Taylor: May I move you on from biomass to waste, but in passing say that I found what Mr Strawson had to say very interesting and very thought provoking? There are some biomass sources of energy which are in a sense also waste products and I was thinking about things like wood pellets. In Leicestershire several schools are heated from wood pellets and I switched on the boiler at one Castle Donnington school just some weeks ago. There seemed to be great potential there for it to be using biomass in the national forest in which Leicestershire sits, but let us move on to waste. Our Committee has spent a lot of time looking at the Landfill Directive and the government is in a bit of a bind on this; realistically it is doing what it can, but recycling rates are not increasing at a rapid enough rate and things like waste minimisation and re-use are not producing the goods either. So they are soft-shoe shuffling towards incineration, which is now being entitled energy from waste. I should like to ask

Mr Cozens in particular to tell us how many energy-from-waste projects are actually running in the UK at the moment approximately.

Mr Cozens: There are approximately a dozen what you would call municipal energy-from-waste plants running now; approximately. There are one or two under development, but effectively we are seeing the barriers to entry of more of these plants so high that people are looking for other ways of solving the problem.

Q191 David Taylor: Is Edmonton your largest?

Mr Cozens: Yes, Edmonton is the largest, followed closely by Allington, which is under construction.

Q192 David Taylor: So there are about a dozen at the moment.

Mr Cozens: Yes; roughly.

Ms Hartnell: We could provide a list.

Q193 David Taylor: On a significant scale.

Mr Cozens: In scale everything from about 120,000 tonnes of waste a year to half a million. In the context of energy from waste, I think the debate needs to move on really. The origins of energy from waste were perfunctory really. Waste was perceived as a problem, burning it was seen as way of solving the problem; energy recovery was not really on the horizon. More recently, energy from waste was called thermal treatment by some people; again the context is something you do to the waste to get rid of it or to stop it being a nuisance. We have got to get over that as well. We have to be able to move towards a much more sensitive understanding of resource efficiency in the economy that we run.

Q194 David Taylor: You said earlier on Mr Cozens that we should not focus on the mechanism for converting the potential of the waste into the energy, we should ensure that we do in fact utilise it. Do you want to move us away from the concept of incineration and focusing on that? Is that the argument?

Mr Cozens: Yes, that is correct. When you look at the whole question of resource efficiency, and Joan Ruddock is one of the stars in my firmament with her on a recent Bill, but there is more to resource efficiency than recovering materials. If you think about the sort of materials that we go to such pains to recover, they are not in fact rare. We recycle iron, we recycle aluminium, glass, they are the most common things you can find in the earth's crust. It is not their rarity that makes it worth recycling them. What makes it worth recycling them is the energy we save by doing that. There is a very interesting inter-reaction between energy and materials' recovery. There comes a point when effort spent on increased materials' recovery becomes counter-productive. We also have the parallel things which come through legislation, the Landfill Directive which you mentioned, which seeks to limit the harm done to the environment by landfill, the fugitive emissions of methane because of its greenhouse gas potential. At the moment, diversion of biomass from landfill is the big news in the waste industry. It is what is driving

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everybody with the prospect of huge fines for those local authorities which cannot comply. It ought not to pass our attention that that huge problem we are looking at, the diversion of biomass, and we are not talking about things that you could recycle here, we are talking about waste biomass, in the one context it is a problem, in another context it is a huge opportunity that we are blind to. There are enormous synergies with biomass production as an energy crop. Again, you need to look no further than Scandinavia to see how intelligent solutions to these problems have emerged. If we go back in time to the first oil price shock and how the Swedish economy behaved, I think you will see there a blueprint for the way we are going to need to live in the next 20 years. They looked at their indigenous resources to see how they could best optimise their use. If you look at a combined heat and power plant in Scandinavia, you will see a magazine of fuels in the bunker. There will be fuels which have been derived from waste, combustible elements of, you will see forestry wastes, sawmill wastes etcetera. The plant operator will use those opportunistically according to the economics of his business; when it gets colder, he might even be burning coal or oil. We need to look at our own resources in those ways. In particular, I think we should start to see energy from waste not as something which you would do maybe on a local scale to solve a local waste management problem, but something we should look at in terms of the fact that we have these materials, what is the best use to which we can put them and where can we best take them to realise that best use?

Q195 David Taylor: But some of the by-products of obtaining energy from waste by incineration are less desirable, are they not, dioxins, particulates, things of that kind? Are you saying that times have moved on and we do not need to be alert to the concerns that we have and local communities about that?

Mr Cozens: We need to be concerned about that, not just for combustion of waste but combustion of anything. If you look at the incineration plants which were running in the period up until 1996, you could produce dioxins by burning coal or oil in those plants, but the production of dioxins is not a function of the fuel. The precursors to dioxin production in such a plant can be found in many fuels, most of which are quite acceptable. It is the way you burn them that is important. In modern incineration plants, dioxin emissions are not a problem. It is the method of combustion that is the issue.

Q196 David Taylor: I know we have given biomass and biofuels a good run through, but looking at biofuels, we are lagging behind dramatically, are we not? Is it the case that France and Germany have some sort of figure like 100,000 tonnes a year of biofuels and we are only at about 10% of that rate at the moment? Are those figures about right? Why are we lagging so far behind?

Ms Hartnell: Are you talking about liquid fuels for transport here?

Q197 David Taylor: Yes.

Ms Hartnell: We are behind. There is a lot of interest in promoting biofuels for transport and there has recently been consultation on the best mechanism for doing that, whether that might be differential fuel duties or a renewables transport obligation. There are powers in the Energy Act which have given government enabling powers to introduce some form of obligation. We are actually going to be making progress on that, but you are right to say we start from some way behind.

Mr Cozens: We should not neglect, in the same context, the potential of waste biomass to contribute towards a solution of that problem. This is an area where I feel the Renewables Obligation is somewhat misplaced. Taking Mr Lazarowicz's point, the Renewables Obligation is about 98% right. There is not a lot wrong with it, so it is well-intentioned and it is fairly well-conceived; a bit of tweaking and it will be fantastic. However, what it does not recognise in advocating the use of advanced thermal treatments like pyrolysis in gasification is that to use a product of those processes just as a way of generating electricity is actually to throw away the major part of the opportunity. Those two processes are the route to convert biomass into transport fuels and the potential to do that is vast.

Ms Hartnell: We have mentioned the Renewables Obligation for electricity, we have mentioned now the potential for an obligation for transport fuels, we have not, although we sent in evidence about it, really mentioned much on the aspect of renewable heat. When we were talking earlier about different cost-effective forms of renewables, we did not really mention that renewable heat is really a very cheap and cost-effective form of renewable energy. Really, we are missing a trick if we do not reward renewable heat and that is why we have been working hard on our proposal for that.

Q198 David Taylor: The wood pellet example I gave.

Ms Hartnell: Yes; very important.

Mr Cozens: On the question of gasification of waste biomass, we have had some hesitant interest out of two oil companies who look at that as a route of providing additional hydrogen to existing refineries. Hydrogen in refineries is what you need to make lighter fuels. So the concept of being able to take a waste material and return it to the economic environment as a transport fuel is alchemy, but it is doable. There is a plant in Germany which does that, Schwartzpump. They take urban waste biomass, they gasify it and it returns to the productive economy as methanol. It is doable.

Q199 David Taylor: You are using biomass as shorthand for biodegradable municipal waste as well as the biomass that we would more normally—

Mr Cozens: To me, it is the same stuff.

Q200 David Taylor: I know it is, but we have tended to keep the two in separate categories. You are suggesting that we should not.

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Mr Cozens: Exactly; it is a resource.

Q201 Chairman: One question area that I would like to close with in a moment is about security of supply, but I want very quickly to go through your evidence and ask whether you could write to me on one or two points. On the second page, there is a terminology “NGT Seven Year Statement”. Can you drop me a note and explain what that means and likewise explain to me what the table under “Lifecycle emissions from renewables” is supposed to tell me. It would be very helpful if you could perhaps write a paragraph or two on the payback for domestic use of solar panels. It strikes me that there are some pretty high up-front costs for that and also photovoltaic equipment, which means the uptake at the domestic level is very limited. Under “Key recommendations for RO” you have a paragraph entitled “Keep the quotas rising”. Could you please write a bit more and explain what that means to me? The question I wanted to ask is: in the United Kingdom at the present time, we have a declining share of CO₂-free electricity generation from nuclear. It seems to me at the moment that the renewables sector is taking the place of some of that lost nuclear, so we are not getting a net gain of new CO₂-free sources of power, we are getting a replacement. The second proposition I should be grateful for your comments on is about just how seriously we can take the actual 24-hour-a-day, seven-day-a-week, 365-day availability. In the case of something like hydro, you have a summer shutdown for maintenance. In the case of the United Kingdom, you only need a UK-wide high pressure system and you have knocked out most of wind. So we are left with one or two things you can burn and store as, if you like, the absolute core of a renewables proposition. Therefore, if you are going to be able to call on 100% of what you need at any one time, you have a lot of potential redundant CO₂ producing capacity that you have to keep there. It does draw into question whether in fact, shall we say, benevolent as we might feel towards your technology, we could brutally say “Is it worth the trouble?” What we ought to be doing is going to make the other sources better, picking up Mr Drew’s point about nuclear, perhaps having some more of that and not bothering with all this bitty stuff that you are talking about because we cannot count on it. Now, rebut that contention.

Ms Hartnell: To start with, the very bittyness is actually what often does provide the security. At the moment, we need to have about 1,000 megawatts of what they call “spinning reserve” which is coal-fired plant which is kept part-loaded to cater for when the electricity, going onto the system suddenly goes down. We need that spinning reserve at the moment to cater for the very largest power plants, in case they suddenly trip, or for the interconnector, were that to trip. As the penetration of wind increases, you are going to need eventually to have some extra spinning reserve to cater for the wind. The cost will be very small. So much research has been done on this in the lead-up to the White Paper and even since then, which I can send you references to, but the costs are

minimal. It is because of that bittyness, the fact that the wind is dispersed all over the country and you never really get the whole place totally becalmed. There are endless studies on the statistics of it. That in itself is an advantage for energy security. You mentioned the summer shut down for hydro. Again, there are many hydro plants in the country; they do not all shut down at the same time. I have never even heard that raised as an issue for energy security before.

Q202 Chairman: Well you ask the Italians; that is part of the problem they faced, but anyway we will not go into that.

Ms Hartnell: They choose to shut down all their plants at one time, so that is not very clever management on their part. It is not an issue here in the UK at all.

Q203 Chairman: In terms of where the potential for renewables lies, where can you pitch it, where you can say day-in, day-out, we can count on X% from renewable sources as being, if you like, a renewables contribution to base load? Are you ever going to be able to deliver that?

Ms Hartnell: We have an inter-connected electricity system. It works because it is totally inter-connected.

Q204 Chairman: I know it works, but you can count on nuclear, coal, those are here, now.

Ms Hartnell: You can count on a certain amount of renewable production, even it is intermittent. You can always rely on that being there, in the same way that you can rely on a certain thermal plant being there.

Mr Cozens: History tells us that we can also rely upon a certain amount of waste. It is difficult to prove, but it just keeps coming and the composition does not change much either. There is a huge resource.

Q205 Chairman: We have a huge public relations battle to convince people, taking up the points Mr Taylor was making earlier.

Mr Cozens: It is a battle, but it is very convenient for the same people who would complain about energy from waste to be myopic about their own profligate consumption patterns.

Q206 Mr Drew: What is the total capacity of renewables if we have the rate of increase in energy use at the moment or perhaps even slightly less? In other words, if we lock into this replacement of nuclear renewables, which has to get you to somewhere about 25%, what is the capacity beyond that, that renewables will fill?

Mr Strawson: In my experience, looking round at other countries which are doing renewables to a far greater extent than we are, I would put that figure—and Gaynor would have her own idea—easily, given time, probably 10 years, at 30% from renewables and 10% of that could be, with the land area that we have at our disposal, from energy crops. I think it is right for renewables to play a major role and it is quite right for a hybrid of renewables to be the right

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approach. On continuity of supply; energy crops and electricity from biomass and what we are doing as well are obviously not intermittent and just as secure as coal.

Mr Candlish: A couple of points, one on the intermittency. National demand is hugely intermittent, if you go from day to night; we have vast amounts of capacity summer to winter, which vary. So that is not unfamiliar to our system. It is also easy to say “The wind is not blowing so the turbine has stopped”, but those are generally very small-scale examples across what would be a very broad network of a large number of schemes. You do not often get problems with the large 500 megawatt generation sets, but when you do, you really know about it. It was too warm in France last summer, so they could not cool their nuclear reactors and we were bringing on oil-fired plant here to back those up. You only need to look at the trips on the East Coast and West Coast of the United States last year to see what happens when networks of these, fantastic when they work, very large power stations, but when they go down, it is absolutely catastrophic. There are downsides there to the super grid, the 1950s model of power generation. What was the other point?

Q207 Mr Drew: What is the figure that renewables can reach?

Mr Candlish: I think the number is high and the one critical point to get in here is that renewables is not just electricity. It is also heat and heat has a massive contribution to play here. It is not represented in any government department at the moment. It is not lobbied for, because it does not have a multi-billion-pound industry representing it and it is a fantastically efficient use of the sort of resources that we can indigenously develop. Right now in Slough, we operate a biomass combined heat and power plant, but we do not operate it in combined heat and power mode, because there is no incentive for us to give the trading estate renewable heat. The lobbying is constantly focused on electricity production to the extent that when you are talking in committees like this and so on, throughout the government departments, if you mention the word “heat” people say “Oh, you mean combined heat and power” which is the electricity version of heat. Nobody is talking about the incredibly valuable local small-scale grassroots projects which can deliver a vast capacity in a very short timescale.

Chairman: Upon that very positive note, may I thank you all for your contribution. I look forward to your further written evidence and thank you very much indeed for stimulating us with some interesting thoughts this afternoon. Thank you.

Wednesday 19 January 2005

Members present:

Mr Michael Jack, in the Chair

Mr Colin Breed	Joan Ruddock
Mr David Drew	Alan Simpson
Patrick Hall	David Taylor
Mr Mark Lazarowicz	Paddy Tipping
Mr David Lepper	Mr Bill Wiggin
Mr Austin Mitchell	

Memorandum submitted by Our World Foundation (U20)

A GLOBAL CLIMATE CHANGE/RENEWABLE ENERGY PLAN

EXECUTIVE SUMMARY

The objective of a Global Climate Change/Renewable Energy Plan is the transfer to a renewable energy sourced low carbon society to mitigate climate change to prevent catastrophic and perhaps irreversible impacts to our world.

The rapid transfer to a renewable energy low carbon economy can be achieved by costing the renewable energy plant required to provide all of a nation's energy and then putting in place finance and policies to achieve this by 2050–60 supported by energy efficiency measures.

The overarching statement of energy policy should centre on “the pursuit of secure and competitively priced means of meeting our energy needs, subject to the achievement of an environmentally sustainable energy system”. (PIU02)

A Climate Change/Renewable Energy Plan should be implemented by national governments incorporating the following measures:

1. A Climate Change/Renewable Energy Budget

“... Increasing the share of renewable energy sources in the energy mix of OECD countries will require continuous and large government support.” (WEO2001/IEA)

Developed nations' governments should establish a Climate Change/Renewable Energy Budget. The objective is to effect the transfer from a fossil fuel sourced society to a renewable energy led world by the provision of financing for renewable energy capital plant towards a target of 80% of a nation's energy to be derived from renewable sources by 2050–60.

The Climate Change/Renewable Energy Budget should be determined by assessing the estimated cost of the renewable energy plant required to supply all of a developed nation's energy supply—this cost should then be spread over 50 years so that the annual Climate Change/Renewable Energy Budget comprises 2% of the total cost after deduction therefrom of the nation's existing energy investment, after including fossil fuel externalities and subsidies, and after deduction of the cost to be applied anyway to the replacement of existing plant. Over the next 50 years all existing plant will be replaced at least once in the UK. (PIU02)

The Climate Change/Renewable Energy Budget should be applied to the funding or co-financing with the private sector of sizeable renewable energy plant.

Joint ventures with the private sector should include an option in favour of the private sector to acquire the government's 50% share within a specified period. This would protect the market interests of the private sector whilst enabling governments to recoup their finance and long term create a rolling fund.

The Climate Change/Renewable Energy Budget would be advantageous to industry as the future moves away from fossil fuels towards cleaner, zero emission technologies as:

- A £2,000 billion global electricity generation market for new plant is forecast over the next 20 years. (Foresight/DTI/Near To Zero Emissions)
- The UK has an approx 10% share of the present world market for power engineering and will need to develop advanced systems to maintain and grow this share. (Foresight/DTI/Near To Zero Emissions)
- “The UK would benefit from being ahead of the game in moving to clean and low carbon technologies”. (Prime Minister Tony Blair/PIU02)

- With security of supply concerns arising throughout the world governments and energy companies will benefit from embracing the new technologies before they are expanded and exploited abroad.

The Climate Change/Renewable Energy Budget could be raised through various sources:

- through developed countries' Environment Budget;
- through a "climate" tax on fossil fuel sourced electricity and energy;
- through the transfer of fossil fuel and nuclear subsidies to the Climate Change/Renewable Energy Budget; and
- through redirecting public funds to meet this global threat.

2. Governments to Provide the Necessary Regulatory Framework Within Which Renewable Energy Technologies can Expand and Flourish and to Rapidly Remove Barriers that Obstruct Such Expansion

"Governments will shape the energy supply landscape, playing a key role in . . . creating appropriate regulatory and market frameworks and in encouraging technology development and deployment." (WEO2001/IEA)

"Government should create powerful incentives to create low carbon options that would put the UK in a favourable position to move to a low carbon future". (PIU02)

For example if the current barriers to renewable energy in the UK are not rapidly removed "it will not be possible to make enough progress towards even the existing renewables target". (PIU02)

Additionally:

- Over the next 20 years almost half the power stations in England and Wales will need to be replaced (Welsh Assembly Report 2002) and all plant replaced at least once by 2050.

Renewable energy plant should replace retired plant supported by the necessary framework.

3. Governments to Impose a Climate Tax which Funds should be Applied to the Climate Change/Renewable Energy Budget

A Climate Tax should be imposed on fossil fuel sourced electricity supplies in developed nations and should long term be considered on all fossil fuel sourced energy supplies to "dampen" demand (WEO2001/IEA) and to encourage energy conservation. A "climate tax" rather than "carbon" may be a preferable name for the general consumer's benefit particularly if its imposition were supported by a high profile Climate Change campaign making the consumer aware of the need for such a tax as per the German Ecotax below.

At present transport fuel in the UK receives such a "carbon" tax in the form of the fuel tax. This generates over £24 billion pa to UK government revenues albeit this is not applied to solve the environmental problem transport emissions contribute to. Similarly energy and electricity, which combined account for greater CO₂ emissions than transport should be so taxed and the revenues applied to The Climate Change/Renewable Energy Budget.

As the Royal Commission for Environmental Pollution reported in 2000—

" . . . we favour a general carbon tax . . . It should be applied upstream, when fossil fuels are first purchased. This would give producers, distributors and consumers of energy an incentive to switch to sources which produced fewer emissions. It would also lead to higher energy prices downstream, stimulating efficiency improvements and reducing consumption."

"We should prepare for the greater use of economic instruments that enable the wider environmental costs of carbon to be incorporated into market prices." (PIU02)

Additionally energy prices in the UK seem to be at or even slightly below the OECD average. (PIU02)

The German Ecotax

In Germany an "Ecotax" was imposed on electricity justified by the need to create funds to provide pensioners with an adequate pension. A German utilities spokesman affirmed this was not largely opposed by the national public for the need to help pensioners was considered an overriding justification. The German Ecotax generates over £6 billion pa.

The UK electricity market is worth £14.58 billion (DTI 2030)—if one applied a tax of 10% increasing it to 20% this would generate approx £1.5 billion/£3 billion pa towards The Climate Change/Renewable Energy Budget.

To overcome the problem of fuel poverty utility companies could have a privileged non-climate taxed supply for these consumers. Alternatively one could examine the German model.

4. Governments to Phase Out Subsidies to Fossil Fuels and Nuclear Power and to Reapply These Funds to the Climate Change/Renewable Energy Budget

“A number of studies indicate that global emissions reductions of 4–18% together with increases in real incomes, are possible from phasing out fossil fuel subsidies’. (IPCC)

The UN estimates that more than \$145 billion pa is spent on fossil fuel incentives.

In the UK British Nuclear Fuels, wholly owned by government, has had its capital plant costs supported by public funds—£85 billion has in recent years been required to cover nuclear waste costs alone, largely government’s responsibility. (House of Commons)

5. Governments to Work With the Existing Fossil Fuel and Other Energy Companies to Ensure Existing Companies Capitalise on the Expansion of Renewable Energy with the Support of the Climate Change/Renewable Energy Budget to Convert Existing Industries and Jobs

6. Governments to Work with the Insurance and Investment Sectors to Generate Long Term Investments in Renewable Energy

It is important that governments “provide transparent consistent and long lasting signals to all participants in energy markets. . . without long term signals these investments will be not be influenced in the directions desired and changes that may need to happen over many years will not come about”. (PIU02)

By governments establishing a credible transitional Climate Change/Renewable Energy Budget coupled with the removal of barriers and necessary policy actions a clear message will be communicated to investment managers as regards the new growth industry for investors.

Thereafter governments should work with the insurance sector and investment funds to procure investment in renewable energy plant, which investments would be secured by governments legislating that increasing percentages of renewable energy should be obtained by utility companies.

Insurance companies have a vested interest in mitigating climate change as insured losses increased 13.9 fold between the 1960s and 1993–2002 (Munich Re) partly due to population growth, increased wealth, and urbanisation in vulnerable areas, and partly due to climate change.

Insurance companies are essentially asset management or investment companies with annual premiums of \$2.2 trillion—with vast funds the power exists to command and control the stock markets.

If insurance companies were able to invest in companies building large renewable energy plants it would have a very significant impact on the necessary transfer to a renewable energy sourced society, which would ultimately reduce future climate change impacts and consequent losses.

“Investments were part of the problem and hence could be part of the solution. All investment managers should modify their investment policies to take account of the potential direct and indirect effects of global warming.” (Chartered Insurance Institute UK)

The insurance sector is probably the only sector that has the collective might to do something about climate change due to its omnipresence and size but at the present time it chooses to be silent . . . Pressure from a more informed public could turn the tide. (Chartered Insurance Institute UK)

7. Governments to Produce Overall Decadal Energy Targets to 2050–60 with 80% of Energy to come from Renewable Sources by Then

It is our energy from fossil fuels that has caused approx 75% of anthropogenic global warming in the last 20 years. (IPCC) Electricity generation uses approx 16% of total energy whilst carbon dioxide emissions from electricity contribute approx 28% to total carbon dioxide emissions in the UK. (DTI)

Hence a 10% or 20% electricity target constitutes only a 2.8% or 5.6% CO₂ emission reduction target in the UK.

It is therefore preferable to set overall energy targets alongside CO₂ reduction targets as well as electricity targets with utility/industry companies legally obliged to procure these percentage of electricity/energy from renewable sources or be subject to a penalty once the framework and funds exist to ensure delivery of the targets. In other countries outside of the UK where land use change contributes approx 25% to total emissions—primarily from deforestation—there should be similar land use targets.

Targets should be within a clear schedule of decadal targets to 2050–60 by which time 80% of energy should be generated by renewable energy sources to prevent potentially catastrophic climate change impacts.

Governments in the developed world should similarly set energy reduction targets.

NB It is not enough to speak only in terms of CO₂ emission reduction targets for some developed countries, whose populations are little expanding, may be able to reduce some emissions through energy saving measures and a partial expansion of renewables. But this is not enough for if the developed world can not set the lead in a clear attempt to transfer significantly from fossil fuels to renewable energy sourced supplies, the developing world may not do so and may rather expand using fossil fuels.

8. *Governments to Support the Transfer to Alternative Transport Fuels*

Transport emissions are one of the fastest growth areas in carbon dioxide emissions. They are projected to increase by 75% on 1997s CO₂ levels by 2020. (UNEP Special Report(SR))

Aviation emissions are projected to grow even faster at 3% pa. (UNEP SR)

In the developing world transportation energy use is projected to grow significantly with per capita motorisation expected to more than double between 1999 and 2020. (IEO/EIA)

The Climate Change Renewable Energy Plan should set clear targets for fuel efficiency and development of low and zero carbon fuelling options: (PIU02)

Fuel cells and hydrogen as an energy source must be supported as the transportation fuel of the future with clear targets set by national governments and market frameworks within which they may expand. The development of biofuels should also be utilised in the interim.

Reduction in aviation demand should be brought about by an aviation tax (PIU02) which funds should be applied to The Climate Change/Renewable Energy Budget.

9. *Governments to Impose Mandatory Renewable Energy and Energy Saving Measures Into Building Regulations*

Approx 25% of the UK's CO₂ emissions originate from energy used to heat/light homes and run household appliances. (Energy Savings Trust (EST))

The Climate Change/Renewable Energy Plan should encourage governments to introduce strict mandatory Building Regulations in all member countries, which ensure that all new build or renovated homes satisfy stringent energy saving measures.

Governments should also aim to develop domestic energy generators at cost effective prices—ie domestic wind turbines which if they could be produced in sufficient quantity could become mandatory additions to new build homes as part of Building Regulations.

Similarly once small combined heat and power plants are on the market (micro CHP) these should also become mandatory energy appliances in new build homes.

10. *Governments to Legislate for Energy Efficient Technologies Including Lightbulbs*

Governments should legislate to phase out traditional appliances in place of energy efficient one or alternatively heavily tax traditional appliances to make them more expensive. The tax could be applied to further reducing the cost of energy saving goods and long term increased demand would also reduce costs. This should be similarly so with energy efficient light bulbs which use only approx 25% of the energy of traditional light bulbs and last up to 12 times longer. (EST)

Additionally and prior to such legislation governments should undertake a national advertising campaign delineating the emission and cost savings benefits of energy saving goods coupled with low cost supplies to attract the consumer.

11. *Governments to Secure the Support of Other Countries Towards a Global Climate Change/Renewable Energy Plan*

Global warming and climate change can only be solved on a global level.

Governments that are leaders on the international stage should particularly utilise this position to create necessary change.

Governments should seek to secure the support of other countries—both developed and developing nations—to A Global Climate Change/Renewable Energy Plan.

The concern would also be to ensure the developing world expands using renewable energy technologies rather than fossil fuels—with 72% of increased CO₂ emissions projected to come from the developing world to 2020 (IEO/EIA) this is critical. Developing countries will require foreign investment to expand their energy infrastructure and industries (WEO2001/IEA). If the developed world through the Climate Change/Renewable Energy Plan can gain financial support for these countries in the development of renewable technologies rather than fossil fuels then the projected emissions may be contained.

12. *Governments to Ratify The Kyoto Protocol and to Significantly Increase the Emission Reduction Targets as Renewable Energy Expands*

The Climate Change/Renewable Energy Plan should seek long term to ensure the Kyoto Protocol imposes significant CO₂ emission reduction targets both in the developed and developing world and make Contraction and Convergence part of its means of implementing equitable reductions.

However only if renewable energy can be sufficiently and rapidly expanded and begin to supply large portions of the world's energy may such governments be then willing to commit to legally binding significant CO₂ reduction targets. Otherwise the fear of an encroachment on economic growth would casue such significant commitments to be avoided.

13. *Governments to Instigate Debt-For-Climate-Change/Renewable-Energy-Plan Swaps*

Climate change is projected to make large sectors of the developing world increasingly prone to drought, famine and extensive flooding, which is and will continue to impact to an escalating degree on the lives of millions of impoverished people, who are already struggling to survive. Already 183 million EXTRA people are already being affected by the increase in disasters as were affected in the 1960s (OFDA/CRED Data).

The Climate Change/Renewable Energy Plan should instigate debt-for-Climate Change/Renewable Energy Plan swaps whereby developing countries' debts are not only cancelled to the benefit of those developing nations but are also tied in with an agreement on the part of the developing country to join the Climate Change/Renewable Energy Plan. (Debt-for-nature swaps proposed by Tom Lovejoy) This would involve the developing countries making a commitment to long term transfer to renewable energy sources with the support of investment from developed countries and for a proportion of future energy growth to expand using renewable energy rather than fossil fuels.

14. *Governments in the Developing World Should Not Be Compelled to Generate The Climate Change/Renewable Energy Budget But May Consider Applying Subsidies to the Fossil Fuel or Nuclear Industry to a Climate Change/Renewable Energy Budget*

Long-term such nations should also set renewable energy targets to effect the transfer from fossil fuels and nuclear energy to renewable energy technologies.

15. *Each Country in the Developed Which is Part of the Climate Change/ Renewable Energy Plan Should be Matched with a Country in the Developing World in a Pairing Scheme Whereby Both Countries Benefit*

There is a need for greater international unity to combat climate change.

Each developed nation should be matched with at least one (or more) developing country to establish a mutual responsibility towards one other (or more) nation whereby the two countries assist each other towards a renewable energy led future.

The partnerships should result in:

- the provision of technological information and personnel;
- the provision of investment information and personnel to faciliate investment; and
- matching of NGO's in both countries to raise awareness amongst the general public about climate change towards the expansion of renewable technologies and the conversion of the public and business in both countries to green electricity and energy supplies.

16. *Governments to Unify in a Global Population Stabilisation Plan*

A key requirement of the Climate Change/Renewable Energy Plan in seeking to stabilise emissions is to stabilise population growth—Even our current population is increasing its energy use by approx 2% pa and hence increased population growth will only exacerbate this.

Since 1960 world population has increased by one billion every 13–14 years and is projected to rise from 6.1 billion to 9.3 billion by 2050 (UN)—an increase of approximately 50% in 50 years.

The increase in population will be largely due to population growth in the developing world which is projected to rise from 4.9 billion in 2000 to 8.2 billion in 2050 based on fertility continuing to decline however if this did not occur the popoulation of the less developed regions would reach 11.9 billion. (UN)

With high fertility and low mortality however, the worst case projection is that world population would be 13.3 billion people by 2050 and 22.7 billion people by 2100. (IIASA)

17. *Governments to Unify in a Global Anti-Deforestation Programme*

Land use change especially deforestation accounts for 25% of the carbon dioxide (CO₂) emissions causing global warming. (IPCC)

A global movement should be initiated by world governments to stop the mass deforestation of our world—The national restriction of deforestation in countries where deforestation predominates could also be incorporated as a necessary criteria in debt-for-Climate Change/Renewable Energy Plan swaps as well as a necessary restriction and criteria for countries seeking foreign investment. At the same time tree planting programmes should be instigated at school level and beyond internationally. (Gore)

18. *Governments with Business and NGO's to Raise Awareness Amongst the General Public/World Community with Regard to the Severity of Climate Change, Its Cause, Impacts and Solutions Under Art 6 UNFCCC*

Since a global change to renewable energy will require the support of the mass public, their awareness of the severity of the crisis, its causes and solutions is critical. This has to be conveyed in simply understood language.

As one of the biggest global industries in the world with annual turnover of \$1 trillion + pa, the energy industry is ultimately dependent on its market—The choice and voice of the consumer can affect its profits and therefore affect its decisions.

“Oil companies have one inalienable imperative—respect for their customer base”
Rodney Chase, Chairman, World Business Council For Sustainable Development

If the global public and consumer can be made aware of the severity of global warming and climate change—they may then be prompted to transfer to cost effective green electricity and energy supplies and so stimulate a market led expansion of these products as well as energy efficiency technologies.

As BP affirmed their expansion of renewable energy ultimately depends on the “consumers” needs’ and choices.

Such a campaign should be of five years duration to ensure the message is conveyed and sustained.

SUMMARY

Global carbon dioxide emissions are projected to rise by 70% from today's levels by 2030 (IEA) which would constitute nearly a 90% increase on 1990's levels. At the same time with a continuation of current government policies renewable energy's contribution to global primary energy is projected to actually fall from 13.8% today to 12.5% by 2030 (IEA) for although renewable energy sources are growing, overall energy consumption is increasing even faster.

Unless stronger government action is taken we will not mitigate climate change in time—before developing countries expand their economies increasing their energy consumption through the use of fossil fuels or before certain feedbacks are triggered which may escalate global warming.

It is hoped that in 2005 when the UK leads the EU and G8 a Global Climate Change/ Renewable Energy Plan may be implemented to begin to effect critical change.

1 October 2004

Supplementary memorandum submitted by Our World Foundation (U20a)

PROGRAMME & EUROPEAN PILOT UPDATE

OBJECTIVE

The objective is to undertake a UK Climate Change Communications Programme, utilising key media to raise awareness amongst the general public, as well as the private and public sectors, about the cause, impacts and solutions to climate change. The role of such a programme is to stimulate support for renewable energy and its more rapid expansion as well as encouraging energy efficiency measures and life style changes to mitigate global warming. Stimulus of the consumer market place may also influence financial investments in renewable and energy efficient technologies as well as prompting existing energy companies to further develop this energy source. It is proposed that the UK Programme could also form part of a pilot model involving four European countries as a precursor to a European Climate Change Communications Programme and long term global programme.

It is proposed that the programme be instigated under Article (Art) 6 of the United Nations Framework Convention on Climate Change (UNFCCC) and be run by an Art 6 Climate Change Steering Group in the UK, comprising parties drawn from government, the private sector and NGO's, such coalitions being recommended under COP 8's Art 6 work programme.

ELLIOT MORLEY MP

In January of this year Sir John Houghton, who has been fully supporting the need for such a Climate Change Communications Programme, and I met with the Environment Minister—Elliot Morley MP and officials to discuss the proposed programme. Mr Morley said he wished to implement the proposed programme. He was also interested in the idea of a coalition between government, the private sector and non governmental organisations.

We were told to further liaise with Defra.

DEFRA

Following this meeting Defra undertook two internal reviews on climate change communications—the first to see what awareness raising activity on climate change had been undertaken and secondly to see what were the barriers to the success of such climate change communications. Thereafter Defra commissioned an independent communications agency—Futerra—whose brief was to assess the information Defra had gleaned and to give an evidence based proposal as to an “attitude change” campaign on climate change. Futerra undertook this work and have made/will make presentations to the Climate Change Communications Working Group and to Lord Whitty and Elliot Morley MP.

THE COALITION

At the same time Sir John Houghton wrote to Lord Browne Chairman of BP with regard to the proposed UK Climate Change Communications Programme to be implemented as a coalition between government, the private sector and NGO's. Lord Browne was supportive of it and his “Distinguished Advisor” Chris Mottershead has worked closely with us since. We organised a meeting of key UK climate change concerned parties as detailed in Annex A attached hereto [not printed], to discuss their views with regard to such a climate change communications programme and also their views as to it being implemented as a coalition. The meeting was chaired by Sir John Houghton and hosted by BP. Parties were in agreement of the need for such awareness raising on climate change and agreed that a parties should come together to implement such a programme.

Sir Crispin Tickell suggested a Taskforce take this forward with the approval of the Prime Minister—which Taskforce could report directly to the Prime Minister, given his commitment and concern about this issue particularly for 2005.

Sir John Houghton wrote to the Prime Minister following this meeting informing him of the meeting's occurrence and of the suggestion that a Taskforce be formed to take it forward.

The Prime Minister responded in support of the initiative in a letter to Sir John Houghton and it was recommended a workshop be held over one or two days to assess the various issues. This Workshop will report directly to the Prime Minister.

We are now looking to organise this Workshop for early 2005—the key issues will be:

1. *The Scale of any Proposed Programme*

We have at present unprecedented alignment of activity—when next will the UK lead the EU and G8 and have a Prime Minister wishing to focus on climate change as one of two key international activities. Hence if we can not at this juncture implement a high profile and sustained climate change awareness raising campaign when will we ever?

It seems at present there have been some Defra funds allocated for some climate change communications for 2005—What we are seeking however is the maximum possible campaign at this juncture and one that can effectively harness the input and resources of the private sector and NGO community as well as government. The concern is however that a less than high profile campaign may be implemented.

2. *Stimulating People to Action*

The Futerra brief was to best determine an “attitude change” campaign rather than an awareness raising campaign or one that is looking to stimulate people to action. What we do need is to stimulate people to action—to support renewable energy by signing up to green electricity tariffs to begin a market led expansion of this product and to understand and embrace the need for energy conservation based on awareness of the issues at hand. To seek to change attitudes without encouraging people to take action would be a little like the AIDS campaign only highlighting the issue without getting people to protect themselves or would be like the drink driving ads or Clunk/Click not telling people not to drink or wear seatbelts.

We need the energy consumer to begin to effect change with climate change.

At present the mass public are largely disempowered for much is read about severe climate change impacts but people little know what they can do to help. Famine appeals including the recent earthquake disaster show that people are willing to help if they understand the crisis at hand. We need to ask for people’s help to stop climate change.

3. *A Coalition between Government, The Private Sector and NGO’s*

A coalition between government, the private sector and NGO community is proposed to implement a UK/European Pilot Climate Change Communications Programme. The benefit of this would be to bring together concerned and powerful parties and to harness their cumulative energy, expertise, manpower, resources and networks in a national movement driven towards change. For example using the vast Virgin, BP, banks, rail, supermarket and NGO networks that exist to access the energy consumer.

4. *A European Pilot Programme*

Also given our leadership of the EU and G8 we are in an excellent position to make any such UK programme a European pilot with two or three other member states towards a long term full European programme. To not do so would be a missed opportunity for climate change can only be solved on a global level. This would also fulfil our remit to lead internationally on climate change this year.

We have been told Belgium could be an interested partner. Also Germany could be considered based on the recent Anglo-German Climate Change conference and the Art 6 Chairlady, who is from Bulgaria, suggested an accession state.

Additionally we wrote to Margot Wallstrom last year when she was still Environment Commissioner at the EU regarding a proposed European programme. She responded very positively and said we should come “forward with concrete proposals for co-funding to her funding departments”. She has now moved to communications at the European Commission and hence may be in an even better position to assist.

SUMMARY

We have only a limited time within which to effect the necessary change with climate change—before emissions rise too high and before developing countries expand using fossil fuels. Developing countries need to imminently transfer to renewable energy sources to set the lead and example before developing countries further expand. Energy conservation must also critically be embraced.

The energy consumer is key to a market led expansion of renewables and is also key to our meeting our Energy White Paper emissions reductions targets. The consumer needs to understand the cause, impacts and solutions to climate change so that they may begin to take action, which may on a market led basis begin to effect change.

We ask that the UK Government seeking to lead on climate change recognises the critical importance of a sustained and long term Climate Change Communications Programme and one that also harnesses the input of the private sector and NGO community in a national and international movement driven towards change.

No greater global issue exists today than the mitigation of climate change—for within one generation alone we may either save or irrevocably alter our world. The Asian Tsunami has painfully shown the destructive force of Nature and may be but a shadow of what is to come if we can not radically reduce global emissions. A UK/European and long term global climate change communications programme needs to be implemented now if we are to hope to begin to effect change in time for the global consumer needs to be informed and directed of the critical role they can play.

17 January 2005

Witnesses: **Sir John Houghton**, former Co-Chairman of Working Group 1 of the UN Intergovernmental Panel on Climate Change (IPCC) and former Chief Executive of the UK Met Office, **Dr Andrew Dlugolecki**, Review Editor of the Insurance and Financial Services Chapter of the IPCC Third Assessment Report, Board member of The Carbon Disclosure Project and The Tyndall Centre for Climate Change Research and advisor on climate change to UNEP Finance Initiative and **Ms Christina Hutchins**, Director, Our World Foundation, examined.

Q208 Chairman: May I apologise to everybody in the room for the delay in the start. I am afraid our Committee domestic business overran, for which I apologise. We welcome as our first witnesses this afternoon Our World Foundation and may I thank you for sending in your written evidence. We welcome Sir John Houghton, the former co-chairman of the Working Group 1 for the United Nations Intergovernmental Panel on Climate Change and the former chief executive of the UK Met Office. I now know who to blame for my weather forecast, or I used to anyway. Mr Andrew Dlugolecki, the review editor of the Insurance and Financial Services Chapter of the IPCC Third Assessment Report and a board member of the Carbon Disclosure Project, the Tyndall Centre for Climate Change Research and advisor on climate change to the UNEP Finance Initiative. It is almost a pocket c.v., your responsibilities. Anyway, you are very welcome, and Christina Hutchins, the director of Our World Foundation, who has a wonderfully brief title! As you know, the inquiry which the Committee has before it is to take stock of where we are with reference to Kyoto and the targets that we set. Can I ask you a very straightforward couple of questions. Why is it, in your view, that the policies which the Government have put forward effectively are not delivering what they hoped for in terms of the UK target for CO₂ reductions and what principally do you think the Government should do to recover the position?

Sir John Houghton: Thank you. That is a good question. We are very disappointed. I think everybody is very disappointed at the way the renewables energy targets, for instance, are not going to be met until 2010. Now, the reasons for that may be many but we notice that other countries, in particular Germany, have done very much better on renewables than the UK. Their building of wind sources of energy have been very much greater than ours by a factor of five or six already. The growth of solar pv energy in Germany is enormously greater than anything in this country and they have incentive schemes and mechanisms which seem to be working very much better than ours, and we would like to say a little more about that in a minute, I think. We need to begin to put our house in order and to become more determined, I think, that what we do is going to actually be delivered rather than allow forces which would tend to operate against more renewables taking their place. I think I will ask Andrew to add to that.

Dr Dlugolecki: One practical example of that is in the electricity industry, which I am sure you must be familiar with, but just very briefly we have conflicting policies. One is saying the Renewables Obligation to generate more renewable electricity and the other one is saying produce electricity as cheaply as possible. My background is from the finance industry and now the finance industry is very

unwilling to touch renewable energy because what has happened is that those conflicting policies have driven some of the green suppliers bankrupt, which means that now the banks own the power stations, which they never wanted to do, and nobody is going to build new power stations when the guiding rule is that you must have electricity as cheaply as possible. That is unfair when renewable technology is still evolving and therefore cannot compete at this point in time only on price. The time will come when it will be able to, but it cannot do it yet.

Ms Hutchins: The House of Lords Select Committee on Science and Technology recently said that the Renewables Obligation tended to act as a cap rather than stimulating the market and they suggested rolling targets and capital grants. Also, we are suggesting that perhaps the UK could consider the German REFIT scheme with a renewable energy feed in tariff, which basically guarantees renewable energy producers access to the grid for a fixed price for a fixed term, which is a great stimulus, and it actually costs less than the Renewables Obligation. Also, we would suggest that perhaps REFIT could be adopted for community scale projects and this need not be marginal. For example, in Denmark 80% of the wind projects are community owned. Other suggestions that we would like to make to stimulate the UK market would be the creation of a significant climate change renewable energy budget to supply significant capital grant cost for the building of large-scale renewable plant, such as tidal lagoons, should be reconsidered. Also, as Sir John said, we need to learn from countries which expand renewables, produce clear policies to bring renewables more in line. We also need to stimulate the consumer market through a high profile climate change communications programme. Just like any other product would be marketed, so too we need to stimulate support for renewable energy as well as energy efficiency technologies. In turn, obviously consumer support will build confidence in the investment sector. Finally, we would also like to suggest that perhaps in the UK what we could do, which would also help our targets, is to provide support and grants to help consumers adopt domestic scale micro CHP. Basically, at the moment 1.3 million people buy boilers every year and therefore if they could be encouraged to buy micro CHP within less than 10 years that would generate sufficient capacity to take over from the existing nuclear power stations if you take into account the emission losses through transmission.

Chairman: Right. Thank you for that helpful start.

Q209 Paddy Tipping: It is interesting that you have started by discussing the UK policies and the real engines for economic growth at the moment are China and India. If you look at the population growth, it is going to come from the developing

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world. Global warming requires a global solution. In the developing world how big an issue is it? What priority does climate change get?

Sir John Houghton: Can I comment on that? I think it is a global issue and it demands global solutions, you are absolutely right. But those global solutions are made up of individual countries doing what they need to do and what is absolutely clear is that we cannot expect China, India and countries of that kind to take very big steps.

Q210 Paddy Tipping: I take that as a given. That is a given, we all agree on that. Let us just talk about what we are going to do elsewhere. What political policy priority has global warming got, let us say, in China? That is where some real growth is taking place.

Sir John Houghton: Well, if we are talking about China, I know China reasonably well. They are in fact very concerned about climate change. They know about floods, they know about droughts, they know about storms, they know the sorts of things that will happen and they are trying to become very efficient in their energy. During the 1990s they actually cut their CO₂ emissions. They are going up now quite considerably, but they actually cut them in the 1990s though efficiency means. They want to do that. They are a big country, they want to industrialise and they are going to do that whatever. We have got to help them do it, of course, in ways which are sustainable. We have got to help them with renewable energy schemes, with efficiency schemes, all sorts of things. China are well on board as far as the ideas are concerned, but China in the political arena will not move until the US moves and that is the major issue as far as China is concerned. If I can return to the UK scene and what we are not doing—

Q211 Paddy Tipping: No, I do not want to talk about the UK. We will have plenty of time to talk about the UK.

Ms Hutchins: I would say that obviously it is true that in China perhaps they are more conscious than in other parts of the developing world. In many parts of the developing world people are just trying often to survive. At the moment there is a great push, which is fantastic, for the alleviation of poverty. We have Gordon Brown trying to raise £100 billion per annum. We have the new report by the United Nations trying to increase their budgets from 20 billion up to 135 billion per year and up to 195 billion by 2015. The point is that a lot of people in the developing world are not conscious of global warming and yet they are going to be directly affected and they are already in the front line. There are 183 million extra people being affected by disasters already. Some of that is climate change. What we need to do is to obviously increase awareness in those countries amongst the people, the companies and the governments that climate change will radically undermine those countries unless they take on board mitigation policies. Also, what we need to do is to link the alleviation of poverty to what we were suggesting linking it to, debt for

climate change/renewable energy plans. Basically, at the moment we are talking about writing off 100% of the debt, but that money will be applied to health, education and welfare. What we should be looking to do with the Treasury, the EU and the G8 and UNFCCC is also suggesting that that previous debt funding is also applied to the expansion of renewables in those countries because that will help not only those countries and also the global community but also it would help their economic prosperity. As we know, too many people do not even have power. So we are suggesting that.

Dr Dlugolecki: During a little bit in my career I was responsible for developing countries in my old company so I have visited them on business rather than just climate change. You are right when you infer that they do not see climate change as the big issue, it is development. I have been to almost all the COPs¹ as well, so again I meet people there. The key thing is how to give them some incentive to want to see climate change as an issue which will reward them as well. At the moment under the Kyoto Protocol we have gone along a rather legalistic bureaucratic route with the CDM, for example, almost on the basis that nobody should make money out of climate change and we are going to make the mechanisms as hard as possible to do it. If you take an alternative model like Contraction and Convergence, which you might have heard of, I think one of the great benefits or bonuses in that is that it creates emissions rights for developing countries which are greater than their current consumption of fossil fuels, much like Russia has signed up to, and that is the reason why Russia has signed up to Kyoto. By doing similar things for developing countries you then give them an incentive to participate in the whole process of fighting climate change. At the moment the developing countries are very suspicious that there is a plot to stop them developing and we need to get around that by letting them see that there is a way for them to make money and develop sustainably.

Ms Hutchins: Could I just make two final points. At the moment there is this big push to alleviate poverty. Climate change will ultimately completely counter the efforts which are being made to alleviate poverty. They will be pouring money into a bottomless pit unless we mitigate climate change.² The second point is that if we are talking about raising \$135 billion per annum, rising to \$195 billion per annum by 2015, what we need to be doing is approaching climate change with that kind of financial clout, ie as we are suggesting, a global climate change renewable energy plan which is significantly deploying renewables internationally with that kind of money.

Paddy Tipping: That is helpful, thank you.

Q212 Chairman: Just a point on that. We seem to load into what we expect people to do to relieve their debt lots of things and you have now loaded another

¹ Conference of the Parties under UNFCCC

² *Note by Witness:* The World Bank recently stated that it had become the world's third largest reinsurer internationally, because so much of its development funds are being diverted into disaster recovery.

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requirement on to the less developed world to achieve. In other words, they have got a shopping list and they have got to tick the boxes before debt is cancelled. Given, for example, removal of corruption might be an absolute key to getting any improvement in a less developed country, how are you going to rank all of these extra things you are asking countries to do to get themselves relieved of debt?

Ms Hutchins: We were suggesting at first instance, before the recent push has come, for the alleviation of debt being tied in to those monies being completely applied to health, education and welfare. Initially we were not suggesting that the alleviation of debt finance would go into renewables but that one would look at each country on a specific basis, one would assess their renewable sources, see what funding (if any) they could apply to the expansion of renewables and that that money should be levered with developed countries either on a one to one, five to one, 10 to one basis and if the country was so impoverished they did not have to apply any monies but they made a commitment to work with developed countries to expand renewables. It is only since the global push to alleviate poverty is tying in all that money to health, education and welfare that it would seem futile if one did not include climate change mitigation, the expansion of renewables, into that mix because, as I have just said, if they do not mitigate climate change they will become increasingly undermined through human suffering as well as economic disbenefit.

Q213 Patrick Hall: If I could ask Ms Hutchins, with regard to the evidence submitted to this Committee, the paper on a global climate change renewable energy plan, one of the elements of that is the proposal that Government should instigate debt for climate change/renewable energy plan swaps. How would that work?

Ms Hutchins: What we were suggesting is that at the moment, as I say, Gordon Brown is leading on the alleviation of debt, so basically number one is that climate change and the expansion of renewables need to be introduced significantly to the Treasury so he can take it forward, also through the EU and the G8 presidencies and through the Kyoto, UNFCCC process. Basically, how that could work on a practical level. Number one, the key principle, will be the alleviation of debt, as I have just said, and that each country should be considered individually. Secondly, that the country commits to working with developed nations to progress a realistic schedule of deployment and that realistic targets are set for each country. Then we move on to the funding and obviously, as I said a moment ago, if the debt at the moment is being earmarked for health, education and welfare then climate change and the expansion of renewables need to be put into that. That then could receive leverage from developed countries through the GEF and otherwise either on a one to one, five to one or 10 to one basis. Also, we need to increase awareness in these countries of how climate change will radically undermine the peoples and the

nations because that can create a ripple effect for future policy. As I mentioned a moment ago, economically it can only help to benefit the countries and they need to be made aware of that because not only do these countries need energy in order to grow economically but also countries such as North Africa have great resources in the Sahara for wind and solar thermal which they could, given support, help to export and that would help them financially as well. The final point is to not impose a debt for climate change/renewable energy plan swap gives such countries complete unfettered licence to further expand using fossil fuels which, as we all know, means we will never mitigate climate change. On that final point I would like to say, as everybody knows here, the IPCC at present are projecting a 5.8° centigrade increase this century at worst. I imagine many of you are aware of the Hadley Centre and the global dimming problem, which is now projecting possibly a 10° centigrade increase this century, 2° centigrade possibly by 2030, 4° centigrade possibly by 2040. So it is critical that we encourage and support developing countries to expand their renewables as well as ourselves.

Q214 Patrick Hall: On the point the Chairman raised about how much can we realistically expect to attach to debt relief, I do not think you have said you wish to replace the other programmes with issues to address global warming and sustainable energy but to add that to the list. Okay, but do you see that as being realistic given the pressing poverty in certain parts of the world? I think if you are going to develop that argument you need to show the links between these things, if indeed there are links between global warming and poverty and environmental degradation and the economy. Those are the sorts of arguments which might work, but is that something that you have developed so far?

Ms Hutchins: I would say that if we study, as many experts have internationally, the increase in natural disasters since the 1960s we will see how already climate change may be radically affecting countries both in the number of people affected and also economically, as Andrew will be able to tell you. Therefore, if the present debt payments are being applied to health, education and welfare, on a health level under climate change many counties will become increasingly stricken with diseases such as malaria and other diseases. As per Peter Cox and the programme, many of these countries will become uninhabitable. When we are talking about a 5.8° or a 10° centigrade increase that is the global average. That means other regions may rise far higher. How is that going to affect peoples' health and welfare? So therefore to not have it in the mix—it is the number one priority, surely, because it affects everything else.³

³ *Note by Witness:* Promoting renewable energy will also create sustainable wealth in developing countries, as well as avoiding climate-related disasters. Wind, solar, run-of-stream and modern biomass reduce the need for oil imports, and make use of locally available resources.

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Q215 Patrick Hall: Okay. What can Britain do, not only when it has got the presidency of the G8 but in the long-term, perhaps taking up your partnering scheme suggestion?

Sir John Houghton: I think one has to be realistic, of course, about what is possible in the shorter term and then in the longer term and I think in the short term of course there is going to be a great deal of emphasis on poverty, education, welfare, and so on, but nevertheless there has to be some education not only of people in the UK but also people in the developing countries about what is likely to happen with climate change, particularly in floods and droughts, extreme events and extreme heatwaves and the whole problem that is going to cause for their agriculture and to some extent for their survival in certain parts, particularly the Sahara and African countries. We are certainly not proposing that there should be some bureaucratic arrangements which are made as part of the debt removal scheme because what we need is more bottom-up procedures which will help those countries to grow for themselves the necessary contributions to their growth in energy, renewable energies rather than fossil fuel energies. I happen to be a trustee of the Shell Foundation and the Shell company has put \$250 million—and they are going to put another \$250 million—into a capital fund, a charity for supporting renewable energy growth in the Third World, in the poorest of countries—

Q216 Patrick Hall: I was asking what Britain could do and I think your answer is a more general one, also about what corporations can do. If I have misunderstood, I apologise for interrupting you, but could you look at what Britain specifically can do so that people here can relate to that and maybe keep Government to account on what has actually been achieved, or is it just some general vague international activity which it is not always easy to relate to?

Sir John Houghton: I am sorry, this is not vague international activity, it is activity undertaken by a British company which is actually very effective and I was using it as an illustration of something which is very effective in developing countries because of the way in which they do it. It is done from the bottom-up and it is done making sure that poor people actually run the schemes and develop their own processes rather than just some top-down approach. If Government and industry in the UK can get together in ways which would enable this to occur, not in the bureaucratic sense but in an actual real sense then progress would be made.

Q217 Chairman: Ms Hutchins is bursting to say something.

Ms Hutchins: Basically, Sir John's point is that we need to avoid bureaucracy and it does not have to be complex. The partnership should be seen as positive development, not unwieldy impositions. Basically, how do you do it simply? Well, simply you bring together in the UK parties such as the Shell Foundation, the investment sector from the City. You have small groups, not unwieldy groups. So you

have a finance group and you also have a technological innovation group to give advice and technology transfer. You have a country which they are paired with, for example someone in Sudan recently said to me that they were trying to find funding for a renewables project but they did not know where to begin really. So simply a country could have a list of renewable projects which sought funding and they would come to that partner, say it was the UK, to the finance group, who would be able to see whether there was anything here that the UK could assist with. If not, that could go to a finance group in another country, which would be a pivotal centre for investment in renewables basically and have key people involved, as would the technical group.

Q218 Mr Drew: In terms of negotiations with those countries that are trying to develop, is there any case whatsoever for conditionality, to say to them that there would be additional aid if they were to look at means of producing energy and forms of transport which were environmentally acceptable. I know this is provocative, but one way in which you could argue that you could at least stop the world from getting worse is to actually take those countries that are in the early stages of economic development and give them incentives so that they were able to do that through sustainable means of energy and transport.

Sir John Houghton: If I might try and answer that. In the first instance you have to help them do it. You cannot say that a condition of giving them this is that they should actually do things which are perhaps technically quite difficult for them or even administratively quite difficult for them in developing new forms of energy and putting those forms of energy out and financing these schemes, and so on. There is no point in us putting conditions in unless we are prepared to actually help them do that. I think the way to help them do that is not just via Government, it is via Government/industry cooperation because a lot of industries are involved in those countries too. There will have to be some sort of backing with some finance," but this comes from what you are basically trying to do, by that sort of cooperation and making sure that it works from, as I say, the bottom-up rather than something just imposed upon them and saying, "Take it or leave it." We cannot do that. We have to help them a great deal. Technological transfer is one part of it, but it is even helping them rather more than that with developing business techniques in addition to developing the way in which they can grow waste-to-energy schemes. The Shell Foundation has done a lot of those, which are very effective, much more efficient than the World Bank because they are doing it on the ground floor level rather than from the top.

Q219 Chairman: Just a quick brief comment, Ms Hutchins.

Ms Hutchins: Well, obviously aid would be great but, as we know already, a lot of it does not get to where it is meant to be going and there is corruption,

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so another thing that we could consider would be to send out micro generation CHP technology—give it instead of finance to such countries.

Q220 Chairman: In your evidence, in fact the first point you make in paragraph 1 of what you sent to us, you suggested that we should move towards a target of 80% of the nation's energy to be derived from renewable sources. If we look specifically at the United Kingdom, what is your route towards that objective given our somewhat slow progress to the targets that have already been set?

Ms Hutchins: Basically, you assess obviously what a country's energy (not electricity but energy) requirement is and you can work out how much you would need to transfer every year to renewable sources over that kind of timescale. Given the existing slow growth, it really means that we have to, number one, come up with the will to do it. If there is the will, everything is possible. Secondly, the funding to support it and the removal of barriers. At the moment we are in an emergency situation and really we should be moving forward—

Q221 Chairman: That is a great general statement, but let us deal with practicalities. How do we get from where we are to where you suggest we want to be? What sort of money are we talking about, what methodology and how are we going to do this?

Ms Hutchins: On a funding level, if you take the UK's energy consumption now and not allow any additional increase and then discount the amount of existing energy investment it works out (based on 2000 figures) at around £5 billion a year of capital funding required to support the expansion of renewable energy projects. What we were suggesting was that that money could be going into supporting renewable energy projects but in joint ventures with existing energy companies and that after so many years the energy companies would have the option to buy out the public share, ie retain 100% of long-term profits, and thereby the climate change/renewable energy budget would be a rolling fund. You would not necessarily have to put up £5 billion annually between here and 2050.

Q222 Chairman: Just to be clear, you are inviting the government of the day to make a long-term commitment of £25 billion worth of capital?

Ms Hutchins: £5 billion per annum.

Q223 Chairman: Yes, but over what period, because we have got, what, forty-five years to your target?

Ms Hutchins: Sure. Basically, what I said is that it could become a rolling fund. You would create joint ventures with the energy sector and they would have the option to buy out the government's investment.

Q224 Chairman: But why should the energy sector not do it itself? At the moment what we have got is a system where there are some financial encouragements through the Renewables Obligation to move forward, and private companies

are making those investments. Some major energy suppliers are busy telling us that they can supply green energy. Why should they not do it?

Ms Hutchins: Because the energy companies, according even to BP, seek Government leadership and also we have a critical global issue. The action is not happening as yet sufficiently in the energy sector, so Government needs to take leadership on it.

Sir John Houghton: Could I just raise one renewable energy source, which I believe is important and lots of other people believe it is important too, and that is tidal energy. We have the highest tides in the world in the UK and the potential for tidal energy—and this is being looked at by companies like Tidal Electric and the like—is perhaps 50% of the UK's total electricity needs. The problem with something like a tidal energy project is that the money is all needed up front and the pay-back period is rather long, 20 or 30 years, because there is no fuel involved and it is a sizeable scheme. Companies on their own will not invest in that way. What we need is Government/industrial partnerships producing demonstration projects in things like tidal energy. The technology is known. There is no problem about any part of the technology. There are no particular environmental problems with tidal energy. We know exactly when it occurs. It is not like wind energy, intermittent and you are not sure when it is coming, you know precisely when the tidal energy is there. So there are areas of that kind which the Government has hardly looked at and it is hardly supporting and hardly encouraging. Unless there is real encouragement, real incentives and a willingness from Government to put a capital share, along with industry, into demonstration projects those things will not get off the ground.

Q225 Chairman: I just want to ask Dr Dlugolecki, does that make financial sense to you?

Dr Dlugolecki: Yes, it does. There was a big renewables conference sponsored by the German government in Bonn last year, in June, which considered these issues and precisely the point that Sir John has raised was a key issue for everyone, including the finance sector, that the main trouble with renewables is that the cost is up front. The energy is free but all of the cost is up front and finding that money when you are competing with fuels which are unrealistically cheap (that is the fossil fuels) is almost impossible from a financial point of view. Why are the fossil fuels unrealistically cheap? Because at the moment consumers are paying nothing for the damage which will happen in 30, 40, 50 years' time. In fact it is already beginning to happen from using these fuels. So these fuels are unrealistically cheap. So on your main premise about why do we not just use renewables, quite simply the fossil fuels are unrealistically too cheap and therefore nobody is going to start renewables unless there is help, first of all to recognise that the structure of renewables projects is different because they are all up front and so the banks, etc., need a different kind of comfort on the risks side, and secondly governments have to set a clear pathway. I think this is going back to the question you asked

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earlier. There has to be a clear pathway with milestones along about where we intend to be at different points in time. Interestingly, there was a report by one of the biggest American power companies which burns coal, called Cinergy, and what they said was—and bear in mind this is in the USA—“What we need from Government is a clear view of where we are going in terms of how quickly emission limits are going to come in.” So they accept that even in the USA it is going to come in, but there is not the incentive for them to develop clean coal technology, for example, until they know how fast it is going to come along.

Ms Hutchins: I have three additional quick points. When we are talking about a £5 billion per annum renewables budget for the UK, first of all let us put that in context. That is only about a fifth of the environment budget and only about a fifth of the fuel tax. The second point is, what is our world worth? If Peter Cox and the Hadley Centre are correct and the UK is going to have a habitat like Africa in 80 years’ time, what money would put that right? Thirdly, we should consider the German Ecotax model because that has been their most successful climate policy and that has generated vast sums of money. It would easily cover such a budget.

Q226 Chairman: But that Ecotax was to raise money for the German pension situation, was it not?

Ms Hutchins: But its objective was to make energy consumption expensive. That was the primary objective.

Q227 Alan Simpson: I am a great fan of tidal power and have been for decades. It is a bit difficult to harness in Nottingham!

Dr Dlugolecki: It could be arranged!

Q228 Alan Simpson: It may well be if we do not get our act sorted out. You know that the Renewables Obligation is currently set at 10.4% that energy suppliers have to contribute from renewable sources by 2010 right up to 15.4% by 2015. You have nudged this along a *souçon* and suggest that it should be set at 80% by 2050. It would be interesting to know if you think that is realistic. I am just in the process of doing a place that will generate a surplus of energy from a combination of micro CHP and photovoltaics, but I cannot see anyone else on our street who is going in that direction and to get that sort of 80% figure we have to have a seismic shift in our thinking and our policy focus. Can we do that?

Ms Hutchins: Well, I would ask you the same question, can we do it? I think it is about the will, the funding and the removal of barriers and mobilising the population.

Dr Dlugolecki: I would answer that very simply from the business point of view that if you actually look at the rate at which technologies have spread in the last one hundred years then the answer must be yes, it can happen, but if we do not remove some of the barriers it may not happen. If you look at the spread of the car, at one stage people were concerned that London was going to grind to a halt with horse manure and yet within twenty years the horses had

gone. Look at the spread of the mobile phone. You just have to look around. It is perfectly feasible that that could happen, but we can also stop it happening.

Ms Hutchins: If we do not and if it is not achievable in the developed nations before the developing countries further expand using fossil fuels then we will never put the lid on climate change if certain feedbacks are triggered. So we have to make it possible.

Sir John Houghton: People say actually that of course technology will do it anyway, industry will do it anyway, so why do we worry? Because it has happened in the past, it will happen in the future. But it is not quite so simply because the reason why it has to be done on the timescale we are talking about is that . . .

Chairman: Well, as you have stopped speaking, I am going to adjourn the Committee for 10 minutes to enable colleagues to go and vote and Mr Simpson will continue our line of questioning. So you can think a little more about the answer. The Committee stands adjourned for 10 minutes.

The Committee suspended from 4.00 pm to 4.20 pm for a division in the House.

Q229 Alan Simpson: If I can pick up from where I think we left off, I think the point I was heading towards is that I do not think the Committee needs to be convinced of the moral, ethical, environmental case for the changes which you are describing. I think what we are looking for is an identification of the mechanisms of getting there and I think those mechanisms really need to be focused for us on what Government has to do. I was just trying to bring us back to the question of how we change the economics of what is viable. I know from my own place that if I wanted to do something cheaply I would not be doing this combination of micro CHP and photovoltaics, but in the long term or in the medium term it makes sense to try and have power systems which generate more energy than they consume. In part of your evidence you gave us an example of the German Ecotax system raising 6 billion a year?

Ms Hutchins: It has raised vast amounts, yes.

Q230 Alan Simpson: It would just be helpful first of all to know what is the rate of tax which applies in Germany because you suggested 10 per cent?

Ms Hutchins: It was incremental. It was a tax on electricity, mineral heating, oil and gas. It started off on electricity at 2 pfennig per kilowatt hour. I think it was 6 pfennig on mineral, 4 pfennig on heating oil and 0.2 pfennig—I can give you the exact figures—as a first round, and then they increased it in 2000 and 2001. The mineral went up to 6 pfennig twice, I think it was.

Q231 Alan Simpson: Just let me cut to the chase here. I think the figure for us that is relevant is what the rate is now because that would be helpful.

Ms Hutchins: I will have to get back to you on that one.

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Q232 Alan Simpson: Sure. If you have not got it, we do not need to go through the history but if you could just let us know at some point. But in a sense that is a very narrow approach to the tax process and I think the cleverness of the German approach is that in some ways they have not related it to climate change at all, they have tied it to pensions, so that it engaged a different sort of coalition. I really would like you just to say would you first of all want this just on energy generation and not on things like the current windfall profits the oil and gas industries are sitting on, something in the region of £5 billion this year for doing nothing really. The second is, is the wider issue that you raise a question of whether we tax not fossil fuel consumption but energy consumption? Is there a need to change the whole nature of the energy market so that energy suppliers can actually sell thermal efficiency rather than energy consumption?

Sir John Houghton: I think the most important tax to have or the most important weighting to provide is on the fossil fuel part of the energy system because that is what you are really trying to cut down, and that in itself of course will help to produce energy efficiency also, particularly for people who are of course having to pay that tax because they get their energy from that means. So that is important to develop it in the first place. It is a question which I think Andrew might like to answer.

Dr Dlugolecki: I think opportunism has its place. So if the opportunity arises to get some more money from an environmentally friendly direction, as you say, where the fossil fuel industry is making a lot of money then I think there is something to be said for that. But I would only see that as something which if the opportunity arises you take advantage of it, but you do not have that in your plan and you do not rely upon that kind of thing happening. You are asking what specifically can we do. There is a number of other things that one can do. You are looking at tax there, but in terms of efficiency one big thing which is coming in quite soon, which is interestingly in the finance industry, is that there is an EU directive on the energy performance of buildings and that is going to really waken up the entire property-owning sector in the UK because to them until recently climate change has not been an issue and there is a big difficulty in running buildings, commercial buildings anyway, in a climate-friendly way because the tenants and the owners have different objectives. The tenants want buildings which are as cheap as possible to run, whereas the owners maybe want buildings which are capitally very efficient and over the long-term will be better to run. So you have a conflict of interest there. So that EU directive is creating a new platform where we can see climate change coming in as a big issue in terms of the running of buildings. Another very specific one is where there was a big fanfare when Tony Blair announced in Johannesburg that the Export Credit Guarantee Department (ECGD) had ringfenced £50 million for the export of renewable energy from the UK, and not a penny of that has been claimed. No one has come forward to use that money to export. That again was one of the

things which were analysed in the Bonn renewables conference. It is not just a British problem, it is a generic problem for the renewables industry. The renewables industry tends to be small companies and they just cannot be bothered. They do not have the resources, let us say, to deal with the problems of exporting. It is enough trouble for them manufacturing in their own country, let alone exporting to a country where there may be corruption and all sorts of other problems, plus the procedures for getting the credits from ECGD or their foreign equivalent are very cumbersome. So one thing Government could do is to look to see how to get small renewable companies to be able to export, and they need a lot of assistance to get started. I am not just saying, "Well, let's just give them money and it's a subsidy." It would be good for Britain ultimately because you are creating new industries and it is very necessary, and we can see it is not just a British problem, it is all over the world and that £50 million is just sitting there unused. In terms of my own industry, the finance industry, there is increasing interest in what we can do about climate change. The big finance industry is not interested in investing directly in renewables. You are talking there about venture capital finance. This is new stuff and it is highly risky. You have got the risk of the entrepreneur, the risk of the technology and the risk of the market. The big investment companies do not have the skills to do that. They invest in big companies. What you have seen recently is the formation of something called the Carbon Disclosure Project, which now has over a hundred backers which collectively control something like \$11 trillion of assets. So it is very, very big. It is partly UK but it is also international and what they are finding is great difficulty as investors in finding out which companies are treating climate change seriously. So one thing that Government could do is to bring more focus in terms of the requirement on companies to report their performance on climate-related activities. For example, just publishing their emissions would be a good start. Similarly, for investors I think it would be very worthwhile to sponsor some research—and I think it would be tiny in terms of the amount of money—so that one could judge which investors are actually paying attention to climate change in the way they invest their money. So you could say, "How many emissions did this £100 million of investment create?" At the moment there is no recognised metric for doing that. It would need very little money to actually sponsor some research and come up with a method that people would accept as being reasonable to do that kind of thing. Another reason why investors do not go into renewables is because there is tremendous pressure on them to invest securely. So they do not tend to look at the long-term, they only look at very short-term returns. The Treasury tried to change that with a Pensions Bill in 2000 and it is looking again at trying to change it, but there seems to be a tremendous need to bring the trustees of pension funds up in terms of their ability to look at these issues. There was a report published on 17 December, the Morris interim report on the

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actuarial profession. The actuaries are extremely influential in the way they influence investors' decisions, the fund managers they appoint, the strategies they adopt, and that report concluded that actuaries are very, very narrow and introverted in their thinking. They tend not to think about the wider world, environmental issues, and so forth. So that again is another opportunity. There are certain key decision-makers that the Government could do things with. You may think this is a litany of criticism, but I can give you a positive example as well.

Chairman: We are up against time restraints for some of our colleagues. I think we have got the message. I am sorry, Ms Hutchins, I know you are bursting to get in but two of my colleagues have short, sharp questions to bring your session to a conclusion.

Q233 Mr Lazarowicz: The point I want to make relates very much to the issue of what Government can be doing as well. In your paper you have made the point about if we are going to get the kind of change in renewable policy that is required in the renewables market we actually need to make sure the public are brought on board in a much bigger way and are actually aware of the issues and some of the solutions. You have been doing some work in relation to how the view of the UK climate change programme should include a strategy communications plan. Can you tell us a little bit about what you have in mind there, what is the extent of the programme that you have in mind, what it will consist of, and also give the timescale? Can you also in that answer roll up also the issue of what response you have had so far in your discussions with Government as to the likelihood of that type of communications programme coming forward.

Sir John Houghton: Well, just very quickly to say I chaired a meeting last May which was hosted by BP. The object of the exercise was to say how can we get together with Government or Government, industry and NGOs together to have a concerted, cooperative public awareness programme on climate change with a wide range of stakeholders. We had a lot of good people at that meeting, a lot of senior people from right across the board, including Government, and as a result of that I wrote a letter to the Prime Minister and he supported that sort of approach on the basis that—

Q234 Mr Lazarowicz: What kind of scale are we talking about, can you give us some idea? Everyone has communication programmes. What is going to be special about this one given the challenge that we are facing?

Sir John Houghton: Well, what it has to present is to give people information about climate change in a way that they can be informed about it. Government needs an informed public if they are going to have the confidence to move ahead with the sort of programme we have been talking about earlier on and put the sort of money in that we were talking about earlier on. So it has to be a large scale

programme. It also has to try and not only change people's attitudes but also give them information about what they need to do, why the renewable energy business is important so that it is coupled in with renewable energy information and all that sort of thing too. I think Christina could actually say a little more about that.

Ms Hutchins: We are talking about a major programme and one which is sustained for many years of the scale of the kind of HIV, the drink driving campaigns, that kind of impact. We also feel that it should have the same kind of tone as the famine appeals. I think the tsunami disaster has shown you how people are willing to help given the right buttons to push, and therefore the tone is very important. Where we have got with it so far is basically, as Sir John was saying, we have been having meetings with Defra, who are keen to implement a communications campaign, and we are proposing that that be implemented in coalition with Government, the private sector and the NGO community. At the moment it seems that there is some uncertainty as to whether the Defra campaign may move forward as a less than high profile campaign or not, certainly in the first year. They are talking about local and regional awareness-raising and, as Sir John said, they are talking perhaps only in the first year about changing attitudes, whereas we think we should be getting people to take action.

Mr Lazarowicz: Perhaps in view of the time I could just simply ask you, if possible, to give a note of a bit more detail about what you actually have in mind in practical terms in that kind of programme.

Q235 Joan Ruddock: Well, I agreed with the Chairman that I might ask you about global dimming and I do so because I watched the amazing Horizon programme last week. Before that I was totally ignorant on this subject. I imagine most people still are. As I understand it, what we have is essentially a global cooling because of air pollution and as we begin to reduce air pollution that effect goes away so that actually global warming, which we have all been so obsessed about, might be on an even faster track than we had envisaged to date. I just ask you what you think the implications of that are and how much more seriously, perhaps, this Committee, the Government and everyone else has got to address global warming because it is possibly a greater order of magnitude. I think Miss Hutchins referred to the Hadley Centre, which of course is onto this already.

Sir John Houghton: Yes. I was responsible for the scientific part of the 2001 IPCC report. We did know about the particles situation then. We took the sulphate particles into account in so far as our projections for 2100 were concerned, expecting of course that sulphates were dropping in all countries of the world because of the problems of acid rain, and that of course is occurring and that is what part of what the programme was about. Just a general point about the science. There were various scientific points made on that programme, one about aircraft and about cloudiness, and so on. Having been involved in this process for the last fifteen years or

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so, the science has become stronger. Our projections in 1990 have become tougher because positive feedbacks tend to be stronger than we believe they might be. We have always tried to be very conservative in our projections and not put forward things which were too uncertain, but those uncertainties tend to be moving in the direction of making things harder and making global warming greater than we expect it might be otherwise, and that is a very serious matter actually. It demonstrates, and that programme demonstrated very well that almost all the evidence we have is pointing in the direction that it will be substantially worse than we expect. Of course, at the moment a lot of the global warming we have actually committed to to date has not occurred because the oceans are preventing us from warming up. They take time, twenty or thirty years, to warm up. So we are committed already. Even if we stop burning all our fossil fuels tomorrow we are already committed to a substantial degree of climate change and climate change by 2050 will become larger than we expected whatever we do, in a way, and then it becomes worse still. We have got to mitigate so that the damage will not become absolutely impossible by the middle of the century, and that is what we are talking about today. Having realised that, we are in an urgent situation to do something about it and Government really needs to say, "This is very high priority." We have got to get all parts of government together, the DTI, Defra, the Treasury, and so on. We have got to get together with the major players in industry, the BPs and Shells, and so on, of this world and for the Government to approach them and say, "Look here,

we really do want to move along in the mitigation programme of renewable energy and renewables in particular. Please, how do we do that in a joint partnership with you?" We can then help other countries in the world also because we could become big in the business of renewable energy. We are not big at the moment, we are small compared with many other European countries. So why do we not just pick up this particular subject?

Ms Hutchins: My response very quickly is, yes, the implications are that we are talking about global catastrophe and in twenty-five years from now there will be irreversible melting of the ice cap. Basically, Kyoto cannot deliver what is needed at the moment because governments will not commit to sizeable emissions reductions until alternative energy sources are on board because it will undermine their economic development. Therefore, that is why it is critical that we implement a global climate change renewable energy plan to rapidly expand renewables. We would suggest, because you were talking about a mechanism to do that, that we would much like to bring together with Government a small steering group comprising government parties, no more than 12, environmentalists and the private sector to take this plan forward. There are some excellent minds including parties involved in the international task force and other parties contributing who could help to expand and develop this.

Chairman: Thank you very much indeed for your stimulating contribution and for your paper. I am sorry it has been a little bit disjointed because of the voting, but nonetheless thank you for coming.

Further supplementary memorandum submitted by Our World Foundation (U20b)

1. The Chairman: *Re the achievement of the government's 2010 10.4% renewables target; additional actions to assist the achievement of the Government's 2010 10.4% renewables target* [Q208]

1.1 The Mechanism

The key requirement is to establish a Small group of visionary parties, ideally including Hermann Scheer who led Germany's renewable expansion since the German Federal Environment Ministry has presented a long term sustainability model, which shows that renewable energy could contribute up to 58% of national primary energy by 2050, supported by significantly improved energy productivity (3–5% pa). Additionally the European Renewable Energy Council (EREC) recently broke down the growth rates of renewable energy sources up to 2040, by decade, to show a possible 47% penetration of renewables into global energy supply by 2040 under an "Advanced International Policies" (AIP) scenario.

These are models and policies which should be examined by the group, who would access best practise and policies internationally and determine a "blue print" for the rapid UK and international deployment of renewables. Germany's and EREC's policies and measures may be key to this. Once the best international "blue print" is determined, this can then be invoked not only within the UK to set the example but also internationally as the Global Climate Change/Renewable Energy Plan through the UK's leadership of the EU and G8 and with the UNFCCC/Kyoto process. The summary target would be the transfer from fossil fuels to renewable energy sources, so that 60–80% of a country's energy were procured from renewable energy sources by 2050–60. The group would work under the auspice of the PM, Climate Minister and Climate Change Department.

Further UK considerations additional to those given in the evidence session are :

1.2 NETA/BETTA is the main problem—we need to modify the regulatory regime and adopt the German REFIT model. Also embrace REFIT for community projects and allow REFIT type schemes to run in parallel with the EU-ETS (the EU and UK want the ETS to become the only scheme- but one size will not fit all, we need a diversity of funding styles).

1.3 Push business consumers (especially outside the EU ETS like the retail sector) to buy green energy, as advocated by the Carbon Disclosure Project as well as getting domestic consumers to sign up to green tariffs and support planning applications.

1.4 Enlist consumer power: The RO rules make it hard for electricity supply companies to offer meaningful green power tariff schemes to consumers—they have to use sources that are additional to (or retired from) the RO system. Given the scarcity of green power in the UK, this means slow growth. (only about 60,000 subscribers so far—and most of those are for fund schemes, not supply schemes). By contrast, in the rest of the EU (Denmark, Germany and the Netherlands in particular) supply schemes are very popular- over 2m subscribers. So ring fence some capacity for the consumer market—maybe support it with a REFIT scheme.

1.5 Accept mine methane into the RO.

1.6 Create a serious government industry partnership to do what is needed to solve the problems.

1.7 Introduce an Incremental Climate tax on all fossil fuel sourced energy supplies to make them more expensive than renewables. The tax should be applied to the climate change/renewable energy budget to provide funding for the significant deployment of renewables. While the tax is rising, consumers must be educated on the issue, and provided with the opportunity to switch to renewables and more efficient products.

1.8 Have a Climate Change Minister and lead department responsible for co-ordinating all climate change related activities—if this could be progressed internationally it would also mean that in each country there would be one key port of call regarding climate change related matters. A Minister should also have final say on all his departments activities which would ensure all areas were progressed with climate change at the heart of all initiatives rather than any other agenda. This department could also borrow from the business world in terms of creating a Change Programme, that will transform other departments into recognising that climate change is a fundamental, permanent part of their brief. The Prime Minister should oversee it and the project could be chaired by a Cabinet Minister tasked with ensuring that all policies in every department are reviewed in light of climate change, that all MPs and civil servants are properly briefed and accept it is a critical issue and become involved in the process of tackling it. It would enforce departments to produce a plan that collectively will deliver the UK's 2050 target. It will ensure the electorate understands and actively supports the climate change programme and will produce proposals that will bring other countries on board. It should be staffed by a mix of civil servants and non governmental high fliers to ensure cohesion.

1.9 Aim for higher efficiency standards which will suppress energy growth and increase energy productivity (the amount of energy required per unit of GDP). Energy intensity is key to the German model to procure approx 60% of its energy from renewables by 2050. One should ensure energy efficiency in the power generation sector and encourage innovation in the manufacturing sector: by providing capital grants etc (see package of measures that was announced for wave power and was in line with what industry asked for?), by providing tax advantages on energy efficient goods, by progressively taxing non energy efficient goods and long term phasing them out—using the climate tax to support energy efficient innovation and by announcing future efficiency standards (may need to be EU-wide). One also needs a long term (3–5 years plus) high profile climate change communications programme so that the energy consumer understands the critical need for them to save energy and utilise energy efficient technologies. The climate tax would also encourage people to use less energy.

1.10 Introduce rebate schemes—which link the buying of energy efficient goods to the purchase of green power to run them.

2. Paddy Tipping MP: *What political policy priority has global warming got, let us say, in China? That is where some real growth is taking place.* [Q210]

China has actually reduced its energy intensity (energy/GDP) quite well in recent decades—in fact faster than has the USA. Their reducing energy intensity curve crossed over and went below the USA's reducing curve around about 1998 (see “Reading the Weathervane” Worldwatch report 160, Worldsworth Institute Washington DC 2002.).

This was mainly due to the fact that it was expanding rapidly and installing new more efficient power plants and manufacturing processes, whereas the US was saddled with older systems. Of course total energy use is still growing. But China has a very large renewable energy potential—the current plan is to get 12% of its electricity from renewables by 2020 but in theory they could have much more eg up to 170GW of wind generating capacity by 2020 (See the EWEA's WindForce12 on China). A recent study by WADE, the World Alliance for Decentralised Energy (WADE China Model Dec 2004), has suggested that small/medium scales decentralised power generation using local sources is much more relevant for China than conventional large centralised fossil or nuclear plants since it avoids having to build very expensive grid links

across this vast country, and avoids the energy losses that would be incurred by long distance energy transmission. That is also true of many other developing countries eg Africa. Overall there are around 2 billion people who are unlikely ever to be served by grids.

3. Patrick Hall MP: *How is one to rank all the extra things countries should do before they are relieved of debt/ How would these Debt-for-Climate Change/Renewable Energy Plan swaps work?* [Q213]

One would not seek to rank health, education, welfare and climate change/renewable energy—it is however critical climate change and renewable energy be the fourth consideration if former debt funds are to be reapplied. This is because—climate change is already affecting the world’s climate—there have been increased floods, droughts and windstorms part of which may be attributable to climate change. With such natural disasters the number of people affected has significantly increased since the 1960s, the majority of whom are in developing countries—see www.ourworldfoundation.org.uk/dis-nof.htm. Such changes in the world’s climate cause other impacts which again particularly affect those in developing regions—see www.ourworldfoundation.org.uk/effects-nof.htm. Additionally such climatic changes are influencing both insured and economic losses, and are causing the greatest impacts in developing countries and to its people—see www.ourworldfoundation.org.uk/plight-nof.htm under Insured and Economic Losses. It must be noted few people in developing countries are insured and hence they have no recourse when their homes are washed or swept away. Hence if climate change can not be mitigated through the deployment of renewables, peoples in developing countries’ health and welfare will become increasingly affected—as temperatures rise there may be no place for education if the purpose of life becomes merely seeking to survive. By embracing renewable energy developing countries are doing the most critical thing they can to help their health and welfare as well as their economic prosperity.

Mechanism to deliver this: a small steering group of no more than 12 parties from government, the private sector, aid organisations and environmentalists to take this forward including ideally Gordon Brown. This group would be different to the one mentioned in 1 above. It would work with debt relief parties to assimilate the Debt-for-Climate Change/Renewable Energy Plan swaps into current debt relief plans. It would also need to work with the proposed finance and technology groups once they are set up as well as with the GEF and Kyoto/UNFCCC parties. It would be responsible for working with a country or countries it is in partnership with to determine with debt relief parties and the developing country involved on a country specific basis.

1. What portion of former debt should be applied to the deployment of renewables?
2. What renewable sources the developing country has which could be developed with assistance?
3. What would be a conservative and realistic schedule of deployment of such renewables given additional financial assistance?
4. How much leverage should be procured ie will this former debt funding applied to renewables be matched 1:1, 1:5 etc?
5. How this will help the country economically?
6. How can awareness be raised in the developing country of the need for the expansion of renewables? Perhaps the partnered nation would also commit to apply some monies towards this which monies would go a long distance in a developing region. It would be necessary to make the government, business and peoples aware of how their country will be affected under increased global warming. The group would work under the auspice of the Climate Minister and department.

4. Patrick Hall MP: *What can Britain do, not only when it has got the presidency of the G8 but in the long-term, perhaps taking up the partnership scheme suggestion?* [Q215]

Britain can include the partnership scheme in the Global Climate Change/Renewable Energy Plan and promote this plan and concept this year through its leadership of the EU and G8. Britain should endeavour to get at least initially a few countries to agree to adopt a Global Climate Change/Renewable Energy Plan and these countries should firstly determine best practise to be included in the plan (taking a close look at Germany’s measures) to rapidly accelerate the deployment of renewables. The partnership scheme should be set up and include at early instance partnerships with Africa, India, Brazil and China. Britain needs to promote the recognition that it is imperative developed countries rapidly and imminently transfer significantly to renewable energy sources to set the lead before developing countries develop further through the use of fossil fuels. As well as the provision of financial and technological assistance through the finance and technological groups referred to below and the linking of debt-for-climate change/Renewable Energy Plan swaps delineated in 2 above and the need for communication programmes to increase awareness of the issue to stimulate support for the solutions, Britain could also encourage developing countries to accept emissions quotas so that they can trade the surplus (as Russia will do). This will give them a financial incentive to preserve the surplus by developing renewable energy, not expanding their economies with fossil fuels. Britain also needs to get the USA to be part of the action—the USA has not committed to Kyoto as

they do not wish to compromise their economic growth—they may be convinced long term of the economic advantage of expanding renewables once other nations begin to take a significant lead on this, particularly as oil prices rise.

Mechanism to deliver this: a finance group, a technology group and a communications group in both the developed and developing country. The finance group of no more than 12 parties should include best people from the investment sector, city/investment groups/venture capital funds/banks and best people from domestic energy companies, which companies would be bodies interested in investing in such regions. ie BP/Shell. The group would also have government representation including an Export Credit Guarantee party. Long term developed nations' governments should consider creating a fund to invest monies into the deployment of renewables in developing countries, which investment may/may not be short term contingent upon repayment after X years or may be tied into deals whereby the developing country agrees to export Y% of the energy from this renewable source to the developed nation if this is feasible ie Saharan regions could export wind/solar thermal resources to parties in Europe. The technology group would comprise leaders in the renewable energy industry who would be able to provide the developing region with technological advice and assistance. It would also include parties from industry organisations eg the BWEA who could put developing countries in contact with renewable energy technology manufacturers ie turbine manufacturers for export of such technologies. It would also look to second professionals from such companies to the developing region to help them develop renewable energy industries themselves. The communications groups in both the developed and developing region would consider joint ventures in the raising of awareness about climate change—corporate sponsorship of such communications activities particularly in the developing region could be considered—the aim would be to ensure all sectors of society were aware of the climate change imperative and the critical need for countries to change to renewable energy sources and embrace energy conservation and energy efficiency technologies. The three groups would work under the auspice of the Climate Minister and department.

5. Chairman: *If we look specifically at the UK, what is the route towards a target of 80% of the UK's energy to be derived from renewable energy sources by 2050–60 [Q220]*

5.1 Germany has a long term sustainability model and policy projecting almost 60% of its energy can be derived from renewable energy sources by 2050—EREC projects 47.7% of global energy supply could be procured from renewables by 2040. We should look at the policies Germany has adopted including the German Ecotax as well as best practise from other countries including the EREC breakdown and proposed international policies. Utilising visionary best minds including Hermann Scheer from Germany and other key parties a blue print should be determined for the best way to rapidly expand renewables which may involve measures delineated in the Global Climate Change/Renewable Energy Plan with further measures being added to this.

This will likely involve in the UK the replacement of the RO with the German REFIT scheme which has significantly assisted Germany's renewables expansion. It is the hope that given the increased severity of the problem national practises that are not as effective as others may be overridden and replaced with more effective measures—the crisis of climate change taking priority over the continued use of ineffective or slow mechanisms. With the RO, as a phase, in one could adopt REFT for community projects before moving towards the full embrace of REFIT. Once one has such a definitive blue print one should then move forward quickly and assertively to implement it in the UK as a Climate Change/Renewable Energy Plan and then globally.

5.2 Additionally one should create a Climate Change/Renewable Energy Budget of approx £5 billion pa to provide capital funding for renewable energy plant—this should be a rolling fund with the government entering joint ventures with energy companies which ventures may be contingent upon the energy company acquiring the government's share after X years. At this point the energy company would pay back the government's original investment in order to procure the government's share. The monies would be reapplied to the Climate Change/Renewable Energy Budget. The budget could be funded by a climate tax similar to the German Ecotax. For example in 2003 the Ecotax was expected to generate €19 billion.

5.3 We need to significantly increase our energy productivity (the amount of energy that is used per unit of GDP)—this requires significant improvements in energy efficiency—Germany's 2050 model of 58% of energy from renewables is inextricably tied in with much improved energy productivity. Again we need to study Germany's approach to increasing energy efficiency. A sizeable contribution in the UK would be the efficient use of gas.

5.4 Efficient Use of Gas—the UK is currently on course to become a major importer of gas (from Norway, the Middle East, north Africa, Malaysia and Russia) yet despite new high efficiency domestic to industrial scale Combined Heat and Power (CHP) technologies (80 to 90 plus % efficient) UK policy is still encouraging huge medium efficiency (60% at best) CCGT power stations. Furthermore with the rising gas imports (LNG and piped gas from Russia) there is an energy loss of 20–30% in liquefaction/re-vapourisation of LNG or pumping gas over long distances from Russia. Hence there is a need more than ever to use gas in high efficiency CHP technologies not CCGT—for both emissions and balance of payments reasons.

We also need to implement a long term and sustained high profile Climate Change Communications Programme to ensure the energy consumer in all sectors understands the need for energy conservation and efficiency as well as the need for their support for renewables.

5.5 The UK should also consider importing renewable energy from the Sahara if it can give initial support to countries in the region to build sizeable wind and solar thermal plants:

The UK currently imports oil, and the Energy White paper has set a course to import gas to supply over 50% of our energy needs.

Solar Thermal and Wind in the Sahara

The most obvious very large-scale, cost-effective, renewable energy resource which could be supplied to the UK and to the rest of Europe is electricity transmitted by low-loss (high-voltage direct-current) cables from solar thermal schemes and wind farms in Saharan Africa. The cables would run under the Med Sea and across the European mainland. Hydrogen from electrolysis could also be added to natural gas pipelines. The cost-effective solar thermal resource of the Saharan countries is many times global energy demand. Unused land in Morocco alone could generate all global electricity. To generate the equivalent of all UK electricity (400 TWhrs/year) which is 36% of the UK's primary energy consumption would require solar mirror arrays covering an area of 26 miles by 26 miles. A mirror array 5 miles by 5 miles would generate the same annual output as a 2GW CCGT power station—which could easily be using LNG imported from the same country. Detailed plans for the schemes and transmission routes have already been drawn up and presented at the Bonn renewables conference by TREC (Trans-Mediterranean Renewable Energy Cooperation). With endorsement of UNEP/UNDP, the TREC plan should receive political and financial support from the EU and NEPAD to become a major factor in tackling global warming while fostering European and African development.

5.6 Biomass emissions sequestration—The UK should significantly increase biomass production and lead in the rapid sequestration of biomass emissions (as well as coal). By increasing the biomass content as the fuel becomes available in the UK the output of such schemes could become carbon-negative, not just carbon-neutral. The electricity produced may be marginally more expensive than other generation methods but reducing atmospheric carbon dioxide by the large-scale sequestration of biomass emissions could be a significant and unique tool to combat catastrophic global warming. The UK could also lead as a model for other nations with this practise.

6. Alan Simpson MP: *What is the current rate of the German Ecotax (and further information) [Q231]*

670 € for 1.000 L of regular leadfree petrol

485 € for 1.000 L of Diesel

20.5 € for 1 MegaWatt per Hour Electricity

(Source : German Embassy 2005)

Germany's red-green coalition government introduced a set of ecotaxes on 1 April 1999 designed to make energy and resource consumption more expensive while lowering the cost of labour. The Ecotax was a tax on petrol, diesel, electricity, heating oil and natural gas and was introduced in five steps. Labour costs were cut by reducing pension contributions. By the end of 2002, the new taxes had brought in an extra €39.3 billion, most of which was used to lower the pension contributions from their level of 20.3% of gross wages in March 1999 to 19.1% in January 2002. Employers and employees have shared the 1.2% saving equally. In 2003 alone it raised €18.6 billion over and above other energy taxes. During its first five years in force it produced the following results:

- For the first time since the establishment of the Federal Republic of Germany fuel consumption and CO₂ emissions in the transport sector fell for four years in a row (2000–03) whereas previously they had increased. CO₂ emissions were cut by 6–7%.
- Since 1999 the number of passengers on public transport increased year by year—Up to 1999 they fell continuously.
- Fuel consumption became a key factor when buying cars.
- There was an increase in rail freight.
- Car sharing organisations increased their membership—26% in 2000, 22% in 2001, 8% in 2002, 15% in 2003 in relation to the previous year.
- Solar thermal installations for hot water showed double growth rates with renewable energy booming thanks to the ecotax and the market incentive programme for renewable energy funded from the ecotax.
- The German Institute for Economic Research stated the effect of the ecotax on employment was the creation of 250,000 new jobs by 2003 whereas macro-economic development was scarcely affected. (Others have stated only 60,000 jobs created.)

Apart from increasing the use of renewable energy (particularly as a result of the Renewable Energies Act EEG) the Ecotax reform has been the Federal Government's most successful climate policy instrument to date. Furthermore escalating damage caused by climate related natural disasters is increasing. Munich re affirmed flooding on the Rivers Elbe, Danube and Rhine in 2002 caused financial damage of €9.2 billion in Germany, which shows greenhouse gas reduction and climate protection is financially worthwhile. (Source: Green Budget Germany)

7. Mr Lazarowicz MP: *Please provide more information on the work Our World Foundation has been doing towards how the UK climate change programme should include a strategy communications plan. The extent of the programme Our World Foundation in coalition with others is proposing, what it will consist of, and the timescale? What response there has so far been in discussions with Government as to the likelihood of that type of communications programme coming forward. [Q233]*

Our World Foundation has been proposing the need for a UK Article 6 Climate Change Communications Programme and European Pilot Programme Towards a Long Term Full European and Global Programme. The objective is to utilise key media to raise awareness amongst the general public, as well as the private and public sectors, about the cause, impacts and solutions to climate change. The role of such a programme is to stimulate support for renewable energy and its more rapid expansion as well as encouraging energy efficiency measures and life style changes to mitigate global warming. Stimulus of the consumer market place may also influence financial investments in renewable and energy efficient technologies as well as prompting existing energy companies to further develop this energy source. It is proposed that the UK Programme could also form part of a pilot model involving four European countries as a precursor to a European Climate Change Communications Programme and long term global programme. It is proposed that the programme be instigated under Article (Art) 6 of the United Nations Framework Convention on Climate Change (UNFCCC) and be run by an Art 6 Climate Change Steering Group in the UK, comprising parties drawn from government, the private sector and NGO's, such coalitions being recommended under COP 8's Art 6 work programme. A working structure of how such a coalition could physically operate has been proposed and can be obtained on request. (NB A NOP poll recently found only 3% of the working population identified domestic energy use as a cause of climate change.)

The Extent of the Programme:

We are proposing a major high profile climate change communications programme—The programme should be sustained for 3–5 years plus (the Art 6 UNFCCC recommend five year programmes) and should 'harness the network' of business, government and NGO community. For example BP who is leading from the private sector wants to utilise its networks of petrol stations to access the energy consumer. Similarly other networks including banks, supermarkets, travel networks, major companies—Virgin, the Body Shop (who have run climate change initiatives), utility companies and such environmental groups such as Friends of the Earth, RSPB, Greenpeace and WWF could be utilised to maximise the impact and outreach of the campaign. Furthermore such bodies could also contribute financial and human resources to maximise the campaign. As delineated above the UK programme should form part of a European pilot programme with two/three other European states towards a long term full European/Global programme. It is recommended the programme be commenced in 2005 as time is of the essence. Most importantly we are proposing the need for an action based campaign—one that prompts people to take action based on an understanding of the issues at hand and of what they can do to help. The Communications Programme should have the impact of the drink/driving or HIV campaigns, with the same tone as the famine or disaster appeals. ie we need to ask people to help and take action. The recent Tsunami appeal shows the response of the global public given a humanitarian crisis. We need to appeal to the energy consumer on this level. We could focus on a region such as southern Africa (through SADC) which is projected to become increasingly drought stricken in the decades to come due to climate change as well as Bangladesh which is projected to have significant regions inundated due to sea level rise. Nationals from such countries could be involved in the UK Climate Change Communications campaign to bring home to the UK consumer how their actions and emissions will radically affect these peoples.

The mass public should be asked to:

Sign up to green energy tariffs to stimulate a market led expansion of renewables, support renewable energy projects, save energy both at business and in the home, utilize energy efficient technologies at work and at home including lighting (LED's), micro-CHP boilers and fuel efficient vehicles, consider life style changes where necessary, support positive governmental policies that aim to reduce ghg, including taxes on aviation and investments in public transport rather than roadbuilding, consider micro generation supported by tax relief and grants under Clear Skies, commit to engaging in energy audits and other tools as provided. Perhaps they could be given incentives to do so or some form of tax relief, adopt the habit of energy budgeting/recording (possibly supplanted eventually by a DTQ scheme). Again incentives would be beneficial. Perhaps some incentive if they reduce their energy usage by 10%, 20% etc. Try to become carbon-neutral and be given an incentive to do so.

What response has there been to date from the UK government?

Sir John Houghton and Christina Hutchins met with Elliot Morley in January 2004 who stated he wished to implement the proposed programme. He was also interested in the idea of a coalition between government, the private sector and non governmental organisations. We were told to further liaise with DEFRA who were assessing internally their climate change communications, its effectivity to date and the barriers to more effective delivery. Thereafter DEFRA commissioned an independent communications agency—Futerra—whose brief was to assess the information DEFRA had gleaned and to give an evidence based proposal as to an “attitude change” campaign on climate change. Futerra undertook this work and made presentations to the Climate Change Communications Working Group and to Lord Whitty and The Rt Hon Elliot Morley.

The Coalition:

At the same time Sir John Houghton wrote to Lord Browne Chairman of BP with regard to the proposed UK Climate Change Communications Programme to be implemented as a coalition between government, the private sector and NGO's. Lord Browne was supportive of it and his “Distinguished Advisor” Chris Mottershead has worked closely with us since. We organised a meeting of key UK climate change concerned parties which included: BP, Tom Delay/the Carbon Trust, Steve Howard and Alison Lucas/The Climate Group, Mike Porter/Head of Communications/DEFRA, Bryony Worthington (and Tony Juniper at a later meeting)/Friends of the Earth, Nicky Gavron/Deputy Mayor/Greater London Authority, Sir John Houghton (Chairman), Stephen Tindale/Greenpeace, Francis Sullivan/HSBC, Dr Andrew Dlugolecki, Nick Grout/Office of Science and Technology, Fred Dinning/Scottish Power, David Hone and Richard Sykes/Shell, Sir Crispin Tickell, Mike Hulme/Tyndall Centre, Chris West/UK Climate Impact Programme, David Russell/Universities Superannuation Scheme, Andrew Lee/WFF and Christina Hutchins/Our World Foundation with Janet Morris/Director of Marketing/EST attending a later meeting. The meeting discussed parties' views with regard to such a climate change communications programme and also their views as to it being implemented as a coalition. The meeting was hosted by BP. Parties were in agreement of the need for such awareness raising on climate change and agreed that a parties should come together to implement such a programme. Sir Crispin Tickell suggested a Taskforce take this forward with the approval of the Prime Minister—which Taskforce could report directly to the Prime Minister, given his commitment and concern about this issue particularly for 2005. Sir John Houghton wrote to the Prime Minister following this meeting informing him of the meeting's occurrence and of the suggestion that a Taskforce be formed to take it forward. The Prime Minister responded in support of the initiative in a letter to Sir John Houghton and it was recommended a workshop be held over one or two days to assess the various issues. This Workshop will report directly to the Prime Minister.

The likelihood of such a programme proceeding

DEFRA are currently considering whether to proceed with the Futerra recommendations for an “attitude change” campaign—Futerra are recommending regional and local action supported by a national roadshow. It is not anticipated as a high profile “above the line” campaign at this point nor is it intended in year 1 to tell people what they can do to help. It is the great hope that with the new scientific findings as revealed by the International Climate Change Taskforce and the Hadley Centre projecting 10C/11.9C global average temperature increases this century and the former highlighting that unless change can be brought about in the next 10 years we will reach a point of no return, that as a consequence of these critical new findings, a major campaign can be implemented in the UK calling people to take action. Time is of the essence. Also as suggested we hope such a programme may be implemented as a European pilot programme perhaps with such partners as Belgium, Germany and an accession state. Margot Wallstrom when Environment Commissioner affirmed in writing that she agreed with the need for such a high profile Climate Change Communications campaign, that she was sending the details of the proposal to the European Climate Change Programme and the Johannesburg Renewable Energy Programme for them to consider implementing. She also invited us to “come forward” with concrete proposals for co-funding to her funding departments. She has now moved to communications which may assist our case.

Hence we hope that the Prime Minister/UK Government may consider implementing such a high profile action based campaign in coalition with the private sector and NGO community—to harness the network in a national/international movement driven towards change. The potential of such a programme to be a European pilot programme would also complement the UK agenda. It is the hope the Workshop can be imminently arranged and report directly to the Prime Minister for him to determine forward action.

8. Joan Ruddock: *What are the implications of the recent findings regarding global dimming and how much more seriously, perhaps, this Committee, the Government and everyone else has got to address global warming because it is possibly a greater order of magnitude. [Q235]*

It is imperative we start acting now much more seriously and urgently than we have so far. It means that potentially the rate of warming could almost double to as much as 10C by 2100, because up till now other pollutants have been concealing the real size of the problem. This is underlined by a recent exercise to estimate the sensitivity of the climate system (www.climateprediction.net), which reported that the upper limit of change could be as high as 11.9C, rather than the 5.8C projected by the IPCC in 2001. It may be that we have only Ten Years before a point of no return. At present however CO₂ emissions and energy growth are continuing to rise internationally.

We need to take significant action for otherwise we may undermine our planet Earth for many thousands of years. Many regions may become completely uninhabitable, perhaps if certain feedbacks are triggered as the Hadley Centre projects many species may perish. This is no longer something that is projected to significantly affect remote future generations—it is to affect the existing population. Our own children and grandchildren may grow up in a rapidly warming world, with insufficient food and water for perhaps billions of people, with increased and dramatic floods, droughts and windstorms, with international conflict as people flee countries and global economic disarray. We ask that each person, who is in a position to help effect change—please does so—we ask that the UK bring together best international minds in the determination of the most effective way to rapidly expand renewable energy and then leads internationally with this Global Climate Change/Renewable Energy Plan so that we may begin to bring about change—To know that when we look our children in the eye we know we have done all we can.

Contributors: Sir John Houghton, Dr Andrew Dlugolecki, Christina Hutchins, Sustainable Energy Consultant: Professor David Elliot—Director Open University Energy & Environment Research Unit, Additional Material: Neil Crumpton/ Chairman CHEC Campaign for a Hydrogen Economy.

Please see Global Climate Change/Renewable Energy Plan document hereafter¹.

7 February 2005

Memorandum submitted by Friends of the Earth (U39)

EXECUTIVE SUMMARY

1. 2005 offers a historic alignment of opportunities for the UK to lead the world in efforts to tackle climate change. However, in order to convince the world that we are deserving of the leadership role that the Prime Minister has indicated he wishes to take, we must first demonstrate a commitment to meeting our national climate targets and to assisting Europe in meeting its Kyoto target.

2. The Government's review of its Climate Change Programme offers the potential to get the UK back on track to meeting its 20% carbon dioxide reduction target by 2010.

3. To do this the new programme must be designed using fundamentally different principles. A "top down" rather a "bottom up" assessment must be undertaken to identify those sectors where emissions are currently rising and policies targeted and designed accordingly.

4. Targets, and policies designed to meet them, must be adaptable and expressed in relation to net reductions achieved relative to a fixed baseline, and not in set amounts of carbon subtracted from a projected, and therefore uncertain, future baseline, as was the case in the previous programme.

5. The UK should commit to introducing a package of measures that give sufficient control over emissions to guarantee the delivery of sustained year on year reductions as soon as possible.

6. The programme review also provides the opportunity to increase the effectiveness of existing policies—the EU Emissions Trading Scheme, the Climate Change Levy and the Energy Efficiency Commitment—and to introduce new policies to plug the gaps in the existing framework. By, for example, introducing new measures to ensure renewable transport fuels and efficient vehicles penetrate the transport market and rising demand for energy in the commercial and domestic sectors is reversed.

7. Internationally, the UK should use its Presidency of the EU and Chairmanship of the G8 to move towards a renewed international consensus around the need to take urgent action to tackle climate change under a legally binding international framework. It should also be accepted that developed countries need

¹ Not printed. See www.ourworldfoundation.org.uk/globalplan.doc

to deliver immediate and sustained emissions reductions, and that to avoid technological lock-in to high emission pathways, public funding through international financing institutions should be available for only sustainable energy developments such as renewable energy.

INTRODUCTION

1. Latest scientific findings indicate that global sensitivities to increasing concentrations of greenhouse gases could be far greater than first thought, and that warming could be occurring far faster than anticipated. The need for a truly global, legally binding framework to bring down emissions rapidly is more pressing than ever.

2. The UK and Europe have been leading the world in the political battle to secure a legally binding international framework to tackle climate change. With Russia's decision to ratify it looks very likely that the Kyoto Protocol will come in to force early in 2005. This protocol seeks to reduce emissions from developed countries by 5% relative to 1990 levels. It is the first step towards much deeper cuts that will be necessary if we are to avoid temperature increases in excess of two degrees. To achieve this, the IPCC's Third Assessment Report indicated that global emissions, which have been rising by about 1.5% per annum, would need to peak and decline within the next 10–15 years.

3. In order to maintain credibility internationally, it is imperative that as well as continuing to demonstrate political leadership, the EU and the UK must meet their reduction targets and show that they can successfully decouple economic growth from rising emissions.

4. Under Kyoto the EU has a target to reduce greenhouse gas emissions by 8% (relative to 1990) by 2012. The EU is not currently on track to meet its target—in 2002 a reduction of 2.9% had been achieved meaning that we some distance from the linear path to meeting the target where we should have achieved a 4.8% reduction.

5. In 2001 the European Environment Agency predicted that a 7.2% reduction was possible with additional policies and measures and if several Member States, including the UK, over achieved their target. If no overachievement was taken into account, the reduction fell to just 5.1%.

6. The UK's contribution to the EU Kyoto target is to reduce by 12.5% but it is clear that in order for the EU as a whole to comply the UK will need to go further. This is entirely possible as the UK met its Kyoto target in shortly after agreeing to it in 1997 largely due to the dash for gas that occurred during the 1990's when a switch from coal to gas and the building of more efficient power stations lead to reductions of about 1% per annum for most of that decade.

7. In 1999 the UK set a more ambitious national target of a 20% cut in carbon dioxide emissions by 2010, and in 2003 in the Energy White Paper it set a long term target of a 60% cut in CO₂ by 2050.

8. Current trends show that the UK's Climate Change Programme is failing to deliver sufficient reductions to meet our 20% target by 2010. The last published version of the DTI's Energy Paper outlining projected energy trends and resulting emissions indicated that with existing policies and measures we were on course to meet only a 15.2% reduction. Even this is optimistic given that in 2003 we were only 7.5% below 1990 levels and that the power sector has recently highlighted flaws in the projection methodology that may lead to even higher projected emissions.

9. The review of the Climate Change Programme will need to introduce new policies and measures and to toughen up its use of existing measures if it is to succeed in making up the projected shortfall. The most important challenge for the programme is to deliver a package of measures that provide control over all sources of greenhouse gas emissions that we can then apply with increasing pressure to meet whatever cuts the latest scientific results indicate are necessary. At present, in developed countries, annual reductions of approximately 1–3% are required.

10. The two ways of delivering emissions reductions are to decrease the carbon intensity of our energy system by for example switching from coal to gas and increasing our use of renewable energy, and increasing our resource productivity ie improving energy efficiency. The existing CCP contains a mixture of measures which seek to achieve these aims in various ways in various sectors—however, there appears to be no consistency of approach to emissions in different sectors and little sign of any top-down assessment of whether the coverage of the policies is adequate or the measures sufficiently robust. Annex I provides a rough overview of the type and coverage of existing measures in the programme.

11. The fact that emissions have fallen and risen in no discernable pattern since the late 90's indicates that the partial coverage and range of types of measures being used do not provide Government with sufficient control to guarantee reductions in emissions of carbon dioxide.

SECTION A

REVIEW OF THE UK'S CLIMATE CHANGE PROGRAMME

Changing the Framework

A top down approach

12. One of the most fundamental changes that can be made to the programme is to adopt a more “top down” rather than “bottom up” approach to designing policies to achieve our emissions targets—that is to start with the question: Which sectors’ emissions are currently rising and need to be addressed? Rather than building towards a given target using estimated amounts of carbon saved from various policies and measures that exist already, or are planned for introduction. A top down approach would lead to more effective targeting of policy and more comprehensive coverage.

Adaptive targets and policies

13. Policies should also be designed so that they are adaptive and reach targets relative to a given baseline year (1990 in the case of the 2010 20% CO₂ reduction target) rather than set amounts of carbon removed from a projected future emissions scenario. The existing programme has largely failed to deliver because many of the policies were not able to adapt to changing circumstances (such as high gas prices relative to coal and increasing demand for energy) and targets were expressed as set amounts of carbon irrespective of what that delivered in terms of net reductions against the baseline year.

Strengthening Existing Policies

14. A number of measures already that are designed to deliver emissions savings and Government has theoretically at least a reasonable degree of control over emissions in at least one sector—industrial (including the power sector). However, the effectiveness of existing measures will be determined by how Government chooses to implement them. So far generous allocations in the EU Emissions Trading Scheme and weak Climate Change Agreements and indicate that substantial savings, even in this sector, are unlikely to be achieved for the majority of the remainder of this decade.

The EU Emissions Trading scheme

15. This covers approximately fifty per cent of our emissions of carbon dioxide that come from industry. The scheme, which places a cap on emissions but enables trading of emissions permits to be used to assist with compliance, will come into force in 2005. The first round of trading runs from 2005–08 and the UK has used it to achieve a 5.5MtCO₂ reduction from Business as Usual Projections for the power sector.

16. Allocations in the first phase have been generous and taken us a long way from a linear path to meeting the 20% target in 2010. There can be no adjustment to allocations once trading begins and so we have effectively ruled out achieving any additional saving from 50% of our emissions until 2008 when the second traded period begins.

17. It is true that UK industries could still decide to beat their caps and sell credits overseas, taking us closer to the target, however, the opposite is also true—credits can be imported taking us further away.

18. The initial allocation was the Government’s best opportunity to constrain emissions as the scarcity of allowances will set the price of carbon and in turn influence behaviour. It is true that scarcity will be determined by how all 25 members of the EU allocate, but the UK was seen to by many to be setting the pace, and, as the second largest emitter in Europe, controlled a sizeable portion of the market. Despite this the UK chose to allocate very generously for more details see Annex II.

19. The Review of the Climate Change programme will need to determine the level of reduction required from industry in the second phase of trading (2008–12). Allocations will need to be significantly reduced—in all probability savings will need to be tripled—if we are to stand a chance of meeting our 20% target.

20. The rules of the game also need to be tightened at a European level (see EU Presidency below for details).

Climate Change Levy

21. The climate change levy has the potential to deliver significant emissions reductions by internalising the cost of carbon intense fuels and profligate use of energy. However, so far, its impact has been limited primarily because of the low level at which it was introduced—energy costs for most businesses remain a relatively small expenditure item.

22. In the industrial sector where energy costs are high, most sectors have secured exemptions from the levy and instead signed “Climate Change Agreements” with Government. These negotiated agreements have so far been very generous and have failed to deliver significant savings in all but the iron and steel sector where there was a large falling off of capacity.

23. These same sectors are likely to seek exemptions from the EU Emissions Trading Scheme which would otherwise introduce a cap and trade mechanism to constrain emissions. If this is to be allowed the UK Government must ensure that targets under future CCAs are tough and absolute (ie not expressed as targets per unit of production) in order that they require an effort equivalent to the effect of the trading scheme.

24. The classification of levy-exempt forms of energy includes renewable energy but the definition used is different to the one used in the Renewable Obligation in that it makes imported sources of renewable energy eligible and includes energy from mixed waste incineration. These loopholes should be closed.

25. The Levy Exemption Certificates that act as proof of exemption can be attached to non-renewable units of electricity and sold as “levy exempt” without the corresponding “Renewable Obligation Certificate” or “ROC”. This means that there is significant potential for double selling and the weak incentive the levy creates for renewable energy is still further weakened. The Government should introduce proper accreditation for all renewable electricity offerings in the domestic and commercial sector and ensure no double counting occurs.

The Energy Efficiency Commitment

26. The principle tool for delivering energy efficiency in the domestic sector is the Energy Efficiency Commitment (EEC). The demand reduction achieved in the scheme is calculated using derived figures for set activities, which are sometimes weighted to encourage investment in particular activities (eg promotion of more efficient appliances). Targets are not expressed as a percentage of energy supplied and are not measured against the 1990 Kyoto baseline. Consequently there is no requirement to prove a net reduction in supply or demand as a result of the scheme being in operation. The weighting of credits further undermines the transparency and breaches the environmental integrity of the scheme. In other words, although efficiency may on paper appear to be improving, overall demand for energy and the associated emissions, can continue, and are continuing, to rise.

27. The EEC establishes the concept of a regulatory approach to delivering energy efficiency and uses trading mechanisms to enable participants to meet targets. However, by being “bottom-up” in its design, it fails to address fundamental market failures where suppliers are incentivised to sell more units of energy to their customers, sometimes offering tariffs with banded structures that reward profligate use with lower per unit rates. These contradictory market forces help to undermine the overall effect of EEC on total demand which continues to rise year on year.

28. Friends of the Earth proposes a move towards a far more flexible traded mechanism incorporating features from the Renewables Obligation. These should include the immediately setting targets expressed as a percentage of the overall supply of energy rather than a set amount of energy supplied (as is currently the case), greater incentives to trade, and a buy-out mechanism to limit cost impacts.

29. The shift to a more flexible traded system is unlikely to be able to be fully implemented until after 2008 when the design of EEC will be next revisited. In the meantime, we recommend that the principles of a more trading based system be piloted in the commercial sector (see below).

New Policies to Address Gaps

30. It can be seen from the table in Annex I that there are significant gaps where no substantial measures exist to ensure a shift towards a less carbon intense economy. Friends of the Earth recommends the following measures be introduced to better complete the policy framework:

CROSS SECTORAL MEASURES:

Renewable Heat Obligation

31. This would in effect be a cross cutting measure that, like the Renewable Obligation, would incentivise investment in renewable energy across industrial, commercial and domestic sectors.

32. Heat accounts for roughly a third of our demand for fossil fuels and yet there is no dedicated measure designed to support the development of renewable sources of heat as it is not included in the existing Renewable Obligation.

33. Friends of the Earth supports the introduction of an obligation on all suppliers of fossil fuels for heat such that a rising proportion of their business is provided by renewable sources of heat eg biomass, ground source heat pumps and solar thermal. A fuller briefing on how such a measure could be practically applied is available.

 IN THE COMMERCIAL SECTOR:
Demand Reduction Obligation (or Trading in “Negawatts”)

34. There are few measures in this sector, beyond the weak climate change levy, to encourage either energy efficiency or the switch to less carbon intense fuels.

35. Friends of the Earth recommends that a “demand reduction obligation” be introduced in the commercial sector. This would take the form of a cap and trade system with a buy out mechanism. The obligation could be applied to the utility companies serving the commercial sector or to commercial customers themselves. The scheme would provide a financial incentive for the obliged parties to seek out cost effective ways of reducing the growing demand for energy in this sector, by setting a target for the total amount of energy to be supplied in a given year. The target could initially be set at “no net growth in demand”.

36. Those companies beating their targets can trade over-compliance with those unable to meet their targets. The existence of a buy-out mechanism would ensure that there was no absolute limit of the amount of energy that could be provided (unlike in the EU Emissions Trading Scheme where there is no buy-out) but that a cost would be internalised by those exceeding their target. The benefits of such a scheme are that unlike in the case of a tax it is a flexible mechanism and introduces a positive financial incentive as well as a penalty.

IN TRANSPORT:

37. Aviation: Uniquely, aviation is currently free from any policies or measures designed to curb emissions. This must be addressed or forecast increases will swamp savings made in other sectors.

38. Government must internalise the environmental cost of emissions by introducing an emissions charge either as a stand alone charge or by increasing Air Passenger Duty. It must also begin proceedings to opt aviation into the EU Emissions Trading scheme (see EU Presidency).

39. Road transport: In distinct contrast the number of new regulations that have been introduced in the industrial sector, efforts to curb transport emissions have been largely reliant on fiscal incentives or voluntary action. Fiscal measures such as road fuel duty need to be increased, with revenue raised going to provide real alternatives and Vehicle Excise Duty could similarly be increased for gas-guzzling cars like 4 × 4s, recycling the revenue back to greener cars.

40. In addition however new measures are needed to enable new technologies to effectively penetrate the market including:

A renewable transport fuel obligation:

41. There is currently no measure, other than a weak duty rebate for biofuels, that incentivises the commercialisation of renewable fuels in transport. As in the electricity sector, if the introduction of alternative fuels is to effectively reduce emissions, it must displace existing fuels. A price signal alone is insufficient to ensure this happens as incumbents in the market will have little incentive to change business practices and new entrants will find it extremely difficult to enter what is a highly consolidated and mature market.

42. In July of the this year a new law was introduced in the Energy Act enabling the Government to introduce a Renewable Fuel Obligation similar to the Renewable Electricity Obligation. Government has, however, yet to make any announcement about whether it intends to set targets and introduce such an obligation. The Government must use this measure to help to bring about increased fuel diversity and reduced emissions and an early announcement would ensure that companies who are interested in investing in renewable fuels locate in the UK, creating jobs and revenue streams for farmers, rather than in other European countries who have already introduced far more favourable support mechanisms.

A legal requirement to improve vehicle efficiency:

43. A clear timetable of regulations designed to ensure the rapid uptake of high efficiency vehicles such as “hybrids” should be introduced such that by 2010 all new cars sold meet stringent new upper limits on fuel consumption per mile travelled. The only measure intended to increase the efficiency of vehicles is a voluntary agreement at EU level. This phased agreement is coming under increasing pressure from car manufacturers who have sought to water down the next round of commitments. The voluntary nature of the measure will prevent it from achieving substantial improvements and if hybrid vehicles are not to remain niche products, regulations will need to be introduced to help them compete with cheaper, less efficient alternatives.

IN THE DOMESTIC SECTOR:

44. The domestic sector does not currently pay the climate change levy and the primary tool the Government has introduced to incentivise energy efficiency is the Energy Efficiency Commitment which applies to utility companies supplying energy. The most important step Government could take to reduce emissions in the domestic sector is to introduce a top down market based mechanism that incentivises energy companies to sell energy services rather than units of energy (see above).

45. In the meantime, many additional measures could be introduced to increase incentives for householders to reduce their energy demand and to switch to cleaner fuels including:

- Stamp duty rebates for efficient homes.
- Much tougher building regulations applying to existing as well as new developments.
- A domestic business tax allowance allowing private landlords to claim investment in energy-saving materials against profits.
- Council Tax reduction for householders installing energy saving measures.
- Reduced rate of VAT to 5% for the supply and installation of energy efficient products or materials (in non-grant schemes when householders employ contractors).

IN THE INDUSTRIAL SECTOR:

Rates reform

46. New rules governing how business rates are calculated are to be introduced in April of next year and are likely to hand a significant rebate to coal fired power stations while increasing the rates payable by clean renewable alternatives. This example of how perverse effects can be introduced, undermining Government's climate objectives, highlights the need for far greater integration between Departments and to deliver clear unequivocal policy signals. A solution to this particular problem would be for Government to create a new formula for the calculation of rates which was at least in part based on carbon emissions per unit of production.

SECTION B

UK PRESIDENCY OF THE EU

47. Two important policy decisions will be being discussed next year: the EU's position on reduction targets post 2012 and the review of the EU Emissions Trading Scheme.

POST 2012 TARGETS

48. Russia's ratification of the Kyoto Protocol now means that targets for future commitment rounds can begin to be discussed. The EU must continue to press ahead not only with meeting its existing target but also in setting challenging new targets. Friends of the Earth is currently consulting internally on the level of targets we will be recommending, however, initial discussions indicate that they will need to be in the region of at least a 30% reduction by 2020.

49. Another important point that must be accepted is that departure from linear reduction paths towards targets, means that targets must be made more stringent to compensate. Increased concentration levels of gases will be achieved if the volume of emissions over time is higher than would be the case if a linear reduction path is adopted. This is the case if high emissions are sustained and reductions only achieved towards the end of the target period—if this occurs to achieve the same reduction in concentrations a deeper cut needs to be achieved at the end of the period.

EU EMISSIONS TRADING SCHEME

50. The EU Emissions Trading Scheme represents the most significant piece of climate legislation anywhere in the world to date and if it is implemented effectively it has the potential to control approximately half of Europe's emissions of carbon dioxide.

51. However, experiences to date have shown that the level of subsidiarity in the scheme allows too great an opportunity for Member States to undermine the effectiveness of the scheme in the name of protecting international competitiveness. A review of the Directive will commence in 2005 and under the EU Presidency significant progress could be made towards improving this ground breaking tool.

52. The UK needs to pursue the following objectives:

- set a challenging European level cap on total allocation of allowances in the second phase of trading (2008–12);
- extend the scheme to cover other sectors including land based transport and aviation;
- extend the scheme to cover other greenhouse gases;
- increase the harmonisation of rules governing how Member States allocate allowances to participants including: fixing the baseline years for future allocations; introducing compulsory auctions; establishing technology benchmarks for new entrants; providing consistent incentives for plant closures; and agreeing banking and borrowing rules;
- committing to 100% auctioned system in the third phase of trading;
- introducing tough penalties for abuses;
- introducing tough caps on use of overseas credits (ie Joint Implementation and Clean Development Mechanism credits) to meet domestic targets; and
- establish consensus on the need to introduce a UN procedure to oversee the development of company level trading internationally.

DIVERSION OF PUBLIC MONEY TOWARDS SUSTAINABLE ENERGY DEVELOPMENTS

53. In addition, the EU has significant influence over how public money is spent in international finance institutions. Historically huge sums of money have been spent underpinning fossil fuel developments, locking in emissions for many years to come. Friends of the Earth is calling for public money in the shape of international loans and guarantees to be diverted away from projects with high emissions—particularly export focussed projects, which have delivered little in the way of economic advantage to host countries and simply served to provide developed countries with cheap fuels. Instead public subsidies for truly sustainable renewable energy projects should be greatly increased. More information on this recommendation is provided in Annex III.

SECTION C

UK CHAIRMANSHIP OF THE G8

54. The UK's chairmanship of the G8 in 2005 provides a key opportunity to achieve political consensus amongst the world's richest countries on the urgent need to take international action to tackle climate change.

55. Our Prime Minister has already stated that his two priorities will be climate change and Africa. On climate change he has indicated that he will pursue three themes:

- consensus on the most recent scientific evidence with a view to agreeing a global environmental limit;
- work to speed up the deployment of existing carbon abatement technologies; and
- work to engage high emitting developing countries such as China and India.

56. Friends of the Earth largely supports these aims and hopes that they will deliver tangible outcomes. The G8 summit in July will need to lead to a firm consensus amongst the G8 that immediate and sustained activity is necessary to tackle climate change under a legally binding internationally agreed framework. A key test of work streams begun in the G8 will be whether they culminate in re-invigorated discussions and negotiations at the first meeting of parties to the Kyoto Protocol in December of the same year.

57. Key milestones towards this goal could include:

- agreement to review the adequacy of commitments which should have happened in 1998 (UNFCCC Article 4 para 2.d);
- consensus between developed and developing countries about the reorientation of global agricultural subsidies towards supporting biofuels and away from food production;
- agreement to establish an international framework governing the development of company level emissions trading schemes enabling all UNFCCC signatories to design and implement effective schemes to control their domestic emissions; and
- consensus amongst G8 and OECD countries to divert public funding away from projects which lock us into high emissions pathways and to support instead truly sustainable renewable energy developments.

More information on each of these suggestions is available from Friends of the Earth.

Annex I

The diagram below roughly maps out where policies currently exist and what they seek to achieve:

<i>Sector</i>	<i>Reduce Carbon intensity</i>	<i>Improve Resource Efficiency</i>	
Power	Regulation: Renewables Obligation		} 50%
	Regulation: EU ETS encourages fuel switching and penalises inefficiency		
Industry	Regulation: EU ETS encourages fuel switching and penalises inefficiency		
	Fiscal: Climate change levy (CCL) and CCAs—weak incentive to switch to cleaner fuels and increase efficiency		
Commercial	Fiscal: Climate change levy—weak incentive to switch to cleaner fuels and increase efficiency		
Domestic	Public spend: grants for small scale renewables		
		Regulation: Reform of Building Regulations	} 25%
		Regulation: Energy Efficiency commitment	
		Public spend: Community Heating grants	
		Regulation: Reform of Building Regulations	
Public		Policy: Efficiency targets for buildings	
	Policy: requirement to consider CHP (excluding the NHS)		
Transport	Public spend: Powershift grants	Fiscal: Company car taxation	} 25%
		Fiscal: Graded Vehicle Excise Duty	
		Voluntary measure: EU voluntary agreement on vehicle efficiency	
		Public spend: Investment in public transport	
	Fiscal: Congestion charge exemptions	Fiscal: Congestion charging	

Annex II

Quantifying the UK’s over allocation in the first round of the EU Emissions Trading Scheme (2005–08)

The current draft allocation plan covers 46% of the UK’s carbon dioxide emissions. In 2002 we were 8.7% below our 1990 CO₂ emissions levels needing to make a further 11.3% reduction (18.6 MtC) by 2010 to meet our 20% target. Even if we are aiming for only a 15.2% reduction by 2010 then savings of 10.7 MtC across all sectors need to be made.

NAP allocation

The current NAP proposes only a 3% reduction on industrial emissions (a 0.2% reduction on the baseline years) which is 2 MtC off 2002 levels by 2007.

To reach the 15.2% target from now until 2007 a “fair share” requirement on industry calculated by proportion of emissions would be 3.5 MtC.

This would require emissions in other sectors (domestic and transport) to be reducing in equal proportion. However emissions in these sectors are currently rising. If however we assume they can be stabilised to reach our target then industrial emissions would need to reduce by the full amount eg 7.6 MtC.

- 1990 baseline = 164.6 MtC
- 2010 15.2% target = 25MtC reduction
- 2002 achievement to date = 14.3MtC
- Gap = 10.7 MtC
- 46% = 4.9MtC
- 2002–07 contribution (linear path) = 3.5 MtC
- Assuming no decline in transport and domestic emissions = 7.6 MtC

Supplementary evidence on the diversion of public funding away from fossil fuels and towards sustainable energy developments

Memorandum from Friends of the Earth

CLIMATE CHANGE: LOOKING FORWARD

Opportunities for IFI Energy Policy Reform in 2005

1. Friends of the Earth believes the Government in 2005, has a unique opportunity to make substantial progress in reducing global emissions by demanding a shift in the financial investment driving the energy industry. As John Prescott, Deputy Prime Minister said:

“Financial investment is essential in achieving all Sustainable Development targets, financial investment which is often not readily available².”

2. At the World Summit on Sustainable Development (WSSD)³, the UK Government’s pledged to phase out energy subsidies which inhibit sustainable development⁴. The Government also pledged to urgently and substantially increase the global share of renewable energy sources to develop more diverse, advanced, cleaner, affordable and more efficient energy technologies⁵.

3. International Financial Institutions (IFIs), such as the World Bank and European Bank for Reconstruction and Development, play a key role in international investment and therefore sustainable development. The sustainable development commitments made at the WSSD specifically included that the UK Government ensure IFI’s and other agencies support efforts to create a level playing field for renewable energy and distributed and decentralised energy⁶. A report on IFIs commissioned by the Department for Environment, Food and Rural Affairs (DEFRA) argues:

“unless investment flows (of IFIs) are explicitly focused on and supportive of environmentally and socially sustainable economic growth, such growth will not be achieved.”⁷

4. IFIs are responsible for accelerating climate change by the significant subsidies they provide to the fossil fuel industry. Friends of the Earth estimates that IFIs have provided at least \$110 billion for fossil fuel projects in the last ten years⁸. The finance provided by these institutions for projects often provides essential political legitimacy as well as economic security that allow these projects to go ahead.

5. Friends of the Earth believes that, if the Government’s long term climate change goals are to be achieved, IFI’s continuing bias towards supporting fossil fuel projects must end, as has been recommended by the World Bank’s own assessments such as the Extractive Industries Review (EIR)⁹. If the Government continues to support ongoing IFI finance in fossil fuel projects, it will continue to stifle the development of renewable alternatives.

6. Generally, IFIs have as the, or as a, central pillar of their mandate poverty alleviation through sustainable development. Friends of the Earth believes that all projects financed through IFIs should promote sustainability.

7. Approximately 80% of IFI energy projects over the last 10 years have been export-led and have therefore made very little contribution in meeting the energy needs of the global south. The Extractive Industries Review concluded, in respect of World Bank funding of such investments, that in the vast majority of cases they had not alleviated poverty or promoted sustainable development and were therefore not a suitable use of World Bank funds. In DFID’s last assessment of its partnership with the World Bank, it was noted:

“there remain doubts as to whether, at all levels, the bank group is fully focused on its over-arching objective of contributing to the elimination of poverty.”¹⁰

² John Prescott, in DETR (1999) “A better quality of Life—a strategy for Sustainable Development in the UK”, DETR, London.

³ The WSSD in Johannesburg, 2002.

⁴ Sustainable Development Task Force: Progress since the World Summit on Sustainable Development (WSSD) www.sustainable-development.gov.uk/sd_strategy/taskforce/wssd.htm

⁵ Sustainable Development Task Force: Progress since the World Summit on Sustainable Development (WSSD) www.sustainable-development.gov.uk/sd_strategy/taskforce/wssd.htm

⁶ Sustainable Development Task Force: Progress since the World Summit on Sustainable Development (WSSD) www.sustainable-development.gov.uk/sd_strategy/taskforce/wssd.htm

⁷ Report of a Royal Institute for International Affairs / Forum for the Future workshop held on behalf of DEFRA Brian Pearce and Paul Ekens “International Financial Institutions: Enhancing their role in promoting sustainable development” October 2001 <http://www.sustainable-development.gov.uk/wssd/ifi/02.htm>

⁸ Based on data available from the Sustainable Energy & Environment Network Database (SEEN www.seen.org). However, due to the lack of transparency of many ECAs, much data is unavailable.

⁹ The Extractive Industries Review, commissioned by the World Bank in 2000.

¹⁰ DFID (2000) Working in Partnership with the World Bank Group p B7.

8. This is not just the case for the World Bank. A recent report by Christian Aid¹¹ illustrates the negative impact on poverty of oil investments. Another report, by Friends of the Earth International¹², illustrates the fundamental incoherencies of all IFI financed oil, mining and gas projects with sustainability and the urgent need to phase out these investments.

9. The involvement of IFIs in the fossil fuels industries has long been recognised as controversial. The consequences of these projects are not only of concern due to their hugely significant contribution to global climate change, they have also caused significant and irreparable harm to local environments, the poor and indigenous communities.

10. The controversies over investment by the World Bank in oil, mining and gas projects led the Bank to commission the Extractive Industries Review (EIR) in 2000¹³. The EIR recommends the World Bank phase out lending for fossil fuels over five years, while phasing in significant lending for renewable energy. Dr Emil Salim, the eminent person appointed by World Bank President Wolfensohn to lead the review, said:

“The Bank would do better to invest and concentrate on activities where the private sector is not interested, and that is renewable energy. When the World Bank wants to have an impact on global development, it should find new venues and new fields where the private sector is not interested.”¹⁴”

11. These recommendations have not been taken up by the bank. Friends of the Earth believes IFIs are imposing the energy demands of their northern shareholders on the south, who are left with depleted resources, exacerbated poverty, and no sustainable energy sources.

12. Friends of the Earth believes the Government must demand the World Bank, and all IFIs, including the European Bank for Reconstruction and Development, the European Investment Bank, the Asian Development Bank, the African Development Bank, the Export Credit Guarantee Department and the InterAmerican Development Bank should invest in projects that address the energy needs of the poor and minimise environmental impacts such as climate change. IFIs should dramatically increase investments in sustainable energy resource development. This includes setting targets for increasing proportions of investment in renewable energy within the energy portfolio, increasing annually at 20% (up from 6% of total energy investment) while phasing out lending for fossil fuel projects over the next five years.

13. A shift in IFIs energy portfolio to renewables, must be carried out alongside a new approach to lending that places communities and their environment at the centre of these investments. All proposed IFI energy investments must be screened for their poverty alleviation potential, be scrutinised for their strategic environmental impact in a region, and must receive the free prior and informed consent of affected communities. Furthermore, internationally recognised environmental and social standards must apply to these projects, IFIs should impose sanctions on project promoters for non compliance with these standards, all relevant information relating to these projects must be made freely available to stakeholders, independent monitoring of projects must be regularly carried out, and an independent ombudsman must be made available to affected communities.

14. DFID have stated:

“Climate change is the quintessential global environmental problem. It is immaterial from where a ton of CO₂ is released into the atmosphere. Its effect on global warming will be the same.”¹⁵”

It is clear the poor will be most affected by global warming¹⁶. Friends of the Earth believes that adaptation to the effects of climate change is not enough. The Government must take urgent action to prevent further climate change.

15. At the World Summit on Sustainable Development (WSSD)¹⁷, the UK Government’s pledged commitments included the phase out of energy subsidies which inhibit sustainable development¹⁸. The Government also pledged to urgently and substantially increase the global share of renewable energy sources to develop more diverse, advanced, cleaner, affordable and more efficient energy technologies¹⁹.

¹¹ Christian Aid, *Fueling Poverty: Oil, War & Corruption* <http://www.christianaid.org.uk/indepth/0305cawreport/cawreport03.pdf>

¹² See Hands off! Why International Financial Institutions must stop drilling, piping and mining <http://www.foei.org/publications/pdfs/handsoff.pdf>

¹³ For more information see www.eireview.org

¹⁴ Emil Salim at Press Conference in March 2004, London.

¹⁵ DFID (2000) *Achieving sustainability poverty elimination and the environment—strategies for achieving the international development targets point 2.14*

¹⁶ See for example, UNEP and WMO (2001) *Climate Change 2001: Impacts, Adaptation and Vulnerability*,

¹⁷ the WSSD in Johannesburg, 2002.

¹⁸ Sustainable Development Task Force: Progress since the World Summit on Sustainable Development (WSSD) www.sustainable-development.gov.uk/sd_strategy/taskforce/wssd.htm

¹⁹ Sustainable Development Task Force: Progress since the World Summit on Sustainable Development (WSSD) www.sustainable-development.gov.uk/sd_strategy/taskforce/wssd.htm

16. The sustainable development commitments made at the WSSD specifically included that the UK Government ensure IFI's and other agencies to support efforts to create a level playing field for renewable energy and distributed and decentralised energy²⁰.

17. Furthermore, the Department for International Development (DFID) has already recommended that the government:

“end environmentally damaging subsidies, introduce and raise user charges, increase low resource use taxes, increase charges for environmentally damaging activities and use incentives for environmentally beneficial activities.”²¹

18. Friends of the Earth believes these obligations have not been fulfilled by IFIs. Furthermore, if the Government is serious about tackling climate change it must immediately call for a phase out of IFI funding of fossil fuel projects and to redirect this finance to sustainable renewable energy investments.

11 October 2004

²⁰ Sustainable Development Task Force: Progress since the World Summit on Sustainable Development (WSSD) www.sustainable-development.gov.uk/sd_strategy/taskforce/wssd.htm

²¹ DFID (2000) Achieving sustainability poverty elimination and the environment—strategies for achieving the international development targets point 2.14.

Witness: Ms Bryony Worthington, Energy and Climate Campaigner, Friends of the Earth, examined.

Q236 Chairman: We welcome now Bryony Worthington from Friends of the Earth. May I first apologise to you for the delay in your being able to give your evidence and thank you for your patience in remaining with us. Sometimes votes come and business overruns. I want to start our questioning by just looking at two fundamental questions which I put to our previous witnesses. The Government set themselves a target in advance of the requirements of Kyoto. They have now had to row back on it and I am interested to know why that is the situation. How did they decide on 20%? Why did they think that was the right number, from which they have now resiled? What practically should we be doing to recover the ground?

Ms Worthington: Okay. Well, it is interesting. The history of the 20% target is somewhat shrouded in mystery, but what we do know is that in 1997 when the Labour Government was preparing a manifesto at that stage emissions were steadily decreasing year on year. From 1990 to about that time we have seen a steady reduction in emissions thanks to the dash for gas. I think generally commentators believed that we would be able to maintain that throughout the remainder of the decade and into the next decade and that the 20% target was simply a continuation of the linear path and therefore was a sensible target. So I think that is the reason why they set it. However, they then went on to produce their climate change programme, which they believed would deliver that target, but it was fundamentally flawed on many counts and actually what we are seeing is that that linear pathway has not been adhered to and emissions have yo-yoed really up and down since the late 1990s with no discernible pattern. So really they are not on track and the latest results and projections show that we might only make a 14% reduction, not 20%, and even that is very ambitious given that we are currently at around 7.5% below 1990 levels. So there is a huge hill to climb. I think you also went on to ask what should they do about it. Well, they have a climate change programme review, which of course this inquiry is very kindly for, and they can, I think, introduce new measures and a new approach

which would get them back onto a linear pathway and that is essentially what we would like to see them do.

Q237 Chairman: Given that the dash for gas gave them, if you like, a head start but also a rather nice comfort zone they did not have to do very much because other people were doing it. The electricity generators were replacing coal with gas. Did that not take the pressure off the rest of the economy to contribute in terms of CO₂ and other greenhouse gas reductions?

Ms Worthington: Certainly in relation to meeting Kyoto, the Kyoto target was pretty much met when it was signed so there was not really very much pressure to do very much and I think there was a certain amount of complacency that industry would just keep on becoming more efficient and fuel switching would continue. The failing stems from a number of different failings because nobody really is taking an overarching look at the economy as a whole and starting from the point of view of where are emissions rising—

Q238 Chairman: Let me just stop you because that is a very interesting point. You say nobody is doing it. Do you know why, and who would you nominate to do it?

Ms Worthington: Well, we would like an independent body which is not the Department for Transport or the Department for Trade and Industry, and indeed perhaps is not even Defra, to take on the role of setting carbon budgets for the UK plc, all sectors that contribute climate change gases. We do not really have strong feelings about who should do it, but there is a strong case, perhaps, for the Treasury taking on this role. We are now living in a new world where carbon has a price and in fact will have an effect on the public purse in the years going forward. So it may make sense to integrate it into a Treasury function so that it becomes looked at in terms of a carbon budget economically as well as them having an oversight over policies and measures.

19 January 2005 Ms Bryony Worthington

Q239 Mr Mitchell: Why is the EU not reaching its targets as well?

Ms Worthington: Well, the EU are also not on a linear path, this is true. If you look at which sectors have failed to reduce, it is overwhelmingly transport which has failed to be tackled at a European level. The same is true in the UK, of course. So yes, you have seen some countries going beyond and still managing to produce some reductions and other countries where their economic cycle is growing and their emissions are rising. So it is a combination of sectoral failure. There perhaps are not enough policies to tackle transport emissions. But also with the individual countries the net total is that we are not making enough of a reduction.

Q240 Mr Mitchell: The new accession states usually come from a mucky industrial tradition. It is going to get worse, is it not?

Ms Worthington: Well, it is interesting. Their part of the burden-sharing agreement is to obtain an 8% reduction on 1990 levels, which is the same as the EU's target, and they are well below that because they have had quite a significant economic downturn since 1990. So there is not much incentive on them at all to clean up, but with them coming into the EU you would hope that financial flows from the reconstruction bank or EIB would help them to clean up their industry and they would continue to go on and make savings. So I do not think the picture is clear yet as to what they will be doing and the jury is still out really in terms of looking at their allocation plans to industry through the Emissions Trading Scheme, which would give you a good signal as to which countries are continuing to want to improve their resource efficiency and which are not, but I would have to submit some supplementary on that.

Q241 Mr Mitchell: Do you want a further reduction of 30% up to 2020? How likely is that given the fact that we are failing already?

Ms Worthington: Essentially what we are beginning to look at is rather than talk about scary large numbers that are at a long distance from here which politicians actually feel able to sign up to because it is nothing to do with their particular term in office, we should probably start to look at incremental targets which are expressed annually. There are studies which show that from 2010 if OECD countries are to make substantial reductions you could set targets of maybe just a two to 3% reduction per annum. That is much more manageable as a figure than setting a very long distant target and Friends of the Earth is still looking into those options as a new way of looking at targets. It is very well supported by the science of climate change. Climate change is dictated by emissions over time, not simply by how low our emissions are at a certain point in the future, so the linear pathway is a really crucial thing in trying to control those concentration levels.

Q242 Mr Mitchell: You also want a reduction in the cap for Emissions Trading Schemes in the second phase. How likely is that given the fact that the revision of our own National Allocation Plan has already made it more difficult in the first place to achieve that?

Ms Worthington: I think I would agree with Christina, who said that anything is possible if you have enough political will and on this issue hopefully we will see slightly more willingness to make the market work. This has been a trial period, this first phase of trading, and I think everybody is pretty unanimous that there is not going to be much scarcity and it will not deliver many of the savings. But we are testing how it works and by the time the second phase comes in there will be more willingness to take action. The problem will be, of course, competitiveness concerns and whether the EU can continue to push ahead while other countries are not involved. We would argue that the EU can and should push ahead, but it ought to be mindful of how it can protect some of those industries that it might want to, and particularly they could use border tax adjustments or traditional trade routes to try to protect themselves as they go forward from making themselves uncompetitive relative to other countries.

Q243 Mr Mitchell: How happy are you with Emissions Trading Schemes? Is it not really just going to be a way for individual industries to buy a failure to comply and overall of obfuscating the issue so much that people think something is happening when it really is not?

Ms Worthington: We are not very happy at all with how it has been implemented to date.

Q244 Mr Mitchell: You would prefer another method?

Ms Worthington: No, the scheme itself theoretically can work and can be very economically efficient. The problem is that it is a political instrument and it has been implemented in a political way. We hope that it can be improved.

Q245 Mr Mitchell: Is it going to be an effective discipline, do you think?

Ms Worthington: It will fundamentally change companies' attitudes to their emissions. Company accounts being produced from this year onwards will carry a new asset line in the budget which says whether you have a carbon liability or a carbon asset. So suddenly it is no longer just the concern of the environmental manager within a company as to what their emissions are, it is going to be a matter for the financial directors and the chief executive; it will appear in the accounts. So it fundamentally changes the attitude of emissions by its introduction, so it is groundbreaking. It is not yet implemented in the right way, but that does not mean to say that the theory behind it is not strong.

19 January 2005 Ms Bryony Worthington

Q246 Mr Mitchell: Just one last question from a layman's point of view. How is it all measured? How can you be so precise, a reduction of 2.9%? How on earth do you know?

Ms Worthington: A good question.

Q247 Mr Mitchell: It is comparing old plant, new plant, all kinds of systems, the efficiency of which you do not know. It is not as if it is an overall measure of somebody going out with a sniffer and saying, "2.9% worse this week." How precise is the measurement as to what it is?

Ms Worthington: Well, we had a very stark illustration of how you can get it wrong with the DTI's energy projection, where they were forced to admit that they had actually got the figures wrong and they were using the wrong conversion values. But in layman's terms what happens is that an installation is required to calculate its CO₂ emissions derived from its fuel consumption and then use formulae for that. They are quite detailed formulae and they take into account the different fuel types, even to the degree that different coal stocks have different values for carbon dioxide. But it is a derived calculated figure.

Q248 Mr Mitchell: Is it cheatable?

Ms Worthington: Yes, but it is regulated by the Environment Agency and their officers are responsible for checking and verifying that those figures are correct, and they are independently verified.

Mr Mitchell: Thank you.

Q249 Joan Ruddock: You have heard my question previously on global dimming and the fact that I, as one person, having seen one television programme am much exercised about this. I just wondered in the light of what you know of global dimming just how likely you feel we are to meet any of the targets, in particular the very ambitious 60% by 2050? Is it doable?

Ms Worthington: Well, as Sir John Houghton pointed out, they have known about the effect of aerosols and whether it has an enhancing or a dimming effect on the effect of concentration, but the degree of uncertainty about that part of the science is probably the largest degree of uncertainty of all of it, so it is still highly unknown and uncertain.

Q250 Joan Ruddock: Can I just interrupt you there? Is it not that more recently it has been measurable because of the reduction in air pollution in western countries?

Ms Worthington: The programme, which was very compelling, seemed to imply that. I think we will have to wait to see what the IPCC make of it in terms of integrating it into their next assessment report. What we believe, to use a poor analogy, is that we are essentially in a car hurtling at a speed at which we do not really know how fast we are travelling towards a wall and we are not quite sure how far away that wall is. Essentially, what is important is that somebody sits down and works out how to invent the brakes. That is what the UK can do and that is what the UK

and Europe can do. We must work out how to control our levels of emissions and that will involve Government intervention. That is the challenge for our generation. I feel very passionately that we can show it can be done, we can do it without huge amounts of pain and economic recession. That should be then an exportable set of knowledge that we can then send out to other countries and encourage them to take the same path that we have. But we have to prove it can be done and the exerting of control and the inventing of the brakes is important because, as science firms, once we have the levers in place we can simply ratchet down according to the levels of the later science. Without any degree of control we are simply out of control and very possibly will reach a point where we have no return.

Q251 Joan Ruddock: Your analogy suggests that we do not know how to invent the brakes, whereas I think Sir John and his group were perhaps suggesting it was the political will that was lacking. Do you really think there is a knowledge gap still?

Ms Worthington: There is a combination of a partial knowledge, because nobody is looking at it in its entirety. Governments tend to take a very bottom-up approach, "We will tweak this tax here," or, "We'll introduce this policy measure here," but no one is looking at it in its entirety and that is what is needed now, to gain control over all sources.

Joan Ruddock: Thank you.

Q252 Mr Lepper: If I could just follow on that line of thought, because in your evidence you say that the current climate change programme has a mixture of measures which seek to achieve emissions reductions but there appears to be no consistency of approach. I think that is exactly the point that you have been making to us just now. Is there any sign that the review of the climate change programme is addressing that lack of consistency? I am not going to get mixed up in your analogy of the car, but where do you see the driving force ought to come from in knocking heads together and bringing about that consistency? Is it the department we shadow, is it the DTI, the Department for Transport, the Treasury, or does it much matter which of them it is as long as somebody takes the lead?

Ms Worthington: Sadly, I think it does matter who does it. Obviously some departments have more clout than others and this is why I think possibly we would be interested to see if the Treasury felt it was a role they should perform. The Cabinet Office, similarly, who have cost-cutting responsibility could also be encouraged to do more. As to whether the current review of the climate change programme has taken a different tack, we would like to see the failings of the last programme more clearly acknowledge, that the bottom-up approach to policy making has not delivered the kind of control which is necessary. That said, there are some interesting measures which have been discussed within the programme which take us some way towards addressing some of the obvious gaps, but I do not think there is a sign yet that they are

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recommending a new holistic kind of carbon budgeting approach, which is what we would like to see adopted.

Q253 Mr Lepper: Is there any sign of the emphasis that the Prime Minister has been placing on the pace of climate change during the presidency of the EU and the G8, etc? Is there any sign that the urgency which he in his public statements gives to that whole issue is affecting the thinking generally within government departments?

Ms Worthington: Sadly, not enough really. I think Mr Blair seems to be more interested in the kind of global politics of the current *impasse* and seems to be quite relaxed about the fact that perhaps we are not doing as well as we should be at home. That is regrettable because it is not something which goes unnoticed in these discussions and I think he should pay far more attention to domestic policies on this issue if he is intent on taking a leadership role internationally. There are lots of examples. The recent emissions trading debate over the allocation of more allowances at the last hour indicates that Number 10 did not step in on the side of the angels but actually chose to put competitiveness concerns, or so-called competitiveness concerns ahead of the environmental integrity. So yes, it is an important issue which we would hope they would place more attention on.

Q254 Mr Lepper: So it is talking about the global problem and the need to deal with it rather than looking at what we can be doing?

Ms Worthington: There is a mythology that does the rounds, which is, "We're only responsible for 2% of the emissions. We've already done a lot since 1990. We're doing our bit." But we all know that the bit that we have done was almost entirely an accident because of the dash for gas and that 2% of remissions, although it is small, we are one of the leading developed countries and if we, as a stable, well-developed country cannot show that we can get our emissions onto a downward trajectory how on earth can we persuade anyone else to do the same?

Mr Lepper: Thank you.

Q255 Joan Ruddock: I know Friends of the Earth is always going on about road transport and transport in general as being the key to making some real change. Can you tell me, in relation to the price rises for fuel which have occurred over say the last year is there any evidence that those rises have been sufficient to reduce car usage?

Ms Worthington: No. The policy at the moment seems to be frozen and the fuel duty escalator has—

Q256 Joan Ruddock: No, I was talking about the market rises rather than in terms of global oil prices.

Ms Worthington: Well, the problem, as always, is that it is not simply about price because elasticity kicks in and people will simply be prepared to pay more for a service that they require or need. What you need is a mechanism that triggers innovation. There is a lot of people making a lot of money out of the status quo and, as we have seen with the

renewable electricity industry, what you needed was some kind of carrot and stick that said, "We're not just simply interested in relative prices, we are actually going to oblige a certain portion of your business to change towards renewables. That thinking, which has resulted in a good mechanism, has not been applied to any other sector. So we see the Treasury simply reducing duty on biofuels in the hope that that will introduce a whole new industry producing renewable transport fuel. It simply will not because unless the big companies who control that market who are asked or obliged to do that there is no reason on earth why they will. It is a highly capitalised industry and new players find it very difficult to enter. So obligation is the obvious route. So I do not think it is as simple as what the effect of prices are; there is also this question of how do you force innovation.

Q257 Joan Ruddock: I asked you that because you believe that there should be a greater escalation of the fuel tax, but if there is no evidence that raising the price reduces the amount of mileage that we all do in our cars then how is that going to have a major effect? How high would you have to go to actually make people reduce their mileage?

Ms Worthington: We do not have an answer for how high because we see it as part of the package. As I was saying, we need to try to use mechanisms which cause innovation. So if you were to do it through a tax route the important part would be the recycling of that revenue to Government into alternatives to the car. So it would not simply be the price alone but the fact that you would recycle into public transport or alternative transportation which would perhaps cause a reduction in emissions. So it is not simply a price issue on its own.

Q258 Joan Ruddock: But is there enough public transport to get people out of their cars?

Ms Worthington: I think there is a shift towards more investment in public transport. Certainly, as we have seen in London, with the Congestion Charge there has been quite a shift and various cities around the world are looking at very innovative solutions. There are talks of very lightweight tram systems being looked at in Wales at the moment. There is more interest in it, but yes, we need to have dedicated funding mechanisms for that. Obviously the fuel duty goes into general taxation. Some of that should be ringfenced for public transport.

Q259 Joan Ruddock: What about the liaison between departments, DTI and Defra? Do you think that is good enough? Does that have an impact on whether these solutions are taken forward?

Ms Worthington: I have to say we have witnessed probably one of the most unhelpful interactions between two departments through the Emissions Trading Scheme with the DTI representing what they believed to be the competitiveness of industry and Defra representing our need to meet our targets and it has been, I think, quite acrimonious at times. So I do not think the relationships are as strong as they should be. I think we have to accept that we

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simply cannot protect existing high emitting companies to the detriment of the whole society. There is going to have to be a shift and actually it will be for the benefit of society as a whole if we encourage those players to move and innovate. It is regrettable that often a very conservative approach is taken to simply helping those who are currently powerful to remain powerful and we need to see more innovation.

Chairman: I would like to bring Alan in on the domestics and the time constraints.

Q260 Alan Simpson: I am just finishing the fine drafting of an Energy Services Bill so my eyes lit up when I came to the part of the FoE submissions which said that you were recommending a top-down market-based mechanism that incentivised energy companies to sell energy services, so I would be quite keen for you to just trace out the direction your thoughts are taking, but also if you would just confirm two things. One is, whichever way we look at that, it is not compatible with a unit price-based competition policy. It is the nature of the current competition policy which makes that plea unobtainable. The second is that whatever we come up with really ought to be industry-neutral so that we do not inadvertently find ourselves saying, "Well, it's okay to lob £85 billion at burying nuclear waste because it is not carbon, but anything that is carbon can't be touched so we need to look at how we service general efficiency but not energy consumption."

Ms Worthington: Okay. I might ask you to clarify the last bit, but in terms of what we see as being wrong at the moment in terms of the demand for energy, the current Government mechanism operates on a bottom-up approach so it adds together savings attributed from different activities that companies undertake to arrive at a set amount of energy saved. Meanwhile, everybody is installing more and more electrical goods into their homes and spending more time or whatever living a more luxurious lifestyle. The demand for energy is actually continuing to rise even though these small incremental projects may be taking some of the edge off that growth. When you get into carbon constraint where you have absolute targets against a baseline year, simply constraining growth is not enough, you have to start to reduce. What we would suggest is again more of a top-down approach where we look at the overall trend in and demand for energy from any sector. In fact we would suggest starting in the commercial sector, where there are very few policies at the moment to incentivise this kind of activity, and you create a budget for energy demand which is implemented through a system of tradable certificates between those companies who service those customers and essentially providing people with a target level of demand that they will fulfil. If they need to go above that target they pay the penalty or purchase credits from somebody else who has managed to reduce demand from their customer base. That is taking the principles of the Renewables Obligation, some of the elements of the Emissions Trading Scheme and applying it to energy

demand so that you fundamentally change people's views from one of, "We will make more money if we sell more units," to, "Well, we have to try to meet our customers' needs with this amount of energy." That will change the relationship between the units sold and the service provided and should incentivise companies to look for those low-hanging fruits, the least cost solutions which they could probably much more easily uncover than Government might be able to.

Q261 Mr Lazarowicz: Can you tell us something about how you think the Energy Efficiency Commitment should be improved? As there is meant to be a Defra/Treasury view of policy in this area, can you briefly give us some idea as to what is the nature of the changes you would like to see in the commitment?

Ms Worthington: We would first of all want the target for the commitment to be expressed as a percentage of overall demand so that the target rises as energy demand rises, in the same way that the Renewables Obligation keeps pace with the growing demand for electricity. Otherwise, you are simply providing a static amount of savings against a rising baseline. That is one of the fundamental problems with the scheme at the moment. As I have just outlined, we would prefer a far more top-down approach to encouraging people to make savings so that you would start with looking at the totality of your customers' demands and giving people targets to reduce that demand, or if we feel it is politically unacceptable to ask for reductions yet from this sector that you simply say no net growth. That would equally be a way of tackling growth in demand. Those are some of the fundamental things which need to change to make the Energy Efficiency Commitment a useful tool in reducing demand rather than simply encouraging various small projects that take place.

Q262 Mr Lazarowicz: Again, it might be helpful to have a bit more information sent to us to give us some idea what you mean in more specific terms about the domestic centre.

Ms Worthington: Certainly, yes.

Q263 Mr Lazarowicz: Again, you are also critical of the way that the Climate Change Levy has actually impacted upon emissions and again I would be interested in knowing first of all why you think the levy has not been working well and what should be done to it to make it work better?

Ms Worthington: Well, essentially it has not been set at a high enough rate to really fundamentally incentivise changes in behaviour. That is one of the most fundamental problems. The recycling of the revenue which has come in also has gone towards National Insurance reductions, which whilst that is a good thing it is not very well targeted in terms of how you might use the revenue to encourage more reductions in emissions, which would then automatically affect the scheme. Some money is obviously being recycled through the Carbon Trust, which is welcome, and we hear encouraging news

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that they are making progress in terms of helping industries and businesses to realise savings. There is also quite a number of exemptions from the levy, which has resulted in climate change agreements being negotiated between Government and industry. These agreements are fairly opaque, well, entirely opaque actually and very hard for us to scrutinise in terms of understanding whether they are actually being asked to do anything. We hear great things about how much has been saved, but it is very difficult to verify whether that is just as a result of business—

Q264 Chairman: You can write us a letter with the questions that you would like to have answered on the grounds that it is opaque and we cannot find out and we will put them to the relevant Secretary of State.

Ms Worthington: That would be welcome. Thank you.

Chairman: All right. Well, you do that.

Q265 Mr Lazarowicz: What you are saying, to be clear, is that it is a relatively simple technical issue and quite a big political issue, this Climate Change Levy. It is not a particularly complex scheme to work out. That is the message I get partly from what you say. Could I just ask you, in terms of an increase to the Climate Change Levy what kind of a level of increase are we talking about?

Ms Worthington: I have not properly considered that, so I would have to give you a supplementary on that.

Mr Lazarowicz: Okay. That would be helpful.

Q266 Chairman: I, too, would welcome some further thoughts about the Energy Efficiency Commitment because it seemed to me that companies are doing it but there did not seem to be much of a connect with the customer and I would be grateful for your

thoughts as far as that is concerned. Just one final postscript question. Sheffield Hallam University did some work on evaluating where you got your best value for money in terms of the public pound being spent for carbon dioxide reduction and glass fibre loft insulation came out as the leading light. The use of biodiesel oil see rape, sadly from my point of view because I think it is a good idea, came at the bottom. We do not hear much about what I might call simple, straightforward things like that. We hear lots of very sophisticated, complicated schemes. We are we not concentrating a bit more on the easy things to do?

Ms Worthington: Well, it is interesting because whilst it may be true that fitting loft insulation is the most economically sensible thing to do, human beings are not really very sensible economic actors very often and actually we would like Government to concentrate on the simple things but actually the really simple thing you could do is to shut down inefficient coal-fired electricity-producing power stations because they are operating at 30 or 35% efficiency when a modern CHP could reach over 60 or 70% efficiency. So there are some simple things. There are twelve or fourteen coal-fired power stations which represent maybe up to 20% of the UK emissions. Now, tackling them is a lot simpler for Government than trying to encourage 21 million householders to fit insulation. So economic efficiency perhaps does not always translate into simplicity or ease of result really.

Chairman: I think my observation would be that you discussed and our previous witnesses discussed great publicity campaigns involving the public. If we cannot crack the loft insulation one we are going to be struggling. Thank you for your very clear answers. Thank you for your evidence. There are lots of questions which came up and I am only sorry that time prevented us from quizzing you more and we very much look forward to the supplementary information which you very kindly volunteered. Thank you.

Memorandum submitted by WWF (U35)

EXECUTIVE SUMMARY

WWF welcomes the opportunity to contribute to the Efra Committee's inquiry into climate change. This opportunity is timely for WWF since we are shortly to launch our first global climate change campaign—Powerswitch!—designed to address climate change in over 50 countries across the world.

As part of this campaign in the UK, WWF will be intensifying its efforts in challenging the government, power sector and industry to deliver on targets and take the urgent deep cuts in greenhouse gas emissions required to avoid dangerous climate change. There are no excuses: recent WWF research modelled by ILEX shows that the UK power sector can in fact achieve 60% reductions in CO₂ emissions by 2020, without any major shifts in current policies and in a way that is cost-effective to the power sector and delivers significant savings to government and consumers.

We have chosen to orientate our submission explicitly around the issues of UK leadership on climate change and the forthcoming UK Climate Change Programme (CCP) review. Our recommendations can be summarised as thus:

1. *UK Leadership in 2005: G8 and EU*

WWF strongly advocates that the UK government use its leadership position globally to:

- Promote and seek agreement from parties to the 2°C ceiling (staying below an average global temperature rise of 2°C above pre-industrial levels) for avoiding dangerous climate change.
- Reaffirm its commitment to implementation of the Kyoto Protocol, and continue to use its influence to ensure Russia confirms its final ratification of the Protocol.
- Initiate discussions on the adoption of an international framework for climate change action post-2012, which builds on the Kyoto process, and agrees that G8 countries adopt mandatory absolute caps for the post-2012 time period.
- Engage with the larger emitters among the developing countries to assist them in decarbonising their development, and build new coalitions of Heads of State on deep emissions' reductions targets.
- Ensure that the EU conducts a thorough review of its progress towards meeting its Kyoto target.
- Ensure effective implementation and enforcement of the EU Emissions Trading Scheme (ETS), and strong National Allocation Plans (NAPs) for the second phase.
- Call for the EU to take on deep cuts in the second commitment period (ie post Kyoto).
- Lead in ensuring that international sustainable energy initiatives (eg JREC and REEEP) result in measurable commitments.
- Initiate engagement with the most vulnerable developing countries to build a broader international consensus on the scale and urgency of climate change.
- Lead the debate for redirecting agricultural subsidies and introducing stronger incentives to support biomass production.

2. *Forthcoming Review of Climate Change Programme*

In light of the forthcoming review of the UK CCP, WWF would recommend the following to the UK Government:

- A reinforcement of a robust commitment to the 20% emissions reduction target by 2010 within the CCP.
- CCP policies that correctly reflect and address the longer term aspirations of the Energy White Paper (EWP) (2003), and set interim targets for 2015 and 2020 towards achieving the 60% reductions target in 2050.
- A commitment to serious reductions in emissions from the CO₂-intensive power sector, which currently contributes over one-third of total UK greenhouse emissions.
- Set challenging limits to CO₂ emissions on electricity generators and other sectors covered by the EU ETS.
- A strong NAP for Phase 2 of the ETS based on robust and fixed projections from the start.
- Fiscal and regulatory incentives for reducing energy demand and increased energy efficiency across all sectors (including homes and other buildings), and support for energy-efficient technologies in the context of the Energy Efficiency Action Plan.
- The development of a robust Code for Sustainable Buildings (CSB), as recommended by the Sustainable Buildings Task Group, with incentives to encourage the private sector to meet the CSB.
- The introduction of fiscal and regulatory measures to encourage and incentivise large integrated power generators and suppliers to offer energy management services to consumers.
- The extension of the Renewables Obligation to 20% by 2020, in line with the level identified in the EWP, and supported by increased investment in a diversified portfolio of renewable energy technologies (including biomass, solar, wave and tidal technologies).
- Renewable energy policies that cover provision of funding for research and development of technologies, address current network/infrastructure and planning constraints that currently hinder projects' development, and allow for appropriate community consultation, accurate communications and promotion in the public arena.
- The cessation of investment in nuclear power.
- Incentives for power companies to promote Combined Heat and Power (CHP), and offer embedded generation benefits for industrial users that invest in CHP on-site.
- A government requirement that all new public buildings install CHP and all new communities meet zero carbon standards.
- The implementation of targets and policies to cut new road spending and invest substantially in public transport systems (eg bus and rail).

 INTRODUCTION

Climate change is the most serious environmental threat facing the world today. Aside from its environmental impacts, climate change has far-reaching implications for poverty eradication, development, population migration, international relations and security worldwide. As such, the UK and other countries must treat climate change as a foreign and domestic policy priority. Global warming is already having a huge impact and countries' decisions in the next five to 10 years will be crucial in avoiding long-term irreversible damage.

To avoid the worst impacts of climate change, we need to ensure that, as agreed by the UK government at the European Council conclusions of May 2003, global mean temperature is limited to a 2°C increase above pre-industrial levels, and that warming is reduced as fast as possible from that peak. To exceed such levels would have tragic implications for people, ecosystems and species—jeopardising food security (with potentially hundreds of millions more people at risk of hunger and poverty); significantly damaging or disrupting arctic ecosystems, boreal forests and mountain ecosystems; and threatening millions of species with extinction²².

To limit global warming to a 2°C peak, it is critical that all countries cut down on their emissions of greenhouse gases. This will require industrialized countries to reduce their emissions by at least 60–80% over the next few decades²³. Large emitters in the developing world also need to ensure that their emissions go down: some may need to set carbon caps, others to ensure that their carbon emissions do not grow in parallel with their economic development. The most vulnerable developing countries, from Africa to Central America, largely mountainous, arid or island states need to be brought more fully into the climate negotiations, particularly in terms of adaptation to impacts which are, in some countries, already occurring.

WWF has a strong presence in other European and G8 countries, as well as many developing countries, and has long been an important player in international climate change negotiations. WWF has been working across the UK, EU and internationally via its network to ensure commitment for keeping below this 2°C ceiling, and achieving deep cuts in emissions.

Building on these efforts, WWF will shortly be launching its first ever global climate change campaign—Powerwatch!—later this year, to lift the profile of climate change in the public arena and challenge governments and industry to make a swift and major shift away from fossil fuels consumption. Through this campaign, WWF is specifically challenging the biggest global carbon dioxide (CO₂) emitter—the power sector in developed countries—to become CO₂-free by 2050. As part of this campaign in the UK, WWF is calling upon the UK government to deliver on its targets and take serious action on the power sector and industry to cut emissions.

1. *UK Leadership in 2005: G8 and EU*

The UK Government has an unprecedented opportunity in 2005 to steer discussions and negotiations on climate change internationally, particularly as Chair of the G8 and President of the European Council, as well as in parallel processes. The Prime Minister's commitment to use the UK's position to advance international action on climate change is vitally important. It is an opportunity that, if missed, will undermine UK credibility in this area. WWF would urge the UK government to prioritise the following objectives:

1.1 COMMITMENT TO STAYING BELOW THE 2 DEGREES THRESHOLD: The UK government promotes and seeks agreement from parties to the 2°C ceiling for avoiding dangerous climate change. Countries must commit to keeping below a maximum global mean temperature increase of 2°C above pre-industrialised levels (ie not from present day), consistent with the current science and accepted thinking on thresholds and impacts.

1.2 KYOTO PROCESS: The UK reaffirms its commitment to the implementation of the Kyoto Protocol, and continues to use its influence to ensure Russia's quick ratification. The Russian government has now signed off on the ratification documents and set in train the process for ratification in the Russian parliament²⁴.

1.3 POST 2012 FRAMEWORK: The UK should initiate discussions on the adoption of an international framework for climate change action post-2012, which builds on the Kyoto process. At the very least, the UK should be pushing for a future climate change action regime that is based on:

- (a) reduction targets that will avoid a level of global warming increases exceeding 2° above pre-industrialised levels; and
 - (b) recognition that, from the outset, industrialised country targets need to be more aggressive than developing country targets.
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²² See www.metoffice.com/research/hadleycentre/obsdata/globaltemperature.html; www.ipcc.ch/pub/SYRspm.pdf

²³ Decision by the UNFCCC in Bonn in 2001 (decision 5/CP.6).

²⁴ http://www.panda.org/news_facts/newsroom/other_news/news.cfm?uNewsID=15352

For the G8 specifically, the UK must promote agreement for a multi-lateral “cap-and-trade” system for emissions globally, based on mandatory absolute caps from Annex 1 countries. Bilateral schemes will not deliver the emissions reductions required to stay within a 2-C regime. The sound low-carbon technology investment initiatives currently promoted by UK government are unlikely to realise full business and economic potential without a strong international framework to incentivise uptake of such technologies. The two are interdependent.

In terms of the EU Council specifically, the UK should promote adoption by the EU of the Climate Action Network framework as an effective long-term regime for climate change action²⁵. WWF supports this equitable “multi-track approach” which includes three elements: (a) continuation of the Kyoto process in ensuring deep cuts from industrialised countries; (b) decoupling of economic growth and emissions in developing countries (ie decarbonisation), and (c) an increase in resources for adaptation in vulnerable countries.

1.4 ENGAGE LARGE EMITTERS: Through the G8 process the UK must engage with the larger emitters among developing countries and build new coalitions of Heads of State on deep emissions’ reductions targets. These countries include China, India, South Africa and Brazil. Their involvement will be key to achieving meaningful global emissions reductions in any future climate change policy and market regimes. Discussions must focus on decarbonisation strategies as a way forward—decoupling economic growth from carbon emissions.

1.5 US APPROACH: The UK government should hold a firm position on its objectives for advancing climate change action internationally next year, whatever the outcome of the US elections in November 2004. The UK government will need to act more assertively in driving forward the agenda towards setting mandatory caps globally, and building coalitions with the aforementioned developing countries. The UK must ensure that re-entry of the US into the international climate change regime is based on US commitments to tough emissions reductions domestically.

1.6 EU TARGETS: The UK should ensure that the EU conducts a thorough review of the EU’s progress towards meeting its Kyoto target (ie “demonstrable progress”), identifying areas where more effort is needed, irrespective of whether or not the Protocol enters into force.

Effective implementation and enforcement of the EU ETS and the delivery of strong NAPs for the second phase (2008–12) is essential. The UK is in the best position to lead on this issue, since it implemented the first domestic trading scheme and has the experience and expertise to share on delivery of such systems. The UK must work with the EU towards tightening the rules governing the scheme to enable it to set far more challenging targets in the second phase of trading, and seek clarification and harmonisation of rules for consistent application across Member States.

The UK should drive discussions on increasing harmonisation of the system in terms of review processes for plans and verification procedures, in addition to the introduction of auctioning of allowances and the future inclusion of non-traded sectors (most notably transport and aviation) in the ETS for the second and subsequent phases. WWF believes that the ability of participants to source allowances from outside the EU severely undermines the integrity of the system and recommends that this be disallowed from Phase 2 onwards.

The UK must also call for the EU to take on deep cuts in the second commitment period (ie post Kyoto) and adopt a 30% emissions’ reductions target by 2020.

1.7 SUSTAINABLE ENERGY INITIATIVES: The UK must lead in developing a robust and coherent strategy to reorient global investment away from fossil fuel intensive and inefficient energy infrastructure, particularly in middle income countries. Sustainable energy initiatives—notably JREC²⁶ and REEEP²⁷, but also any initiatives aimed at implementing recommendations arising from Renewables 2004, the Extractive Industries Review and the G8 Renewables Task Force—must result in measurable commitments, be better integrated and far better resourced if they are to form the basis of a coherent and comprehensive plan to support decarbonisation in developing countries. The UK’s 2004 Spending Review must reflect this and the UK presidencies should be used as a means to secure matching funding from other developed country governments.

As part of this process, the UK should seek financial commitments through the Extractive Industries Review, countries’ Export Credit Agencies, and International Funding Institutions for supporting investment in renewable energy development and energy efficiency initiatives in developing countries.

The UK should promote a meaningful follow-up process to the Renewables 2004 Conference to ensure that technology transfer and development approaches are better coordinated and that voluntary commitments made at the Bonn conference are implemented. At present, the credibility of these programs in delivering meaningful outcomes is questionable.

²⁵ A Viable Global Framework for Preventing Dangerous Climate Change—CAN Discussion Paper, COP9 (Dec 2003)—http://www.climatenetwork.org/docs/CAN-DP_Framework.pdf

²⁶ Johannesburg Renewable Energy Coalition.

²⁷ The Renewable Energy and Energy Efficiency Partnership.

1.8 **ENGAGE MOST VULNERABLE COUNTRIES:** Any international agenda must act to reduce the vulnerability of developing countries and poorer communities where climate change impacts are already occurring or will occur soon. The UK government could play a lead role in initiating engagement with these most vulnerable developing countries—drawing attention to specific climate change impacts and developing a longer term global action framework. This development outreach could fit well as part of the climate change science conference proposed for February next year. The UK can uniquely bring to this forum the expertise on the “2°C science” and related impacts from highly reputable research institutes such as the Hadley Centre, and can articulate the scale and urgency of climate change, disseminate research on thresholds and impacts, and address adaptation needs.

1.9 **AGRICULTURAL SUBSIDIES AND INCENTIVES FOR BIOMASS:** The UK is in a good position to lead the debate for redirecting agricultural subsidies and introducing stronger incentives to support biomass production. Such initiatives could provide an important contribution to reducing international and EU dependence on fossil fuels for energy and transport, as well as reducing commodity dumping on developing countries and facilitating greater market access and economic prosperity for African and other developing farming communities.

This initiative provides natural synergies between the UK government’s Africa and climate change agendas for the G8 and a clear focus for the UK’s G8 and EU Presidencies. It could help deliver on both OECD biomass commitments and policy imperatives to assist developing countries as well as enable the UK to align multiple constituencies including the environment and development lobbies and farmers. Even in the US, environmentalists, agricultural states’ representatives and farmers’ lobbies have identified support for bioenergy as a potential “win-win” for climate and rural development.

This will coincide with the planned EU Biomass Action Plan and EU Biofuels Directive, and builds on progress already made by the UK in linking agriculture, trade and the environment in the EU. In particular, there is considerable scope under the current EU Common Agricultural Policy (CAP) reform to press for more support for a stable, environmentally sustainable biomass supply.

2. *Forthcoming Review of the CCP*

The UK government’s credibility as a global leader on climate change will be fatally undermined unless it sets an example on the homefront, and does more to tackle UK emissions through energy supply, housing and transport domestically in line with its targets.

In 1997, the Government set an overall domestic target of a 20% cut in CO₂ emissions by 2010, and a goal of 60% reductions by 2050 in the 2003 Energy White Paper (EWP). However, we are not on track to meet these targets with the CCP failing to deliver on emissions reductions, and emissions actually rising in 2003²⁸. In its audit of the CCP (February 2003), the Sustainable Development Commission stated that the UK could fall well short of its domestic goal, highlighting over-optimistic baselines and reductions projections. With only five years left to deliver, UK government needs to take urgent action. The forthcoming review of national climate change policies and their effective implementation will be critical. WWF would identify the following objectives as being of critical importance to the delivery of an effective UK CCP:

2.1 **COMMITMENT TO TARGETS:** First and foremost, the UK should reinforce a robust commitment to the 2010 20% CO₂ emission reduction target and demonstrate, in detail, how this will be achieved through each of the policies within the CCP. The CCP must also reflect, incorporate and address the longer term aspirations of the EWP and set interim targets for 2015 and 2020 towards achieving 60% reductions target in 2050. Targets must be set for the EU ETS, energy demand reduction, combined heat and power (CHP) and energy services, renewable energy, housing and transport. Reference to reductions in carbon dioxide and other greenhouse gas emissions must be clear and consistent in relation to each policy and overall targets outlined therein.

2.2 **ROLE OF TREASURY:** WWF firmly believes that the Treasury must play a key role in the development of these policies. Strategic investment and fiscal incentives will be critical to successful implementation (eg in renewable energy technologies and energy efficiency measures), and must be duly reflected and supported in the government’s budget plans and allocation.

2.3 **THE UK POWER SECTOR:** The UK power sector currently accounts for over 30% of total UK greenhouse emissions. If the UK government is serious about meeting its overall national reductions targets, the emissions from the CO₂-intensive power sector need to be drastically reduced. The UK government should set tough targets on the power sector and indicate how this should be achieved.

A forthcoming report commissioned by WWF²⁹ and conducted by ILEX provides significant evidence to suggest that with minor extensions to current policies, and by incorporating additional aspirations from the EWP, the UK power sector could cut its CO₂ emissions by 60% from 1990 levels between now and 2020. Moreover, while being easily achievable, reductions could save the government billions of pounds. Results show that reductions could be achieved:

- at low cost, and in many cases lower than the costs of continuing “business as usual”;

²⁸ See www.defra.gov.uk/news/latest/2004/emissionsstats-250304.htm

²⁹ This report will be made publicly available shortly.

- with a likely net saving of more than £1.9 billion in 2010, and £4 billion in new investment in 2020;
- with potential savings on electricity bills totalling close to £0.9 billion in 2010, and £1 billion in 2020, delivered through implementation of energy efficiency measures;
- with existing technologies as opposed to radical policy shifts; and
- without resorting to new nuclear power (and with closure of all reactors by 2020).

2.4 EMISSIONS TRADING: The UK government must set challenging limits to carbon dioxide emissions on electricity generators and other sectors covered by the EU ETS and press other European countries to take similar robust action through their NAPs for the second phase (2008–12).

Through (stringent targets, companies will be encouraged to respond to increasing carbon costs by changing their investment decisions and exploring the different options available for reducing this economic impact via uptake of cost-effective low-carbon abatement technologies.

The UK must deliver a strong NAP for Phase 2, and prevent the power sector from unnecessarily weakening the scheme as has occurred for Phase 1. WWF's research shows that the UK power sector has the capacity to reduce its emissions significantly below a "business as usual" scenario, at relatively low cost. Earlier research commissioned by WWF (again, through ILEX³⁰) indicated that the power sector can in fact deliver up to nine times the amount currently stipulated by current government projections for the first phase ie delivery of 48.2Mt CO₂ reductions compared to 5.5MtCO₂.

It is also important that the UK's Phase 2 allocations are negotiated using previously agreed and robust projections. This will avoid the situation that is occurring at present whereupon DTI have steadily revised projections upwards, leading to increasing allowances, after the Plan has already been submitted to the Commission.

2.5 ENERGY DEMAND AND EFFICIENCY: The UK government should prioritise further development and implementation of energy policies that underpin the achievement of EWP aspirations on energy demand. WWF recommends using a reduction target for energy demand of 0.2% per annum. Targets should be set in relation to overall energy demand, with further investment in the provision of appropriate information and active promotion for the uptake of energy efficient technologies.

Energy efficiency forms the cost-effective backbone of the EWP, expected to contribute 50% of reductions under the 2050 scenario. Indeed, WWF's research shows that implementing energy efficiency measures would represent a net saving rather than a cost during the next six to 16 years. Under one scenario, for example, a reduction in UK energy demand could produce a net saving of £4.2 billion from reduced investment in new plant in 2020, if the EWP's aspirations regarding electricity demand are met. Generation costs could also be up to around 8% lower than "business as usual".

However, while measures to reduce electricity demand, as outlined in the EWP, are potentially extremely cost effective, they will be rendered meaningless unless the government ensures that the current obstacles to energy efficiency and demand are overcome. Developing proper incentives for increased energy efficiency across all sectors (including homes), and for supporting energy-efficient technologies in the context of the Energy Efficiency Action Plan, can significantly help deliver this goal, but the government also needs to set a target in relation to overall demand.

Through its One Million Sustainable Homes (OMSH) campaign, WWF is lobbying for better building standards and a range of incentives in energy efficiency to facilitate the development of sustainable homes.

As per the recommendations of the Sustainable Buildings Task Group, WWF is calling on government to develop a robust Code for Sustainable Buildings (CSB) with minimum standards for energy efficiency. The minimum entry level to the CSB should be equivalent to the BREEAM/EcoHomes "Very Good" standard. Compliance with the CSB should be a requirement for all publicly procured buildings. The government should also introduce incentives to encourage the private sector to meet the CSB such as preferential treatment in the planning process and fiscal incentives such as rebates in stamp duty. Stamp duty rebates should also be offered to home buyers who carry out energy efficiency improvements within a certain period after moving in.

Over the longer term, the government should require all new communities to meet zero carbon standards.

2.6 DELIVERY OF ENERGY SERVICES: There must be provision in the Programme to encourage large integrated power generators and suppliers to increase their efforts to develop energy services. The government should introduce fiscal and regulatory measures to incentivise suppliers to offer energy management services (eg that result in discount schemes for residential customers who cut their energy use by a certain percentage)³¹. By becoming energy service providers rather than suppliers of units of energy, power companies would ensure that business and private households had electricity at a lower cost without forfeiting comfort and lifestyle. Given that the general trend for energy policy is to increase the cost of emissions, power companies will gain by gearing up for a radically new business environment.

³⁰ The WWF-ILEX note can be made available, upon request (from WWF).

³¹ See California's 20/20 Rebate Program (<http://savepower.lbl.gov>)

2.7 RENEWABLE ENERGY: The Renewables Obligation should be extended to 20% by 2020, in line with the level identified in the EWP. This should be supported by increased investment in a diversified portfolio of renewable energy technologies, including biomass, solar, wave and tidal technologies. Our research shows that extension of the Renewables Obligations to 20% (combined with energy efficiency aspirations) with almost exclusive regard to onshore and offshore wind will be sufficient to more than halve power sector emissions by 2020. But if we are looking beyond this date—to the 60% emissions' reductions target set by the government—we need to diversify the UK's sources of energy further. This has additional multiple benefits in terms of security of supply, rural development and reduction of system costs.

Provision of funding of research and development of technologies cannot alone boost market uptake of renewable energy in the UK. WWF strongly urges the government to make a formal commitment to addressing current network/infrastructure and planning constraints that currently hinder development and are major reasons for our shortfall on current renewables targets. Appropriate community consultation is also essential. Lack of public understanding, misleading information and inaccurate negative press have proven prohibitive for project uptake.

The government should also lead by example in relation to consumer take-up of green electricity to drive demand in the market place, and set a favourable procurement policy in place for all public agencies to source a set percentage (eg 10%) of their electricity from renewable sources.

2.8 NUCLEAR: The government should not commit to any new investment in nuclear power. Our research shows that it is possible to achieve our desired emissions' reductions without resorting to nuclear energy. Instead, concerns about security of supply can be easily addressed by diversifying our fuel sources, investing in a wide variety of renewable sources and, above all, reducing our energy consumption.

2.9 COMBINED HEAT AND POWER: The government is grossly falling short of its target of 10GW of CHP capacity by 2010. The reasons why the UK is not in line with this target need to be addressed with further action taken to increase capacity.

For example, the government should provide incentives for power companies to promote CHP and provide embedded generation benefits for industrial users that invest in CHP on-site (eg rebates or funding). The government must insist that all new public buildings install CHP and renewable energy generation.

2.10 TRANSPORT: Effective transport policies and targets are crucial. Based on DTI projections, transport emissions, if left unchecked and unabated, are likely to surpass power sector emissions in 2015, and as early as 2005 if the emissions' reductions potential from WWF's research is fully realised. Policies to cut new road spending and invest substantially in public transport systems (eg bus and rail) must be explored and implemented.

The increased spending and expansion of airports as envisaged by the Aviation White Paper must be revised and amended in line with national climate change targets so that the forecast rise in passenger demand is constrained. Onsite airport vehicle fuel and aviation fuel taxes should be introduced, rather than the perverse tax free status the industry enjoys at present.

8 October 2004

Witnesses: Mr Andrew Lee, Director of Campaigns, and Ms Caterina Cardoso, Climate Change Programme Leader, World Wildlife Fund, examined.

Chairman: I am sorry you are tail-end Charlie on a rather late running day. For that I apologise. We will do our best to get through as many of the points that you kindly raised in your written evidence as we can and to that extent on behalf of the World Wildlife Fund may I welcome Mr Andrew Lee, the director of campaigns, and Caterina Cardoso, the climate change programme leader. Mr Hall is going to commence our questioning.

Q267 Patrick Hall: I see that your brief emphasises that one of your tasks was to try and maintain biodiversity, etc. in the world and protect habitats. Clearly climate change is a threat to the world biodiversity, especially the long-term effects of climate change, but surely we have already got climate change locked into the system which is happening right now so there are immediate and short-term effects. Looking through your evidence, I think it is fair to say that the emphasis is on dealing with the long-term effects of climate change. I have

not seen anything in there which suggests that we should be doing things immediately. What I would like to know from you is how much your organisation thinks we should be doing now to adapt to existing climate change and would that effort divert resources from dealing with the long-term effects, which is where clearly your emphasis seems to lie?

Ms Cardoso: Both these need to be tackled because unfortunately climate change in parts has already occurred and there is nothing we can do about that. It has already occurred and low-lying nations, biodiverse regions such as the Arctic, for example, really need that we develop adaptation strategies and that is the way our organisation goes and the way we think the Government should go as well. However, any efforts towards adaptation should not distract attention from long-term mitigation. We do not gain much by adapting if we do not do something to mitigate as well because, for example, if we go above two degrees adaptation would not be useful any more. So we actually have to deal with the

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climate change which has already occurred. That is just a fact of life. But we have to avoid the worst dramatic impact that would occur with more than two degrees.

Q268 Patrick Hall: Yes, but you can see that from the political point of view and maybe the public's point of view the evidence of changes already occurring can have a tremendous impact, such as flooding, a greater incidence and intensity of flooding, as we have had in this country recently. So if there was political pressure to invest heavily in trying to prevent flooding, adapting to existing climate change, does that not risk preventing us from looking at the long-term threats? How would you seek to overcome that if you accept that premise?

Mr Lee: I think there is a difference between fiddling while Rome burns and actually raising the very real issues of what kinds of impacts are going to occur. A recent report we were looking at in WWF suggests that two billion people who rely on water from the Himalayan glaciers could be at risk in terms of their water supply in the future with this two degree scenario. That work does need to be done. There needs to be work done both on mitigation of the impacts that will happen anyway, but perhaps more importantly to mobilise those issues through the heads of those governments to apply pressure back on the emitting countries, whether those are the developed countries, Europe and the US, or China, for example, and actually bring home the real impacts as well as looking at some of the short-term measures which will have to be done anyway if some of those people are not going to suffer. It is a slightly different issue to, "Do we put more money into Boscastle?"

Q269 Patrick Hall: I think we have got to get to a position where people see the relevance of both and I do not think people in Carlisle would see a flood protection scheme now as fiddling whilst Rome was burning. What we have to do, surely, is to try and ensure that such investment is capable of dealing with more incidents and greater incidents in the future. My concern was that perhaps your emphasis being only on the long-term, certainly in this evidence, you are not assisting in getting the measures that are needed now linked in if this construction, for example, is capable of dealing with the effects of longer term climate change rather than just the short-term.

Mr Lee: Just to be clear, WWF is doing both and we are looking in the UK at how rivers and the coast could be managed by working with natural processes to adapt to climate change rather than just use a concrete solution, which still protects the residents of Carlisle, incidentally. But also globally we are looking at our entire programme of investment now to see whether we are investing money in places which are going in any case to be irrevocably changed by climate change. So we are conscious of trying to keep our balance, if you like.

Q270 Mr Mitchell: Why do you think Government is not even reaching our domestic targets?

Mr Lee: Well, I would sum it up really by saying three things, some of which has been mentioned here today. One is about political will. We think it is not so much knowing what to do as actually the political will to do it. That is compounded by departmental muddle. It is about the interface between different Government departments that has come up today, but also I think sitting behind all of it are what I would describe as the bogus fears about competitiveness which are being put against really very solid climate science. I think this myth needs to be exposed.

Q271 Mr Mitchell: It is a cost and a burden, is it not?

Mr Lee: Well, there is no evidence in the long-term. If you look at the work of people like Adair Turner now and other very well respected people, I would have to say where is the economic case that has been put anywhere effectively that taking the sorts of actions we need to take to tackle climate change will damage the economy?

Q272 Mr Mitchell: But that assumes that everybody else is doing it. The economic case for not doing it is that there is a burden now.

Mr Lee: Yes, and that is where you get into the importance of the EU leadership and the global leadership so that countries are moving together exactly so you do not get that competitiveness.

Q273 Mr Mitchell: The countries will not move together, will they?

Ms Cardoso: I would like to add something to that in relation to competitiveness. As far as the powersector is concerned, for example, the competitiveness issue is not applicable. The power sector in the UK does not suffer. It does not have to compete with the power sector in the rest of Europe, so that is not an issue. The fact is that in the National Allocation Plan and the Emissions Trading Scheme the power sector could have delivered considerably more than what it did. The targets were very much weakened due to pressure from the power sector and they do not have a problem of competitiveness. So that is something which we are still trying to figure out why it happened.

Q274 Mr Mitchell: You said it was political will. Political will derives from the electorate, otherwise governments are scared of doing things either because it imposes costs on people or duties, or because it does not feel the public is sufficiently concerned. That is a chicken and egg situation, of course, but it could be that the public has heard so much about it, then doubts have been cast by others on the need and then people are not convinced. A delay until the public can be either convinced or the situation becomes irrelevant might be advisable. Can you convince the public to accept a burden which a middle-class consumer, a middle-class household, a middle-class market might well feel is entirely appropriate? This is extending it far wider than that.

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Mr Lee: I think this is where I would bring the issue back. You were mentioning earlier, Chairman, loft insulation. If you say to people, “Are you prepared to make big sacrifices and potentially lose jobs to tackle climate change?” that is a very different question to saying, “Would you like to have somebody come into your house and work out how we can fix it so that it uses less energy, you save money and it’s better for the planet?” Very few people are going to say no to that. That is what we are talking about. When we talk about energy services, which is the jargon word, that is what we are practically talking about for me living in a terraced house in Hampshire and I think there is a great danger—you talked about over-complicating—of actually over-dramatising the level of change. This point about step-wise change year on year, a lot of these things are common sense and a lot of them save money. We are convinced in WWF that a lot of them provide opportunities for innovation and for new business. What they do not do is ensure that everybody who is currently a player will necessarily be a player in the future, that is the difference, because we are talking about transforming a market, maybe new companies coming in, maybe existing companies changing their portfolio of what they do away from energy supply to services. I think a lot more needs to be done to present what a low carbon lifestyle would look like, what it would feel like, so people can understand what we are really talking about.

Q275 Alan Simpson: Can I just pursue that, Chairman? Back to your terrace. Does it not mean that the nature of the energy market, the nature of the changes that they face is that the people who knock on your door have to come from companies that are not saying, “Look, sign up with us and we’ll give you 10% less, or 12% less, whatever it is,” but instead are saying to you, “Sign up with us on a five year service contract and we will supply you with the energy, insulation and conservation measures and energy saving equipment, fridges, whatever, such that we will make money out of your non-consumption of energy”? Is that not the trick that we have to find?

Mr Lee: This is what we looked at with this ILEX report, which Caterina could talk more about, which looks at exactly what the power sector could do.

Q276 Chairman: Would you like to develop that point, because I want to ask you about the power sector. But if there is more that you think they could do, please tell us.

Ms Cardoso: Yes, there is quite more that they could do. The whole thing, for example, about energy services is, as you say, there would be an argument. Another thing they would do, for example, is convince the Government to set the policies which make the gains from energy efficiency more visible. For example, at the moment if somebody actually invests in energy efficiency in their house such as insulation they reap the benefits but when they try to sell the house they gain nothing with that. But, for example, if actually that was something that was

incorporated in the value of the house—and Government policies can do that—it would be completely different. Again, for example, in terms of rental accommodation if the landlord does something to improve the efficiency of the house the house is more comfortable but he cannot really charge a higher rental because of that. So there is a huge problem in terms of information. People do not know what they are gaining and they are not policies that actually make those gains more visible and more up front. You gain after five years. How do we actually make those gains appear straight away at the first capital investment?

Q277 Chairman: Let me just follow that up because some people in the street I live in installed some solar panels. They were then told by the local authority to take them down because they did not fit in with the fact that it was in a conservation zone. But the real question which occurred to me was, why on earth did they invest in them when their timescale of payback might take 10 years and that at the domestic level is a real problem because a lot of the investment you might make in low energy equipment you will never get your money back in terms of lower energy usage before you move house. How should we tackle that issue?

Ms Cardoso: It depends. One way will be, for example, capital grants, the same thing they are doing for the commercial sector, to actually have it for the domestic centre as well. That would be a possibility, that it could be discounted through other means. That would be one way of tackling that issue. I guess still the main thing is about the information because there are certain areas in which people will live, for example, for longer than five years. I would say it takes at most two years to actually reap the benefit of insulation and other boiler insulation, etc.

Chairman: Insulation, yes, but the more expensive investment, no. Mr Mitchell wants to come in.

Mr Mitchell: Well, no, I want to put a question to the Chairman. Did they take it down?

Chairman: Yes. Unfortunately, they had to take it down.

Q278 Mr Mitchell: I have got another question. What Alan says is, I think, very interesting because we talk about changing markets and I think that is the aim. Rather than changing individual aims and objects, psychology or whatever, persuading people, you change markets by subsidy, by finance, by intervention. What Alan is suggesting, I think, is a five year deal with the customer that they will invest in measures in that house which will reduce his consumption and that will be an arrangement. You also need some degree of subsidy or support for things like solar panels so that what you say does not happen, that people installing them actually take a loss. There is no incentive to a long-term investment because the market will not support it. We have to change the whole financing really rather than the psychology.

Ms Cardoso: I would say that we have to change both. We need to change the finance. For example, at the moment packages in terms of financing these

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kinds of things are extremely difficult to get. There is also a matter of psychology. But at the end of the day I think the easiest way of going through this is really through the Emissions Trading Scheme because this gives the incentive to companies to begin to change the way they look at energy. This is what Friends of the Earth were saying before. At the moment they are very much trying to sell as much energy units as they possibly can. The moment that there are incentives that will change the market. The incentives actually say, "Well, for each energy unit that you sell you are actually going to incur a cost unless you produce it through renewable energy." They are going to change the whole way they look at the market and that is going to be the trigger. I think, going through the households is quite complicated in a way, whereas we have five or six major power companies in the UK. If we can change them by giving them the right incentives by putting a price to carbon, I think that is perfectly possible.

Q279 Chairman: Let us just pick up on this because I am a bit confused about this power company argument. On the one hand you said earlier as far as the Climate Change Levy was concerned it had been mitigated by representations from power companies. On the other hand, not all that long ago London Underground was plastered by notices about "London Electricity if you want to buy green energy." They were making a virtue out of selling you the electricity more expensively, although it is a homogenous commodity. So on the one hand they are trying very hard to sort of wave the green banner and wrap themselves in an environmental wrapper, saying, "We're responsible," and yet you are telling us they are being irresponsible by the lobbying they are doing. From the nuclear point of view, they have nothing to lose. They would love the whole country to increase the investment in nuclear power because it is CO₂-free and we could take a trick straight away. The gas people must have felt relatively virtuous because they are part of the dash for gas and reduction in CO₂. So that leaves us with the real problem, which is the coal-fired power stations. You say in your evidence that there could be very significant contributions to CO₂ reductions from the energy sector, so would you like to develop the argument, wrapping in the question of green credentials? Which bit could make the biggest reductions and how should they do it?

Ms Cardoso: Which power sector companies could do the biggest reduction?

Q280 Chairman: If you want to do it company by company, fine, or if you want to do it sector by sector, fine, but tell me who has got to do what and how.

Ms Cardoso: Well, the first step again I think would be for the Government to set the right framework because there are many companies who actually would like to become greener but they do not have the right framework from the Government. So both in terms of allocations of remissions—

Q281 Chairman: Hang on, I am talking about the power generating sector.

Ms Cardoso: Yes, I am talking about the power generating sector as well, and that is what the power companies have been telling us as well, that they do not have the certainty that the Government is going to pursue a system of incentives for green energy. So I think that would be the starting point. Then basically once that system of incentives is in place the power companies have a number of options on how to reduce their emissions. One of them is to close coal. There is no reason to continue having coal. They can switch to gas. I think the medium-term solution is to switch to gas. A second one is actually to increase renewables and for that again we do need a good framework from the Government. The Government should extend the Renewables Obligation to 20% by 2020. That would give a much more secure investment framework for companies. The final thing is actually to start addressing all the various energy services, which we have discussed before.

Q282 Chairman: Why do you say no to nuclear?

Mr Lee: Well, for a number of reasons. Firstly, because we think there is absolutely no evidence whatsoever that it is economically viable, and those words come from the Secretary of State for the DTI, not from WWF.

Q283 Chairman: Do you believe everything the Secretary of State for DTI says?

Mr Lee: No, but I think on this, if she is taking the competitiveness argument—

Q284 Chairman: You are selective in your belief, are you? After having slated Government for poor coordination and knowledge in the area, you are now according the Secretary of State probity on nuclear, are you?

Mr Lee: Well, even the DTI is saying there is no economic case for nuclear, let us put it that way. The second point is we have not solved the waste problem. The third point is that it is not needed. The point of the work we did with this report is to say, "Actually, it is not too late to get on with this, with sufficient will and with a sufficiently clear framework for businesses. The trouble is, I think at the moment the power companies and the Government are looking at each other to see who will blink first and each, to some extent, is saying to the other, "You act." "No, you do it. It's your fault. You need to give us a clear signal," and the Government is saying, "No, you need to do more." So I think in the climate change review the Government needs to break that deadlock by saying, No, this is what needs to happen. This is the regulatory framework, these are the incentives. It is now going to be profitable for you to invest in the sorts of things that Caterina mentioned. We do not think nuclear needs to be part of the solution.

Ms Cardoso: I would like to add something to that. It is not just DTI but most studies which actually look at energy see that nuclear energy is not economically very viable. They usually do need quite

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a few subsidies to go ahead. In terms of alternatives, where to invest the money, one can invest, for example, in energy efficiency measures and that would be much, much cheaper.

Q285 Chairman: Have the French got it wrong?

Ms Cardoso: It seems so.

Q286 Chairman: But they have got 70% invested in nuclear power in terms of their generation—

Ms Cardoso: And they are heavily subsidised. It is the French taxpayers who pay.

Q287 Chairman: But they are not producing any CO₂ from it, are they?

Ms Cardoso: They are producing other kinds of dangers and economically you can—by increasing energy efficiency measures, by reducing energy demand, I think, for example, if there was a target to reduce energy demand, if there was, for example, 0.2% reduction in energy demand per year, which corresponds with what the Energy White Paper has been saying on energy efficiency, that would be much more cost-effective in reducing CO₂ emissions than giving subsidies to the nuclear industry and incurring all the other problems that occur with that.

Q288 Chairman: My final point. If it is so straightforwardly expressed as you have said, just 0.2% reduction—

Ms Cardoso: That is our interpretation or their target—not ours exactly, ILEX's interpretation.

Q289 Chairman: Okay. So it is well supported and well documented. Why do you think the Government are not leaping towards that achievement of that straightforward objective given the problems they are facing in having to row back on their own target?

Ms Cardoso: It is a very good question. I personally would think that one of the reasons is that there is not a strong lobby behind it. When it comes, for example, to the power sector there is a very precise group of industry who actually want to lobby for something. When it comes to energy efficiency, the benefit of energy efficiency, they are spread all across society. So you will not have basically all the UK population lobbying for that. They are not concentrated, the benefits, they are spread out. So that is why I think it is so important. All right, we commissioned the report to ILEX, which was reviewed by most major players in the power sector. It actually says if we can actually meet the 20% target with no nuclear energy and at a much lower cost, then business as usual. But what happens? Those costs are spread out, so who is going to be lobbying for that? That is one of the problems.

Mr Lazarowicz: You mentioned earlier on the UK's position in the leadership of both the G8 and the EU later this year and the Prime Minister has said that climate change is a major priority in both those two presidencies. What would you put as a kind of headline of things that the Government should be doing to make use of its presidency period in both these organisations? Obviously engaging the US is

undoubtedly one of the priorities, but could you tell us what would be the best things the Government could do to make use of that opportunity?

Q290 Chairman: Can I just presume on Mr Lazarowicz's question by just raising a point which came at the last sentence of paragraph 1.5 of your evidence, where you say, "The UK must ensure that re-entry of the US into the international climate change regime is based on US commitments to tough emissions reductions domestically." Does that dilute Kyoto, and if we achieve that objective, to follow Mr Lazarowicz's point, how is the United States going to engage in this when they have rejected Kyoto?

Ms Cardoso: I think there is an important difference between what the federal government says and what is happening at the levels of the different states. The state of California, New York and New England, they are all seriously considering to actually have caps on their emissions. They are also considering a cap and trade system. So we would think that an important way, and a very useful way, of engaging with the US would be through the states, for example exploring ways of how we can link potential cap and trade systems in these states together with the European system. That would be a way. Much of the policy in the States, from what I understand, much of it actually comes from the states. It is very bottom-up on many issues. So foreign policy would be top-down but issues, for example like this one, which actually comes down to what the local people do, is very much bottom-up and it is much stronger. I think there is much more potential for achieving a cut-down in emissions in the US if one goes via the different states. So that would be my first suggestion as far as the US is concerned. As far as the most important achievement of the G8, I think it comes out of commitment from different countries that we do not go above the 2° centigrade increase in temperature. That is absolutely key. There are many countries which support this view, so it is a matter of bringing it together and making it public.

Q291 Mr Lazarowicz: What the people have said to us today and all the other evidence we have received is very convincing and we as a Committee are most likely to be convinced and we will, no doubt, be doing our best to convince our colleagues and we will have a very strong report and very strong recommendations at the end of our process, but the issue which I suppose always concentrates the mind is that to achieve real change does not just require the governments of the world to act, it requires above all a worldwide public movement effectively and you do what you can as NGOs to bring it about and obviously governments try to do what they can as governments. What can Parliament do to actually help encourage the kind of worldwide pressure for change, which is really the only way you are going to bring on board governments?

Mr Lee: I will have a crack at it. This is a huge issue, of course. In the UK there is a fledgling organisation called the Climate Movement being set up by all the major environmental NGOs in response to the issue

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that this is such a massive thing we have to deal with that no one organisation can do it. The model there is to build a coalition more like perhaps the Jubilee 2000, the drop the debt sort of model, which involves church groups, trades unions, business, a very disparate network. Part of the thinking behind setting up the climate movement is that it could become a trigger for similar movements in other countries. There was a discussion about whether it should be set up as a global organisation and the feeling was that that is too much to bite off in one go. Let us see if we can get more of a movement here. But the other part of my answer to your question would be, going back to this thing about what does it look like, what does a low carbon lifestyle look like and why would people be interested in it, there are some very symbolic and very important decisions about to be taken by the Government. The Sustainable Community summit, which is going to happen before the end of January, is a critical opportunity for the Government to say in advance of the publication of the climate change review that every new home built in these new communities in the south-east will come up to the higher standards in terms of actually not just energy efficiency but a whole range of other things. That does a lot of things. It does not just impact upon the people who go into those homes, it also sends a very powerful signal to the market, it also creates volume just in terms of the number of houses built to those standards with the kind of kit that you were talking about earlier, so it brings the production cost down, and the idea of a sustainable building code (which is what is being vigorously debated right now to go into that summit) is that that would then set a benchmark across the construction industry. Okay, that only deals with new houses and you have then all the issues of refurbishment, but those sorts of things could be used much more actively, I think, as a way of promoting "This is what it means to you as a citizen. These are the sorts of choices." Then I think you would find more people supporting it and saying, "That's a good idea," and there is clear evidence from the construction sector that there is a market demand for this sort of property and that people are actually prepared to pay more for it. We think that the very small extra build cost, which would be very tiny if there was the volume, could easily be covered by things like a green mortgage at a preferential rate, looking at council tax levels, and so on; in other words to take out the front-loaded cost and give customers the benefits over the years. I think there is the public movement, climate movement end and there is what the Government could be doing now with issues like housing.

Q292 Mr Lazarowicz: That is helpful. If I could turn very briefly to a separate aspect of the issue and just ask you to say a little bit more about why, with regard to the EU Emissions Trading Scheme, you are unhappy at the idea of sourcing emissions from outside the EU. Should international emissions trading be encouraged? You have heard the evidence

from Our World that it is actually needed to bring developing countries on board the worldwide Emissions Trading Scheme?

Ms Cardoso: We are definitely extremely supportive of an international trading regime, very supportive of that. We are lobbying for that and the Kyoto Protocol actually sets already the basis for that. With regard to this particular issue about sourcing emissions reductions from outside the EU, the reason why we oppose that is because for an emissions reduction to actually have some value as a reduction it has to be a reduction in addition to business as usual or less than business as usual. For example, if we are sourcing it in countries where they do not have targets it is extremely difficult to actually make sure that that reduction is a real reduction or whether it is just a reduction that would have happened anyway by accident, in which case it has no value. So that is the main reason why we oppose that. The second reason is that our objective is very much to reduce emissions at home, to set the example for the rest of the world of how one can reduce emissions without that having a negative impact on the economy, in fact it can even have the contrary. So we are very supportive of an international trading regime. There are countries outside the EU which are interested as well, such as Japan and China, and we think those options should be pursued.

Q293 Mr Mitchell: What sort of cost are you talking about? Is it a small extra cost? The Government wants to build these houses in the south-east for £60,000, which the Institute of Chartered Surveyors says would not build a cigar box! Can you put a figure on the amount of extra cost involved in being energy efficiency for new buildings?

Mr Lee: The best figure we have is that if you take the highest quality housing in terms of the environment like the BedZed development in London you are talking about 2% on the build cost and that is without the volume. That is partly because quite a lot of the technology is expensive because it is still not in the big market and we think that is not a big percentage.

Q294 Chairman: Can I just conclude by turning now to the role of agriculture and particularly the use of biofuels. There seems to me to be a paradox in this country. That is that Defra on the one hand are very enthusiastic. They tell us about the benefits. The Chancellor, on the other hand, makes a reduction in duty for biodiesel and bioethanol, but as far as the use of indigenous raw materials from UK agriculture is concerned, to the best of my knowledge nobody has built a plant. The Secretary of State, upon being probed about this problem, says: "If we are more generous this will encourage imports of biofuels, but on the other hand if we meet our obligations under the EU directive for blended fuels, if we do not have a biofuels plant it will be imported." This paradox appears to be irresolvable. What is your practical advice about what should

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happen? Should we first of all have a UK biofuels industry? Secondly, what do you think we need to do to get one actually underway?

Ms Cardoso: WWF is supportive of biomass but it is also supportive of the way the market works. So I think, for example in the context of the CAP reform there should be more support for biomass. Whether, on giving those supports, the UK farmers decide to go ahead with it I would say is a different question. I think what is very important is that the options are explored, the pros and cons are explored and that there is a diversion of subsidies from excess of food to biomass. That would be our view on that point.

Mr Lee: In terms of the dilemma you have just described, it is curious that that point of view is being put for biofuels, that imports are the problem, we should have our own industry. That argument is happening. Whereas for wind energy, for example, the argument put by the DTI—I am sorry to mention them again—is exactly the opposite, “Oh, well, it doesn’t matter if we just import all the technology.” What we and I think actually all the NGOs have said is, “Look, there is a huge market opportunity here for the UK to be a leader in the world on some of these things.” So personally, yes, I think biofuels, biomass is a part, probably a small part in the UK, of the solution but certainly part of the mix. It has other benefits, rural development benefits, benefits for land managers, and we should be trying to get a slice of the action, if you like, in that case. It would probably have much bigger benefits in other countries, of course.

Q295 Chairman: Do you think as a principle it is important to tackle these issues on as many fronts as possible? I come back to the point I made to our previous witnesses that if you look at what gives the best value for money for the expenditure of the public pound in CO₂ savings it is loft insulation and biofuels suddenly comes right at the bottom of the spectrum, which is where I personally suspect the Treasury are camped by saying, “We have a limited amount of money to spend in this area so let’s put it

where we get the biggest bang for the buck,” which is a rational economic judgment. But what it means is that you close down not just biofuels but many other options if you are looking to put public money into trying to stimulate the types of development that we have been talking about. So do you consider it important that you fight on as many fronts as you can or should you just concentrate all your resources, coming back to your observations about the power sector, for example, on where you are going to get potentially the biggest hit?

Mr Lee: Well, I think we have outlined where we think some of the big hits are now. I think this does relate back to the climate programme review and the lack of a clear long-term vision. What scale of climate change are we trying to avoid? What degree of real reduction in emissions do we want and what does that look like in terms of the energy future, because going back to your point about nuclear earlier, is our vision in the future of highly centralised energy production and lots of imports or is it of more decentralised production in combined heat and power, using biofuels, and actually there needs to be some thought about what that looks like, how it all fits together, because then there is some kind of direction. Then in the shorter term I think it is possible to make some really quite clear economic decisions about if we put the investment here it will bring this technology nearer to market. But as part of an overall view—and this is part of the problem, I think, with the debate about wind at the moment in the UK—it has been hugely polarised because it is sort of, “Wind farms will do nothing.” Well, wind is an important part of the mix, but it is only part of it and by not talking to people about what the whole thing looks like all the attention is focused on the wind debate. So a clearer plan, I think.

Chairman: Thank you very much indeed. Your answers have been very clear, and thank you for your very interesting written evidence. If there is anything else you feel you wanted to respond to in writing following these exchanges, please do not hesitate to let us know and thank you very much for coming.

Wednesday 23 February 2005

Members present:

Mr Michael Jack, in the Chair

Ms Candy Atherton	Mr David Lepper
Mr Colin Breed	Joan Ruddock
Mr David Drew	Alan Simpson
Patrick Hall	David Taylor
Mr Mark Lazarowicz	Paddy Tipping

Memorandum submitted by the Energy Saving Trust (U17)

1. This is the response of the Energy Saving Trust (EST) to the Environment, Food and Rural Affairs Committee's inquiry into Climate Change initiated in June 2004. This response should not be taken as representing the views of individual Trust members.

2. EST was established as part of the Government's action plan in response to the 1992 Earth Summit in Rio de Janeiro, which addressed worldwide concerns on sustainable development issues. We are the UK's leading organisation working through partnerships towards the sustainable and efficient use of energy by households, communities and the road transport sector.

3. EST welcomes the Committee's inquiry into Climate Change and the opportunity to submit evidence. Please note that our response is not intended to be a comprehensive overview of all policies necessary to deliver the Government's climate change targets. Rather, it provides a broad overview of key policies. As one of the key delivery agents for the Government's Climate Change Programme EST will be undertaking a significant amount of work over the coming months to feed into and inform the Government's review of the UK Climate Change Programme. This work will inform our final view of the full suite of policies required to deliver government targets in this area.

4. Against this background our response focuses on:

- Developing fiscal measures for homes and transport.
- The Energy Efficiency Commitment post 2005.
- Increasing consumer demand for sustainable energy—the role of Sustainable Energy Networks.
- Encouraging low Carbon transport.

DEVELOPING FISCAL MEASURES FOR HOMES AND TRANSPORT

Domestic Energy Efficiency

5. EST believes that Government must signal further fiscal measures to encourage consumers to save energy. Such action will be necessary to keep government on track to deliver its climate change targets. This view was supported recently by the House of Commons Environmental Audit Committee who recently reported that Treasury are "failing to exploit opportunities for more imaginative policy initiatives" and will need to explore "the scope for introducing further policy measures to promote both renewable energy and energy efficiency".¹

6. Such policy measures should include measures to encourage consumers to take a "whole house" approach to energy efficiency. A whole house approach to energy efficiency is one that encourages homeowners and landlords to consider the energy efficiency of their property as a whole. Such measures are needed to stimulate action on the more hidden energy efficiency measures—especially cavity wall and solid wall insulation. As energy audits for home movers become obligatory in 2006 with the introduction of the Home Condition Report in England and Wales, we believe this would enable Government to introduce stamp duty incentives on energy efficiency work carried out by a home mover. We believe this is the single most important fiscal change needed. In addition, and to incentivise householders not moving home, we favour a tax incentive, as is available in France and other EU countries. We also recommend allowing private landlords to offset energy efficiency work against their tax return and to benefit from capital allowances, which would benefit the landlord as well as the tenant (the home energy user).

¹ *Budget 2004 and Energy*, Environmental Audit Committee, August 2004 (http://www.parliament.uk/parliamentary_committees/environmental_audit_committee/eac11_08_04.cfm)

7. Over the course of this year (2004–05) EST is undertaking further research into whole house fiscal measures for home energy efficiency. This work will fully determine the likely impacts of the measures outlined above, and explore whether other measures may be as, or more effective in encouraging consumers to take a “whole house” approach to energy efficiency. This project is due to report during the first quarter of 2005. We would be happy to send copies of our final report to the Committee.

8. In addition, the Trust would like to see the longer-term consideration of links between Winter Fuel Payments and energy efficiency to help the elderly make their homes warmer.

9. Fiscal measures also have a key role to play in tackling the barriers to the purchase of defined products. The 6th VAT Directive places constraints on reducing the rate of VAT for the purchase of energy efficiency products. However no such constraints exist for our proposed inefficiency charges for high energy consuming household appliances. Kitchen appliances are, thanks to the Energy Efficiency Commitment (EEC), now comparable in retail price across all efficiency levels (A–G) so those on low incomes are still buying inefficient appliances without realising that they will have higher running costs for the following 10 years or so. By imposing a 10% product charge on appliances rated D and below, consumers will be clearly directed to efficient products which will be cheaper and will reduce the ongoing costs of the poorest in society. Introducing inefficiency charges would rapidly transform the appliance market such that only A–C products would be available on the shelves. This would have a very positive effect; reducing CO₂ emissions by 23,000tC/yr, saving households a total of £13 million/yr² on their fuel bills, and immediately increasing HMT revenue by £60 million per year (although this would rapidly decline as manufacturers change their product lines).

10. As well as inefficiency charges for inefficient appliances EST would also like to see them for inefficient lighting. The imposition a 50p inefficiency charge on tungsten GLS light bulbs would help to redress the relative price premium between CFLs and conventional bulbs³ and also help to stimulate consumer interest in CFLs. We calculate that an inefficiency charge would result in carbon savings of 42,000 tC/yr⁴, and increase HMT revenue by £80 million per year.

11. Ideally EST would like to see inefficiency charges matched by a VAT reduction on some A rated products. These proposals have received some encouragement from government. However, as noted above, the 6th VAT directive places constraints on the government’s ability to introduce such inefficiency charges. If government can progress this issue in future negotiations EST would like to see 5% VAT offered on:

- The most efficient products in their class (A+ and A++ for cold appliances) to incentivise continuous progress on improving the energy efficiency of new products and introduce the most efficient products to the UK, that are not currently marketed here,
- CFL light bulbs to encourage market transformation,
- DIY energy efficiency materials to allow householders to buy loft insulation at the same VAT rate as when the insulation is laid by an installer.

FISCAL MEASURES

Transport

12. Changes to Company Car Tax seem to be effective in reducing emissions. However, VED differentiation is not providing sufficient incentives to purchase lower-carbon cars. The maximum VED is currently £160 per annum for a Band D diesel car with emissions of 185 g/km. This is only £95 more than the rate payable for a Honda Insight. Around 60% of cars registered for sale in the UK fall into Band D—offering limited incentives for consumers who wish to buy an Executive or Large Family car.

13. Recent research by MORI for DfT indicated that a differential between bands of £150 would persuade 55% of consumers to change to a lower emission car. EST has recently commissioned research to evaluate the impact of VED in altering the UK vehicles fleet. The report will be available in October and we would be happy to share this with the Committee.

14. A more radical approach—discussed for a long time, but never implemented—is a feebate system of subsidies for purchase of low emission vehicles matched by charges on high emitting vehicles. In principle we would expect this to be effective, as we know that financial instruments applied to upfront costs have greater impact on consumer behaviour than taxes on running costs (eg fuel duty). There are obvious political and administrative concerns, but we believe it would be helpful if HMT could stimulate debate on this sort of issue.

² These Carbon and financial savings would result from consumers shifting from purchasing C-G rated appliances to A rated appliances.

³ Standard tungsten GLS bulbs retail at between 20p and 60p per bulb, while the average high street price for a CFL is approximately £5.

⁴ Carbon savings resulting from 50p inefficiency charge and reduction in VAT to 5%.

15. The cost of motoring is also an important issue. Motoring costs are 4.8% lower in real terms now than in 1997, whereas bus travel is 8.2% more expensive and rail travel 3% more expensive.⁵ Motoring costs are forecast to fall further in real terms this decade: improvements in vehicle fuel efficiency and no real terms increases in fuel duty will result in “an average reduction in motoring costs per car kilometre across the car fleet as a whole of some 20% in real terms between 2000 and 2010”.⁶

16. Friends of the Earth has calculated that keeping motoring costs constant through gradual increases in fuel tax could raise between £16.7 and £30.2 billion this decade⁷. Also, increased fuel prices provide a vital incentive for the auto sector to manufacture more efficient vehicles with lower carbon emissions.

The Energy Efficiency Commitment post 2005

17. The Energy Efficiency Commitment is the major policy for saving energy and carbon emissions from households and as such plays a key role in delivering government’s climate change targets. We are confident that EEC2 (2005–08) will prove to be as successful in transforming markets for energy efficient products as EEC1, and will continue to prove its cost-effectiveness and good value for money for customers. We believe that in 2007 the case for increasing the activity of EEC3 will be made. EST hopes that EEC3 will roughly triple the activity level of EEC1. It is only by installing the energy efficiency measures in homes that the UK as a whole can achieve the necessary carbon and energy savings from this sector.

18. Our response to the recent consultation on the Energy Efficiency Commitment can be found at [www.est.co.uk/aboutest/resources/consultations]. Key points from this document are outlined in the proceeding paragraphs.

19. Overall EST would like to see higher carbon savings in EEC2 from the increased level of activity, and believe that consideration should be given to reviewing the savings in markets that are subject to rapid change. This would primarily affect appliances, where the market transformation that has been achieved in many product areas, due in no small part to EEC, has had the effect that the baseline appliances (against which savings are judged) have changed considerably. The implication of this is that the expected energy (and carbon and financial) savings being achieved in the latter part of the EEC phase are considerably smaller than those achieved at the beginning, or when the ex ante savings were set.

20. We also recommend that, in order to increase the level of carbon saved per measure the balance of non-priority group should be increased. If the proportion of the priority group in EEC more closely reflects the proportion of benefit recipients in the community (40%) the carbon savings from EEC would be greater than currently envisaged.

21. There are increasing numbers of A+ fridges and fridge freezers coming on the retail shelves and we have now reached 91 different models which achieve this standard. We therefore believe that there should be a differentiation between A rated and A+ and above rated cold appliances. We would recommend that Defra should use EEC2 as an opportunity to effect a transformation in the cold appliance market towards the most efficient products (A+/A++) by applying an uplift factor to these products. This would mirror the success of EEC1 in transforming the appliance market towards A.

23. Currently there are some anomalies in the way the EEC and Warm Front schemes interact, and we believe there are unnecessary barriers between these programmes becoming more integrated in delivery.

24. Firstly it appears to be unnecessary to limit the Warm Front managing agents’ use of resources which they have been paid for by the suppliers: if a supplier pays the managing agents to install insulation measures in homes then the managing agent can only use this to invest in insulation and is not allowed to use it to fund heating systems which might be needed to bring a household out of fuel poverty. This appears to be an administrative rule that is not serving the householder well.

25. EST would also like to see increased use of HEED—the Home Energy Efficiency Database—to facilitate improved targeting of installations or scheme integration. HEED holds property specific data collected from both the scheme managing agents and the energy suppliers. It is therefore a valuable information resource that could be used proactively especially with regard to ensuring Warm Front eligible households receive further measures. By strengthening the reporting requirements on energy suppliers and the Warm Front managing agents we will be able to develop HEED into a really useful resource to all delivery agents.

⁵ Data from House of Commons Written Answer, 17 March 2004

⁶ Department for Transport, Local Government & the Regions (2000) “Transport 2010—the Background Analysis”.

⁷ Friends of the Earth (2002) “Paying for Rail”.

Sustainable Energy Networks

26. While regulation will be a key part of the necessary policy mix, it cannot do everything. There needs to be consumer demand. To do this we must engage people as citizens as well as consumers.

27. In recognition of this EST will, in early 2005 pilot the concept of a Sustainable Energy Network (SEN) in a number of parts of the UK. The aim of the network will be to engage consumers on the main actions they can take to address climate change. It will provide information, advice and support for action locally, and will cover both homes and road vehicles.

28. The SEN will enable us to work far more effectively with the English regions. It will act as a delivery mechanism for consumer facing aspects of regional energy strategies. Regional delivery will allow delivery mechanisms that are consistent with regional goals, whilst retaining the ability to share cost effective best practice across a national network.

29. Delivery also needs to be local. Local authorities have a key role to play in this, in three ways, as an exemplar using energy sustainably, as local “regulator” and as a community leader. But there are functions that some local authorities may not be well placed to deliver: disseminating information on consumer products, providing energy advice and delivering consumer campaigns. There is no conflict between a larger role for local authorities and the work we propose for the SEN. Indeed increased local government involvement in providing community leadership would be a key objective for the SEN.

30. We do not intend to start from scratch, but rather to build upon the existing infrastructure provided by the network of Energy Efficiency Advice Centres (EEACs). We do not seek to replace existing activity, but rather to augment it and make it more easily accessible. The most significant differences between the EEAC network and the SEN are:

- The SEN will provide increased resources, providing significantly higher activity by the network.
- The SEN will provide a stronger local management capable of dealing effectively with matters on the regional level or with local authorities, as appropriate, to deliver real results against the targets set.
- The SEN will go beyond advice and awareness to ensure tangible action is taken.
- The SEN will cover all areas of sustainable energy (energy efficiency, renewable energy and transport), whereas the EEAC network delivers activity relating to energy efficiency.

Low Carbon Transport

31. EST’s TransportEnergy programmes are currently under review by DfT. Existing programmes were largely designed to provide grant to support to specific technologies. Going forward we do not believe this is appropriate. We are arguing for programmes designed to support the introduction of advanced low carbon vehicles, probably via two programmes—the New Vehicle Technology Fund to support demonstration vehicles and a new Low Carbon Vehicle Programme to provide early market grant support for exceptional performing vehicles, eg hybrids. Full details of our views on the future of our Transport Energy programmes will be available in our response to the DfT’s consultation “consultation on the Transport Energy clean vehicle grant programmes”. This is due to be submitted in late October and we would be happy to make our response available to the Committee.

32. Signposting consumers to the cleanest vehicles also plays an important role. For basic consumer information a good car label is essential. There will be no EU agreement in the short term, so EST has been pursuing a UK voluntary approach through the car working group of the Low Carbon Vehicle Partnership. This has now been successful, so subject to agreement of the full LCVP this should be operational in 2006. The agreement in the LowCVP car working group was for a label based on current VED bands, and in a colour-coded A-F format (similar to white goods label).

33. EST would support a Renewable Fuels Obligation for biofuels, since this could guarantee a modest carbon reduction from road transport—we estimate the saving could be between 0.5 million and 1 million tonnes of carbon, depending on the lifecycle saving of the biofuel and the percentage blend applied. However to get these carbon savings it is crucial that the biofuels included in the Obligation are properly and independently accredited, as life-cycle carbon benefits depend greatly on the agricultural processes applied and use of waste products used in production. It is also vital to ensure that any biofuels be imported to the UK under an Obligation do not cause other environmental problems, such as deforestation, as a result of their production.

34. At a European level the current EU voluntary agreement requires EU-wide new car average emissions to fall to 140 g/km in 2008–09. Current trends indicate that this is improving vehicle efficiency, but not sufficiently quickly. So the target is unlikely to be delivered in the UK. However, it is a key policy instrument that needs to be maintained, extended and reinforced.

35. UK Government is supporting extension past 2008, eg for a target of 120 g/km in 2012. We agree this needs to be at EU level. However, given the only partial success of a voluntary approach, the option of mandatory approach needs to be pursued. The traditional objections to regulation could be overcome to

some extent by the use of a tradable permit system. This could be linked to either the EU ETS or (more likely) to a future “white certificate” system for the other non-ETS sectors. The EU should be pushed to extend the same approach to other light vehicles (vans).

1 October 2004

Witnesses: **Mr Nick Eyre**, Director of Strategy, and **Mr Brian Samuel**, Head of Policy Research, Energy Saving Trust, examined.

Chairman: Ladies and gentlemen, can I bring the Committee to order and welcome our first set of witnesses from the Energy Saving Trust: Mr Nick Eyre, their Director of Strategy and Mr Brian Samuel, their Head of Policy Research. Gentlemen, you are both very welcome and thank you very much for the written evidence which you were able to send. May I again apologise for the fact that our earlier efforts to have some dialogue on this subject were curtailed. Thank you for your patience and forbearance in coming back. You can see that as a result of what happened we have got a fantastic turnout of talent and interest on this occasion.

Paddy Tipping: That is on the other side of the table!

Chairman: That is true. You are more than generous to those who are coming to visit us, Paddy. If David Drew would be kind enough to start our questioning.

Q296 Mr Drew: Nick and Brian, it is good to see you here. Can I just ask a gentle introductory question because I have been very impressed with my energy efficiency advice centre, they are always keeping ministers informed of things but do they go beyond people like MPs and councillors? To what extent are they able to engage with the general public to get the general public to understand that energy efficiency matters?

Mr Eyre: Quite a lot is the easy answer. I will let Brian give you the details.

Mr Samuel: I think the energy efficiency centres have been very successful. Typically they have around 750,000 enquiries a year by the telephone and have a further 250,000 hits on the web site on an annual basis. Over the years the 52 energy efficiency advice centres have handled 3.7 million customer enquiries so we believe they do serve the market very well and there is a desire for the market to interface with the centres themselves.

Q297 Mr Drew: If you had more money what would you do?

Mr Samuel: If we had more money we would look to widen the scope of the services available from the existing infrastructure taking that forward through a Sustainable Energy Network. Basically we would look to engage with consumers not only on energy efficiency but also on embedded renewables and transport issues as well. Transport in particular is very much a consumer issue given the level of emissions in the UK from transport.

Q298 Mr Drew: What would be the budget for an average energy efficiency advice centre? Are we talking tens of thousands or hundreds of thousands?

Mr Eyre: I have not got the detailed figures with me but I am sure we could provide those.⁸

Q299 Mr Drew: It would be quite interesting to see those.

Mr Eyre: It is of the order of £100,000 annually. That is our contribution. Currently all the advice centres get contributions from other sources, frequently from local authorities but also from other sources. So we are getting more of a bang for Defra’s buck in that way.

Q300 Mr Drew: There is some confusion between the role you pursue and the Sustainable Energy Network. Could you define for the benefit of those who are uninitiated in these differential organisations what the differences between yourselves are besides having different names?

Mr Eyre: The Sustainable Energy Network is an idea that came out of the Energy White Paper, and I have to say we were involved in getting it into the Energy White Paper. The concept is, as Brian says, we would like to scale up the activities of the energy advice centres to do more and to contact more people because although we think it is good that they contact three-quarters of a million people a year that is still a small minority of the population. What we would see is the centres distributed across the UK providing a local service which would be managed by the Energy Saving Trust, by ourselves centrally, and we would provide the corresponding services that are naturally provided centrally such as web sites and some hotline facilities and literature support because you need a national back up to that sort of local service.

Q301 Mr Drew: Can I be absolutely clear. Are we saying that the Sustainable Energy Network is looking at macro issues? It is trying to persuade the general public that they could do more and this would be having an impact on global warming. The energy efficiency advice centres on the other hand are dealing with the nitty-gritty of “if you wanted to make your house more energy efficient these are the sorts of things you should do, and there are some grants available to do this work”?

Mr Eyre: We are talking about scaling the advice centres up into a Sustainable Energy Network. We are talking about something bigger and better.

⁸ *Note by Witness:* The average EST contribution to an Energy Efficiency Advice Centre in 2003–04 was in the order of £130,000.

23 February 2005 Mr Nick Eyre and Mr Brian Samuel

Q302 Mr Drew: This is a directional thing?

Mr Eyre: But you are right, that part of the problem is that consumers in their homes and their cars are responsible for about half the UK CO₂ emissions so what is often thought of as an industrial/business problem is not entirely that and we do need to engage people, whether it is as consumers or citizens, if we are going to make a real dent in the problem.

Q303 Chairman: How do you measure your success? If people come and ask advice in these energy efficiency centres do you do any follow-up work to see if they have taken up the advice and done anything about the information given?

Mr Samuel: Yes we do try and report on the level of energy savings made based upon the advice. Obviously it is difficult to get an accurate figure. Currently over the life of the energy efficiency advice centres 1996–97 to 2003–04 we have saved some 62 terawatt hours approximately. Obviously there is a band of sensitivities around that. This equates to 4.5 million tonnes of carbon on a lifetime savings basis. That is the actual length of time the measure would last for. That has been achieved at a cost of around £7.8 per tonne of carbon.

Q304 Chairman: Of the issues raised by the public, what does it tell you about the policy initiatives to deal with energy saving in the areas that people ask about?

Mr Eyre: It tells us that people often know some of what they need to do. They have a sense that insulation, heating systems, lights are important and are in some way related to the problem and often that they know roughly what to do, but they may not know where to go and they certainly do not know who to trust. I think the issue of trust is quite a big one. We know that the energy suppliers in their own energy efficiency programmes often feel that consumers do not trust them. We know that consumers in general do not trust builders and do not trust many heating installers so there is a breakdown of trust between the consumer and the people who are best-placed to deliver some energy efficiency programmes and we have to work hard to overcome that.

Q305 Mr Lazarowicz: On the question of getting the message over to the public, we understand that you have recently launched a new campaign to promote energy efficiency in the home. Can you tell us a bit more about that campaign and what form it will take?

Mr Samuel: Basically that campaign is in support of the Energy Efficiency Commitment under which the energy suppliers are obliged to deliver energy efficiency savings. It is seeking to raise the level of awareness of the activities of the energy suppliers.

Mr Eyre: I think it ties back to the point I was just making that we have found and others have found, including Government, that many consumers are not quite sure why energy suppliers should be offering them deals to reduce their energy because it is counter-intuitive. It needs to be made clear that in a sense Government has made this happen and

Government is expecting the energy suppliers to do that and it is not a con; there are some very good deals out there. You can get efficient light bulbs cheap, you can get your house insulated for far less than the real cost of doing it, and people should do those things. That is the simple message from the campaign.

Mr Samuel: The costs of providing measures such as cavity wall insulation are a lot lower than the general public perceive them to be. With the Energy Efficiency Commitment they are even lower still.

Q306 Mr Lazarowicz: I can certainly see the merit of what you are doing. I think most of us probably have the experience where every single jumble sale you go to there is a large number of low energy light bulbs being sold by somebody who does not know what to do with them. Can I just be clear is the campaign directed very much at this energy commitment from the suppliers or is it part of a wider campaign?

Mr Eyre: This specific campaign over the next month or so is particularly geared towards the Energy Efficiency Commitment. We were given an additional £3 million this year by Defra specifically for this purpose. The reason for the timing of course is that the scale of the Energy Efficiency Commitment is going to be doubled from 1 April so there will be more good offers and it is all the more important, given the centrality of the Energy Efficiency Commitment to carbon saving targets in the household sector, that people do understand what is going on and why.

Q307 Mr Lazarowicz: Is it going to be linked into any other informational activity by the energy suppliers because £3 million is not a great deal of money in contrast to the other advertising outlets provided by the energy suppliers, surely?

Mr Samuel: We would certainly like to see the energy suppliers develop innovative products to reach the market through energy services, packages, et cetera. Certainly there are opportunities to do that and we would like to see them take advantage of that. The targets for the second Energy Efficiency Commitment are higher and therefore more will need to be done and energy suppliers will need to reach the market in more efficient and more effective ways so we would like to think that that would happen.

Mr Eyre: Just to put the scale in context, we expect the suppliers between them will have to spend £400 million a year to deliver the Energy Efficiency Commitment at the scale that is expected from next April so I would be surprised if they did not do quite a lot more marketing than we are doing with £3 million but the point of our marketing is that it is not from a commercial brand and therefore can be seen to be unbiased information in a way that clearly information from a commercial company cannot be.

Q308 Mr Lazarowicz: I know one of my colleagues will be returning to the future of the commitment later on, so if I could turn at this stage to another area of concern and that is the encouragement of loft and cavity wall insulation and general purchase of

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energy efficiency products. One of the problems that seems to affect the take-up by the public of these opportunities is the long pay-back period. People do not see the benefit in financial terms up-front so they hesitate sometimes to invest in the products. What are your plans to address these concerns about the long pay-back periods for domestic consumers of energy efficient products and devices?

Mr Eyre: I think it is the point Brian made earlier which is there is a difference between the perception (which you clearly have as well as other consumers) that the pay-back for these is long. With an Energy Efficiency Commitment deal on cavity wall insulation a customer can get it for perhaps £100 or £150. That pays back in two years so it is a lot more sensible than putting your money in a building society. The difficulty is convincing people of that and getting them to act. It is not the actual pay-back period that is the problem. They give a pay-back that any business person would consider an extremely attractive deal.

Q309 Mr Lazarowicz: Can the energy suppliers not do more here? Maybe they should pay for the installation and then recoup the savings in the bills that would otherwise have been charged over that period?

Mr Eyre: That is essentially what an energy services deal is and changes to the detailed regulation, the so-called 28-day rule, last year will make it easier for them to do that. So I think we do expect the big energy suppliers to come forward with more offers of that type, and some of them are beginning to do that.

Mr Lazarowicz: Thank you.

Q310 Joan Ruddock: I just wanted to ask if I am correct in thinking there is probably no plan to advertise any of this on television? Am I right?

Mr Eyre: No, you are wrong.

Q311 Joan Ruddock: Fantastic.

Mr Eyre: The campaign we have got on the Energy Efficiency Commitment will have some television advertising. It certainly will not be restricted to that. It will have local radio and press as well.

Q312 Joan Ruddock: I would make the point that your point about the lack of trust between consumers and utility companies is just so true. When I get the big mailings from them I say, "What are they up to now? Why are they trying to take more money off me?" Getting the message over that this is in the national interest, that the Government is requiring the companies to do this and it is for your benefit would be a really powerful and important thing to do, it seems to me, and I hope you have had an input into this that that is the television message that we need to get across if this campaign is going to work.

Mr Eyre: I will just urge you to watch more television then!

Joan Ruddock: I cannot; I just want to ensure it is there.

Q313 Chairman: I am intrigued by the fact that in the Energy White Paper it says insulating around 4.5 million cavity walls from this year to 2010 would save 1.2 million tonnes of carbon. How are we doing against that target at this moment in time? How many cavity walls have been insulated?

Mr Samuel: About six million have been insulated.

Q314 Chairman: Out of how many?

Mr Samuel: Out of a potential of 17.5 million. There are just about two million where it is unknown if they have got cavity wall insulation or not and there are some nine million potentially in there to insulate. The problem is getting customers to take those steps. Obviously campaigns such as the Energy Efficiency Commitment should help tackle that market. There is certainly far greater potential than that outlined in the White Paper.

Mr Eyre: Can I just add I think the easy answer to your question, Chairman, is that we are not doing very well on cavity wall insulation. The current market size is about 300,000 a year and if you do a quick bit of arithmetic that is not going to give you anything like 4.5 million additional by 2010 so whereas in some other areas of energy efficiency, particularly white goods, there are some very good stories to tell about changes in the market, this is a tough one because it is invisible and it is difficult to get people excited about.

Q315 Chairman: In the White Paper it says "illustrate where savings might be achieved". Is that language right? Should it not be savings that "must" be achieved?

Mr Samuel: We would like to think that that language will be used in future.

Q316 Alan Simpson: Nick, I am not at all unhappy with what you are doing but I was troubled by some of your comments when you said you were confident that EEC2 will prove to be as successful in transforming markets for energy efficient products as EEC1. My experience of this is that people say to me, "There are only so many low energy light bulbs you can eat." The industry has gone for the cheapest, least demanding areas to be seen to be active. The ODPM says that only 16% of our existing housing stock in Britain meets SAT rating 65. We are not going to meet our 2010 commitments to reduce domestic carbon emissions by 20%. How do we count that as a success?

Mr Eyre: As I said, we can count as a success markets like washing machines where we have gone from 5% of A-rated product to 80% in just a few years and a similar story in fridges and freezers.

Q317 Chairman: Can I interrupt you just a moment? Is that models on offer as opposed to models in use?

Mr Eyre: That is new sales figures that I am quoting here. Clearly that takes time to work through the stock. I am not sure I agree with you on light bulbs. There are something like 500 million lights in use in homes in the UK and from memory only about 30 million of those are low energy light bulbs so there are quite a lot more light bulbs that people can

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use saving money and saving carbon at the same time. I take your point that on the fabric of buildings that is where the progress has been slowest and most difficult because those are markets where a lot of the investments are discretionary. People have to buy a fridge, they then have a choice whether they buy a good fridge or a bad fridge and we have now on the whole got them to buy good fridges. For cavity wall insulation people just do not have to do it so most of them do not do it.

Q318 Alan Simpson: How far, when you peel the surface away on this, do the figures that you quote reflect a purchasing pattern that rewards those with purchasing power and in which the poor are still purchasing, fuel efficiently, poor products? We have been having this from the energy industry. They say, "It is not us; it is the consumers; they do not buy the products." You ask them why they do not buy them and in a short space of time they will admit it is because people who are fuel poor are also poor, so they are in trap that no amount of advertising is going to get them out of. How can we say that is a success?

Mr Eyre: I think that is why market transformation is important because when virtually every product in the shops is A-rated and then in a few years' time virtually every product on the second-hand market will be A-rated then people on low incomes are going to have high-quality appliances as well as people on high incomes. I think in general the initial niche markets for the most efficient equipment will be taken up by people on high incomes, but those products are working through to people on low incomes. Again for building fabric you are in a different position and that is where the Government and devolved administrations' fuel poverty programmes are absolutely crucial in getting good heating systems and getting insulation into the homes of people on low incomes.

Q319 Alan Simpson: All I am trying to say to you is if we are to look for success criteria for EEC2, surely we have to go beyond an assumption that the poor have to wait until energy-efficient products turn up in second-hand markets, and the only way we are going to do that is to build both targets and obligations into the delivery part of EEC2 rather than waiting for consumer power to reach the poor?

Mr Eyre: 50% of EEC2 activity will by law have to be for people on benefits and those people in general are getting free offers from the energy suppliers, so whilst it is primarily a carbon saving programme and it is in general more expensive for suppliers to save carbon for people on low incomes because they cannot make a contribution, I think the Government has taken note of that and ensured that a fair share of EEC activity will go to people on low incomes.

Q320 David Taylor: Next year will see the introduction of home information packs and part of that will be home condition reports with obligatory energy audits, which allows at least in principle for fiscal incentives via stamp duty to those who have

invested in energy efficiency measures. Six weeks ago a Bill was introduced in the Commons which would have introduced such fiscal incentives. It seems to be an open and shut case but do you see any problems? What are the problems, what are the barriers to such a measure being incorporated into legislation?

Mr Samuel: I think there is one main, obvious barrier and that is in the report actually being carried out to the required standard. Obviously that requires you to have people who are capable of carrying out those surveys. After that it is actually getting people to take up the opportunities that will then exist through reduced stamp duty. Of course stamp duty only applies to the 1.2 million homes per annum that are sold so therefore other mechanisms, perhaps incentives through reductions in council tax, might also be required for those non-movers. The other point of course concerns those houses that are below the stamp duty threshold of £60,000 (or £150,000 in the most deprived areas) so some form of grant scheme would actually be required to address those particular segments. These could be funded by increases in stamp duty for homes above the £250,000 bracket so it would be revenue neutral. Although that is quoted as a barrier we believe it can be readily overcome.

Q321 David Taylor: Your report is admirably concise and pretty comprehensive. The section on fiscal measures has got eight particular suggestions but you identify establishing incentives as the single most important fiscal change needed. Could you just back that up with some figures on the sort of savings there might be and the costs that there might be as part of the incentive?

Mr Samuel: I think the level of savings will depend on the level and type of measures that are implemented. If you use the most basic cavity wall insulation and loft insulation you are perhaps looking at 0.2 million tonnes of carbon per annum. That should provide savings of around about £58–£60 million and at a cost of £190 million per annum. If you then went further and looked at better heating controls then perhaps you are looking at 0.25 million tonnes of carbon with savings of around about £70 million and at costs of around about £220 million.

Q322 David Taylor: You would tell the Treasury this is revenue neutral because you would be increasing stamp duty further up the range. I presume that you are aware of how controversial stamp duty has become. Do you think this is politically tenable?

Mr Eyre: I think we would leave it to people who have to face elections to decide whether—

Q323 Ms Atherton: Thanks a bundle!

Mr Eyre:—whether stamp duty should go up as a disincentive to energy inefficiency or down as an incentive to energy efficiency. What is clear to us is that there needs to be an incentive. All we are saying is that you can make that revenue neutral if you want. It is clearly a political decision how to do that.

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Q324 Ms Atherton: You mention that council tax could be used as an incentive to encourage energy efficiency for those who are not moving. If I were lucky enough to live, say, in the South of France what incentives might I find in France or other European countries to encourage me to make that investment?

Mr Samuel: France has implemented a different system whereby in return for energy efficiency investments in property you would then get a rebate on your income tax. In the case of the UK where there are 4.5 million people who fill in tax returns, the majority obviously through pay-as-you-earn, it would perhaps over-complicate tax forms as well for a number of people. So the French system has definitely got merits and is proving successful there but whether it can be readily applied to the UK, and if so would it be any better than stamp duty and council tax rebates, I would question.

Q325 Chairman: How many houses are bought and sold each year out of the total proportion of the housing stock?

Mr Samuel: It is about 1.2 million, 7% I think.

Q326 Chairman: So you have only got 7% that could be the subject of your fiscal incentive and 93% remain untouched?

Mr Samuel: Yes but it is each year so obviously over time it does increase. From our perspective it is probably better to tackle those 1.2 million houses, bearing in mind there are only 300,000 houses at the moment getting cavity wall insulation.

Q327 Chairman: And that number is of the built stock, not new houses?

Mr Samuel: It is of the built stock.

Chairman: Right, okay.

Q328 Mr Lepper: Can we turn to transport? 22% of the UK's CO₂ emissions are attributable to transport, 95% of that attributable to road transport. We were quite concerned to hear that schemes like Powershift, Clean-up and New Vehicle Technology schemes were being cut this year. The Secretary of State for Environment, Food and Rural Affairs assured us at our last meeting⁹ that although they might be about to be abolished they were going to be replaced by better schemes and so far as she was aware there would be no cuts in the finances available for these replacement schemes. Can you tell us a bit more because I know with the Department for Transport you are involved in those schemes. Could you tell us a bit more about why Powershift, Clean-up and the rest are going and what is going to replace them?

Mr Eyre: I think we can say that the reason is that the Department for Transport, having taken legal advice, was concerned that two of the schemes—Powershift and Clean-up which are grant programmes—might not comply with the European Union's state aids rules and therefore took the decision to close those as from the end of this

financial year. We were already discussing improvements to those programmes with the Department for Transport so we are now working with them to allow the Government to put revised schemes which would be designed to be state aids compatible to the European Commission as quickly as possible. I think to say they have been cut whilst it may be accurate perhaps it could be a little misleading. Certainly the DfT has not indicated that it wishes to reduce our budget for these sorts of programmes for next year and we are hopeful of getting schemes up and running as quickly as we can, but of course that does mean getting the necessary state aids approval.

Q329 Mr Lepper: That does suggest that there is going to be a gap between the ending of those schemes which do not meet the state aids criteria and their replacements; is that true?

Mr Eyre: That is correct, yes.

Mr Samuel: Yes and the length of that gap would depend on the time it takes to achieve state aids approval.

Q330 Mr Lepper: Could you give us any indication, any guess at how long that gap might be?

Mr Eyre: I think we are talking months rather than weeks. I would happily attempt to be more specific but I would simply be wrong so—

Q331 Mr Lepper: It has been suggested to us that these changes came as a surprise to some people involved, for instance in the road freight industry and other stakeholders. Is that a justifiable criticism? You have suggested some discussions going on over a period of time but others have suggested to us that it came as a bit of a shock.

Mr Eyre: I suspect that the hiatus did come as a shock because the Department for Transport, for fairly obvious reasons, had not gone around saying to the industry, "We are taking state aids legal advice on whether these schemes are legal." That is not the sort of thing you would expect a government department to do.

Q332 Mr Lepper: Did the state aids issue apply to all of those schemes which are ending and/or being replaced because again a point the Secretary of State made to us is—and perhaps she did not dwell so much on the state aids issue although she did mention that—there was also a shift from an emphasis on air quality to climate change in the nature of what the replacement schemes were attempting to do.

Mr Eyre: The intention is that the replacement schemes should be more clearly focused. The Clean-up scheme will continue to focus on air quality. The Powershift programme will be replaced by a low-carbon programme which you will not be surprised to hear focuses more on climate change. So the attempt is to be very clear about the objectives of different programmes.

⁹ Wednesday 9 February 2005

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Q333 Mr Lepper: Do you feel from the point of view of the Trust that there is sufficient liaison between Defra, the Department for Transport, the DTI and the Treasury on these important issues?

Mr Eyre: I think the strict answer to your question is, yes, I think there is sufficient liaison through the Sustainable Energy Policy Network and through other meetings of officials and doubtless of ministers as well. I suspect the issue may be one more of priority given to climate change in some departments.

Q334 Paddy Tipping: Such as?

Mr Eyre: I think Defra and DTI in drawing up the Energy White Paper have clearly given a very high priority to climate change.

Q335 Paddy Tipping: The Department for Transport?

Mr Eyre: There are some other departments, of which you have named one, which perhaps (understandably) do not give such high priority to climate change because they have other burning issues.

Q336 Paddy Tipping: The oil companies you mean?

Mr Eyre: No, I think it is to do with the extent to which they see climate change as central to their objectives as a department. I think perhaps we need to push the message harder that because the use of energy and climate change cuts across the whole of the economy and indeed all human activity then it needs to be a central objective for every government department and that should include the Treasury on taxation, it should include the DFT on transport, and it should include ODPM on housing.

Q337 Chairman: Is there a word that is missing from your answer to the question where you said there is enough liaison but is it, question mark, effective because if you disaggregate the gains that have been made by the “dash for gas” just about every other sector in terms of emissions output (and transport probably being the worst example, particularly re aviation) has been steadily increasing over the time when we are supposed to be reducing in overall terms our greenhouse gas emissions? Secondly, climate change judging by the Prime Minister’s prioritisation and this is supposed to be at the heart of government. Some of the evidence we have received has suggested that it has not quite reached the heart yet.

Mr Eyre: I would agree that the reality is that some government departments are perhaps slower to change than some of us would wish. That is because they have got other understandable priorities. I really do not think it is liaison; I think it is political priority.

Q338 Mr Lepper: Have you noticed any discernable shift in those attitudes as we approach the UK’s Presidency of the G8 with the Prime Minister’s stated emphasis on the importance of climate change

as one of the themes of that Presidency? Has that filtered down into every department of government from your perception of it?

Mr Samuel: If I can just refer to a different department, the Department for Education and Skills, we believe that informing future generations is a key aspect in order to reduce climate change emissions. We have a very small schools programme at the moment that only addresses 250 schools but we have noticed more engagement from DfES in relation to developing a Framework for Sustainable Energy. Previously the priorities of that department have been different but it is moving towards addressing these types of issues. I think the thing is the pace of some departments is naturally slower than others because of other issues at the moment. We would like to see sustainable development and sustainable energy efficiency/carbon reduction being much more deeply embedded in the future.

Q339 Mr Lepper: Perhaps the Prime Minister needs to be doing a bit more to communicate across departments the importance for him and for all of us of these issues over the next year?

Mr Samuel: I would say that applies equally to the regions and local authorities as well.

Q340 Mr Lepper: Could I ask about one particular tool in all of this and one in which I as a non-driver have no direct interest and that is vehicle excise duty. I believe the Trust has argued that the differentiation in vehicle excise duty does not provide sufficient incentives to purchase lower carbon cars. You point out that the difference between band D and others is only £95. What would be a sufficient incentive to encourage the purchasing of lower carbon cars?

Mr Samuel: If I could clarify the fact there are six bands. The top two bands for the lowest emission cars only cover 3% of new vehicles. The highest band, band D, covers 27% so as well as increasing the differential between bands we would certainly welcome at least one further band to penalise the more inefficient vehicles. The actual differentials themselves need to be sufficient to encourage consumers to take action and at the moment the bands A and AA have the greatest differential of £30. That is where the highest level of switch is actually shown to be. So therefore as a minimum we would expect something around £30 to be appropriate, increasing over time. However, we would welcome the lowest emission cars being further incentivised, perhaps through some “feebate” mechanism whereby they receive a financial incentive for purchasing vehicles with low carbon emission levels whereas those right at the top end actually are taxed far heavier than currently.

Q341 Alan Simpson: I just wanted to come back on the point you were making, Chairman, about liaison and beyond and the point David made about the leadership issue. You mentioned the work going on in the Department for Education and Skills. Do you regard them as a high carbon emitter department and, if not, would you say that there is a caricature that has some merit in it which is that those

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departments that produce the least carbon emissions and have the duty to clean up take climate change seriously and those that are responsible for the greatest carbon emissions are the ones for whom the message still has yet to sink home?

Mr Eyre: I think it is clear there is a tension on an issue like school energy efficiency about which department is responsible for it. Is it the energy efficiency department or is it the schools department? I think we would argue it should be both.

Q342 Chairman: Can I just bring this session to a close whilst we just focus on transport. All of the discussion on fiscal measures has been aimed at the consumer, either the fuel or the vehicle. What work, if any, has been done on fiscal incentives to the manufacturer to produce technically more advanced systems that would deliver reduced greenhouse gas output than is at present the case?

Mr Samuel: At the moment you have a voluntary agreement at the European level which has not achieved as great a result as perhaps we would have liked and that is to set a level across a company's portfolio of vehicles to achieve 140 grams CO₂/kilometre. At the moment that, as I mentioned, has not proved as successful. Whether you want to then take that voluntary agreement and make it

mandatory is something that we think needs careful consideration. The European Commission's target of 120 grams CO₂/kilometre by 2010, as the Commission admits, is not going to be achieved.

Q343 Chairman: With respect, Mr Samuel, you have not answered the question which I put. The question was about whether in fact we should be using a carrot as opposed to a stick, ie some fiscal incentives to manufacturers to improve the energy efficiency of vehicles and whether any work had been done on such instruments?

Mr Eyre: I think the direct answer to that question, Chairman, is that we have not done any work along those lines and I am not aware of work by other people. Of course we do provide incentives through Powershift for lower carbon vehicles to the consumer and through the New Vehicle Technology Fund we provide some support for demonstration of low carbon vehicles but as an organisation we do not have any specialism in R&D so I do not think we are particularly well qualified to answer that question.

Q344 Chairman: You have done very well with all the other questions we have asked you so thank you very much indeed. Thank you again for the written submission and for your contribution to our inquiry.

Mr Eyre: Thank you, Chairman.

Memorandum submitted by the Local Government Association (LGA) (U13)

1. The Energy White Paper states that local authorities have a "pivotal" role to deliver the step-change needed to reach the long-term target of 60% CO₂ reduction by 2050. Local authorities have an essential role in helping to deliver national targets as they are uniquely placed to not only turn national policy into reality but to have a direct interface with the public through the services they provide. Through their influence on transport, planning and housing, local government actions have social, economic and environmental impacts and also hold a great potential to help deliver the step-change that both national policy and international emission reduction targets require. Local Authorities are increasingly recognising the value of managing their own energy use to help reduce running costs and to help protect their communities from the impacts of climate change.

2. The LGA has a programme of work dedicated to sustainable energy and climate change as a result of a partnership with the Energy Saving Trust, as a priority project within the LGA Business Plan. The LGA works actively with its networks on climate change issues comprising of both local authority officers and councillors. It is clear that the current "pockets of excellence" where local authorities are addressing the climate change agenda in spite of the barriers to local action and perpetual pilot projects need to be rolled out to deliver the step change that international climate change policy requires but to do this, local authorities are dependent on a corresponding supporting national framework within which they can work most effectively.

3. Currently, there are barriers to local action at a national level which constitute a real threat to any future widespread progress. Comprehensive progress will never be achieved at local level until Government acknowledges these very real barriers to local action and ensures that they are properly addressed so that local authorities are enabled to fulfil their potential. Energy White Paper aspirations reaching from 2010–50 will remain nothing but aspirations if government does not address the number of national policies that are needed in order for the UK to keep on track in reducing CO₂ emissions as well as strong messages that the UK government should communicate as Chair of the G8 and as President of the European Council in 2005.

4. Summary of main points:

In terms of national policies required to ensure the UK reduces greenhouse gas emissions:

- **Planning and Building regulations:** The government needs to set a clear, robust set of regulations which ensures that the technology available is adopted across the board in order to achieve deep

cuts in energy use. As building standards require a step-change to reach the highest standards for maximum reduction of CO₂ emissions the government also needs to address the problem of skills shortages and inadequate training.

- **Measurement and monitoring of progress against national policies:** there is a need for independent monitoring of the level of penetration of national programmes, and supporting evidence such as energy consumption data in the local authority's area, to inform subsequent policy decisions.
- **Increased introduction of financial incentives:** there needs to be a much greater use of environmental taxes or levies raised on unsustainable energy activities in order to encourage and fund sustainable alternatives where practical.
- **Transport policy:** Government needs to seriously address the rising sources of CO₂ from the transport sector and make the necessary links between climate change to air quality and transport funding.
- **Procurement and funding of programmes:** a national loan scheme should be introduced for local authorities in order to fund projects at local level. The urgent problem of the competitive and fragmented nature of funding needs to be addressed together with sustained, long-term funding of government programmes. Government needs to urgently rationalise funding streams.
- **Coordination of current national programmes** is required as currently programmes do not correspond with government's Energy White Paper targets, whilst learning from successful projects needs to be widely shared so that a basic suite of proven measures can be made available.
- **A national climate change communications strategy** needs to be introduced which covers both adaptation and mitigation. The economic and social benefits associated with action on climate change need to be emphasised to all target audiences so this is not considered simply as an environmental issue alone. There needs to be an accompanying education strategy whereby sustainable energy is integrated into all levels of schooling.

5. With regard to the UK's role as President of EU Council:

- The UK should ensure the adequate and thorough implementation of existing climate change related legislation across the EU, as well as guide the analysis and any policy changes resulting from the EU Commission's consultation on a climate change strategy. The UK Presidency should ensure that changes to EU structural funding remain coherent with existing commitments on EU-wide climate change legislation and European targets for greenhouse gas reduction.

6. As Chair of the G8:

- The UK should encourage those countries on an international level who have not signed the Kyoto Protocol of the economic and social benefits of integrating sustainable solutions, using existing examples to be held up as compelling evidence.
- The UK should urge the G8 countries to provide clear incentives and levers which enable developing countries, together with technical assistance and capacity building to promote appropriate environmentally sound and efficient renewable energy use and assist developing countries in relation to prevention, preparedness and limitation of the effects of climate change.

MAIN POINTS:

7. Planning and Building regulations:

Building regulations should ensure developers integrate sustainable energy measures systematically in order to significantly decrease the embedded energy profile of the buildings in both the construction phase and also in their life time use. Building Regulations can often be regarded as maximum standards when they are minimum standards. Building Regulations produce a level playing field in a way that the planning process does not as different local authorities have different approaches to planning applications. The regulations are becoming too detailed and complex to be fully understood.

8. The government needs to set a clear, robust set of regulations which ensures that the technology available is adopted across the board in order to achieve deep cuts in energy use in the next raft of Building Regulations; the regulations need to take into account how current practices relates to climate change, such as increased demand for a product in hot weather.

9. By embedding high-quality energy efficiency and sustainable energy requirements into the building regulations could further develop the renewable energy generation capacity.

10. To support action by local authorities, a locally appropriate renewable energy requirement should be provided for in all local development plans and Government should grant local authorities the powers to insist that their renewable energy targets are met.

11. Government needs to enforce higher building standards, particularly those of BREEAM and Eco-homes as developed by the Building Research Establishment, by including these standards in the review of the Building Regulations.

12. Powers to intervene over unsafe or unfit public buildings should be extended to allow local authorities to require owners to bring grossly energy inefficient housing (ie SAP30) up to current good practice standards.

13. Planning is constrained by shorter term political horizons; there is a need for more pressure on Government to take into account longer-term thinking when it comes to planning guidelines.

14. Many local authorities are also concerned that the regulations are becoming burdensome to enforce. The Magistrates' Courts Act 1980 causes local authorities difficulties as it requires a local authority to take legal action within six months of becoming aware of the contravention. Prosecution is difficult as six months is a short period of time—contraventions are not always immediately apparent, builders not always easy to track down and there is a timescale for good practice using the Enforcement Concordat. Anecdotal evidence suggests that Building Control Officers have to assist the builder (and often the householder) more often in choosing products and methods of construction that will meet the requirements of the regulations.

15. The current nation-wide skills shortage exacerbates the problem of a low quality of energy efficient housing stock as many buildings also fall prey to “cowboy builders”. As building standards require a step-change to reach the highest standards for maximum reduction of CO₂ emissions the government also needs to address the problem of skills shortages and inadequate training.

16. Measurement and monitoring of progress against national policies:

One of the main barriers to progress on reaching national targets is the lack of independent monitoring of the level of penetration of national programmes, and supporting evidence such as energy consumption data in the local authority's area, to inform subsequent policy decisions.

17. Local authorities need energy consumption data for properties at the level of six-figure postcodes to target their resources most efficiently.

18. Comprehensive monitoring of programmes and initiatives urgently needs to be introduced to review the effectiveness of all schemes at regional and national level.

19. “Intelligent metering” provides the opportunity to measure detailed energy use in buildings. Buildings are profiled and monitored, changes in equipment use and behavioural changes can be detected: OFGEM must be encouraged to make all metering, installed by utility companies on a rolling basis, provide this service in public buildings; initial efforts could focus on the top 20% of sites consuming the greatest amount of electricity.

20. Financial incentives:

Whilst no single policy instrument is a panacea, the Association renews its call for a much greater use of environmental taxes or levies raised on unsustainable energy activities in order to encourage and fund sustainable alternatives where practical.

21. Taxation should favour and encourage energy conservation compared to energy consumption. For example, VAT rates should be lower on energy conservation measures than on energy use. A reduction in taxes and levies on sustainable alternatives could play a much greater role in terms of changing consumer behaviour.

22. The Government needs to introduce financial incentives which will reduce payback for all sustainable energy, energy efficient systems and equipment to less than five years.

23. Transport:

The transport sector produces approximately 27% of the total UK CO₂ burden. Within the transport sector, Road transport produces 90% of the CO₂ Emissions¹⁰. The National Vehicle Fleet has increased by 24.3% in 1992, to 30.6 million vehicles in 2002. The combined distance travelled by this fleet has increased 18% from 1992 to 2002, to a massive 486 billion vehicle kilometres. Cars and light vans contribute over 92% of the distances travelled¹¹. Despite the general reduction in CO₂ emissions from many vehicle types, there is still no sign of CO₂ emissions falling in the transport sector. The overriding problem remains the continual steady increases in annual traffic growth and the exacerbating effects of traffic congestion. Government needs to seriously address these rising sources of CO₂ and make the necessary links between climate change to air quality and transport funding.

24. Procurement and funding of programmes:

Procurement is an area where local authorities have a real opportunity to make discerning choices and demands of suppliers, and this in turn can develop renewable energy.

25. To facilitate this, the establishment of a national procurement facility would enable those local authorities with skills or resource shortages with regard to procurement to use without risk.

26. Local authorities that attempt to address climate change at a local level are beset by problems associated with the competitive and fragmented nature of funding opportunities. Government needs to urgently rationalise funding streams.

¹⁰ Transport Statistics Great Britain 2003.

¹¹ National Atmospheric Emissions Inventory.

27. The criteria for innovation in schemes in order to receive funding should not be obligatory. Whilst innovative approaches are to be welcomed, there are many tried and tested schemes which have effective results at a local level.

28. The time for perpetual pilots is over. Government needs to acknowledge this and recognise that in order to achieve nationwide action and the step change, necessary resources are required to support widespread action. Long-term funding of government programmes is needed to encourage local authority and wider community commitment and engagement.

29. Funding criteria should be modified to support and complement government guidance which encourages new partnership working as currently funding criteria can be contradictory which acts as a disincentive to local action.

30. A national loan scheme should be introduced for local authorities in order to fund projects at local level.

31. Current National Programmes:

Generally, there is a lack of coordination of national sustainable energy programmes with Energy White Paper targets which adds unnecessary complexity and discourages investment.

32. All programmes need to correspond with government targets to encourage local authorities and the private sector to make the necessary investments. The Association shares the government's aims to help roll out the "pockets of excellence" of local authority activity more broadly. However, in order for local authorities to take strategic decisions on how energy fits into their functions, government needs to lead the way by coordinating national initiatives which are currently patchy and disjointed. Local government has a wealth of practical experience to offer on the way these schemes work

33. Learning from successful projects needs to be widely shared so that a basic suite of proven measures can be made available to every local authority.

34. Whilst it is appropriate that emissions reduction targets are set at international and national levels, as climate change is a global issue and its effects are trans-boundary, regional targets should be decided in consultation with local authorities rather than taking a top-down approach. Through consultation opportunities for joint-working can be prioritised and optimised.

35. Biodiversity should be integrated and promoted more strongly through the climate change strategy.

36. Communications:

Currently there are no economies of scale: whilst there are small pockets of excellence at a local level where local communities are acting on this agenda and changing their behaviour, due to local initiatives and national schemes, a wide-spread national communication and education campaign is desperately needed if we are to instigate the behavioural change necessary to meet national policy targets. Government needs to have an understanding of current practices eg for businesses, knowing the inputs, outputs, client base, trends and dependencies.

37. All communication needs to relate to both adaptation and mitigation: often local authorities (and the public) find it harder to get to grips with what adaptation really means for their locality, compared to mitigation issues of the development of renewable energy and energy efficiency promotion, etc.

38. Getting through to the sceptics: In communicating climate change, target audiences should specifically focus on those who feel they are too busy with other priorities to deal with green issues through emphasising the "quality of life" issues and the real costs savings involved, ie money that can be saved and generated if people get involved in tackling climate change. There are case studies which demonstrate that through tackling issues both collectively and as individuals in energy efficiency for example, this has led to reductions in NHS admissions, crime rates, domestic violence and also higher employment and academic performance of pupils in schools.

39. Establishing individual ownership of the problem of climate change: It is important to design messages for target audiences—no "one size fits all". In many cases, the very language of "climate change" can simply turn off key stakeholders, or distance them from the problem which they feel is too big and abstract for an individual to tackle. In communicating climate change, it should not be regarded by individuals as a problems enforced from above but instead that everyone can play a part from individuals, businesses, schools, public sector, etc. If people are shown the no/low cost ways to reduce their carbon emissions, only then will the UK be on our way to a significant reduction in domestic emissions.

40. Education Strategy:

Sustainable energy issues should be integrated into the education at all levels of schooling. For example, a number of individual schools use their local renewable energy installation as a tool to educate pupils but this needs to be replicated nationwide.

41. UK's role as President of EU Council:

The UK Presidency needs to emphasise the correct, adequate and thorough implementation of existing climate change related legislation as much as focussing on forthcoming draft legislation. The UK Presidency should ensure the robust enforcement of existing legislation and a quicker process which ensures compliance

across all Member States, rather than seeing compliance as an end, long-term goal. The UK Presidency needs to ensure that changes to EU structural funding remain coherent with existing commitments on EU-wide climate change legislation and European targets for greenhouse gas reduction.

42. The UK Presidency should guide the analysis and any policy changes resulting from the EU Commission's consultation on the EU climate change strategy.

43. UK's role as Chair of the G8:

The UK should be encouraging those countries on an international level who have not signed the Kyoto Protocol of the economic and social benefits of integrating sustainable solutions to the global problem of climate change. There are many examples of economic and social regeneration within the UK that can be used as examples where communities have developed sustainable energy and climate change adaptation strategies which have led to benefits such as higher employment, higher income for the local community, lower crime rates, lower hospital admissions, lower rates of domestic violence and higher academic success rates. These existing examples should be held up as compelling evidence to those international partners who remain unconvinced of the need to tackle climate change. The UK should demonstrate that by tackling social and economic problems, climate change is no longer solely an environmental issue, but a holistic "quality of life" problem which the international community must tackle together.

44. The UK should push for the G8 countries to provide clear incentives and levers which enable developing countries, and especially least developed countries, to achieve Kyoto, including through ensuring international activities and policies ie Official Development Assistance (ODA), export credit agencies, trade and investment agreements, incorporate climate change concerns. G8 countries should provide technical assistance and capacity building for developing countries to promote appropriate environmentally sound and efficient renewable energy use. Furthermore, the G8 member states should outline how they will assist developing countries, especially small island developing states, in relation to prevention, preparedness and limitation of the effects of climate change ie flooding, droughts, storms etc. The UK should lead by example, ensuring its trade, investment and development programmes incorporate and promote climate change priorities.

30 September 2004

Witnesses: Mr Ian Bateman, Climate Change Officer, Devon County Council, **Mr Don Lack**, Director of Leicester's Energy Agency, Leicester City Council, and **Mr Bill Edrich**, Environment Programme Manager, Kirklees Council, Local Government Association, examined.

Chairman: Our next set of witnesses comes from the Local Government Association. We welcome Mr Ian Bateman, the Climate Change Officer and you come from Devon County Council; Mr Don Lack, who is the Director of Leicester's Energy Agency, unsurprisingly from Leicester City Council; and Mr Bill Edrich, the Environment Programme Manager from Kirklees Council. Paddy Tipping and Colin Breed will start our questioning.

Q345 Paddy Tipping: In your evidence you point out, quite rightly, that there is good local authority practice. Can you give us some examples of it? What are the shining examples?

Mr Lack: We will take it in turns to provide these examples for you. If you look around the local authorities in the UK you will see that there are examples that you rightly say are shining. I will speak for my authority, Leicester, because we are Britain's first Environment City so we feel that we have been practising quite a lot since 1990. We have a proactive programme for renewable energy in the buildings that we own ourselves as well as in the private sector. We promote energy efficiency. We have adopted the hierarchy of energy efficiency. If we use energy we use it more effectively and energy efficiency-wise and then maximise renewals before we use fossil fuels. We use best technology. We have an energy efficiency advice centre. You were talking earlier about. It is a touchy-feely centre so people can feel and touch. They can also buy the answers and the solutions. Not only do we give advice and

awareness but we point towards solutions. We have the eco house in Leicester, one of the first eco houses in the UK. It has been there now for some 15 years. It is very successful. It has been expanded. Again it is a touchy-feely centre. People live in the house as well so it is a real example. We also have an infrastructure where we generate *energies* energy. We are quite unusual in that we are a local authority that is a generator, a supplier and a distributor. We have powers under the Energy Act to supply electricity to any building we own, so we do. We maximise those powers and use a thing called Use of System. I am going to slow down now and stop and hand over to my right.

Q346 Paddy Tipping: Perhaps if I can carry on with you. You can do it in Leicester, you can do it in Devon, and I guess you can do it in Surrey?

Mr Edrich: It is actually Kirklees, Huddersfield and Dewsbury.

Q347 Paddy Tipping: A long way away. Your councils are doing it; why cannot all the councils do it?

Mr Lack: I think they can.

Q348 Paddy Tipping: Why are they not then?

Mr Lack: They need to be enabled and empowered. Some of them are doing it and probably not waving the flag so you cannot always see that they are doing it. They need to be empowered through legislation and enabled through resources. One of the key

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things that we are trying to get across is with procurement policies there is a massive opportunity there. If we have got 400 local authorities why do they each have to individually procure a service when we could have national procurement and save vast amounts of time and resource and finance? That is one example.

Mr Bateman: I think the climate change issue is an extremely broad issue and we cannot have it as a single stovepipe activity. What I have learned from my 12 months in post is that it is not a new activity, it is an existing activity. What I have spent my first year doing is bringing together all those threads which have come from lots of other disparate areas of work, bringing in the waste management strategy, bringing in the local transport issues, bringing in the planning and building control issues. You can go across most local authorities and you can see all those strands of work there and it is a matter of corralling them together to make sure it is in a consistent whole and that it can represent a climate change policy, for want of a better word. The majority of local authorities perhaps do not know it but they are already doing it, they are already part of this climate care club in some way or another.

Q349 Paddy Tipping: It is about raising the profile, demonstrating you can do it and lifting consciousness?

Mr Edrich: It is also co-ordination within the local authority which is of extreme importance. What you have got here and in the local authorities that I would call excellent rather than just good is strong co-ordination and drive by elected members as well.

Q350 Paddy Tipping: Mr Lack, you told us about the barriers and in your evidence you talk about barriers in central government. Are you going to expand on that? What would you like the Government to do to make this more effective?

Mr Lack: We have already heard about the joined-up thinking approach across all the departments and we sometimes find that we are in the enviable position of talking to a number of different departments and we can join them up through the local output. I think that is a key thing. From the local authorities' perception we are not supposed to be risk takers, we are not supposed to be innovators, we are supposed to be guardians of public funding and yet sometimes the innovation you might argue is risky. My local authority always says to me "Who's done it before?" If I can do them an example, a good case study of somebody who has done it before then they feel satisfied by that because it has reduced their risk. If I say, "Well, we are a bit trail-blazing here, this is us going for it" they are very concerned about that. If you could introduce a mechanism whereby they could have that risk underwritten that would help, especially through the financial procedures. That would be an example. That can be a procedure thing or it can be an awareness raising opportunity, to enable local authorities to be able not take the risk by going for innovation—and in climate change we

are going to need some real technology changes, we need to do things better than we are doing them at the moment. That is one example.

Mr Edrich: Also you have mentioned five areas where you say if we could move on it would clear some of the barriers. Certainly planning is one of those areas and I am sure that might be raised anyway. Building regulations is another area. Don has elaborated on the financial and procurement incentives. I am sure we will touch also on cultural change and how you change people's perceptions to "this is something that we need to be doing".

Q351 Mr Breed: My perception is that it is a lot easier to get things done in metropolitan areas and big city areas where you have got some critical mass. I recall the Committee visited Leicester not so very long ago.

Mr Lack: It is a nice place to visit.

Mr Breed: And it was very, very useful and very informative. Turning to Mr Bateman, who comes from Devon, I would say there are some massive problems in terms of trying to overcome some of the real difficulties of some of the schemes that you really want to introduce. I come from Cornwall so I know a bit about what is happening in Devon as such.

Ms Atherton: You should not say that too loudly!

Q352 Mr Breed: Can you perhaps give us an idea of how the authority has tried to overcome some of the resistance that you get from some of the residents to the things that you really want to do to affect climate change?

Mr Bateman: What we are starting to do is put together a climate change communications activity to try and make sure that climate change is relevant to local people. We are trying to build this thing called Agency for Change trying to change attitudes. So that is the first step that we are doing. We have just got a small amount of money put into climate change communications activity. This is based on local heroes. We are bringing it down to the local people to try and identify local people who might be heroes in saving the planet by doing something. That is the first step we are taking because it is the communications bit up-front that is the important thing and you will not get behavioural change without changing attitudes. If you come from Cornwall you understand the wind farm debate; we have that debate now going in Devon.

Q353 Mr Breed: You have not got any wind farms yet, but that is another matter. Just finally, do you think that there is sufficient Government support for the rural schemes as such? I think there is quite a lot of support into the cities for many of the initiatives they do. It is a lot easier to get recycling and all the sorts of things that Mr Lack was talking about. Bearing in mind the sparseness of population in rural areas the costs are incrementally more in order to get the same sort of effect. How does the LGA try to tackle the two different areas of rural as opposed to urban when you come to look at the support they are getting?

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Mr Bateman: I do recognise the problem but I do not have any information at the moment to be able to answer that. We could come back to you and provide an answer.

Mr Edrich: We have got two areas which could provide answers to that type of question. One is certainly Shropshire which is a two-tier council, and the other is Cornwall. Both of those councils have gone for Sustainable Beacon status and I am sure that both of those would be able to provide evidence to the Committee. I will check that with the LGA but I am sure they will be able to provide something to you.

Mr Lack: One of the examples we have got is that within the regions local authorities do network so within the East Midlands you have the Nottinghamshire and Derbyshire partnership which allows the bigger authorities to enable the smaller authorities. That is working quite well. In Northamptonshire 17 authorities have joined together to get a lot of their projects working across the whole of their area and the same effect happens within Leicestershire with the Leicestershire authorities. They also utilise the Home Energy Conservation Act Forum to bring those devices together. I think that is another opportunity within the regions. They are working well at the region but sometimes—and it comes back to the question you asked me—one of the barriers can also be the region itself, how the development agencies work within the region, how they work off the local authorities and enable local authorities. There is a lot of opportunity there and the development with the regional assemblies is obviously also a powerful opportunity. This can be well co-ordinated with the government office within the regions. This is something that has been changing quite a lot recently with quite a bit of shuffling and that always has a knock-on effect to local authorities, in holding them back or delaying them. What we need to be saying is how this can happen at a region. To give an East Midlands example, we have completed an energy strategy for the East Midlands and we now have a co-ordinator working in the East Midlands. Of course funding for that co-ordinator post is relying on where you can grab the money from each time and who can do it. We have been fortunate to be DTI funded for the regional work so far. It is always a challenge, a battle, and that is the problem, where the local authorities are working quite well is because they have battled to try and get the resource or find the funding to make it happen in the region or in their own locality.

Mr Edrich: Or they see particular problems or areas that they might have to address and do some work about. If you look at the East of England they have done some work and are probably one of the leading areas on adaption issues to do with climate change. That is a whole group of local authorities working at a regional level trying to solve problems which they perceive are going to be coming to them as local authorities.

Q354 Joan Ruddock: Obviously you have spoken about your own authorities. I have yet to meet Mr Jones, who has been employed by the Mayor of

London and who I think comes from Woking which I understand was able to demonstrate overall carbon CO₂ reductions. Have you in your own authorities been able to demonstrate actual reductions that are measurable as opposed to saying we have all these programmes and all these interesting things we have done. Have you got a baseline and you can show reductions over a period of years?

Mr Edrich: You have got to understand there are two elements to that. There are reductions in CO₂ in the community and reductions from councils.

Q355 Joan Ruddock: Indeed, the question I am asking is for your whole authority are you doing that piece of work?

Mr Edrich: Yes.

Mr Lack: In Leicester we developed the DREAM model with the Open University and De Montfort University back in 1990. It measured the whole city—business, domestic, city council and the energy and carbon emissions, re-visited that on two occasions (the last full run being in 1999) and that showed that we had made a 32% carbon reduction in that period and a 6% energy reduction in that period which was quite significant and showed we were on the right lines. However, it also showed the transport sector was soaking up what we had been trying to achieve in the building sector. It did not show we were going in the wrong direction. It encouraged us and also showed us the complications of the modelling. I would like to go a bit further with that, that one of the effects of the modelling is that in 1990 we had a utility system where we only had one supplier for electricity and one supplier for gas. In 1999 we had a utility system where there were 32 different suppliers and the quality of data has gone down. So that is one of the biggest effects we have seen. The way we have dealt with that is that we have started to install an intelligent energy metering system across the city where we monitor what is happening not only in our own buildings but what is happening in businesses, and we are able to monitor in real time, half-hourly data, and that is a massive potential. I would have liked to have thought that this is something that would come out of the de-regulatory energy market and enable people to have access to real information in real time, not only for commercial and local authorities but for the public sector, because obviously if you open the bill and you get well informed data about what you are doing in your own home you can take action, but if you just see the bottom figure and it shows you in credit you get a well-being factor straight away; you feel good about that, you have made this money, you are saving money and you think you are efficient when in actual fact you probably are not.

Chairman: David Taylor wanted to follow that up and Candy wants to come in as well.

Q356 David Taylor: Earlier on we had no lack of good examples from Leicester in terms of environmental successes, the Eco House in particular, but would you not accept that perhaps the twin towers of the New Walk Centre, which are the council headquarters in Leicester, are not a

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specially shining example as you drive up the long drag of Welford Road and, set against the night sky quite late on most days, whether they are working late or not, it seems to me there is an immense amount of light consumption.

Mr Lack: It is an old 60s building that is a challenge for any local authority. You are quite right, there are two big towers. On the top of the smallest tower, B block, is an array of solar panels creating energy from the sun, so it is a shining example of how you should do it. The whole of the electricity for both sites—it is a megawatt site—is supplied by two wind generators in Leicestershire, at a place called Beacon Energy. So that building is carbon neutral right from day one for its electricity use.

Q357 David Taylor: That is good, but I was thinking about the consumption monitoring, following your point about intelligent metering.

Mr Lack: Half-hourly data; we are able to monitor exactly what is happening in the building every half hour—we can actually see what is happening. We could see, when the summer came and it was very hot, that we had a three degree temperature increase; that the electricity consumption raised dramatically because people were bringing in their own fans from home and putting them on their desks, switching them on, and that peaked and showed that we are going to incur a £9,000 penalty just for the few days where we peaked. But had we had solar films on the windows, which we were arguing to put on, as an energy efficient measure, we could have avoided that.

Q358 David Taylor: All of that is great, but the point I am trying to make—and I am sorry to interrupt—is that maybe there has not been sufficient focus on energy conservation at times when the building would not normally be operational. I am interested in what you have to say about intelligent metering. Years ago, in another life, I designed software which was involved in this area and tracked some of the things that you are talking about. But actually providing accurate information—and you notice some of the more recent difficulties on that—is not necessarily a precursor to that information being acted on by the component parts of a large building or a large department or a large organisation. Do you think that it really can always lead to a reduction in energy usage when sufficient information is provided, or are people just overwhelmed with the information and do not feel that they have sufficient control over their own environment to be able to take the necessary decision to change? Any of the three of you, not just Mr Lock?

Mr Bateman: I think the important point in all of this is to try to work out for a county council's operations what its carbon footprint is, because after all what we are trying to do is to reduce CO₂ equivalent levels. We have done this for Devon County Council and we recognise that we produce an estimate of about 76,000 tons of CO₂ equivalent per year. But it can only ever be an estimate and it is a build-up from the bottom, and it is not only the electricity consumption, it concerns our use of water,

the waste we produce, the business miles that we do, the commuting impact that we have on the environment, our street lighting and things like that, our use of gas and electricity, what our vehicles do. So we have to look at it in the complete round and identify what our carbon footprint is. Then we have to identify a target. If we are going to meet the Government's aspirational targets of 60% reduction by 2050, if we start today that is only a 2% year on year reduction, and it is getting the mentality that you can make a small reduction, using current technology, that we could probably go on for 15 years to make reductions.

Q359 David Taylor: Mr Bateman, I am signed up to the dream, I really am; I am committed and I am with you and I have been involved in this area for a fair length of time. But is it not the case that it is quite feasible and highly desirable to build in the sort of equipment and infrastructure in new buildings relatively cheaply, to do the intelligent metering and intelligent monitoring of all utility usage—a fair point that you make—but to actually adapt existing buildings which may have quite a long life ahead of them is enormously expensive, is it not?

Mr Edrich: If I can just come in there? We actually run an internal loan fund within our council—it has been running since 1997—and we found that basically for every piece of work that we do, for every ton of energy that we save is actually a negative figure. So if we do not carry out that work we cost the council the actual revenue amounts. For the lifetime of the products we are getting down to round about minus £70 per ton for electricity and insulation work to be put in. So to answer your question directly, there are mechanisms; there are internal loan funds that you can actually do. Lend the money to services, they carry out the work, they take half the savings, they pay back half the savings to the loan fund and you recoup the money and you lend it out again. That sort of loan fund can be expanded up to national level; there is no reason why it should just be at a local level and the Carbon Trust have looked at it and started to do that. So energy efficiency pays for itself and pays for itself fast.

Q360 David Taylor: The last part of the question is: can all of this be handled within a voluntary framework? The frustrations that I had trying to be involved in this sort of programme were significant some years ago. Is there not a compulsory element or a formal structure needed? Should it not all be done within the UK Climate Change Programme, for instance?

Mr Lack: Certainly on the utility side if we can get the right meters fitted in the buildings so that they can provide half-hourly data across gas, electricity and water, that is a simple operation that would enable the data to be available. That does not happen in existing buildings; most public sector buildings do not meter water half-hourly at all, gas very rarely, electricity only if it is above 100 kilowatt. We are doing it across all our buildings. Coming back to your point about can we turn it into real actions? We have people who go out to the buildings

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and explain to them how it actually works. We utilise a thing called a Display Certificate, which is a forerunner to the Energy Efficiency European Directive, which goes into buildings, which shows how much energy that building has used. All local authorities will need to do that in January 2006. We are doing it now in our buildings; we are part of a European project to do that, and we are putting people into the buildings to educate and to raise the awareness. But in fact when you send one of these little charts with a pictorial diagram showing when it was used and where it was used the day before to the manager or the person responsible for that building, and you have at the bottom how much it has cost them, that works—they turn that into action straight away. That is behavioural change and we can see it happening.

Chairman: Thank you very much. Candy.

Q361 Ms Atherton: I would like to ask a question on regeneration issues. There are many schemes going on around the country—Thames Gateway, Urban Regeneration Companies, many local authorities working with RDAs and others. Do you get a sense that there is a real push from ODPM to make sure that climate change and energy efficiency are at the very top of all these regeneration plans? I sit on an Urban Regeneration Company and we are committed, but I do not get it as a central tenet.

Mr Bateman: I think with the recent issue of PPS1, which has a significant chunk on climate change right up front, if it is not now a part of that process it certainly will be in the future because it is there now in black and white. I think all authorities will be required to take on board the guidance that is provided there.

Q362 Ms Atherton: But there are opportunities, with the scale that we are talking about, actually to have a real impact on driving down the costs.

Mr Edrich: I think would be helpful for public authorities would be if we had maybe some powers to insist the renewable energy targets that are carried out, just to have that sort of power there. It does not necessarily mean we would actually have to use them as local authorities, but that would certainly help the case and then it is up to the local members and the local regions to decide whether they would want to use that or not, to do with whatever the feeling is in that sort of area. Another sort of area about that is to look at Regional Spatial Strategies as well. Certainly within the Yorkshire and Humber Regional Spatial Strategy there is quite a large discussion around climate change and looking at renewable energy targets and things like that as well. So, yes, it is coming through, is what I would say.

Mr Bateman: It has found its way into the Devon Community Strategy through the Devon Strategic Partnership as the key issue in terms of environment to be addressed. So it is moving out into the community in that way too.

Mr Edrich: There are also tensions though in these large regenerations that local authorities and planning committees actually have to deal with and that is a real problem and real difficulty, because

what we have is a society that has still not completely gone over to a low carbon society, so we still have these tensions there and they are actually part of any decision-making, whether it is at a local level or a national level, or even at an international level.

Mr Lack: I think the other key thing about regeneration is in a lot of local authorities areas they become arm's length operations and are not directly controlled by the local authority. I am not saying it is a definite barrier but it is another mechanism to go to, and then they do have to make decisions around affordability. We will see standards on building control standards current, as being the minimum standard that you would be aiming for. You would want to be aspiring to much better, so the challenge is to design to better standards, and sometimes obviously that has to be traded off against the cost-effectiveness of going for those higher standards—is there a cost and can you argue the case? It depends how strong an influence you can have over your regeneration companies as to whether you can—not make them toe the line—make them go the extra mile, and what is the incentive and encouragement for them to do that? I think that is an area where there might be a opportunity in the future to make some concessions as to whether there will be a win-win from it, rather than just having it as a challenge that you could go to the higher standard, but what would they get back for that, what additional would they get back for that? And I think that is an opportunity.

Mr Edrich: Obviously the building regulations are being reviewed anyway.

Chairman: We are going to look at that with Alan Simpson's questions.

Q363 Alan Simpson: Chairman, I was going to begin by asking Mr Lack to take us through the details of the proportion of energy supplied by Leicester to its own properties that comes from renewable sources, but I think he may have given an answer to that in relation to the wind farms and the town halls. But perhaps I could widen it? I think it would be helpful if the Committee were able to get from the LGA some breakdown of the Beacon authorities or Beacon achievements of your own Local Heroes that we should start pulling together as the template for a national strategy. If we could ask for that it would be extremely helpful.

Mr Lack: I am sure the LGA would be happy to provide the list of the Beacon authorities and also the authorities—

Q364 Alan Simpson: I am not asking for a list of Beacon authorities, I am asking for a list of Beacon achievements, of what measurably, collectively the LGA would want the Committee and the Government to recognise is already in place with measurable impact, which we could then draw together. I think that would be helpful. My questions are more about the ability that you have currently to impact on building regulations. I am happy to start from Leicester and say that if you were to look at the properties that have gone up over the last 10 years, what proportion of them in the

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public sector or the private sector for residential or private commercial, generate any of their own energy?

Mr Lack: Within the housing sector, over which we have direct control, our own stock, we have been able to rebuild some of the old “Boot” houses in Leicester. They had been built to the maximum NHR standard of 10 at the time—this was all done in '96. I cannot say to you that they have all got renewable energy systems but some of them were fitted with solar thermal panels, but unfortunately because of the right to buy they no longer belong to us because they were seen as a very good offer to take houses over.

Q365 David Taylor: We are talking about the Saffron Estate?

Mr Lack: Yes.

Q366 Alan Simpson: This was built in the last 10 years?

Mr Lack: Within the last 10 years. But coming back to the question you were going to ask me but you did not, which was what percentage of renewable energy do we have across our own buildings? That is 33% from renewable energy, which is procured from the region. The reason we cannot have any more than that is because we generate our own electricity as well and we cannot put that at risk by going on to maximising further renewables.

Q367 Alan Simpson: So you generate that from?

Mr Lack: From combined heat/power, within district heating estates, and put that back into the system.

Q368 Alan Simpson: But to come back to this question that I did ask, and that is going beyond the estates that you build and are now sold, what proportion of the other buildings that have gone up in the last ten years have you required to have a proportion of energy self-generation?

Mr Lack: We do not build many new houses ourselves, we are not allowed to.

Q369 Alan Simpson: Let me be clear, I am not talking about you as a builder, I am talking in terms of local authority powers and the obligations that you as local authorities—and I am not necessarily asking about Leicester, I am asking for an LGA response on this—how far are you successful in making energy self-generation a precondition of planning consents and part of building regulations?

Mr Edrich: The first planning consent really is to go back to the Merton Ruling, where Merton was challenged and won its planning challenge to require installation of renewable energy on a large development by the Government Office of London. That was fairly recent, probably within the last two to three years. I would say that nationally probably very little has actually happened or been required by local authorities prior to that, and this is where the building regulations can play an important part, especially as the building regulations are going to be reviewed this year. We would like to see an

embedding of energy efficiency renewable energy into building regulations as a local government situation, and we would certainly also like to see the embedding of sustainable construction principles and approaches within the building regulations as well. What we mean by that is something like eco homes or the building research establishment environment assessment model for commercial buildings. Those are the two areas which would be very beneficial, and the reason for building regulations is that they actually provide a level playing field across the country and there is a statutory duty to undertake the work as well and that is checked by local authorities. So that is what we would like to see.

Q370 Alan Simpson: You will know that there is a Government commitment to having 15% of our energy supply coming from renewable sources by 2015. Are you asking for the right to incorporate that as a requirement in building regulations?

Mr Lack: We are being asked in our standards. In Leicester our target is 20% by 2020.

Q371 Alan Simpson: The national figure is 15% by 2015.

Mr Lack: Yes, but we have been working since 1990 for a 20% by 2020 as across the whole of our influence, and the estate that is being built by private developers now, 4,000 homes in Ashton Green in Leicester, all benefit from renewable energy. It has to take its energy sources from renewable energy, and it always has to be the high standard of energy efficient homes.

Q372 Alan Simpson: Is that 100% renewable energy?

Mr Lack: It will not be 100% because there will be times when they will need to have a backup supply, but the desire is that they are carbon neutral homes and they are very high efficiency standards and they are to maximise renewable energy. How they do that is down to the individual developer as to which way they would achieve it. The point I was going to make here is that the local authority owns all the land, that is how it has been able to put this caveat in there, and without that it could not have done that, so it has to be fair across the board. And the trade-off that is one of the problems that has delayed the sale of the land is that our property services want to maximise the revenue for this land and the developer is saying that you are putting such high standards on it that we want to trade that revenue off, and there is a conflict of issue there. But that is the standard that we are going for.

Q373 Alan Simpson: Let me come back again to the question which I have asked, which is that in the representations being made by the LGA to Central Government are you asking for a 15% by 2015 or a 20% by 2020 figure to be allowed to be put into building regulation requirements so that that is the new level playing field?

Mr Edrich: I think what we would say to this Committee is that we are requiring or we would like to see a requirement within the building regulation

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for renewable energy. I suspect our submission to the Building Regulation Review this year will actually come up with a figure that we would be looking for. But I would suspect—and this is from consultation with other officers and members—that we will probably be in line with whatever the national and international target is.

Mr Lack: If you say 20, does that stop you getting 25 or 30? There is always a danger. Does it become the standard that everybody works to?

Q374 Alan Simpson: If you say nothing you get nothing, is that it?

Mr Edrich: The other issue about it is, is it embedded or can it be off site?

Q375 Alan Simpson: At this stage I do not care, I just want to know whether that is something that you are seeking as an obligation rather than a wish list.

Mr Edrich: Absolutely.

Q376 Alan Simpson: Two further technical things. At a previous session the Chairman drew the Committee's attention to someone who had managed to install solar panels for a photo voltage roof and they had to take them down because it was a conservation area. Are these issues that you are trying to address and in what ways are you trying to address the issues about incorporation of renewable responsibilities into sensitive areas like conservation areas?

Mr Lack: We certainly have a very positive methodology in Leicester and there will be other examples as well, but one of the things we are doing is to have a solar rental system, which is aimed at anybody—fuel poor, anybody, because you do not buy it, you rent it—and we come along to the building and do an energy survey and make sure that the building is facing the right way, it is orientated the right way; we make sure the building is energy efficient and if it is not we will make it energy efficient.

Q377 Chairman: You turn houses round, do you!

Mr Lack: We turn them round to become energy efficient. So the idea is that you make the home energy efficient and the reward for that is that we then install a solar rental system. But we do that with our planning departments involved. So if we are in an area which is a conservation area and there is a restriction on the front of the building *there* and the panel should have gone *there*, we can put the panel remotely—it does not have to be on the building, it does not have to be on the roof, it can be in the back garden—as long as it can be faced directly. It is a technical fix, so there are ways of doing it.

Mr Edrich: In our authority it is taken on an individual basis.

Alan Simpson: It is helpful to have this evidence, this information about Leicester, but what we are receiving here is evidence from the LGA, and it is about LGA policy and the representations and the position that you are taking. I am sorry to sound finicky, but we have this with other people who come and give evidence to us, that they sound out the best

to us as though it is representative of the rest, but it is not. So I would ask you to come back to us in respect of the LGA.

Q378 Chairman: I think the point that Mr Simpson is making is that it would be helpful to have an assessment in terms of you represent very good practice, but how the rest of England's local authorities stack up. In other words, what is the potential to be had if other authorities were as rigorous as you have illustrated to us, because the Leicester approach is quite remarkable, I have not met anything like that before; but how many local authorities do not adopt as rigorous an approach as you do?

Mr Edrich: There are quite a lot that do, that is the whole thing. There could be three other people sitting here.

Joan Ruddock: In terms of the material that is being sent, that is already being sought and the points that you are just making, could we know the cost of installing the intelligent monitoring systems that you have in Leicester, because to know what that would cost, to see if it could be rolled out across the whole country would be a very important point for this Committee?

Q379 Chairman: You have the idea.

Mr Lack: Do you want me to give it to you now? It costs 17p to get the data from the meters, that is the actual cost, and the return is £1.11.

Q380 Joan Ruddock: Yes, but the cost of installing it and all the rest of it, we need to know that.

Mr Lack: Yes.

Chairman: Ms Atherton and Mr Lazarowicz have some snappy questions to ask.

Q381 Mr Lazarowicz: I am interested in the proposal in your paper for a national procurement facility to, “enable those local authorities with skills or resource shortages to make risk-free choices with regard to suppliers and services, and thus develop renewable energy.” Can you tell us briefly what that procurement facility would look like?

Mr Lack: At the moment each local authority would have to go through a procurement route if it was having to go through the EU procurement route for a major investment, in, say, energy systems and panels, and if we can have a national procurement, which would go through the European procurement route but then allow local authorities to call off from this national procurement, installation of solar panels or condensing boilers, it is to try and save the time and resource of having to do this exercise individually at each local authority.

Mr Edrich: I can give you a practical example? Our council uses the OGC Commerce Procurement for computers; goes to that and says, “Right, we will pull down these computers,” whatever the numbers we actually use, and that is effectively what we are saying there. We are part of a large-scale procurement purchase of solar panels, as part of a

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European project where our Dutch partners are purchasing five megawatts of PV and we have actually just called off that contract.

Q382 Mr Lazarowicz: Without getting too much into technical detail—and I raised it because it was raised in your paper—I wonder what is the problem here? Is it a problem of lack of a procurement facility or is it actually to do with the drive to adopt that kind of approach? We have heard from yourself, we have heard from previous witnesses that in fact energy saving, energy efficiency can lead to returns in a very short-term period. You are talking about a risk free choice. Most people like to make risk free choices when they come to procure anything, but is it not really more to do with the commitment by local authorities to go along the environmentally sustainable purchasing path that is really the problem and that is really what is needed? Is that not the real issue? I am not quite sure why procurement facilities are going to add something to this.

Mr Edrich: What you are getting set up is a sense of regional excellence for procurement and that is being driven by local authorities to do that, to meet some of the Gershon requirements that we have placed upon us anyway. If you go to our authority, we are actually part of the Yorkshire Purchasing Organisation and we purchase our fuel through that organisation and we get extremely good rates for that and have made quite significant savings ourselves. So there is a real drive by local authorities to see procurement as a way to reduce costs and to reduce revenue costs.

Q383 Mr Lazarowicz: I can see the advantage of national procurement in many respects but I am not sure it is particularly a feature to do with energy efficient supplies, and that is something I am still to be convinced about, but perhaps we can leave that for another time. Can I ask a related question which comes from that part of your paper as well? You did make the complaint that local authorities that attempt to address climate change are beset by problems associated with the competitive and fragmented nature of funding opportunities. Is that a real problem as distinct from the problem that applies in any case where a local authority is seeking to access what are inevitably complex funding streams in many areas of work?

Mr Edrich: If you think that we have over 23 funding routes that we can apply for energy, that starts to give you a feel of wasting officers' time to make those competitive bids against those funding streams or initiatives. So, yes, ideas of actually streamlining and bringing funding together would reduce the amount of officers' time we spend in writing bids competitively against other local authorities.

Q384 Mr Lazarowicz: Is it really a problem? I am sure it would be an idea if it was one source, but I am sure if we look through the EU there is probably 1000 plus funding streams for EU funding and there are no doubt 100s from UK Government funding in many areas as well. Is it really a problem in practical terms?

Mr Lack: It has to be time and resource and to meet the cause, and if you are unsuccessful that has an effect, and some local authorities will not make the bid because they do not want to run the risk of not being successful. To give you the example of the Carbon Trust, the local authorities' energy financing scheme came out before Christmas last year and of the 100 local authorities that made a bid there could only be 18 authorities that would successfully get an award of money. But they all went through the same procedure of making that bid, taking up that resource and committing time and cost and that is the problem, and if that is one of a number of bids you could argue how much money has been set aside in making these bids collectively within the public sector and is that a good use of public funding? We would argue that if we do not go there we would not get the extra additionality.

Mr Edrich: The other aspect is that the officers who make the bids are often the officers who have to implement the work on site as well. So there is always a tension between that officer making the bid and failing the bid and thinking, "I could have gone and implemented that work better."

Mr Lazarowicz: It is a wider issue to local government finance, but it is not the time to pursue it today, so I will leave it.

Chairman: Candy, will you draw our questioning to its conclusion in this area?

Q385 Ms Atherton: You have been calling for a national campaign to be held and last week Defra announced a £12 million package of a communications rallying call across the nation and region. Who is going to coordinate it? Are you pleased? Are you involved? And who is going to make sure that Kirklees, Leicester and Devon are singing from the same hymn sheet?

Mr Bateman: I am very pleased with the outcome. I was involved in some of the workshops that came to that outcome and the fact that it is focused on local campaigns is the right solution, with this overarching national campaign to badge it all locally because it is about local people, it is making it relevant to local people. We understand that there is £4 million in each of the next three years, and that if it is spread across all local authorities or all government offices in the regions it is only a very thin amount. So there is some concern there, yes, but we have not really studied the details and we do not know the mechanism for delivering those funds. So we have no idea whether Devon, Leicester or Kirklees will actually see any of the funds, but we are very hopeful that it will come down there so that it will give a boost to our own campaigns at the moment.

Q386 Ms Atherton: You have said in your evidence—and I am going to quote, because I think it is quite startling—that "there are case studies which demonstrate that tackling climate change and energy efficiency issues both collectively and as individuals has led to reductions in NHS admissions, crime rates, domestic violence and also higher employment and academic performance of pupils in

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schools.” That sounds to me like a manifesto for any political party and it strikes me it would be helpful if you gave us, snappily, case studies of just how you have hit these targets in various parts of the LGA up and down the country that can be used as case examples in any future national communications strategy, because they are extravagant claims.

Mr Bateman: I think that particular one was focused on the Beacon housing estate in Falmouth.

Q387 Ms Atherton: Which is fantastic!

Mr Lack: With the education one and the one relating to schools, the houses I talked to you about in the Saffron Estate and one of the benefits that the school reported and recorded was an increase in pupil numbers attending, less respiratory disorders in the classroom—asthma attacks—less peer pressure because the clothing no longer smelt of mould and damp. Basically what it proved to us was if you have fitness standards, if you have good housing then it has a knock-on effect and one of the tests for that was the education, that the school was telling us what they were seeing. We were not probing them; they were giving us the results. So that

is one example as a case study. But also Newark and Sherwood District Council have done a lot on their fuel poverty and health benefits and that is another case that we could provide.

Q388 Chairman: I think we understand even more clearly now why the Prime Minister puts climate change at the heart of his agenda with all of these attributes to which you have been kind enough to refer. Thank you very much indeed for some genuinely fascinating information and also for your agreement to supply some further perspectives from an LGA standpoint, as opposed to your three authorities, which certainly have an impressive record in this area, and I think it is very interesting listening for the Committee. So thank you for your written evidence and thank you for being here, and our apologies again for having to cancel before. Anyway, you are here and you have been heard, so thank you very much.

Mr Lack: Could I just say that we are very pleased to be here as the three authorities and we are pleased that you thought we were excellent, but if it had been Southampton, Newcastle or Manchester, they would have been just as good.

Witnesses: **Rt Hon Stephen Byers**, a Member of the House, Co-chair of the International Climate Change Taskforce and **Simon Retallack**, Research Fellow at the Institute for Public Policy Research, examined.

Q389 Chairman: We welcome our final set of witnesses this evening, the Rt Hon Stephen Byers, who co-chairs the International Climate Change Taskforce, supported by Mr Simon Retallack, a Research Fellow at the Institute for Public Policy Research. Stephen, we are very grateful to you for coming to join us this evening. The Committee’s interest in your activities in climate change were heightened when we sensed that you may have some input into trying to find ways to re-engage the United States in matters connected with climate change. Certainly the impression that has been given by a lot of our witnesses is that there is a reluctance from the United States’ standpoint to fully embrace Kyoto and all that lies behind it. In fact I went on to the White House website and amongst the myriad of information about climate change was a remark by President Bush in 2002 in which he said it would have cost the economy billions and would have lost 4.9 million jobs if America had signed up to the Kyoto Protocol. Equally, in the same speech he then outlined a series of things which he felt in terms of climate change and technology development, sound science and other activities, which he felt were actually enabling the United States to address the question of climate change. Given that you work very closely with your co-chair of the organisation that you are responsible for, Senator Olympia Snowe, you may well have a better understanding of the American perspective on climate change, and if that is the case you might care to share it with the Committee?

Mr Byers: I will do my best, Chairman, and I could say that I welcome the opportunity on behalf of the Taskforce to appear before you and your Committee

this afternoon. The difficulty we have with the American position is that we see it primarily through the prism of Kyoto and a lot of the comment is based on justified criticism of the United States not being prepared to ratify the Kyoto Protocol. I think it is worth reminding ourselves though that this is not something that began with President Bush. President Clinton refused to put Kyoto to the Senate because he knew very clearly that the Senate would defeat Kyoto if it went there for ratification. When the Senate did vote on Kyoto it was not actually on ratification; they voted basically to give guidance to the US administration and they voted—I think it was 95 or 96 to nil—effectively against the Kyoto Protocol. The thing that struck me, not just in conversations with my co-chair, who is a Republican Senator, but with many other groups in the United States—and I have been over there several times in this particular role—is that it is a cross-party agreement as far as Kyoto is concerned; it is a non-starter for a variety of different reasons. We then have a choice: either we can criticise America for not signing up or we can try to find ways of engaging them, and I think the Taskforce was trying to find ways of engaging the United States. I think the important thing for all of us to be aware of is that President Bush is now under increasing political pressure at home domestically to do something on climate change, for a number of reasons. If I can just go through two or three reasons? The first is that both the financial institutions in general but the insurance sector in particular are increasingly worried about the financial costs to them of severe weather conditions. I do not know whether these figures are in the public domain yet, but certainly

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internally the insurance sector in the United States has estimated that the four hurricanes which they had in the Gulf of Mexico last August and September are going to cost the insurance sector over \$20bn in claims. That is a huge impact on that particular sector. They are not without influence politically within the United States and I think they are beginning to bring that influence to bear on President Bush. Secondly, a number of States are taking their own initiatives. Eleven States in the north east of America, six of them Republican, five of them Democrats, are going to enter their own voluntary trading scheme for emissions. It is important because a lot of power generation in America is located in those northeastern States. So that potentially is significant. Then we have California, which is introducing—a not very nicely worded scheme—“the tailpipe emissions reduction”, which is to stop the level of emissions from cars. So potentially very significant, in which California is introducing a requirement on car manufacturers to reduce emissions—a far reaching proposal, so far reaching that the American car manufacturers are threatening the State with legal action, and they may well be joined in that action by the Federal Government. But examples, if you like, of States beginning to do their own thing. The third thing which is significant, is that we have the Ford Motor Company, Dupont and four of the electricity utilities agreeing on a voluntary basis to cut their greenhouse gas emissions to 4% below the 1998–2001 average, and to do that by 2006. So there is a lot going on in the United States; perhaps not as much at the level of the Bush administration as we would like to see, but I think increasing political pressure is being brought to bear, and in the last couple of days the McCain/Lieberman proposal has been re-tabled again in the Senate. So the Senate will have another opportunity to vote on those particular proposals.

Q390 Chairman: When you launched the Taskforce you and Senator Snowe put your name to a statement that started, “Our planet is at risk. With climate change there is an ecological time bomb ticking away and people are becoming increasingly concerned by the changes,” and you put forward the thought that the Taskforce with its diverse membership had been able to find common ground, and indeed your report does suggest that, given the international basis of it, that there are common areas of thought, at least amongst the Taskforce members that support action in this area. If that can be done by a group of people who take a real interest in the subject what prospects do you think there are of there being within the G8 more concerted action on this subject as a result of the fact that the United Kingdom has put it top of the agenda?

Mr Byers: To be honest I think time will tell. I think the important thing is that the Prime Minister has made it one of the two key issues for his Chairmanship of the G8 so it is very much firmly now on the international agenda, politically on the international agenda. We saw the Exeter science conference; we are going to have a meeting in March

of the Energy and Environment Ministers from 20 leading countries, and that will be followed up by a meeting of Ministers from the developing world; then we have the G8 at the beginning of July. So I think those are significant developments.

Q391 Chairman: Does that give any thought that there might be any thought for a what comes after Kyoto Agreement, that in fact players like the United States and Australia who currently do not embrace Kyoto could become involved in?

Mr Byers: They could and I think we have to find a way to almost allow them to get engaged in the process. I was interested by the comments by President Bush in Brussels on Monday where he mentioned climate change; he did not have any specific proposals about how to tackle global warming, but he acknowledged that for Europe climate change was a major issue and he said that we need to find ways in partnership of working together to tackle the consequences of climate change. I do not think that President Bush would have said that a year ago, so I think that is a shift. But the expression I used is that I think 12 months ago the climate change door was locked as far as America was concerned; I think it is unlocked but it is still closed, if you get what I mean? There is still a closed door there and the challenge for those of us who recognise climate change is the most pressing international issue facing our globe at the present time, is to find a way not just of criticising America for not signing up to Kyoto—which I think we can justifiably do—but to say for their own reasons they are not doing it, they are not signing up to it, so what is the practical agenda to engage the United States bearing in mind that there are now these domestic pressures building on President Bush that may not have been there 12 months, five years ago.

Q392 Alan Simpson: I am sure you know better than most of us the gap that exists between what countries say they are going to do and what they actually do.

Mr Byers: Why should I know that more than most people!

Q393 Alan Simpson: I think you may have been closer to where decisions and delivery were located! In terms of the Taskforce comments you gave Britain quite a good press and yet in practical terms the latest figures coming out of the DTI suggest that we are not going to meet our targets of 20% emissions reductions by 2010; it is highly unlikely that we are going to meet the commitments to have 15% of our energy supplies coming from renewables by 2015. You talk to sectors of the energy industry and they say, “The market rules require us to compete on at least price terms not on energy conversation terms.” So how do we put ourselves in a position of European leaders when we are pretty consistently going to fail to meet our own targets?

Mr Byers: I think it is worth saying we will meet our Kyoto obligations so that is to the good. I think you are absolutely right to say that as things stand at the moment our own domestic target of 20% reductions in CO₂ by 2010 will not be met. On the modelling I

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have seen it is estimating that it will get to 14% reductions if we continue as we have done, which is why I think the Government is right to decide to conduct a review of its climate change programme. What I think is very important, as the Chairman has said, is that the Prime Minister has made climate change a major issue for the G8 and indeed for our Presidency of the European Union in the latter half of this year. If we are going to be successful, giving leadership on climate change, we have to lead by example, and the worry I have is that the present review of the climate change programme will be used as an excuse to move away from the 20% target reduction of CO₂ emissions. I have to say that if the Government adopts that approach then almost everything we say as a Government on climate change will be devalued as a result. So I think there is a responsibility on all of us, whether as a Select Committee or individuals, to really say as clearly as we can to the Government, that this review must not be used as an excuse to backtrack but must be used as an opportunity to identify new ways and new methods by which we can achieve that 20% reduction. If we were to pull away from it then all of the fine words about climate change and about how we will use the G8 to give leadership on this issue will come to nothing because people will say that you talk internationally in one language, you do something quite differently at home. That is certainly the message I have been giving to people, if they have been prepared to listen, that time alone will tell. I think it is very important that we act at home as we would want other people to act in their own countries.

Q394 Alan Simpson: Just before you arrived the Local Government representatives were taking us through a range of interventions that they had made, but were saying to us that really if you want significant change the rules have to be changed, whether it is in terms of new rules for building regulations to raise the threshold upon which the market then operates, or whether it is the rules that some of the energy companies are saying to us need to take place, such as we need to create a market that sells less consumption and in which they can compete for selling less, rather than markets that only focus on selling more consumption; or in the market that you cited about California, which seems to introduce new constraints on the nature of vehicles that will be permitted in California. But in each case, when you push us a bit someone will say to you, “We are open to really serious challenge under existing WTO rules”; that each of these initiatives would be challenged on the basis of it being a non-price distortion of the market. So in the role that we have in the G8 and in the European context, are you saying that the lead has to come in pushing for new market rules?

Mr Byers: It effectively applies across the board because sometimes people will use WTO as an excuse for their own inaction, but I think through the G8 and the power that the G8 has, coupled with the need to bring on those big developing newly industrialised countries like China and India, who

are not part of G8 but actually are major players in all of this, to find a way of bringing them on board in the discussions—China now has just become a member of the World Trade Organisation. But if there is an agreement then effectively—and I was involved in the WTO when I was in Government—the way that the World Trade Organisation operates, providing there is an understanding between the major developing countries, European Union, Japan, the United States, then an awful lot can be done. What I think has to happen is a recognition, not just to do with the environment but also that wider social and economic objectives can be achieved through an international system, and the World Trade Organisation needs to be more flexible in what it is prepared to see as the terms and conditions under which trade operates. If it is purely a market-led approach then the desirable objectives that we want to see from international trade, we will not get them, and that is whether it is in terms of helping the least developed countries to pull themselves up out of poverty or whether it is in terms of doing something on the environment, as you will understand they are not the priority of the market. So we need to use the WTO in a way that allows us to achieve those wider social environmental and economic objectives. It can be done but you have to change the basis on which the WTO operates, but within the rules of the WTO it is possible to do that.

Q395 Alan Simpson: I am glad you took this into China and for me, also India, because the question I want to finish on is how we as a British Government in our own right, and how within the international fora in which we exercise some international leadership, we approach our relationship with emerging nations that will have their own massive impact on carbon emissions and climate change. I think it was in 1990 that the World Bank was given the lead responsibility for a sustainability agenda in the developing world and yet over 80% of the investments that they have supported since that time have been in fossil fuel using industries. The recent criticism of DFID is much that our own involvement in aid programmes in the developing world has also been focused on fossil fuel generating industries, and that is at the same time as a claim to want to give a lead in the opposite direction about the reduction of carbon emissions. How do we square that circle?

Mr Byers: There are two comments I would like to make. The first is specifically on your final point. We should also be addressing our own things like the Export Credit Guarantees Department, and the report specifically says that when it comes to the various Credit Export Agencies we have our own, and many other major countries have their export credit bodies, and we should be factoring environmental concerns into those projects that you are prepared to back through Export Credit Guarantees. I remember from my time when I was Secretary of State for Trade and Industry having to deal with a particular proposal to do with a coal fired power station in India, and we were being approached for a very large sum of export guarantee cover for this particular project, and I remember at

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the time raising the issue and saying, “Do we not have an environmental audit to see if this is something that we want to support?” and unfortunately the election was called before there was an answer, and I got moved, so I do not know what the reply was! But it was an indication that these factors then certainly were not taken into account, and why I was very keen that we had a specific recommendation about Export Credit Guarantees being used for positive environmental purposes. In 2000 China was already the second largest carbon dioxide emitter—it was 15%, 14% for the whole of the European Union, and that was in 2000—and China has expanded economically significantly since then, so it is a major emitter of carbon dioxide, and it is vital that we find a way of bringing them on board. What has been fascinating to me through the work of this Taskforce is that China and the Chinese Government have been very responsive, and they are concerned about this whole agenda and the effects of climate change, I have to say on China itself, because if you look at the implications for rice production in China then fairly minor changes in temperature have a devastating effect on the Chinese rice crop, so I think for those reasons perhaps more than any other they are acutely aware that something needs to be done. We make a recommendation of what we call a G8 Plus Climate Group, the G8 certainly plus China, India, Brazil, South Africa, and maybe one or two others—but those are the key four—that we say should come together with the G8 to try to identify ways forward to tackle global warming, and I hope that the Prime Minister for the Gleneagles Summit at the beginning of July will extend an invitation to those countries to attend. I think it will send out a very important signal if he were to do that and I think that would then provide an opportunity, and I think would help the Americans because the difficulty President Bush has is that under Kyoto there would have been huge cuts in American emissions and, as we know, nothing for China and India, and that could not be solved politically in the United States. But if you can get the United States with China and India and the other G8 sitting around the table, identifying what might be the way forward, then I think that would be potentially a very healthy and constructive dialogue.

Q396 Chairman: Can I pick up on a point that you made? You have been very strong on saying what ought to be done and indeed in your Taskforce report on page 11 you say, “Reviewing and significantly increasing the World Bank target to increase its investment in renewable energy arising from the extractive industries’ review.” What are the politics, particularly bearing in mind the key role in both the World Bank and the IMF that the United States plays in actually getting somebody to say, “Fine, (a) we agree with that proposition; (b) how do we then amend the target and move forward?” Is there a political will to take forward in real work what you recommend here?

Mr Byers: We have to bring as much pressure to bear as we can and for the reasons I mentioned at the beginning, to do with the change in domestic

situation in the United States. I certainly think that bodies like the World Bank are becoming increasingly aware of the financial cost of severe climate change, and I think that is a new dynamic coming into all of this, and if we have oil that is above \$50 and it was \$51 a barrel yesterday evening, that is going to have a huge impact and helps some of the argument to do with climate change. There are real worries in the United States to do with energy security post-September 11. So it is a very dynamic situation that President Bush now has to deal with, which perhaps was not the case when he started his first administration. So I think things are changing. I do not want to be overly optimistic; I think we need to use every opportunity to bring as much political pressure to bear as we can. But I do think that there is an opportunity there now that was not there even 12 months ago.

Q397 Mr Lazarowicz: Very briefly, on the G8 Plus group, you have mentioned the positive signs coming from China. Do you see the same type of positive response coming from the other countries which you envisage as being in that G8 Plus group? Will there be a positive response to the invitation, for example, in practical terms if it is to be issued?

Mr Byers: I know China and India better than I do in relation to Brazil and South Africa because we had a representative from China on the Committee and our scientific adviser was Dr Pachauri, who is head of the UN body and also based in India and very well respected and close to the Indian Government. I would not like to say, to be honest. I am not sure I can answer that. Simon, you know Brazil better than I do.

Mr Retallack: I think that the most favourable response will come from China, there is no doubt; India has yet to develop the same sort of scientific capacity as China has as far as understanding the impacts that climate change will bring to India, and therefore there is less a sense of urgency around the issue. Nevertheless, I think the fact that China does seem increasingly willing to take the issue seriously and to commit, for example, to 10% renewable energy target by 2010, which is after all what we have in the UK, will send a very strong signal to other major developing countries and will encourage them to take part in similar efforts. Certainly the Brazilian Government and the Chinese Government in the latest round of UN climate negotiations in Buenos Aires in December jointly presented their own domestic programme of action on climate change, and certainly the Brazilian Government takes the issue very seriously, and I imagine would respond positively to an invitation from the British Government to attend the G8.

Q398 Mr Lazarowicz: Presumably this G8 Plus group will be fairly small in terms of the additional countries to the existing G8. What is the risk of having that type of group set up, having negative consequences on other countries outside the G8 and outside the G8 Plus group? There will be other growing economies that will be part of the process.

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Mr Byers: I think the important part is not to see it as a replacement of Kyoto, so it would run alongside Kyoto, and if you were to do that then the combination of those who signed up to the Kyoto Protocol and the G8 Plus group, you are getting pretty much total coverage of the world's emitters of greenhouse gases. So that in a sense is the attraction of that group, bearing in mind that Australia, although they are not signing up to Kyoto, have set their own target, which would have been their Kyoto target. You may say why have they not signed up to Kyoto, but I am sure they have had some interesting conversations with the American Government about why they have not signed up. So Australia is going to meet its target anyway. We have been very clear as a group saying that we are conscious that our proposals, if we have not got them and have not used the right language, could be seen to be undermining Kyoto, and our whole remit, our terms of reference was to support Kyoto and to try to add to it rather than undermine it. But I think your point is well made, what we do not want to do is to set up a group which takes over and somehow relegates Kyoto; Kyoto was an important first step really, international concerted action to tackle climate change, and we need to be adding to it rather than trying to move away from it, and I am confident that a G8 Plus group can be of benefit rather than have the potential negative consequences that you have touched on.

Q399 Mr Breed: Can we turn to Emissions Trading? The report recommends that all developed countries ought to effectively set up schemes like we have in the EU, of which the UK is a part. It is very interesting to hear about the 11 States in America and I hope that pattern might continue, but the whole idea of looking into the future was perhaps at some stage this could be brought together into some sort of international Emissions Trading Scheme, bearing in mind we are at a very embryonic stage at the moment. What sort of time scale realistically do you think could be put upon that and when would we begin to see some sort of embryonic international Emissions Trading Scheme?

Mr Byers: Globally everybody is looking at the European Union Scheme, which it really is a political imperative to make sure that that Scheme works. I am sure that many members of this Committee will share my concerns about the way it has got off to a rather shaky start, particularly this sort of standoff between the UK Government and the European Commission to do with the levels of allocations within our own national plan. So I would hope that we would get to a situation where that could be resolved, because it is in no-one's interests. So I think we should be trading emissions rather than trading insults, which is where we have got to at the moment with this standoff. So we need to get the European scheme running effectively and once that happens we will have many international companies that will be part of the European scheme and I think when they can see it operating they will be quite comfortable with it, and somebody will be in America saying, "We should be having something

along similar lines," and then you have the potential—which I think is very exciting—because if you then have the 11 northeast States with their own scheme, we could then say within the European Union that we want to extend it and bring in those 11 States, and once you start to do that the potential is very significant, I think, to get a global trading scheme underway. The other attraction is that within the United States, because Emissions Trading is seen to be a market solution to the problem it is very attractive to a lot of people, so I think it has a big potential. And why it is interesting is that of the 11 States six of them have Republican Governors, five of them Democrats, and they are very interested in the whole concept of a market solution to emissions. So I think it has big potential, but we have to get the European scheme up and running and working effectively.

Q400 Mr Breed: So that effectively perhaps is the potential barrier, demonstrating that a really effective scheme can operate, but once that has been set as the example then you will be able to do that. So really there is a lot of pressure on the UK and the EU to demonstrate that this really is a market solution and once that has been proven to a certain extent that will then hopefully be able to be rolled out elsewhere?

Mr Byers: Yes, and the work we have done on the Taskforce, it is very much the case that whether it is the United States or Australia or the major developing countries like China and India, they are all looking with great interest to the EU scheme, and if it founders in this first few months we will pay a heavy price if we allow that to happen.

Q401 Joan Ruddock: I would like to turn our discussions to renewables, and one point on the Export Credit Guarantees, which you mentioned earlier. I am sure you are aware that there is £50 million annually available to companies that wish to export renewable technologies, but certainly when I last enquired none of it had been taken up. I do think that is a very interesting thing to be pursued, given the comments you made earlier. I wanted to ask about targets. We have a target of 15% of renewable sources by 2015; your Taskforce suggests that it ought to be 25% by 2025 in G8 countries, and that some countries ought to have higher targets still. So I wonder which countries should have higher targets, how high should they be and what implications this might have for the UK?

Mr Byers: It is interesting looking at where other countries are in relation to renewables. Just by way of a side comment, last week President Bush announced \$700 million of tax incentives for companies to go into renewables, so it is a big chunk of money being provided there by the Bush administration. Within Europe and the G8 countries, France has a target of 21% electricity generation from renewables by 2010 and Italy 25% by 2010. So they are well on course to meet the target that we have set in the Taskforce, which is why we have said that for other countries—and particularly we had in mind Italy and France—there would need

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to be a tougher target, if I can put it that way, because they have already made such good progress as far as renewables are concerned.

Q402 Joan Ruddock: May I interrupt, Stephen? Are they going to achieve the targets they have set? It is not just aspiration, but will they achieve?

Mr Retallack: They are currently on track. A lot of the renewable regeneration will come from large hydro, particularly in France and Italy as opposed to solar and wind and the sorts of technologies that we would like to encourage here. But, nonetheless, it does indicate that they should go further for 2025 and certainly beyond the target that we recommend in the Taskforce Report.

Mr Byers: At what level? To be honest, I am not sure we are able to say what the new target should be for those countries; we would need to do detailed work in relation to the exact position in those countries, which as a Taskforce we simply have not been able to do.

Q403 Joan Ruddock: And the implications for the UK?

Mr Byers: It makes us realise that our target, although people thought it was severe, is really quite modest, and I hope that as part of the climate change review we are going to put a greater emphasis on the importance of renewables and take either some financial incentives to encourage renewables further, and also ways in which we can make it easier for people to see projects carried through to fruition, which at the moment we all know that sometimes a planning system works against it, and so on, and we have to find ways of supporting renewables in a more positive light.

Q404 Joan Ruddock: So there is no suggestion that the UK would get a lower target just because some are getting a higher one?

Mr Byers: No.

Q405 Joan Ruddock: The 25% would be what the UK would have to get?

Mr Byers: Yes.

Q406 Joan Ruddock: You spoke earlier about the McCain/Lieberman proposals having been re-tabled. Do you have any estimate of what is the likelihood that these proposals might be passed?

Mr Byers: There have been some changes in the Senate following the elections in November and certainly the conversations that we have had people are less optimistic; the changes apparently have not been helpful, as things stand, just to do with the Senators who have left and the new ones that have taken their place. However, if you talk to either Senator McCain or Senator Lieberman, they believe the momentum is growing and is on their side and each time they put it to a vote they increase the number voting in favour of it, and both of them seem amazingly confident that they will get a better vote this time—which is why they have resubmitted it in the last week—and they will keep submitting it through the life of this Senate. There are some more

Senate elections next year and if they go according to the way in which they would normally go, then that is likely to see Senators coming in who are going to be more sympathetic to McCain and Lieberman. The way the Senate works it will not be good enough just to get a simple majority; they actually need to get 60 Senators because that will deny the opposition a filibuster to keep it dead, as it were. So their target is to get 60 Senators voting for it. They seem confident that they are going to be able to do that at some stage within the next four years now, and whether that is true or not they are a better judge than Simon or myself, but both Senator McCain and Senator Lieberman seem very optimistic that the momentum is on their side.

Q407 Joan Ruddock: Is that the only game in town or are there alternatives to getting renewable targets and cap-and-trade schemes in the States?

Mr Byers: I think what is happening is that you have action at Federal level and then you have lots of initiatives happening in individual States and it is quite difficult with our concept of the political governance here in the UK. But States have huge power in America, particularly when it comes to energy matters, and I think that when a number of them begin to move—and if you get California, on its own the fifth biggest economy in the world, a very car-centric society, and if the tailpipe emissions reductions gets through then that will have huge significant in terms of how people look at the whole issue of the environment and climate change.

Q408 Joan Ruddock: Do they have renewables targets?

Mr Retallack: They do not. There have been efforts to introduce renewable energy portfolio standards in the Senate and they have not gone anywhere, but I would add—

Q409 Joan Ruddock: I was meaning State-wise.

Mr Retallack: Yes, a growing number of States are now adopting them, and again in the same sort of areas and there are efforts underway to roll that out across the country, but in Congress it is interesting to note that there are efforts to pass a Bill that would cap the four main pollutants, including CO₂. The Bush administration plan is to cap only three of them, not including CO₂ and the Democrats at the moment are refusing to give their consent to vote in favour of it unless CO₂ is included, and it looks as though there is potential for trade to be done here and there is certainly interest amongst the electric utilities in the US that a deal should be done now and not in two years' time when perhaps Congress may become Democratic, or certainly in four years when there could be a Democratic President in place and more stringent requirements imposed on them than they could possibly get away with now. So I think that is definitely something to watch carefully in the next few months.

Q410 Chairman: Can I follow on in this line of inquiry about legislation? I noticed that Senator Snowe and others have put their name to a Bill which

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they entitled *The Abrupt Climate Change Research Act 2005*, and the objectives, according to the short title to the Bill, is “to provide for the development and coordination of a comprehensive and integrated United States Research Programme that assists the people of the United States and the world to understand, assess and predict human induced and natural processes of abrupt climate change.” That still suggests to me that there is still one heck of a debate going on in the United States as to whether in fact global warming issues are real or imaginary. Does that in itself make it difficult to move forward decisively, politically, whilst you still have this background of argument for and against going on?

Mr Byers: There are still people, as there are scientists in the UK, there are scientists in America who will deny the fact of global warming and climate change. They are getting fewer on the ground. There was a very interesting report from the US Chief Scientific Officer last summer, which for the first time there was an acknowledgment of climate change and global warming. I think the administration is beginning to acknowledge that climate change is not the fiction but is real and is potentially damaging. But you are right to say that there is still a debate and there are some Senators who would deny climate change and would say that even if it does exist it is beneficial. I think the new Chairman of the Senate’s Environmental Committee is one of those fundamentalists who say that this is not a problem and even if it is happening it is going to be for the good rather than detrimental. But I think those people are fewer and far between. I tell this little anecdote, when I was in the States in September and I was meeting with the senior member of the Bush administration talking about climate change and the need for action, and he said, “Gee, Steve, we are not keen on this stuff, it is going to affect the American way of life,” and I pointed out to him as we were meeting they were evacuating three million people from the Gulf States in Florida and Louisiana because of the hurricanes, and I said, “Their American way of life is already being affected, you are going to have to do something about this.” I think he acknowledged that maybe there is a problem.

Q411 Chairman: Let us pursue another one of the findings in your summary of main recommendations, where you said that the G8 Plus climate group agreed to shift their agricultural subsidies from food crops to bio fuels and you make further comments on that. One of the things that has mystified this Committee is that as far as a move in the United Kingdom to have an indigenous bio-fuels industry, the industry tell us that the concessions made so far on duty are not sufficient to make investment, particularly, for example, at the bio-ethanol plant in the UK, a viable proposition. The Government responds by pointing out that on bio-diesel the use of recycled cooking oils and similar waste materials is helping the embryo industry move forward, but somehow we do not seem to be as committed as perhaps we think we ought to be on this. You seem to be rather more enthusiastic about

this as a policy development area. What is your own take as to why we have not made more progress in the UK on this particular front?

Mr Byers: I think to put it very simply the fiscal incentives are not there, and I think if we are serious about encouraging a new market, as it were—and this is why we make the specific recommendation on the Common Agricultural Policy as far as the European Union is concerned—if we were to see a shift, and bear in mind the budget for the CAP is now set to 2011, so we know how much money is going to be in the Common Agricultural Policy, what we are saying is that rather it being committed to production, which it is at the moment, why do we not divert some of that into bio-fuels?

Q412 Chairman: But the new configuration of the CAP does precisely that, in the sense that you are not having money paid to farmers geared to what farmers produce, but you still have difficulties in the use of, for example, set-aside land, you cannot use it for things like bio-fuels. But we come back to the hard-edged issue that the industry, in the case of UK produced sugar beet to fuel a Bio-ethanol industry, and British Sugar have been in front of this Committee time and time again and said a 20 pence per litre duty derogation is not sufficient, and yet when it came to air quality we had a 40 pence duty derogation for liquefied petroleum gas, and it just seems that there is a reluctance to say, “We will do this.” The argument that the Secretary of State put to us is, “Of course, if we are too generous it will invite imports,” but if on the other hand you are going to meet European Union targets, which are not mandatory, they are targets which people pay attention to, to blend bio and mainstream hydrocarbon fuels, you are going to have to get it from somewhere, and I find it difficult to understand the logic as to why you do not at least kick-start your industry here. So if you have any thoughts on that we would be very interested to hear them.

Mr Byers: Certainly I think the Taskforce would agree with the thrust of the point that you are making, that we have to be far more courageous in terms of using the financial power which is there. If one thinks about it, if the present system is not working as we would like it to work—and clearly it is not because we are not seeing this sector taking off in any way—you have to change the incentive and you have to make it more attractive, and you can within the CAP rules do precisely that, and it just needs the political will to make the decision.

Q413 Paddy Tipping: I would like to pursue that for a few moments longer. Fiscal incentives are one approach and the other approach is to have the notion of a bio-fuels escalator, increasing the proportion of the bio-fuels used both in the EU and the UK. The Department of Transport has legislation to do it; the Department of Transport has been consulting about this, but the consultation seems to have been extremely slow and perhaps given a low priority. You have had dealings with the Department of Transport, is there a problem there?

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There does not seem a lot of enthusiasm in that Department for bio-fuels, whereas Defra, whenever they come and see us, are very strong on the issue.

Mr Byers: I was at Transport about three years ago, so I am not quite sure where the thinking is now as far as this is concerned, but I think it is true to say that the Department of Transport has not seen this as an area which is a priority for them, which is perhaps stating the obvious. I think what we do need to see across Government—because it is a Government-wide issue—is not individual Departments playing off against each other and trying to block proposals, but saying, “What is for the common good here?” and if, as the Prime Minister has said, climate change is a key priority for the G8 and our European Presidency later this year, then going back to the point I was making earlier we have to lead by example because you lose credibility

if you are talking of good game internationally but you are not doing very much at home, and I think this is one of those issues where if we could do something and make real progress then we would be in a far stronger position.

Chairman: Thank you very much indeed. It has been a genuinely fascinating insight into some of the discussions that are happening internationally and certainly the agenda which the Taskforce set out was provoking and challenging, and I think your point about making certain that you put your own back yard in order if you are going to have full leadership in this area is a point well made. Thank you very much for sparing the time to come to talk to us. I am sorry that our first attempt to get together was aborted but nonetheless we have benefited from your views on this occasion. I also thank Mr Retallack for his contribution as well.

Written evidence

Memorandum submitted by Professor Peter F Smith (U02)

POLICIES TO ACCELERATE THE PROCESS OF REDUCING CO₂ EMISSIONS FROM FOSSIL FUELS

EXECUTIVE SUMMARY

On the demand side, there should be a radically new strategy for reducing CO₂ due to buildings and transport with the introduction of carbon budgets. On the supply side the UK is well down the EU league table as regards installation of renewable energy technologies. Britain is especially fortunate in having extensive marine resources offering multi-gigawatt power. However, a strictly market approach will not deliver long life, high energy density but high capital cost technologies. Research into renewable technologies is considerably underfunded compared with other EU states. The potential market opportunities for low to zero carbon technologies should persuade the Government to invest more ambitiously in R & D in this area. As regards transport, increased subsidies should be offered on hybrid vehicles as the range of such models is enlarged. Provision of incentives for the production of biofuels and the conversion of existing vehicles to these fuels should be a priority matter to reduce low level pollution and CO₂ emissions. In terms of global policy, there should be an emphasis on providing access to off-grid electricity to least developed countries.

1. ENERGY—DEMAND SIDE

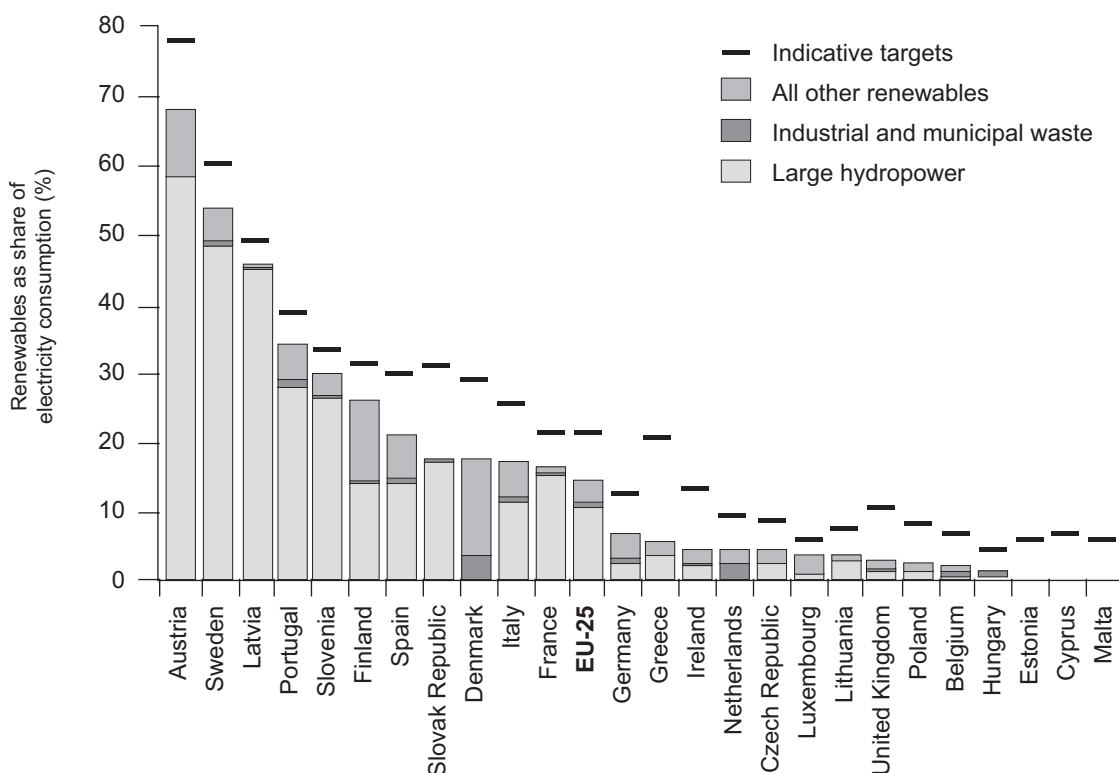
Buildings are still indirectly responsible for a major share of the UK’s CO₂ emissions. Research should be commissioned into the logistics of replacing Part L of the Building Regulations with a carbon budget system for all buildings. This would have the advantage of bringing all buildings into the carbon reduction process whilst avoiding the social penalties of significantly higher energy prices. It would also pave the way for a system of carbon trading with a premium on the base price of carbon credits.

1.1 The system could also be applied to vehicles (see below).

2. ENERGY—SUPPLY SIDE

In terms of the expansion of renewable energy the UK has no cause for complacency. This is shown by the European Environment Agency 2004 in a comparison between 25 EU states of their commitment to renewable energy. The UK is fourth from bottom of states that rise above the base line (Figure 1).

Figure 1



2.1 There is need for vigorous exploitation of the natural assets enjoyed by the UK for the production of renewable electricity. The outstanding resource is the marine environment. A steep increase in the installation of renewable technologies will not be achieved if reliance is placed on market forces, especially for long life, low running cost by high capital cost technologies that deliver gigawatt power like tidal energy. It is not enough for the Government to fund demonstration schemes and then rely on the private sector to run with them. Marine resources offer the greatest opportunity for base load power generation.

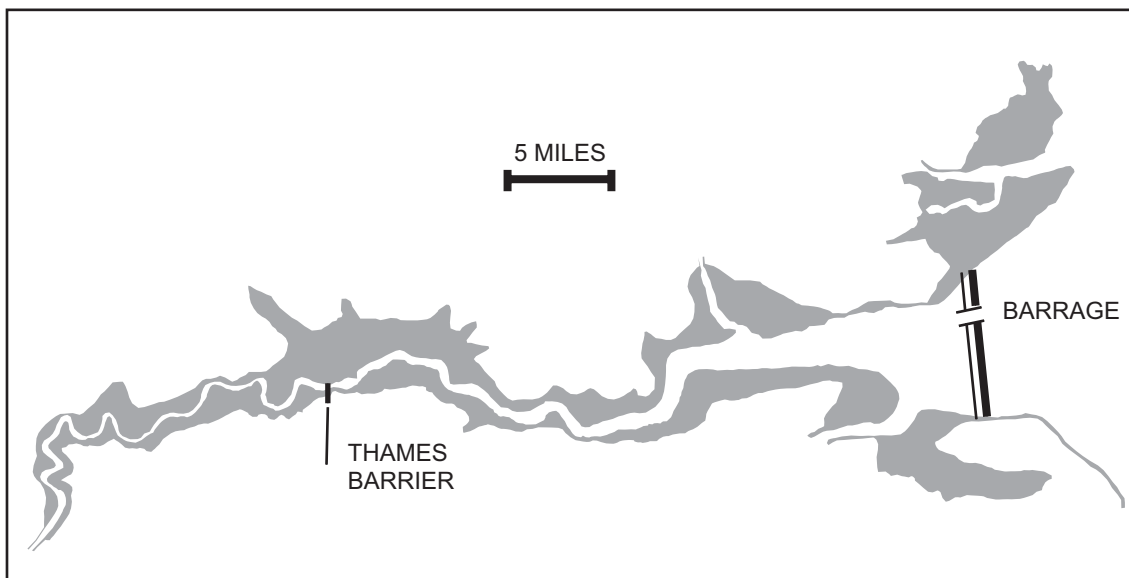
3. MARINE ENERGY RESOURCES

Estuary tidal power:

In 1994 the Government decided to abandon further research into tidal barrages for reasons ranging from the economic to the ecological. Since then the position has changed. Rivers are much less polluted and the risk of catastrophic flooding in the next decades has risen appreciably making it appropriate to reappraise the position.

3.1 Tidal barrages: are appropriate where flood protection is a major factor for example for the Thames Gateway development Figure 2. A barrage in this position could probably meet the electricity needs of the projected urban expansion of London especially if associated with tidal pounds to provide power during slack tidal phases.

Figure 2: River Thames flood risk area below 5m contour



3.2 Tidal fence: technology is an alternative to barrages. Vertical Darrieus rotors are supported within an open concrete structure Figure 3. The system has a high energy density without causing problems for the inter-tidal zones. It is appropriate for estuaries, bays and channels, eg Severn estuary, Morecambe Bay, Pentland Firth.

3.3 Tidal currents: The UK has over 40 coastal sites appropriate for capturing tidal stream energy from underwater horizontal axis turbines (tidal mills). We should progress from demonstration schemes to full scale exploitation.

3.4 Tidal impoundment: This is a proven technology as demonstrated by the project off the coast of North Wales with a capacity of 432MW. There are many suitable sites for this relatively low cost, reliable and unobtrusive form of tidal power.

3.5 Wave power: The “limpet” project on the Isle of Islay has proved the effectiveness of coastal oscillating water column technology. Sites should be investigated with a view to expanding this moderate cost technology.

3.5.1 The “Pelamis” or “power snake” offshore technology has considerable potential, especially in multiple arrays as wave energy farms.

3.5.2 The wave elevator system or “Tapchan” as demonstrated in Norway consists of a narrowing channel which amplifies wave height lifting sea water about 4m into a reservoir. It then has sufficient height to operate as a conventional hydro-electric plant, in this case generating 370 kW. There could be suitable sites in Scotland and the South West.

3.6 Offshore wind: If wind is to make a significant contribution to renewable energy targets the focus should be on offshore machines because of their better load factor than land based turbines and because they circumvent the delays associated with the planning process.

4. OTHER RENEWABLES

The government should set ambitious targets for energy from:

4.1 Rapid rotation crops for use in former coal fired power stations and production of biogas.

4.2 Biogas from waste including anaerobic conversion of sewage and farm slurry.

4.3 Energy crops for ethanol and biodiesel.

4.4 Photovoltaics (PVs): Compared with some other EU countries and Japan the UK has a poor record in exploiting solar power. This is because PVs are uneconomic in the current market situation. Solar energy has the greatest potential of all renewables and much greater research funding should be directed towards this technology.

4.4.1 The lesson from Germany is that subsidies are necessary to pump prime the market and thereby to gain from economies of scale. The German Photovoltaic Preliminary Act 2004 paved the way for the revised Renewable Energy Act which provides for a feed-in tariff of around 50 Eurocents per kWh for roof and façade PVs on domestic as well as commercial properties. The anticipated installed capacity up to the end of 2004 is 580MW. German manufacturers cannot keep pace with demand which is why the Welsh PV plant is exporting almost all its capacity to Germany.

4.4.2 The first step to boost the UK market would be to provide net metering for domestic/small scale PV installations and micro-wind with matching feed-in and buy-in rates.

4.5 There will be serious implications for the grid when over 20% of electricity comes from distributed and small-scale generation. Planning for this outcome should now be well under way.

5. UNDERGROUND AND LANDFILL METHANE

Much of this gas still escapes into the atmosphere. Methane is 27 times more potent as a greenhouse gas than CO₂ therefore it is important to burn it for energy rather than let it escape to the air.

6. SOLAR THERMAL ENERGY

The UK is still only on the threshold of exploiting this resource as a means of avoiding CO₂ emissions. It can be used for either diurnal or seasonal storage of warmth. In 1999 the EU Soltherm Europe Initiative was launched with the aim of installing 15 million m² of solar thermal collectors by 2004.

6.1 Germany responded with its Solarthermie 2,000 research project with programmes like the housing project at Friedrichshafn with 5,600m² solar collectors on the roofs of eight apartment blocks. A 12,000m³ underground heat store collects summer warmth for distribution in winter. This amounts to 1,915 MWh/yr. A scheme at Neckarsulm has a collector area of 27,000m² to meet a heating demand of 1,663MWh/yr.

7. HEAT PUMPS

At present ground source heat pumps are marginal in terms of cost effectiveness. However, efforts are underway to increase their coefficient of performance (COP) from three to five or six. Some claim eight will be possible. This will make them attractive for producing space heating with the added benefit of providing cooling in summer.

8. MICRO-COMBINED HEAT AND POWER

Developments in the efficiency of the Stirling engine have made micro-CHP a viable proposition. Particularly hopes rest on the Microgen system in which electricity is produced within a sealed Stirling engine. Assuming a manufacturer can be found to meet the exacting tolerances it should be on the market in 2005 and be competitive on cost with conventional systems with the bonus of producing 1KW of electricity. The attraction of this system will probably depend on the availability of net metering.

9. TRANSPORT

Whilst efforts to persuade motorists to revert to public transport will continue, the probability is that the volume of vehicles will continue to increase even if the fuel price escalator is reinstated. Therefore most effort should be concentrated on persuading car owners to opt for hybrid or alternative fuel vehicles. To do so it will be necessary to provide capital grants to make up the difference between hybrid and conventional

vehicles as well as concessions on excise duty. At present the payback time for the price difference is six to seven years assuming 24,000km per year. Honda and Toyota are planning to expand their ranges and Ford, Nissan and General Motors will have hybrids on the market in the near future.

9.1 Biofuels: probably hold out the best hope for reducing CO₂ and other pollutant emissions in this sector for the medium term future.

9.2 Ethanol is the most widely used biofuel. It is mainly fermented from corn, wheat or barley but also from biomass waste and rapid rotation poplars. It can reduce greenhouse gas emissions in vehicles by 35–46%.

9.2.1 A 10% ethanol blended fuel is approved by all car manufacturers marketing in the US. Manufacturers are working to produce more flexible fuel vehicles (FFVs) that are able to use E-85 fuel, that is a blend of 85% ethanol and 15% petrol. There are currently over one million FFVs in the US and main manufacturers are increasingly offering FFVs as standard models.

9.2.2 E-diesel is being developed containing 15% ethanol which reduced particulate emissions by up to 30%. It also reduces sulphur content.

9.2.3 An important feature of ethanol is that it is easily reformed to hydrogen in a fuel cell. It offers the prospect of facilitating the uptake of fuel cell vehicles in the short to medium term, either reformed in the vehicle or in garages which will offer pure hydrogen at the pumps. The fuel cell offers efficiencies of 40 to 50% compared with the 18% of the average internal combustion engine.

9.3 Biodiesel: This fuel is refined from soybean, hemp, rape, vegetable oil and animal fat. Fuel grade biodiesel conforms to strict industry standards and can be used as a replacement for conventional diesel or in any proportion. It reduces CO₂ emissions by 78% compared with fossil diesel (US Dept of Energy) due to the closed carbon cycle. Emissions harmful to health are dramatically reduced with biodiesel. Its ultimate promise is for “clean” HGVs and locomotives.

9.4 In the light of these facts the Government needs to do everything possible to encourage the adoption of alternative fuels and the modification of existing vehicles where necessary. One way to do this would be to apply the carbon budget principle to vehicles with year on year reductions in the carbon allowance. A smart card loaded with carbon credits would be issued with the tax disc. Once the allowance was exhausted the only option would be to purchase carbon credits at a punitive price.

10. RESEARCH

The UK is well down the league table terms of investment in renewables research.

10.1 Increased investment is required to reduce the cost and raise the efficiency of various fuel cells appropriate to different uses especially domestic scale fuel cells up 5kW.

10.2 It is a matter of priority to raise the efficiency and reduce the cost of PVs. For example, support research into solar cells which replace the liquid electrolyte with an organic solid and processes that mimic photosynthesis (“biomimicry”).

10.3 To widen the scope for building integrated PVs it is important to accelerate the development of flexible sheet and transparent PVs which will greatly widen the range of their applications.

10.4 A range of benefits will accrue from the scaling-up of the microbial fuel cell to produce electricity from human waste. This opens up the possibility of extensive electricity production from sewage works.

11. HYDROGEN PRODUCTION

The UK should be a full participant in the race to find low energy methods of producing hydrogen so as to be well placed to exploit the market opportunities at the time when hydrogen will be the principal energy carrier for transport. These include:

11.1 Alternatives to electrolysis for the production of hydrogen need to be investigated eg: the hydrogen generator fuel cell producing carbon dioxide and hydrogen from ethanol and water;

11.1.1 Solar hydrogen using light harvesting ceramics to split water to produce hydrogen (University of New South Wales).

11.1.2 Microbial activity that releases hydrogen from organic compounds such as biomass waste.

11.1.3 Regenerative fuel cells.

12. HYDROGEN STORAGE

The viability of hydrogen for vehicles and static fuel cells will depend on the development of safe storage systems. Current developments include:

- 12.1 Metal hydrides with the best storage to weight ratio.
- 12.2 Capillary storage in super-activated carbon.
- 12.3 Carbon nano-tubes.

13. ELECTRICITY STORAGE

The intermittent nature of supply from renewables increases the pressure to find safe, high capacity methods of electricity storage.

13.1 There is still considerable scope for improvements in battery technology.

13.2 The ultimate storage technology is from high temperature super-conductivity. According to the Interdisciplinary Research Centre, Cambridge University, there is the prospect by 2020 of storing massive amounts of electricity in a ring a super-conducting cables with no power loss.

14. AVIATION

In the short term air travel should carry a surcharge to acknowledge the multiple forms of damage it inflicts on the environment, not least its escalating CO₂ emissions. This would have to be an EU wide initiative. A tax would be levied, perhaps as landing charges, on nations that would not comply.

14.1 In the longer term it is virtually inevitable that hydrogen will be the fuel of the future once memories of the Hindenburg have been erased.

15. THE GLOBAL ROLE OF THE GOVERNMENT IN 2005

One of the global problems that can be tackled is to provide access to electricity to the two billion worldwide for whom it is not available. For most this will involve a massive programme of supplying compact solar energy systems and, to a lesser extent, micro-hydro equipment. The challenge suggested by the Electric Power Research Institute in the US is to provide at least 1,000 kWh per year to everyone in the world by 2050, by which time the world population could be 9 to 10 billion.

15.1 Also essential will be provision of energy crops and the means of refining biofuels for powering agricultural equipment, pumps and generators. As the price of fossil fuels rise, it will become increasingly out of reach for poorer communities and therefore an alternative should begin to be put in place immediately.

15.2 These will be important actions towards realising the Prime Minister's goal of alleviating poverty in Africa.

15.3 Finally, it is probably necessary to accept that no further time and effort should be expended on trying to achieve closure of the Kyoto process.

19 September 2004

Memorandum submitted by RWE npower (U3)

INTRODUCTION

1. RWE npower, part of the RWE Group and previously known as RWE Innogy, is a leading integrated UK energy company. Through our retail business, we are one of the UK's largest energy suppliers. We have over 8,000MW of generation capacity in the UK from our diverse portfolio of flexible, low-cost generation assets, sell our expertise in power generation in key markets and are market leaders in renewable energy development. We welcome the opportunity to contribute to the Committee's inquiry into the UK Climate Change Programme (CCP).

2. As a major European energy company with interests in electricity, gas and water services, RWE has a significant interest in the development of EU and wider international climate change policy. The company has played an active part in dialogue between industry and the EU institutions in the development of the existing policy framework. In Member States where we operate, principally Germany, the UK and Hungary, RWE has engaged pro-actively with policy makers to facilitate the efficient and cost-effective delivery of European climate change policy objectives, advocating the use of market-based approaches wherever these are appropriate. We fully support the Government's commitment to using market-based mechanisms where appropriate to deliver its wider energy and environmental policy goals.

PROGRESS TOWARDS THE UK'S 2010 TARGET

3. It is becoming increasingly clear that there is a significant gap between forecast emissions of CO₂ in 2010 and the Government's aspiration of a 20% reduction based on 1990 emissions. Department of Trade and Industry (DTI) projections underpinning the National Allocation Plan (NAP) submitted to the European Commission in April this year suggest that, with current CCP measures, forecast UK emissions of CO₂ in 2010 are 519mtCO₂, 14.3% below 1990 levels, assuming full delivery of the Renewables Obligation and 8GW of CHP. The additional annual savings of 5.5mtCO₂ pa to be delivered in 2010 through the EU Emissions Trading Scheme (EUETS) by the electricity sector increase the overall level of CO₂ reduction to 15.2%.

4. However, we understand from discussions with DTI that further analysis of projected emissions from the electricity sector in 2010 suggests these will be around 6mtCO₂ higher than previously forecast. Errors that we have identified in factors used by DTI and Defra to convert fuel consumption by the electricity sector into CO₂ emissions will only exacerbate this position. Given the importance of future energy and emission projections in assessing the likely impacts of both current and future CCP measures, it is essential that these are fully transparent. Both DTI and Defra need to make further information available on the underlying assumptions and engage in more constructive dialogue with industry if the projections are to be seen as credible.

5. The Government also needs to accept that reductions in carbon emissions will be less than the UK national targets if it is more cost-effective for industry to buy allowances on the EU market than to reduce emissions through investment. This is implicit in the burden-sharing agreement between EU Member States, which implements the requirements of the Kyoto Protocol. This needs to be communicated as part of UK climate change policy.

ENGAGING ALL SECTORS IN DELIVERING CLIMATE CHANGE POLICY OBJECTIVES

6. In delivering climate change policy it is important to ensure that all sectors play their part. The electricity industry continues to be a primary focus of current policy instruments. However, there seems to be reluctance to engage other industries, the transport and domestic sectors to the same extent. If the UK's (and indeed the EU's) long-term ambitions on climate change are to be realised, then it will become increasingly important that other sectors become fully engaged. Policies need to provide sufficient advance warning so that these sectors can prepare to take their proportionate share of the burden. For example, the UK National Allocation Plan under the EUETS gives the message that whilst the UK wishes to lead on carbon reduction, UK industry other than the electricity sector will get the allocations it needs and so does not have to be concerned. It is the Government's prerogative to place all the burden on the electricity sector for the first phase (2005–07) but it needs to make it clear to all sectors that from 2008 carbon reductions will have to be shared more equitably.

7. It is clear that the achievement of the UK's climate change targets will require considerable investment by industry. Within the electricity sector the lead-time for these investments is typically three to five years, with payback periods often in excess of 15 years. The lack of clarity about the scope and specific targets for both climate change and energy policy both at the UK and EU levels, particularly in the post-Kyoto period, can only act as a deterrent to investment. This will lead to the less efficient use of capital and higher costs in terms of achieving policy goals.

EU EMISSIONS TRADING SCHEME

8. The EU emissions trading scheme will be the climate change policy instrument with the greatest impact on the energy sector over the next decade. RWE fully supports the introduction of emissions trading provided the scheme is designed to ensure the creation of an efficient and liquid international market in allowances and the delivery of carbon reductions at least cost across the sectors involved.

9. It is of concern to industry that with only three months to go before the start of the trading scheme, there is still considerable uncertainty regarding allocation to installations in the electricity sector, lack of clarity on underpinning energy and emission projections, the tax treatment of allowances, the functioning of the registry and technical issues relating to the operation of the emissions trading scheme.

10. The current status of the EUETS and its implementation serves to highlight many of our concerns regarding current climate change policy:

- The first phase of the scheme (2005–07) should be seen as a learning phase prior to the second phase (2008–12), which aligns with the delivery of legally binding Kyoto commitments. In this regard, we should not be over-concerned about the first phase targets and should not be requiring an almost-overnight reduction in CO₂ emissions of 20% from the UK electricity sector.
- The lack of clarity in nearly all Member States about the second phase sectoral targets and allocation methodology can only serve to delay investment which is needed now to meet Kyoto requirements. The requirement to develop National Allocation Plans for the second phase by September 2006 is too late in terms of providing investor confidence.

- The achievement of a truly single market in carbon is threatened by the lack of a harmonised approach to the fundamental market rules—for example, the rules governing issues such as closure, new entrants, banking and auctioning which have been left to individual Member States. The outcome of the review by the European Commission due in 2006 only adds to future uncertainty.
- In the UK and a number of other Member States, the electricity sector is taking almost the entire burden of any emissions reductions in the first phase. The opportunity has been missed to engage other sectors, which need to play their part if the Kyoto targets are to be met. It is important that the second phase of the scheme adopts a level playing field in setting targets for both the traded sector as a whole and for individual sectors within the trading scheme.

11. It is clear that any increase in the burden on the electricity sector to deliver further carbon reductions will result in higher energy costs to industry as a whole and the energy intensive industries in particular. It is for these industries to comment on the prospective impact on their international competitiveness. It is also reasonable to assume that as the market value of carbon rises, there will also be an impact on wholesale fuel costs (such as a carbon premium for gas) as well as electricity prices. This will have implications for domestic energy costs as well as for other sectors and their response to climate change policy.

RENEWABLES

12. RWE npower believes that the Renewables Obligation (RO) is a good example of a market-based policy instrument. As the leading renewables developer in the UK, we are fully committed to playing our part in helping to deliver the Government's renewable energy targets. The completion of our first offshore wind farm at North Hoyle was a significant landmark for the UK renewables industry.

13. The long-term stability of the RO mechanism is fundamental to maintaining investor confidence and this has been aided by the recent extension of the Government target to 15.4% by 2015–16. It is important that confidence in the Obligation framework is not undermined by the forthcoming review by DTI in 2005–06.

14. Planning remains a significant challenge to delivering new renewables capacity at the rate needed to meet the Government's target. The first two years of the Obligation have seen a significant increase in the number of planning consents granted. However, we are particularly concerned about the ability of an increasingly influential vocal minority to frustrate the planning process, despite strong evidence that the majority of the public generally support new renewables projects. Government needs to give a much stronger lead in promoting the "hearts and minds" campaign for wind power.

15. Offshore wind is the key to achieving the required growth rate in renewables capacity. The RO review must ensure the longer-term financial viability of this technology. Investment in extending and reinforcing the national transmission system is also a critical path issue if the second round offshore wind farms located in pre-selected areas around the UK are to start to come on stream in the latter part of the decade.

16. The promotion of emerging renewables technologies such as wave and tidal stream is important if these are to play their part in the longer-term.

ENERGY EFFICIENCY ACTION PLAN

17. We support the view that energy efficiency measures are amongst the most cost-effective for delivering reductions in CO₂ emissions from the perspective of the end user. However consumer apathy remains a major barrier to achieving policy goals in this area. The absence of innovative fiscal incentives aimed at changing consumer behaviour and encouraging engagement is a particular limitation of the current policy framework. Tighter building regulations and appliance standards have an important role to play to ensure consumers make the right choices. As a major player in the supply chain, there is a significant opportunity for Government to set an example through its own procurement policies and practices.

18. Energy efficiency is an area where a large number of Government departments and agencies have a role to play in delivering policy objectives eg Defra, DTI, ODPM, Treasury, Ofgem, Energy Savings Trust and Carbon Trust. It is apparent that more needs to be done to improve co-ordination between these various bodies to deliver a more consistent and coherent policy framework. There are also potential conflicts between the social, environmental and economic objectives of energy efficiency policy. We believe that refinement of policy instruments, including separation of the social and environmental goals, together with better targeting of resources could improve the efficiency and delivery of policy objectives.

19. Energy suppliers have made a major contribution to the delivery of energy efficiency improvements in recent years through a range of initiatives including Energy Efficiency Standards of Performance (EESoP), the Energy Efficiency Commitment (EEC) and Warm Front. We remain concerned about the significant burden to be imposed on suppliers through EEC2 (2005–08) and the sheer scale of activity compared with previous obligations. While EEC2 represents a doubling in the number of measures and significantly increases in carbon saved compared with EEC1, we have concerns regarding the capacity available to achieve this in practice and the impact on the affordability of energy. It has been disappointing

that our experience in delivering energy efficiency measures and that of other energy suppliers has not been fully taken on board by Defra and, as a consequence, we have been unable to reach a consensus with Government on what constitutes a realistic level of energy savings and the associated costs.

20. EEC2 essentially preserves the current obligation framework. It requires double the level of energy savings compared with EEC1 and will impose costs on each consumer of around £10–12 per fuel per annum, roughly three times the level of EEC1. We are disappointed that the opportunity to consider moving to a more market-based approach providing appropriate incentives to both suppliers and customers to engage in delivering energy efficiency has been lost and hope this can be considered in the next phase covering 2008–11. Linking energy efficiency improvements with the EUETS or developing a “white certificate” scheme are potential ways forward.

21. Climate change agreements coupled with Climate Change Levy exemption are cited as having been the major route for achieving energy efficiency improvements in the industrial sector. However, there is little transparency regarding these agreements and evidence suggests that their economic robustness and consistency in terms of the carbon reductions achieved is open to question. Given the future linkage of the climate change agreements with the EUETS, it is important that the agreements are made transparent so that there is confidence that the allocation to the sectors with agreements is consistent with other sectors in the trading scheme.

22. The SME sector has proved difficult to engage within current energy efficiency initiatives, although consideration has been given to their inclusion within EEC. This is in part due to the wide range of activities covered and the need for tailored solutions. Consequently, this sector is probably best targeted through direct fiscal measures and incentives, building regulations and measures directed at landlords leasing office premises.

COMBINED HEAT & POWER (CHP)

23. RWE npower is a leading owner and operator of CHP plant in the UK. The combined effect of higher gas prices and lower electricity prices has had a major impact on the economic viability of the CHP industry in recent years, such that all major developers have disbanded their development teams and growth in the sector has stagnated. While electricity prices have begun to recover, gas prices have risen further, so that the economic position remains difficult for CHP plant.

24. The Government has introduced some support measures for CHP plant including CCL exemption, enhanced capital allowances and business rates exemption. With the exception of CCL exemption they have provided little or no financial benefit to the majority of existing CHP schemes. Consequently CHP capacity is currently around 5GW, well short of the Government target of 10GW in 2010. The Government also undertook to review incentives for CHP under the EUETS. However, the allocation proposals under the NAP do not result in any significant preferential treatment for CHP plant. In fact, all of RWE npower’s CHP assets will be short of required carbon allowances due to the baseline methodology adopted. This can only further reduce CHP load factors and in addition will mean unfair treatment when compared with the proposed treatment of new entrants.

25. Exemption of CHP output from the Renewables Obligation has recently been considered as part of the Energy Bill. The Government rejected this and RWE npower welcomes the Government’s commitment to review the treatment within the forthcoming RO review. However, based on the principle of clarity of purpose of regulation, it is RWE’s view that it is inappropriate to use a mechanism designed to support renewables to provide indirect support for CHP plant.

26. If Government is committed to the achievement of its CHP target, then some form of direct support for CHP will be required. However, we would advocate that this must be explicitly linked to demonstrable environmental benefits to avoid the development of CHP schemes where the heat and electricity loads are poorly matched to the specific requirements of the host site. An immediate opportunity would be for Government to facilitate the capture of the full benefit of CCL Levy Exempt Certificates (LECs) by making LECs fully tradeable ie able to be sold separate from the CHP electricity.

EU AND INTERNATIONAL CLIMATE CHANGE POLICY

27. With its role as Chair of the G8 and President of the European Council in 2005, the UK Government has an important role to play in taking forward the Kyoto and post-Kyoto agendas.

28. Securing early clarity on the rules underpinning the second phase of the EUETS and ensuring the delivery of an efficient and liquid market in allowances has to be to the benefit of both the UK and the EU as a whole. Full access to the international project mechanisms must also be secured to enable carbon reductions to be achieved at least cost. The UK should also seek to ensure that all sectors play their part in reducing emissions, including the transport sector.

29. For the period beyond 2012 it is essential that UK and EU climate change policies are seen in the wider global context. The competitiveness of UK and European industry remains a priority. There is little point in the UK or the EU being a front runner in tackling the challenge of climate change if other leading industrialised nations fail to play their part. The impact in terms of economic growth and securing future

investment is likely to considerably outweigh any environmental benefit. It is essential that the USA and Russia are fully engaged and that those countries with rapidly increasing emissions such as India and China are also playing their part. Consequently, the context for UK and EU climate change policies beyond 2012 must centre on achieving a new international agreement. This must be a priority for the UK and the EU over the next few years.

21 September 2004

Memorandum submitted by National Society for Clean Air and Environmental Protection (NSCA) (U4)

EXECUTIVE SUMMARY:

NSCA highlights the need for action on climate change in two areas. Firstly, there is a need for local authorities to become more fully engaged in climate change, through a mechanism which encourages elected members and officers to tackle local greenhouse gas emissions. Secondly, vehicle emissions remain a major challenge, and the UK should use its forthcoming chairmanship of the EU to introduce maximum standards for carbon emissions from vehicles.

INTRODUCTION

1. NSCA brings together organisations across the public, private and voluntary sectors to promote a balanced and innovative approach to understanding and solving environmental problems. It also provides the Secretariat for the Cleaner Transport Forum, a cross-sectoral body addressing cleaner vehicle technologies and fuels.

2. NSCA is both active and influential in the fields of air quality, noise, land quality, local environment management, and industrial regulation. It is a registered charity with over 100 years experience of environmental campaigning, public information provision and policy formulation.

3. Generally, the Society welcomes evidence of a tougher British and European stance against the US administration's hostility to the Kyoto treaty, and hopes for more concerted pressure when the UK takes over the chair in both the EU and the G8 group of major industrial states next year. However, if the UK is to show international leadership, it needs to demonstrate real commitment at home to practical measures which address carbon emissions. NSCA has specific recommendations for two important policy areas, outlined below.

LOCAL AUTHORITY ACTION ON CLIMATE CHANGE

4. NSCA is recognised for its contribution to Air Quality Management policy in the UK, particularly in promoting consistent policy, legislation and guidance, and assisting local authorities in implementing their statutory duties. Many of the measures required to improve air quality impact upon measures to reduce greenhouse gas emissions, either negatively or positively.

5. Local authorities are well placed to significantly influence greenhouse gas emissions, not merely from their own practices but, through their policies, from the activities and practices of others. For example, development control and planning policy can be used to influence the energy use by new developments. Transportation policies can encourage the use of alternative fuels and the greater use of public transport. Housing and other social policies can have a major impact on domestic energy use. Local authorities can even become suppliers of "green" energy, or example through the private wire network in Woking.

6. However, local authorities do not have explicit targets, or a Statutory Duty, for reducing greenhouse gas emissions. There are obligations are implicit in, for example, the requirements for improving home energy conservation and implementation of Local Transport Plans, and wider powers to promote sustainable development. Many local authorities have already made commitments to reducing greenhouse gas emissions (eg the Nottingham Declaration on Climate Change) and some have taken part in the Councils for Climate Protection pilot scheme, which the Government is hoping to roll out to all nationally, on a voluntary basis. Some local authorities are also working with other agencies, such as the Environment Agency/Scottish Environmental Protection Agency, to assess the future impact of climate change upon their local environment.

7. The success of the local air quality management process has highlighted the ability of local authorities to produce local inventories of emissions, and to prepare action plans to reduce those emissions. This model could usefully be applied to the reduction of greenhouse gas emissions at a local scale, adding a new and potentially powerful dimension to the UK climate change programme. A number of UK local authorities are enthusiastically pursuing energy and climate change policies. Others have signalled a willingness to take action. But in the absence of a clear statutory duty to act, many more are reluctant to go beyond their minimum responsibilities.

8. NSCA's view is that there is a need for a mechanism which provides a focus for local authority led action, identifies key members and officers with responsibility for climate change, and communicates current best practice. We recommend the establishment of a Standing Conference on Local Authority Response to Climate Change, as a partnership of local authority bodies and relevant Government Departments.

Crucially, local authorities should be invited by Government to nominate a senior member and officer with overall responsibility for climate change co-ordination within their authority, identifying local champions for action on climate change.

VEHICLE EMISSIONS

9. It is clear that the much of the potential for low-carbon vehicle technologies and design improvements remains unexploited. The latest data from the EU Voluntary Agreement on reducing CO₂ emissions from cars suggests that the agreement may fail to meet its objectives over the agreed timescale. The current Voluntary Agreement is based on an average emission figure across the whole range of passenger cars. The full potential for CO₂ reductions cannot be achieved because increasing sales of highly efficient small cars are counterbalanced by the continuing expansion of the luxury and SUV market. Furthermore, because the larger vehicles tend to travel more distance, even if the planned reduction in the average tailpipe emissions is achieved under the current Voluntary Agreement, this will not produce a reduction in actual fleet emissions.

10. NSCA is concerned that the voluntary approach is failing to deliver emissions reductions at an acceptable level. We note that the Californian Air Resources Board (CARB) is proposing to introducing maximum CO₂ emission standards for vehicles¹, and believe that a similar approach should be considered by the EU. We note that in other sectors, market transformation in energy efficiency is driven by setting minimum efficiency standards, supplemented by other fiscal and information measures. We believe that it is time to signal the need for minimum standards for passenger cars, which could be introduced from 2010 at, say, 300 g/km, and further reduced (for instance to 250 g/km by 2015 and 200 g/km by 2020). Cars already meet minimum standards for noise and pollutants such as NO_x and PM10, and it does not seem unreasonable to set CO₂ limits, as long as industry is given sufficient notice. We therefore recommended that the UK should use its chairmanship of the EU to secure agreement on the phased introduction of maximum CO₂ equivalent standards for passenger cars and other road vehicles.

11. Maximum vehicle emission standards must be complemented by effective fiscal measures and consumer information. Our position on fiscal measures is straightforward; we recommend that vehicle excise duty (VED) should be more steeply raked in favour of energy efficient cars.

12. On consumer information, NSCA has been campaigning for an effective car energy label, based on the A-G banded EU label now used on electrical goods. The Department for Transport has developed proposals, including a pilot trial, which demonstrated the potential for such a label, and has promoted the concept successfully at EU level where . Recently the Low Carbon Vehicle Partnership has taken up the issue.

13. We welcome the willingness of UK car manufacturers to work in partnership to develop a labelling system, but the approach currently being adopted is disappointing. The industry has offered a voluntary agreement to introduce a label, but only on an A-F banding scale. This would be linked to VED bands (which we support), but the proposed scale leaves a large proportion of the high-emitting vehicle market undifferentiated. There is also a concern that a voluntary scheme will not be adopted enthusiastically by car dealers, and may not be enforced effectively. We recommend that statutory backing be given to an A-G car energy label as soon as possible.

22 September 2004

Memorandum submitted by the Met Office (U6)

Note that the research at the Hadley Centre on which this submission is based, is largely funded by the Global Atmosphere Division of Defra, with additional resources from the Ministry of Defence and the European Commission. The scientific results have been published in the peer reviewed literature (eg *Nature*) or are being prepared for publication.

EXECUTIVE SUMMARY

1. The terms of reference of this inquiry are concerned with the policies required to keep the UK on track in reducing greenhouse gas emissions and the government's role as chair of the G8 and as President of the EC in driving forward the Kyoto and post-Kyoto agendas. On the first point, the scientific work of the Hadley Centre underpins the UK government's commitment to reduce greenhouse gas emissions. This submission details some of the latest results, strengthening the evidence, on which the case for a reduction

¹ The CARB paper is on www.arb.ca.gov/regact/grnhs/gas/isor.pdf

is based. On the second point, there are a number of key scientific results which highlight the regional and global consequences of a range of emissions scenarios which include a range of mitigation options. The main topics covered are:

- a. The fingerprint of the effect of human activity on regional climate change.
 - b. The levels of greenhouse gases needed to stabilise climate.
 - c. High impact events under climate change.
 - d. Changes in extreme events in the next 100 years and measures of uncertainty. With a focus on major cities in G8 countries.
2. Key Hadley Centre findings on these topics are:
- a. A considerable amount of evidence already suggests that much of the observed 20th century global warming has been driven by human activity. New evidence shows that human activity has caused warming on regional scales too.
 - b. Stabilisation even at quite modest levels of greenhouse gases may still require some adaptation, but early action slows the rate at which adaptation will be required. Preliminary calculations show that feedbacks between climate and the biosphere accelerate climate change, implying that lower emissions are needed to stabilise climate.
 - c. Even modest global warming in the next 100 years would lead to the melting of the Greenland ice sheet on much longer timescales (of the order of millennia). On the other hand, our results indicate that the Gulf Stream will probably weaken but not collapse.
 - d. Changes in extreme events are the way that most people will first experience climate change. Increases in summer extreme high temperatures are likely to be much larger than increases in mean temperature. For example in double CO₂ conditions, mean summer temperatures are predicted to increase between 2–7°C deg in London, Paris, Toronto and Washington, whereas extreme high temperatures are likely to increase by 10–15°C. Also, the percentage of dry days is predicted to increase by more than 40% in many regions with associated decreases in summer mean rainfall of over 40%.

We would be able to present some of these and other new results at the forthcoming G8 scientific conference at the Hadley Centre, recently announced by the Prime Minister.

A. THE FINGERPRINT OF THE EFFECT OF HUMAN ACTIVITY ON REGIONAL CLIMATE CHANGE

Figure 1. [Not printed, the information is available at www.metoffice.gov.uk]

3. Observations of temperature show that on average the globe has warmed substantially over the 20th century but that there have been large regional variations in the amount of warming. The Intergovernmental Panel on Climate Change (IPCC) concluded in their Third Assessment that there is new and stronger evidence that most of the warming observed over the last 50 years is attributable to human activities⁽¹⁾. Previous analyses have looked at temperature changes over the globe as a whole rather than over individual continents, but recently the Hadley Centre has examined the causes of 20th century temperature change on the continental scale. Here, the focus is on the landmasses of North America, Asia, South America, Africa, Australia and Europe. The modelling study investigated the historic impact on the climate system of:

- greenhouse gases alone;
- the combined effect of anthropogenic sulphate aerosol, lower atmosphere and stratospheric ozone; and
- the combined effect of volcanoes and changes in the output of the sun.

The optimal detection method shows there is a significant greenhouse gas warming signal in all of the continental regions considered (Figure 1, left hand side). Temperature changes from other anthropogenic and from natural factors are detected in some but not all of the continental areas, since these forcings are weaker and more uncertain than greenhouse gas forcing. Therefore, we have more confidence in attributing a man-made greenhouse gas component to continental scale temperature changes than in attributing other factors. The right hand side of Figure 1 shows the temperature changes in the model results compared to the observations for each continental region. The increases in greenhouse gases caused increased warming as the century progressed. This was balanced to a greater or lesser degree, depending on region, by aerosol cooling. In general there is good agreement between observed and simulated changes.

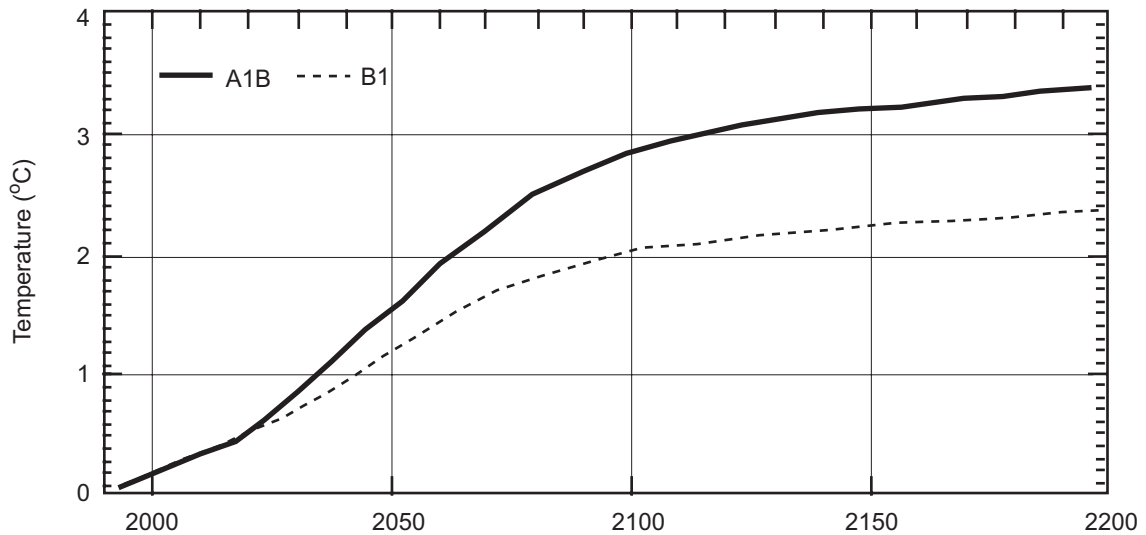
Footnote: (1) Page 158 of Climate Change 2001. Synthesis Report. IPCC.

B. THE LEVELS OF GREENHOUSE GASES ARE NEEDED TO STABILISE CLIMATE

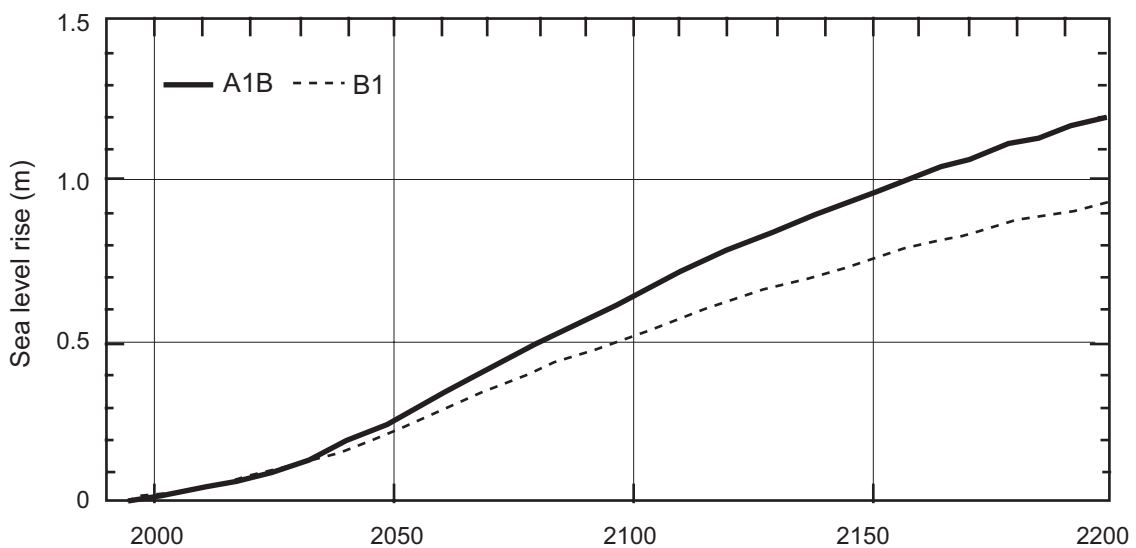
Stabilisation

4. The ultimate objective of the United Nations Framework Convention on Climate Change (UNFCCC) is to achieve “. . . stabilisation of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous interference with the climate system.” Even after greenhouse gas concentrations are

stabilised, it will take a considerable amount of time for a balance to be reached between the incoming solar radiation and the heat lost from the planet. If greenhouse gas concentrations were stabilised today, which would require an immediate reduction in emissions of around 60%, we would still expect the temperature to eventually rise by another 1°C due to the inertia of the climate system. Sea level rise may be more of a problem due to the long timescale for thermal expansion and potential melting of ice sheets.



The predicted rise in global average temperature for scenarios that stabilise greenhouse gas concentrations at 2100



The predicted global average sea-level rise for scenarios that stabilise greenhouse gas concentrations at 2100

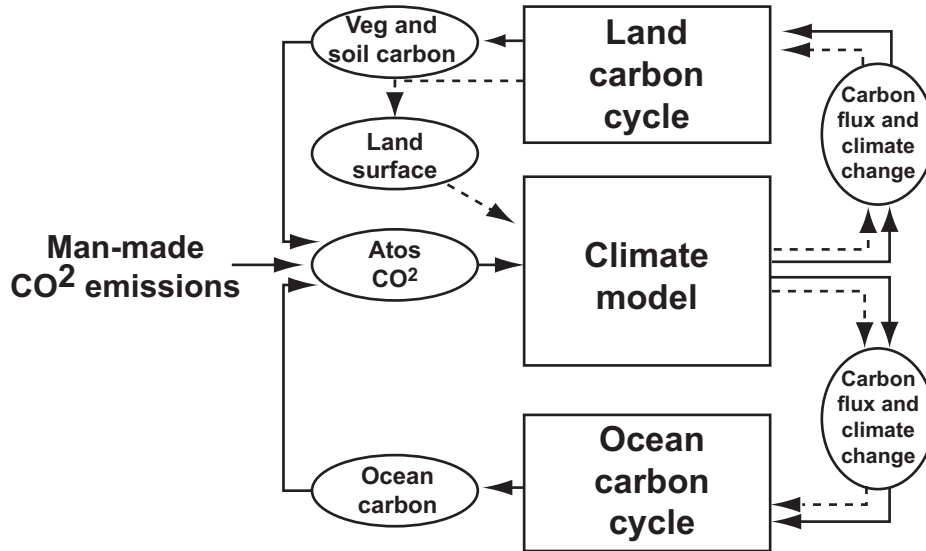
5. We present our first estimates of the temperature and sea-level rise during the 22nd century for two scenarios:

- Proxy for stabilisation at 550 ppm—IPCC SRES B1 emissions and concentrations up to 2100 followed by constant greenhouse gas and aerosol concentrations at year 2100 levels for 100 years.
- Proxy for stabilisation at 750 ppm—IPCC SRES A1B emissions and concentrations up to 2100 followed by constant greenhouse gas and aerosol concentrations at year 2100 levels for 100 years.

Note these scenarios imply unrealistically sharp reductions in emissions at 2100, but are used here to give a general impression of two approximate stabilisation concentration profiles. The following results were calculated using a simple climate model and will be repeated using our full coupled ocean-atmosphere model. Figure 2 shows that for both stabilisation scenarios the global mean temperatures continue to increase between 2100 and 2200, but at a reduced rate.

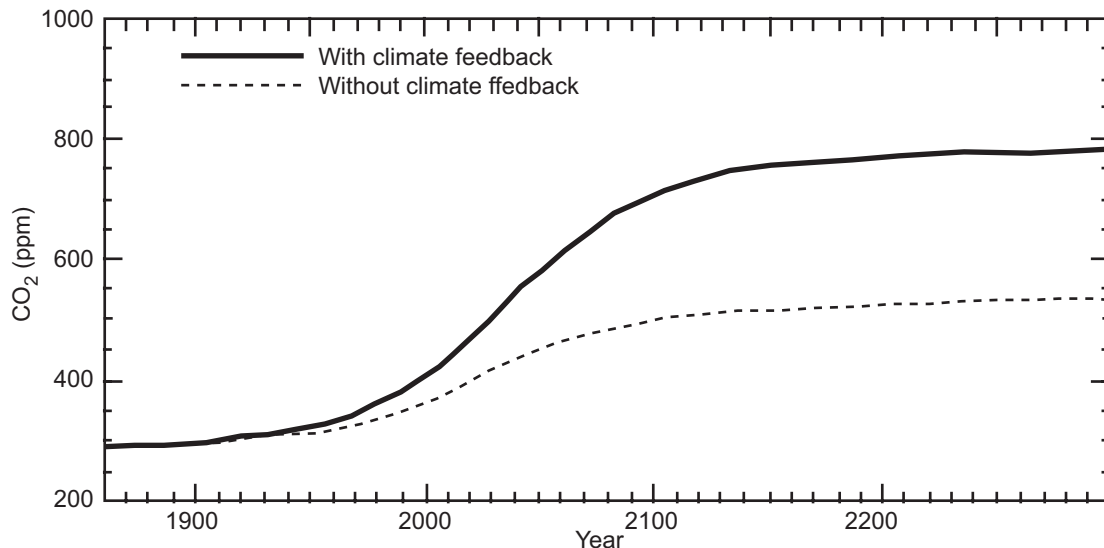
6. The sea level also continues to rise beyond the 2100 concentration stabilisation point. On this timescale the major component of the sea-level rise is the thermal expansion of the oceans. Because the oceans have a large thermal capacity they take a long time to adjust to changes in atmospheric greenhouse gas concentrations, and the commitment to future sea-level rise beyond 2100 (expressed as a percentage of the 21st century rise) is much greater than the commitment to temperature rise. The rate of sea-level rise 100 years after stabilisation is only slightly less than the rate when stabilisation occurred.

The effect of the carbon cycle on stabilisation of atmospheric CO₂ concentrations



Schematic of a coupled climate-carbon cycle model. Full lines indicate carbon fluxes while dotted lines indicate physical changes and climate change

7. The concentration of CO₂ in the atmosphere depends on the amount emitted—for instance, from the burning of fossil fuels and changes in land use—and the strength of carbon sinks, such as the ocean and biosphere, which remove CO₂ from the atmosphere (Figure 3). As the atmospheric concentration of CO₂ increases, so does the ability of vegetation to take up CO₂ from the atmosphere (the carbon fertilisation effect). However, the increases in CO₂ lead to changes in temperature and rainfall, which can affect natural carbon sinks. Over land, climate change can alter the geographical distribution of vegetation and hence its ability to store CO₂. In the Hadley Centre coupled climate-carbon cycle model, we find that climate change results in a dying-back of the vegetation in northern South America. Climate change also affects the amount of CO₂ emitted by bacteria in the soil. In the ocean, changes in circulation and mixing, which accompany climate change, alter the ocean’s ability to take up CO₂ from the atmosphere. In addition, the warmer oceans absorb less CO₂. In order to include all of these feedbacks, it is necessary to treat the carbon cycle and vegetation as interactive elements in full global climate modelling (GCM) experiments. This approach was pioneered by the Hadley Centre and the first results were reported at CoP6 (Conference of the Parties, 6).



Impact of carbon cycle feedbacks on CO₂ stabilisation concentration for 550 emissions.

8. In principle, there are an infinite number of emissions pathways that lead to stabilisation of atmospheric CO₂ concentrations at a given level. IPCC technical note 3 discussed two alternative emissions pathways which would stabilise CO₂ concentrations at a particular level: the IPCC “S” emissions, and the emissions estimated by Wigley, Richels and Edmonds, the “WRE” emissions. These emissions were calculated using a simple carbon cycle model that took account of the carbon fertilisation effect, but other feedbacks—such as that associated with the change of vegetation patterns or the oceans, due to climate change—were not included. To investigate such effects we used a simple climate carbon-cycle model, which includes the feedbacks from vegetation, soils and the ocean. This reproduces the results of the full Hadley Centre coupled climate-carbon cycle model, and was used to make new estimates of the concentrations resulting from the WRE550 emissions scenario.

Figure 4 above shows the CO₂ concentrations that would result. Without including the feedbacks, the emissions eventually lead to stabilisation of CO₂ concentration at around 550 ppm, as intended (below). However, when the more comprehensive feedbacks are taken into account, the CO₂ concentration rises much higher—to 780 ppm by 2300. Thus, the effect of carbon-cycle feedbacks is to allow a greater fraction of CO₂ emissions to remain in the atmosphere.

9. In summary, preliminary calculations show that including the feedbacks between climate change and the carbon cycle greatly reduces the “allowable” emissions that lead to CO₂ concentration stabilisation at a given level. It does this by reducing the strength of carbon-dioxide sinks.

C. HIGH IMPACT EVENTS UNDER CLIMATE CHANGE

Will the Greenland ice-sheet melt?

10. The Greenland ice-sheet would melt faster in a warmer climate and is likely to be eliminated—except for residual glaciers in the mountains—if the annual average temperature in Greenland increases by more than about 3°C. This could raise the global average sea-level by seven metres over a period of 1,000 years or more. We show here that concentrations of greenhouse gases will probably have reached levels before the year 2100 that are sufficient to raise the temperature past this warming threshold.

11. At present, about half of the snow falling on Greenland melts and runs off as water, and the remainder is discharged in the form of icebergs. Climate change caused by higher greenhouse-gas concentrations is expected to produce both higher temperatures and greater precipitation, but most studies conclude that the increase in melting will outweigh the increase in snowfall. For an annual average warming of more than 2.7°C, the melting exceeds the snowfall—a situation in which the ice-sheet must contract, even if iceberg production is reduced to zero as it retreats from the coast. For a warming of 3°C, the ice-sheet loses mass slowly and over millennia might approach a steady state in a smaller inland form. For greater warming, mass is lost faster and the ice-sheet is likely to melt away. Calculations of Greenland’s temperature have been done using different scenarios of carbon dioxide increases followed by stabilisation over the next few centuries.

Figure 5. Predicted warming of Greenland over the next few centuries. The dashed line is the 2.7°C threshold. [Not printed, information is available at <http://www.metoffice.gov.uk/research/hadleycentre/pubs/brochures/>].

12. Figure 5 shows that the 2.7°C threshold is passed in all but one of the 35 combinations of model and stabilisation level. The lowest carbon dioxide concentration considered was 450 ppm. Given that this level is exceeded before 2050 in all of the IPCC report’s emission scenarios, and that carbon dioxide is not the only greenhouse gas, we conclude that the Greenland ice-sheet is likely to be eliminated by anthropogenic climate change unless much more substantial emission reductions are made than those envisaged by the IPCC. This would mean a global average sea-level rise of 7 metres on millennial timescales.

13. This study has been extended at the Hadley Centre, by using its climate model to simulate and predict the evolution of the Greenland ice sheet over several thousand years. This experiment is novel in that changes in the ice sheet, such as the height of the ice or whether the ground is covered in reflective ice or dark soil, are fed back into the climate model.

14. Figure 6 shows that over the 3,000 years following a quadrupling of atmospheric greenhouse gas concentrations, the ice sheet recedes from most of Greenland. By the end of the simulation, it exists only on the mountainous ground of the East. The fresh water released from this loss would cause a sea level rise of around 7 metres. Earlier results suggested that if the ice sheet is removed in this way it would not recover, even if greenhouse gas concentrations were significantly lowered. The next task is to understand at what point the melt down of Greenland becomes irreversible.

Figure 6. The Greenland ice sheet will melt over the course of 3,000 years. Red indicates thick ice while blue indicates thin (or no) ice. [Not printed, information is available at <http://www.metoffice.gov.uk/research/hadleycentre/pubs/brochures/>]

Will the Gulf Stream collapse?

Figure 7. [Not printed, information is available at <http://www.metoffice.gov.uk/research/hadleycentre/pubs/brochures/>].

Figure 7 Simulations using the HadCM3 climate model of the strength of the Atlantic thermohaline circulation from 1930 to 2000 (using historical variations of greenhouse gases, sulphate aerosol, solar radiation and volcanic dust). The simulations show a freshening of the Labrador Sea from 1950–2000, as has been seen in observations, but this is associated with a slight strengthening of the thermohaline circulation over the same period, rather than a weakening as has sometimes been suggested. When the simulations are extended forward from 2000 to 2080 (using a projection of future greenhouse gases and aerosols), both trends are reversed, with a salting in the Labrador Sea and a weakening thermohaline circulation.

15. A key question in climate research concerns the stability of the thermohaline circulation, a system of large scale currents including the Gulf Stream in the North Atlantic Ocean, which carries heat from the tropics to higher latitudes as cold salty water sinks near the poles, drawing warm water north-eastwards. Recent observations have shown a reduction in the amount of salt in the seawater deep in the northwest Atlantic, and this has been interpreted by some as an early sign of a weakening thermohaline circulation.

16. The Hadley Centre climate model (Figure 7) shows that the observations are in fact consistent with a slight strengthening of the thermohaline circulation since the 1960s. Nevertheless, the model predicts that in future it will weaken somewhat as a result of global warming. The model suggests a reduction in the strength of the Gulf Stream by as much as a quarter—but not a collapse. However, even with this reduction in the Gulf Stream, the net result of climate change will be a warmer Europe.

D. CHANGES IN EXTREME EVENTS IN THE NEXT 100 YEARS AND MEASURES OF UNCERTAINTY

17. Good progress is being made in predicting climate change on global and regional scales. Nevertheless, substantial uncertainties remain which are a hindrance to estimating impacts and hence to efficient adaptation. Uncertainty in emissions is dealt with by using a range of emissions scenarios (eg see above). The other major uncertainty is in modeling the climate system. To address this, the Hadley Centre has developed a suite of physically plausible models. So far an “ensemble” of 53 models (soon to be increased to over 100) has been used to estimate of the likelihood of different climate change events. We have extracted temperature and precipitation information from these results for major cities within the G8 countries.

18. Changes in extreme events are the way that most people will first experience climate change. The Hadley Centre has focused initially on temperature and precipitation as there is most confidence in the results for these fields and they are of direct relevance to such concerns as heat stress, flooding, drought.

Summer temperature

19. Figure 8 shows changes in summer² temperatures from 53 different climate models arising from doubling atmospheric CO₂ concentrations with respect to pre-industrial levels³. The blue bars represent the distribution of the changes in mean daily summer temperature by the different models. For example, Berlin has most models showing changes in the mean of between 2 to 5°C with one model showing 11°C. The red bars represent the change in the hottest⁴ day in the summer with values for Berlin ranging from 3 to 19°C but with the majority of models predicting changes of approximately 9°C. This figure indicates that for most of the cities selected, changes in the extremes of summer temperature are likely to be far greater than the changes in average summer temperatures. Such changes in extremes will have significantly greater impacts than the more modest (although still substantial) changes in the means.

² Summer and winter are defined here as the months June, July, August and December, January, February respectively.

³ All results presented here have given equal weighting to each of the 53 climate models. In reality some models will simulate current climate better than others and it would therefore be appropriate to give greater weight to the future predictions of such models. Although this will be incorporated in future analysis no such weighting has been applied here.

⁴ “hottest” in this context is defined as the 99th percentile.

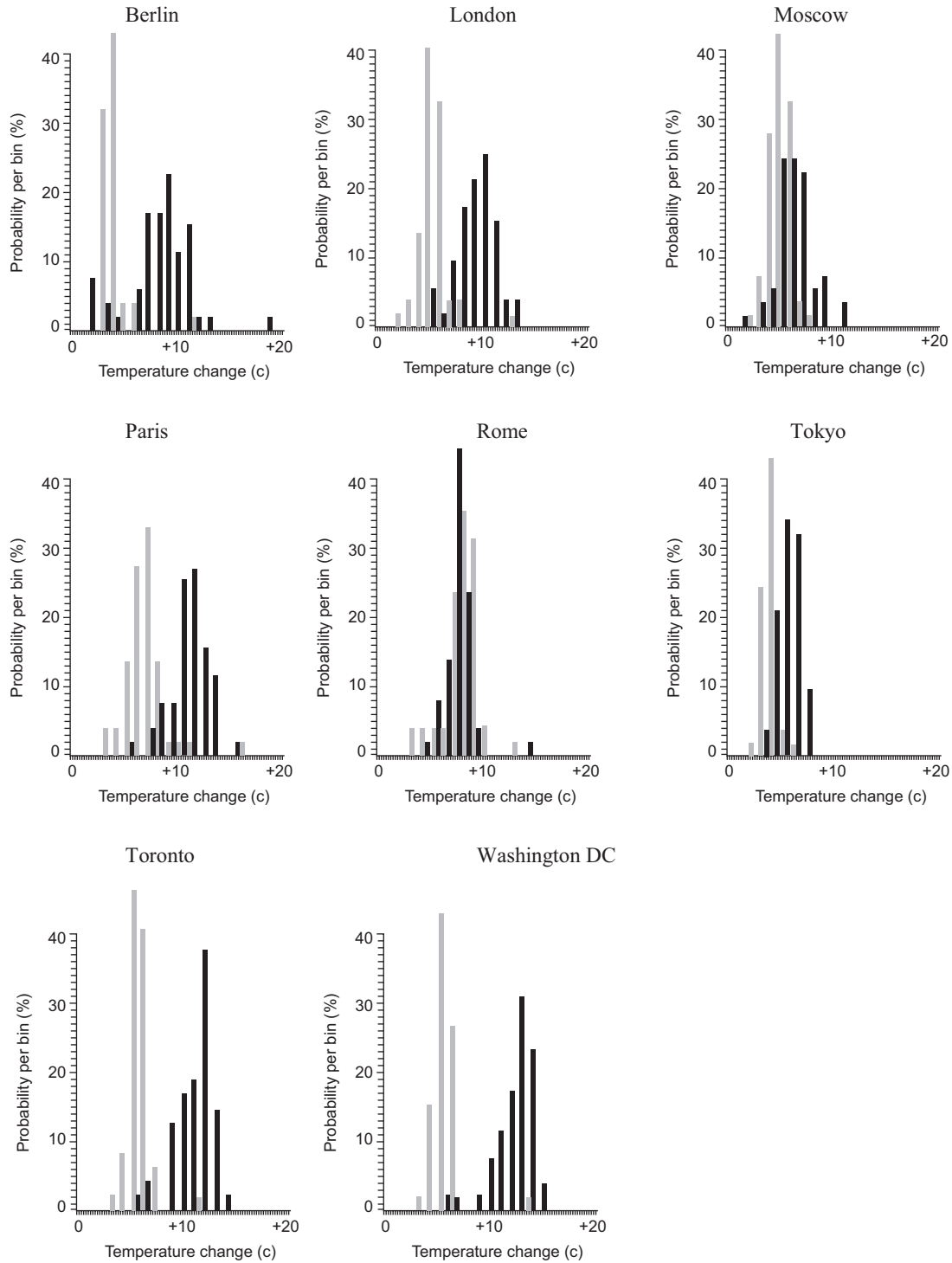


Figure 8. Distribution of changes due to doubling atmospheric CO₂ concentration in daily maximum temperature for the months June, July and August for 53 climate models. Grey bars represent mean daily temperatures and black “hottest day of season” (Average and “hottest day” defined as 50th and 99th percentile respectively).

Winter precipitation

20. To understand the changes in daily weather more fully it is useful to see how the whole distribution of possible daily values changes with increased CO₂. A useful statistical measure to do this is percentile values. For example the 90th percentile is the value below which 90% of all the daily values reside. If we look at how increased CO₂ changes each percentile we can form a picture of how the whole distribution is changing, both extremes and more normal values. Figure 9 shows this for changes in daily wintertime (December, January, February) precipitation due to doubling atmospheric concentration of CO₂ for the same eight cities. The upper and lower lines represents the spread of results given by the 53 different climate models and so give a measure of the uncertainty in the future predictions. To illustrate, for London the range

of changes in the 50th percentile span both negative but predominantly positive changes and with a central estimate of 10% increase in daily winter precipitation, so we would conclude that there is moderate confidence that typical wet days will be getting moderately wetter. For more extremes rainfall, as defined by the 80th percentile and above, all models show more substantial changes (>20%) with the uncertainty range significantly clear of 0% change, thus we would conclude that there is high confidence that extreme daily rainfall will increase substantially for London in winter.

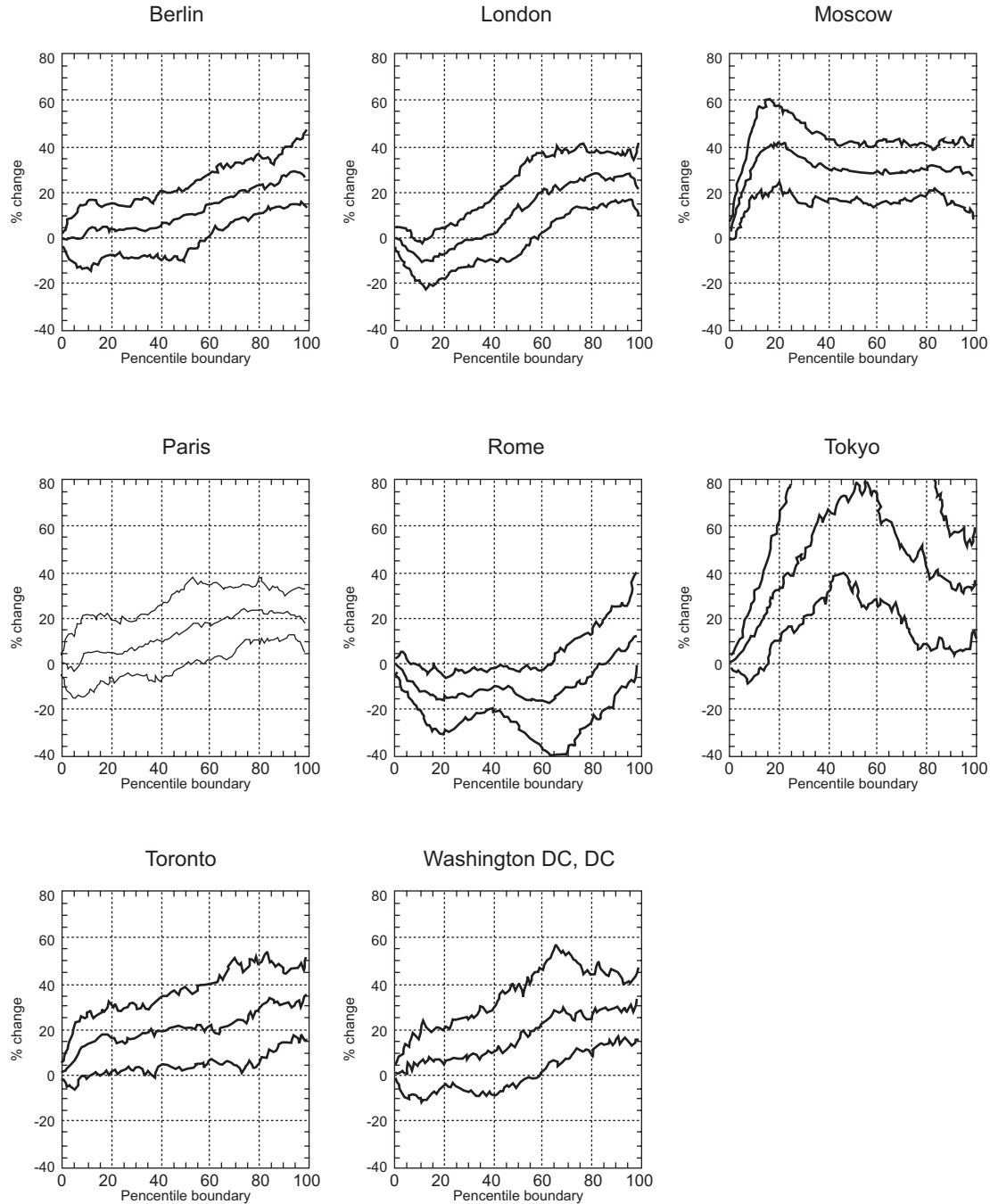


Figure 9. Changes in the distribution of daily wintertime (December, January, February) precipitation due to doubling atmospheric concentration of CO₂. Presented as changes in all percentiles. Upper and lower lines represent the central 80% of results from 53 climate models.

Summer precipitation

21. For northern hemisphere summer much of the land surface shows an increase in the number of days without rain (Figure 10a). This is particularly so for European countries, Canada, central USA, Russia, Africa and the Pacific east coast. Substantial reductions in seasonal rainfall are also seen for many of these areas, with particularly severe drying over Europe and northern South America with seasonal reductions of more than 40% (Figure 10b).

Figure 10(a) [Not printed, information is available at <http://www.metoffice.gov.uk/research/hadleycentre/pubs/brochures/>]. The average percentage change in days without rain in June, July and August for 53 climate models due to doubling atmospheric CO₂ concentrations.

Figure 10(b) [Not printed, information is available at <http://www.metoffice.gov.uk/research/hadleycentre/pubs/brochures/>]. The average change in mean June, July and August precipitation for 53 climate models due to doubling atmospheric CO₂ concentrations.

Further work

22. In order to develop effective strategies for mitigation and adaptation the following areas need further work:

1. Better assessment of uncertainties.
2. More understanding of changes in extreme events (eg of temperature, precipitation).
3. More detail on regional scales.
4. Better understanding of the likelihood of high impact events.
5. A better link between work on predictions of climate change and the impacts of climate change.

The Hadley Centre is involved in research on all of these issues.

28 September 2004

Memorandum submitted by the UK Climate Impacts Programme (UKCIP) (U7)

EXECUTIVE SUMMARY

1. The UK Climate Impacts Programme (UKCIP) would like to inform the Committee of our interest in the “Climate Change: Looking Forward” inquiry. UKCIP is concerned that the issue of adapting to the impacts of climate change should not be overshadowed by the more obvious agenda of mitigating the causes of climate change.

THE UK CLIMATE IMPACTS PROGRAMME (UKCIP)

2. Through this document UKCIP would like to offer itself as a source of information for the Environment, Food and Rural Affairs Committee inquiry “Climate Change: Looking Forward”, as we did for an earlier inquiry into climate change and water security.

3. The UK Climate Impacts Programme was established by government in 1997 and is fully funded by Defra. We help organisations assess how they might be affected by climate change, so they can prepare for its impacts. We co-ordinate and integrate stakeholder-led assessments of climate change impacts at a regional and national level, and provide tools (such as the UKCIP02 climate change scenarios and a risk, uncertainty and decision making framework) and guidance throughout the process of understanding the impacts and developing adaptation strategies to manage those impacts. Within the UKCIP framework, regional scoping studies on climate change impacts have been undertaken for all parts of the UK, and regional climate change partnerships have been established. A number of sectoral studies have been undertaken, and we have started to develop adaptation networks with local authorities and with business. Further information on the UKCIP tools and studies is available from our website (www.ukcip.org.uk).

TWO RESPONSES TO CLIMATE CHANGE

4. The changes in the climate that happen in the next 30 to 40 years have already been determined by greenhouse gases emitted before today, and many actors in society must plan to adapt to those changes, while we also need to reduce our emissions to limit the changes that will occur in the second half of this century and beyond. Mitigation and adaptation are not alternative courses of action; they address different aspects of the climate change issue and both are necessary. While much attention has been focused on reducing the emissions of the greenhouse gases that cause climate change, adapting to the changes caused is another necessary response. UKCIP is keen that the need to adapt is not overshadowed by the need to reduce greenhouse gas emissions. Furthermore, UKCIP sees opportunities for these two responses to climate change to reinforce each other.

ADAPTATION IN THE REVIEW OF THE UK CLIMATE CHANGE PROGRAMME

5. The tenth (and last) of the recently announced terms of reference of the review of the UK Climate Change Programme is “to assess the UK’s response at national, regional and local level to adapting to the impacts of climate change”. Adaptation is harder to quantify than mitigation so that assessing progress towards an acceptable level of adaptation at a national scale is still difficult. UKCIP is interested in being involved in the debate about how this might be addressed.

6. UKCIP would be very pleased to assist with the climate change impacts and adaptation aspects of your inquiry, and hopes these comments are helpful. We look forward to hearing from you, and to providing you with further details on the above in due course.

29 September 2004

Memorandum submitted by the Department for Environment, Food and Rural Affairs (U9)

PART I: THE FORTHCOMING REVIEW OF THE UK CLIMATE CHANGE PROGRAMME DURING 2004–05, LOOKING PARTICULARLY AT WHAT NEW POLICIES MIGHT BE NEEDED TO KEEP THE UK ON TRACK IN REDUCING ALL GREENHOUSE GAS EMISSIONS

REDUCING GREENHOUSE GAS EMISSIONS

1. The Kyoto Protocol is the first important step towards establishing an international framework for agreeing further cuts and future actions in reducing greenhouse gas emissions. The UK's target under the Kyoto Protocol is to reduce emissions of a basket of six greenhouse gases⁵ by 12.5% below base year levels by 2008–12. The UK has also set a national target to move towards a reduction in carbon dioxide emissions by 20% below 1990 levels by 2010. Additionally, the Energy White Paper⁶ published in February 2003 established a new goal for energy policy; to reduce total carbon dioxide emissions by some 60% by 2050, with real progress made by about 2020.

UK CLIMATE CHANGE PROGRAMME 2000

2. The UK Climate Change Programme (CCP), published in 2000, set out the Government's and devolved administrations' strategic approach to tackling climate change. It contains a package of practical measures that it was felt would enable the government to deliver the UK's commitment under the Kyoto Protocol and move towards the domestic goal. Main developments since the CCP was published in 2000 include:

The Climate Change Agreements

3. Climate Change Agreements (CCAs) are agreements with 44 industrial sectors to meet challenging energy efficiency targets in return for paying a reduced rate of the Climate Change Levy (CCL). They began in April 2001 and cover over 5,000 companies and 10,500 sites. Targets are set every two years, and we are now approaching the end of the second target period. Operators will report early in 2005.

4. The results of the first target period in 2002 were very encouraging⁷. The absolute energy savings compared to the baseline years was the equivalent to 16.4 million tonnes (mt) carbon dioxide. The absolute savings figure is dependent on changes in industry activity as well as on energy efficiency improvements. For example, the steel industry's emissions fell by 2.6 million tonnes Carbon (mtc) per annum, partly reflecting a 27.5% decline in output compared with the base year. It is clear that energy management has now become a boardroom issue, with chief executives and finance directors taking a direct interest and substantial additional investment in energy efficiency measures has already taken place.

5. The targets for existing sectors and operators for 2006–10 are currently under review. Defra has also invited applications from new sectors under extended eligibility criteria announced in the budget 2004.

UK Emissions Trading Scheme

6. The UK Emissions Trading Scheme (UK ETS) was launched in April 2002, running for five years from 2002 to 2006. It has 31 Direct Participants who have committed to reduce their baseline greenhouse gas emissions by 3.96 million tonnes of carbon dioxide emissions. In the first two years the Scheme has achieved significant emissions reductions against baselines of 4.64mt of carbon dioxide in 2002 and 5.2Mt in 2003. These were 3.8mt and 3.6mt respectively, in excess of the targets.

7. The experience gained from the Scheme, has placed the UK at the forefront of emissions trading. Participants now have a better understanding of the benefits that Emissions Trading can bring to them and are gaining valuable experience in monitoring, reporting and verification processes as well as trading. Defra has gained valuable knowledge in administering the Scheme as well as in registry development, that has led directly to the development of an European Union (EU)/United Nations (UN) registry.

⁵ The greenhouse gases covered by the Kyoto Protocol are carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons and sulphur hexafluoride.

⁶ *Our Energy Future—creating a low carbon economy* can be found at: <http://www.dti.gov.uk/energy/whitepaper/ourenergyfuture.pdf>

⁷ NAO report: http://www.nao.org.uk/publications/nao_reports/03-04/0304517es.pdf

Transport

8. The transport sector is the third largest source of greenhouse gas emissions in the UK. It is also the fastest growing source of emissions. Whilst the UK's total (net) carbon dioxide emissions have fallen since 1990, the emissions of carbon dioxide from transport have increased from 116,581 kilo tonnes (ktonnes) in 1990 to 122,792ktonnes, representing a rise of some 5% over the period. Transport currently accounts for some 22% of all UK carbon dioxide emissions. Road transportation is responsible for some 95% of all emissions of carbon dioxide from the transport sector.

9. The recent Transport White Paper⁸ described the action already taken and noted that it may be necessary in the long term to move beyond today's vehicle and fuel technologies to radically different alternatives. These might include vehicles powered by hydrogen fuel cells, or fuels produced entirely from energy crops or other forms of biomass. We are committed to facilitating the development of these and other promising alternative technologies, as a potentially cost effective way of achieving carbon savings from road transport in the future. The White Paper acknowledged that the prospect of a transport system powered substantially by biofuels and hydrogen is some years away and committed the Government to introducing a range of measures (listed in paragraph 10.22) in the short term to put the UK on a path to a low carbon transport system.

10. The EU voluntary agreements on new car fuel efficiency with car manufacturers have proved an effective mechanism for improving cars' fuel efficiency and reducing carbon emissions. This approach, which focuses on the levels of carbon emitted rather than on dictating particular technologies, gives manufactures the flexibility to develop the most cost-effective solutions. The agreements are on course to reduce emissions from the average new car from 186 grammes per kilometre (g/km) in the EU in 1995, the base year for the agreements, to 140g/km by 2008, a reduction of around 25%⁹. The UK market profile of carbon dioxide performance is similar to comparable markets like Germany and Sweden, all of which currently exhibit fleet average emissions slightly above the EU average of 163g/km.

11. The Community target for carbon dioxide is supported in the transport sector by the voluntary commitments as one part of three pillars, the other two being fuel efficiency labelling and fiscal measures, for example, in the UK, the Government has introduced changes to vehicle excise duty and company car taxation.

12. Changes to company car tax were introduced in 2002 and provide incentives for employers and company car drivers to choose cars which produce lower levels of carbon dioxide emissions. Although the long term impact of the reform will not be known for some years, Inland Revenue research¹⁰ suggests that the average carbon dioxide emissions of new company cars decreased significantly from a level of around 196 g/km in 1999 (when the intention to switch to a new company car tax system was announced) to 182g/km in 2002. The research also suggests that in 2003 there was a reduction of around 0.15–0.2mtc due to the reform.

13. The Air Transport White Paper¹¹ acknowledged the increasing impact that aviation emissions are making towards total emissions. Forecasts have suggested that by 2030 carbon dioxide emissions from UK aviation will amount to some 16 to 18mtc, of which 97% would be from international flights. This could amount to about a quarter of the UK's total contribution to global warming by that date. The Government is actively pursuing the inclusion of intra-EU aviation in the European Union Emissions Trading Scheme (EU ETS) and will make this a priority for the UK Presidency in 2005. We will also continue to explore the scope for the use of other economic instruments to tackle aviation emissions.

The Energy White Paper

14. The Energy White Paper sets out policies and measures to implement the objectives set out in the CCP for 2010, and provides a foundation for the further carbon cuts needed by 2020 and beyond. With the principles of sustainable development in mind, the White Paper's long-term strategic vision for energy policy has four overall goals:

- to put UK on a path to cut its 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.
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⁸ *The Future of Transport*, published by DfT dated July 2004. <http://www.dft.gov.uk/strategy/futureoftransport/>

⁹ All figures relating to the voluntary agreements are for "tank to wheel" emissions.

¹⁰ Report on the Evaluation of the Company Car Tax Reform, Inland Revenue (29 April 2004). www.inlandrevenue.gov.uk/cars/cct_eval_rep.pdf

¹¹ "The Future of Air Transport", published on 16 December 2003 by DfT. <http://www.dft.gov.uk/aviation/whitepaper/>

15. The White Paper stated that the new EU emissions trading scheme would be a central plank of future emission reduction policies. It also identified further energy efficiency and new renewable energy as main measures to achieve the UK's energy policy goals.

Energy Efficiency: The Government's Plan for Action

16. The White Paper identified energy efficiency as the safest and most cost-effective way to achieve all of our energy policy goals. Reducing energy use can reduce carbon emissions, enhance the security of energy supplies, improve the competitiveness of UK businesses and reduce fuel poverty.

17. To achieve these goals, a step-change in the rate of improvement in energy efficiency will be needed. The April 2004 Action Plan fulfilled a commitment in the White Paper to publish a detailed implementation plan setting out how the Government will deliver this step change.

18. The policies and measures in the Action Plan have been designed to provide savings of 12mtc annually by 2010. This is a 20% increase over the level of savings anticipated at the time of the White Paper, and will save UK households and businesses over £3 billion per year on their energy bills.

19. Implementation of the Action Plan is coordinated by Defra's Sustainable Energy Policy Division and monitored by the Sustainable Energy Policy Network (SEPN).

20. The Government will continue to look for ways to further strengthen the contribution from energy efficiency as part of the review of the CCP later this year.

The Energy Efficiency Commitment

21. Under the Energy Efficiency Commitment for 2002 to 2005 (EEC), electricity and gas suppliers are required to achieve targets for the promotion of improvements in domestic energy efficiency. This current phase of the EEC is expected to save about 0.4mtc per annum. The Energy White Paper firmly set EEC in a continuing key role in the Government's carbon abatement strategy in the domestic sector and committed Government to "consult on an expansion of the EEC to run from 2005 to at least 2008 at possibly twice its current level of activity". Following an informal consultation process with key players (including energy suppliers, the energy efficiency industry, energywatch and Ofgem) Defra launched the formal public consultation on 21 May. The consultation proposals suggest that the second phase of EEC could save up to 0.7mtc pa in 2010. The consultation period closed on 13 August and analysis of the responses is ongoing. The Government expects to put relevant legislation to Parliament in November and launch the next phase of the EEC in April 2005.

The Energy Saving Trust

22. Since 1996-97 the Government has provided funds to the Energy Saving Trust (EST) to run a wide ranging programme of work to promote energy efficiency EST was established as part of the UK Government's response to the 1992 Earth Summit in Rio de Janeiro. This addressed worldwide concerns on environmental issues such as climate change.

23. The Trust works to promote, through partnership, the sustainable and efficient use of energy in the domestic and small business sectors by improving awareness of energy efficiency, providing information and advice, and working with the market to develop and market energy efficient goods and services. The Trust is also active in encouraging local authorities to develop energy efficiency strategies

24. In April 2000 the Energy Efficiency Partnership for homes was launched. The Partnership, which is facilitated by the Trust, brings together all those with an interest in promoting domestic energy efficiency. It aims to create a long-term framework for implementing energy efficiency in homes.

The Carbon Trust

25. The Carbon Trust (CT) is a private company launched in April 2001, as part of the CCL package to take the lead on business and public sector energy efficiency and encourage the development of a low carbon sector in the UK.

26. The CT operates the UK's main information, advice and research programme for organisations in the public and private sectors. CT took over the management of the Government's non-domestic Energy Efficiency Best Practice programme in July 2002 and re-launched it, including an interest free loan scheme for Small and Medium sized enterprises.

27. The CT took over the administration and promotion of the Energy Technology List of energy efficient technologies eligible for 100% first year capital allowances under the Enhanced Capital Allowance Scheme in August 2002.

28. The CT looks to accelerate the development of new and emerging low carbon and energy efficient technologies in the UK. Innovation activities focus on providing a funding continuum across the low carbon innovation process that invests in projects and leverages further funding.

Electricity from renewable sources

29. The Government set a target to increase the proportion of electricity provided by renewable sources to 10% of electricity supplied by 2010, subject to the cost to consumers being acceptable. The Energy White Paper confirmed the 10% target, and set out our aspiration of doubling this by 2020.

30. The 2010 target is challenging, as we are starting from a low base, but we are working hard to meet it. In this context, the Renewables Obligation, which requires all licensed electricity suppliers in England and Wales (there is a similar obligation in Scotland) to supply a specific and growing proportion of their electricity from renewables, is working well. Since the Obligation came into force, over 1,500 Mega Watts (MWs) of wind capacity has received consent. It is estimated that some 350 MWs of new capacity will be built by the end of this year (three times as much as last year). In order to provide a stable and long-term market for renewable energy, the Obligation will remain in place until 2027. The level of the Obligation was 3.0% when it was introduced in 2002–03 and it is 4.9% for the current year, and increases to 10.4% in 2010–11.

31. In December, the Government announced that the level of the Obligation would be increased for the years after 2010–11 so that it will rise in stages to 15.4% in 2015–16 and continue at this level until 2027. A statutory consultation exercise is currently under way. In addition there will be a review of the Renewables Obligation in 2005–06.

32. In 2003, Electricity from all renewables amounted to 2.9% of all electricity generated.

EU Emissions Trading Scheme

33. The EU ETS is one of the policies in the European Climate Change Programme. The scheme will begin on 1 January 2005, with the first phase running from 2005–07 and the second phase running from 2008–12 to coincide with the first Kyoto Commitment Period.

34. The scheme will work on a “Cap and Trade” basis. EU Member State governments are required to set an emission cap for all installations covered by the scheme. Each installation will then be allocated allowances for the particular period in question. The EU ETS is central to our work to move towards a low carbon economy. It is a key measure in helping us to move towards our 20% domestic emission reduction goal and international commitments to reduce emissions of greenhouse gases. Emissions trading is the most cost-effective way of achieving emissions reductions. Emitters can choose either to reduce their own emissions or to buy allowances from other emitters in Europe, who are reducing their emissions, whichever is the cheaper. The overall level of allowances to be allocated in the UK in phase 2 of the EU ETS (2008–12) will be strengthened to be consistent with the trading sector’s contribution to achieving the national climate change target of moving towards a 20% reduction in emissions of carbon dioxide by 2010).

35. The EU ETS Directive required all Member States (MS) to transpose the Directive into national law by 31 December 2003 and to submit a National Allocation Plan (NAP) to the European Commission by 31 March 2004. The UK was the only MS to meet the challenging transposition deadline and was the first MS to publish a draft NAP in January 2004, thus reinforcing the UK’s role at the forefront of tackling climate change.

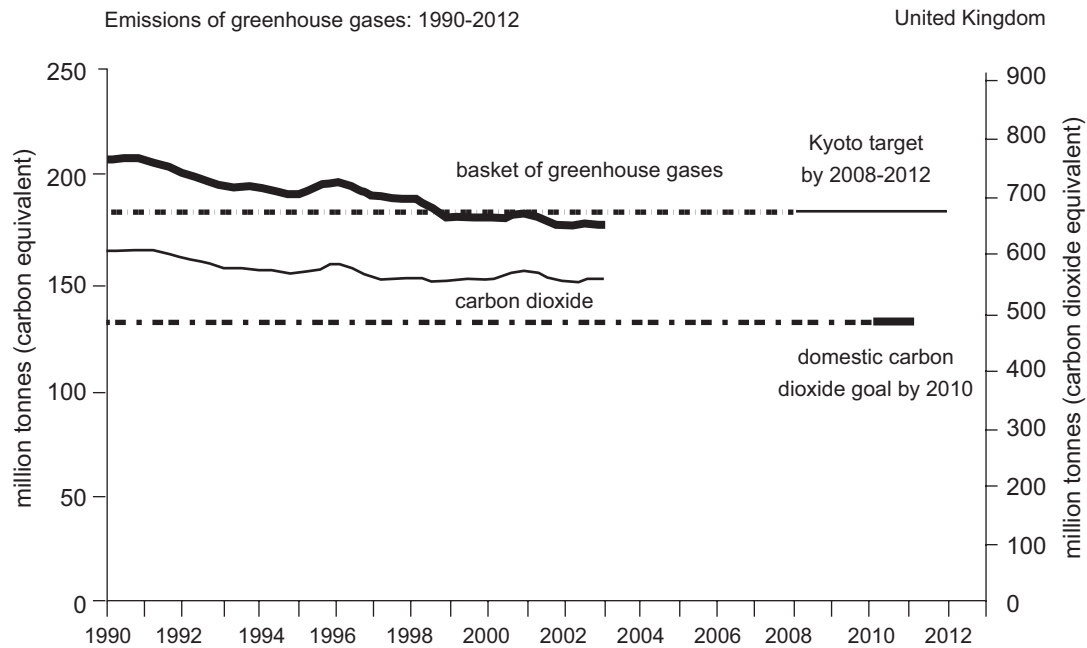
36. The UK submitted its provisional NAP to the European Commission on 30 April 2004, which sets out the UK’s proposals for the allocation of allowances to operators of installations covered in the first phase of the EU ETS. The limit on the overall allocation for this phase is based on securing the same amount of savings from emission trading as we had expected when the climate change programme was published in 2000. The UK NAP was approved by the Commission on 7 July (subject to conditions) along with NAPs from a further seven Member States. Further work on the UK NAP is ongoing which may lead to a revised NAP being submitted to the European Commission in the autumn. Decisions on NAPs from the remaining MS NAPs are expected towards the end of 2004.

37. The UK is leading in the implementation of the EU ETS and is thereby demonstrating its commitment to tackling climate change. Industry is being encouraged to invest in emissions abatement and innovation, and is being given opportunity to take full advantage of the benefits that trading offers. Furthermore, industry now has more time to decide on and prepare carbon management strategies, so that the UK can take full advantage of the European-wide trading scheme.

PROGRESS TOWARDS TARGETS

38. The UK remains on course to achieve its Kyoto target to reduce greenhouse gas emissions by 12.5% below 1990 levels by 2008–12. Total UK emissions of greenhouse gases in 2003 are provisionally estimated to have fallen by 14% compared to 1990. Emissions of carbon dioxide for 2003 are provisionally estimated at about 7% lower than in 1990. Emissions increased by about 1½%¹² between 2002 and 2003, although they remain lower than in 2001. The increase was largely because of greater use of coal in electricity generation and a decrease in net imports of electricity from the continent.

39. The updated climate change “headline” sustainable development indicator¹³ is shown below.

CLIMATE CHANGE HEADLINE INDICATOR¹⁴

Note: Estimates for 2003 are provisional

Source: National Environmental Technology

40. Current projections suggest that the UK is on course to something around a 15% reduction in carbon dioxide on 1990 levels by 2010. The DTI published a working paper¹⁵ on Updated Energy Projections in May 2004. Allowing for the impacts of the CCP, but not the EU Emissions Trading Scheme, this projects carbon dioxide emissions in 2010 at around 14.3% below 1990 levels. A reduction of 1.5mtc in the allocation of allowances within the EU ETS, in line with the UK’s NAP, takes this reduction to 15.2%.

41. Work to finalise projections to feed into the UK’s NAP, and to the review of the CCP, is continuing. We expect to publish a further update alongside the amended UK NAP to be submitted to the European Commission in late autumn.

CLIMATE CHANGE PROGRAMME REVIEW

42. The 2000 CCP included a commitment for the Government to carry out a formal review of it in 2004. The review will aim to provide a comprehensive assessment of the progress the Government and the devolved administrations have made in reducing greenhouse gas emissions since the programme was published to see if we are still on track towards our 2010 domestic goal. If we are not, we will look carefully at whether we should introduce new policies and measures, and/or strengthen existing ones.

¹² Provisional 2003 estimates of percentage changes since 1990 and 2002 are subject to a range of uncertainty of at least + 1/2%.

¹³ This table was first published in a Press Notice issued on 25 March 2004. It represents the first release of data from the National Atmospheric Emissions Inventory for 1970-2002, produced for Defra and the Devolved Administrations by the National Environmental Technology Centre (NETCEN). For further information on the Inventory see the NAEI web site at www.naei.org.uk

¹⁴ The climate change indicator is one of the Government’s 15 headline indicators of sustainable development. These are a “quality of life barometer” measuring everyday concerns like housing development, health, jobs, air quality, educational achievement, wildlife and economic prosperity. They are intended to focus public attention on what sustainable development means and to give a broad overview of whether we are “achieving a better quality of life for everyone, now and for generations to come”. The latest information on all the headline indicators is available at: www.sustainable-development.gov.uk/indicators/index.htm

¹⁵ Updated UK Energy Projections, May 2004: <http://www.dti.gov.uk/energy/sepn/uep.pdf>

43. The review will take into account developments since, including the Energy White Paper, the Energy Efficiency Action Plan, the “Future of Transport” White Paper and the EU Emissions Trading Scheme. The review will also consider the action that the UK will need to take to ensure it is on course to make the “real progress by 2020” towards the longer-term goal of reducing carbon emissions by some 60%, as set out in the Energy White Paper.

44. The review was launched on 15 September with the publication of the Terms of Reference for the review¹⁶. Please find these enclosed in the Annex. It will be a wide ranging and comprehensive review, covering not only the policies and measures to reduce emissions but also the parts of the CCP that deal with, for example, climate change science, impacts and adaptation.

45. It is too early to say what new measures or policies will be included in the revised programme. Our aim is to carry out an open and inclusive review; following the evaluation of key elements of the existing programme, we intend to consult stakeholders, both on the findings of the evaluation and on possible policy options for the future. A full appraisal of the options along with the results of this consultation will be used to help design the revised programme.

46. Defra will submit a supplementary memorandum on its initial assessment of progress for use by the Committee.

PART II: THE ROLE THAT THE GOVERNMENT WILL PLAY IN 2005 AS CHAIR OF THE G8 AND AS PRESIDENT OF THE EUROPEAN COUNCIL IN DRIVING FORWARD THE KYOTO AND POST-KYOTO AGENDAS

47. The UK’s dual Presidencies of the G8 and the EU offer a unique opportunity for to re-inject some positive momentum into the international process. With our presidencies coinciding with the start of negotiations on a post-2012 regime in December 2005, we can also ensure that the UK is at the forefront of this process.

48. Next year is a crucial year for the Kyoto Protocol and the international climate change process as a whole. The Protocol is yet to come into force, having not yet been ratified by 55 countries including annex 1 (developed) countries responsible for 55% of this group’s greenhouse gas emissions in 1990.

49. The United States, the world’s largest greenhouse gas emitter (responsible for 20% of global emissions), has said it will not ratify the Kyoto Protocol. It still remains a signatory of the United Nations Convention on Climate Change (UNCCC) and our scientists agree on the basics: the US National Academy of Science has confirmed that climate change is happening and is caused by human activity. The UK Government will continue to encourage the United States to re-engage in the international climate change process. The G8 has been one of the few areas in which we have had constructive dialogue with the US on climate change and we will pursue this during our Presidency next year.

50. Following the US withdrawal from Kyoto, only Russian ratification (and deposition of its ratification instrument with the UN in New York) can realistically now deliver its entry into force. The Kyoto Protocol is the first and only serious global attempt to deal with the problem of climate change, and the UK Government remains fully committed to it. Securing Russian ratification of the Kyoto Protocol continues to be a key objective on the international climate change agenda and we continue to encourage them at every available opportunity.

51. Under the Kyoto Protocol, 2005 is when the Protocol envisages starting negotiations on the post-2012 regime. This is likely to be at the Ministerial Conference of the Parties in November 2005, during which the UK will hold the Presidency of the EU, as such the UK will have an influential role to play in the negotiations. The UK will continue to do what it can to ensure early entry into force, but we are aware that Kyoto alone is not enough and deeper cuts will be needed in the future. This is evidenced in our domestic policy on carbon dioxide emissions, as set out in the Energy White Paper, which put us on the pathway towards reductions of some 60% by 2050.

52. 2005 is also the date by when Annex 1 (developed) countries must show they are making “demonstrable progress” against their reduction targets. Leadership will be required to ensure that the EU member states are able to do this, which will be essential to put us in a strong position for negotiations on future action.

G8

53. The Prime Minister has identified climate change as one of our priority issues for the UK’s Presidency of the G8 next year. The Government wants to take a strong case for action on climate change to the G8, with the aim of securing some positive outcomes at the UK’s G8 Summit in July 2005.

54. Given that the G8 account for over 65% of global GDP, their actions have extensive political and economic clout, and profile. The G8 are an important engine behind technological development and account for the lion’s share of scientific effort globally, reflected in their responsibility for 70% of the world’s scientific

¹⁶ Press notice for the launch of the Terms of Reference for the review of the UK Climate Change Programme—www.defra.gov.uk/news/2004/040915b.htm

papers and 75% of science citations. Against this background, securing radical and ambitious action on climate change by the G8 would have huge impact, not least because the G8 is responsible for about 47% of global carbon dioxide emissions. Moreover, ensuring developing countries' engagement in the future, demands developed countries taking the lead to reduce emissions. It is vital that we engage meaningfully with other major countries with growing energy demand, such as India and China. Not only on how they can increase energy supply in a sustainable manner, but also to help them adapt to the adverse effects of climate change we are already locked into.

55. We hope to secure agreement on the basic science of climate change and the threat it poses. This would be new and would underpin the debate on further action. We will also be seeking agreement on a process to speed up the development of technology and other measures necessary to meet the threat. To facilitate this, we propose holding an international scientific meeting at the Hadley Centre for Climate Prediction and Research in Exeter in February. This will tackle the big questions to which we need answers—"what level of greenhouse gases in the atmosphere is self-evidently too much?" and "what options do we have to avoid such levels?". Held prior to the G8 Summit itself, we hope that the answers to these questions will help inform discussion in the G8.

56. Action taken under the G8 will be complementary to the goals of the UNFCCC. Work streams taken forward under the G8 would not seek to establish new processes unnecessarily but rather explore where G8 action can add extra value.

57. There will be follow up the cleaner energy technologies part of the "Action Plan on Science and Technology for Sustainable Development" which was agreed in Evian in June 2003 and followed up by the US this year. This seeks to promote the uptake of existing cleaner technologies and spur innovation into new ones, a key aspect of tackling climate change. These technologies will be needed if we are to succeed in making the deep cuts in greenhouse gas emissions which will be necessary, while still providing the products and services one can expect in a modern world. These technologies will also provide secondary benefits such as reducing local air pollution, improving energy security and producing more affordable and accessible energy for remote areas.

58. The Prime Minister's other priority for the Presidency of the G8 is Africa and Defra has already commissioned a joint study with DfID to look at Africa and climate change. This study will review what information is available on climate change in Africa and evaluate the adequacy of existing data to inform policy decisions. This provides an opportunity to identify and raise key issues that the international climate change community and system needs to collectively consider and respond to in order to support African development and bring African concerns into international climate change negotiations and assessments. The position in Africa is very different from the more advanced developing countries where there is a good (and growing) appreciation of the climate problem and how its impacts. Much less scientific work has been carried out on the impacts of climate change on Africa and there is much we simply do not know. The study can add considerable value by identifying these knowledge gaps and what needs to be done to plug them.

EU

59. With the deadline for showing demonstrable progress under the Kyoto Protocol falling within the UK's presidency of European Union, one of the UK's priorities will be to ensure that the European Union can do this. We will need to work closely with our fellow member states and the Commission to ensure that this is, not only shown, but shown convincingly. This would demonstrate that the European Union is taking its responsibilities seriously and sends signals out to developing countries that developed countries are taking action to reduce greenhouse gas emissions.

60. This acknowledgement of what the EU has already achieved will be accompanied by a commitment to further reductions. This needs to be an ambitious but still credible commitment to medium and long-term strategies and targets so that other parties to the UNFCCC and Kyoto Protocol see our intent and commitment. This will be an opportunity for the EU to show what is possible and lead the way in setting more ambitious targets.

61. During the second half of 2005 we expect a number of important issues contributing to the EU's reduction programme in the first Kyoto commitment period, and to the base for reductions thereafter, to come before the Environment Council and other EU Council formations. It is difficult to predict how matters will go in the intervening Dutch and Luxembourg Presidencies, but the Energy Services Directive contains a number of measures that could be of great importance to greenhouse gas reductions and could well be negotiated during the UK Presidency. The negotiations on another round of EU voluntary agreements with vehicle manufacturers aimed at forcing down emissions from the transport sector by improving the fuel efficiency of the new vehicle fleet could still be under way. The negotiation of the second phase of the EU ETS, particularly its extension to other sectors perhaps including aviation, could take place in this period. These three issues together amount to a large proportion of the potential for emissions reduction across Europe, and their negotiation will be of crucial importance.

62. Our position in the EU and the good bilateral relationships we have with other MSs will also be key in the negotiations for the second commitment period of the Kyoto Protocol. Ahead of the Ministerial Conference of the Parties in November 2004, there will be much discussion within the European Union on what should follow the Kyoto Protocol. The UK is well placed to be at the forefront of this and will be representing the EU at the Conference of the Parties.

63. The UK's Presidency of the EU is not just an opportunity to secure action and make progress within the EU, but is another avenue through which the international climate change process can be reinvigorated. Action taken towards agreeing ambitious targets and strategies within the EU would send positive signals to the international community about the EU's level of ambition with regard to progress on climate change. The EU, under the UK Presidency, would maintain the momentum of the international climate change agenda.

30 September 2004

Memorandum submitted by Richard Swann (U10)

SUMMARY:

(A) A new or enhanced policy to increase public awareness of climate change, its implications and mitigation is required if emission targets are to be met. Facilitating better public recognition of existing and future mitigation activities by explicit climate change labelling, and publication of the top 10 personal mitigation actions for families, may usefully contribute to more effective public awareness.

(B) The Government should use its chair of G8 to influence governments not accepting the Kyoto targets. The Government should seek to persuade them of the urgent necessity for global action to mitigate climate change, and the need to reduce their CO₂ emissions.

1. To keep the United Kingdom on track in reducing greenhouse gas emissions requires a new or enhanced policy to increase public awareness. The publicity needs to result in people changing the habits of a lifetime, and implementing personal mitigation measures. Developing a suitable programme may necessitate preliminary research as well as additional funding.
2. There are many activities being undertaken by local authorities and other organisations which are not self evident to the public as being mitigation or adaptation actions. Awareness would be increased if there was some common national or regional labelling or logo such as a "smiley earth". Labelling all these activities would repeatedly remind us of their underlying purpose of responding to climate change.
3. There are a variety of publications suggesting things to do to reduce energy use. It might be helpful if a "top ten" list of the most effective actions that we could personally undertake to reduce CO₂ emissions could be identified and made widely available. Compiling the list would require not just ranking by reduced carbon dioxide emission levels, but also need a judgement of how likely individual measures would be implemented by the community. This judgement would help to ensure that the measures suggested were more likely to be accepted and would achieve a substantial reduction in overall emissions. By contrast, just valuing measures by reduced emission levels might lead to the selection of a "top ten" which were less acceptable to the community, and achieved a lower net reduction in emissions. This "top ten" would periodically need review as the community's evaluation of climate change altered with increased acceptability of mitigation measures.
4. The publicity should make clear the value of individual actions, the effect of which rapidly accumulates when undertaken by many within the community.
5. With respect to the Government's role as chair of G8, a prime role should be to attempt to persuade "non-conforming" governments of the reality and overwhelming importance of climate change as a potential global threat, and the need to undertake mitigation measures to achieve Kyoto targets or better.

30 September 2004

Memoranda submitted by E. ON UK (U11)

E.ON UK was formerly known as Powergen and retains the Powergen brand for its residential and small business electricity and gas retail business.

SUMMARY

Global warming is the major environmental challenge faced by the UK and the international community and energy companies have a key part to play in tackling the problem.

Government energy policy needs to achieve reductions in carbon dioxide without putting security of supply and affordable energy at significant risk.

If the UK is to achieve its 20% CO₂ emission reduction target (as opposed to its Kyoto target) by 2010, policy measures will need to be strengthened.

Creating the policy framework to encourage the investment needed to meet climate change and security of supply objectives is the most important energy policy challenge facing the Government. This will require a closer relationship between Government, energy companies and their customers.

The Government and the EU needs to address urgently, in discussion with the industry, the design of phase 2 of the EU Emissions Trading Scheme and ensure it generates a sufficiently high price of carbon to incentivise shifting from coal to gas-fired generation. It is essential that Government maintains stability in the RO mechanism and its technology neutral approach.

UK efforts to support carbon capture and storage should be at least comparable to those to support renewable technologies such as wave and tidal power.

The UK needs to maintain the nuclear option but will need to address how the investment risks can be managed so that private capital can be attracted to nuclear within a competitive energy market.

A coherent set of policy measures are needed to provide positive incentives on suppliers and customers to invest in energy efficiency measures.

Domestic customers should be given stronger fiscal incentives to invest in energy efficiency. We recognise tax changes raise difficult political issues, but do not believe that the Government will achieve its CO₂ reduction targets without taking some political risks.

The UK Chair of the G8 and Presidency of the European Council in 2005 are an opportunity for the UK to encourage more effective and concerted action at the EU and world level. The review of the UK's Climate Change Programme is an opportunity to ensure that this can be done from a position of effective domestic action to reduce greenhouse gas emissions.

E.ON UK AND CLIMATE CHANGE

1. E.ON UK is one of the UK's leading energy companies, generating about 15% of the UK's electricity needs, distributing electricity through its Central Networks business to the East and West Midlands and supplying electricity and gas to over 10,000 industrial consumers and, through its Powergen retail business, to 8.5 million domestic and small business customers.

2. Global warming is the major environmental challenge faced by the UK and the international community. The UK Chair of the G8 and Presidency of the European Council in 2005 are an opportunity for the UK to encourage more effective and concerted action at the EU and world level. The review of the UK's Climate Change Programme at the end of this year is an opportunity to ensure that this can be done from a position of effective domestic action to reduce emissions.

3. Energy companies have a key part to play in tackling the problem. Carbon dioxide (CO₂) emissions from UK electricity generation have declined by about 20% since 1990 but still account for about 30% of total UK emissions. E.ON UK is investing substantially in measures to reduce CO₂ emissions further. We are one of the UK's leading developers of renewable energy sources with 170 MW of plant in operation and a 60 MW offshore wind project at Scroby Sands off the Yarmouth coast nearing completion. We are also co-firing biomass in two coal-fired stations and have further offshore and onshore wind and biomass projects under development. We aim to have about 1,000 MW of renewable energy in operation by 2010.

4. On the demand side, we are investing in energy efficiency measures under the EEC scheme, and offer energy efficiency measures as part of the commercial products we offer to customers. We are also one of two managing agents for Defra's Warmfront scheme focussed on consumers on low incomes and the elderly. We are also developing micro-CHP technology for domestic use and have recently announced our intention to purchase 80,000 *Whispergen* units for sale to the public.

CLIMATE CHANGE AND OTHER ENERGY POLICY OBJECTIVES

5. Climate change will be a key driver of energy policy for the foreseeable future, but this problem cannot be tackled in isolation from other energy policy objectives. Government energy policy needs to achieve reductions in carbon dioxide without putting security of supply and affordable energy at significant risk. Because there are potential conflicts between these objectives at least in the short term, the transition to a much lower carbon economy needs to be managed carefully, meeting these energy policy objectives in a balanced way. The Government's Energy White Paper published in February 2003 recognised this but did not fully set out how all these objectives were going to be delivered in practice.

HOW IS THE UK PROGRESSING AGAINST ITS CLIMATE CHANGE TARGETS?

6. Latest Government estimates of how the UK is progressing against its commitment to reduce greenhouse gas emissions under the Kyoto protocol and against its domestic target of a 20% reduction in CO₂ emissions by 2010 compared to 1990 were set out in its Updated Energy Projections, published in May. These estimated that UK CO₂ emission in 2010 will be around 140 MtC or around 15% lower than in 1990.

These projections continue to be updated in the light of comments but it is important to note they assume the successful delivery of a wide range of measures included in and additional to those set out in the Climate Change Programme, and historically very low increases in energy demand growth. A further major risk is uncertainty about future fossil fuel prices and the relative price of coal and gas which has a major impact on utilisation of coal and gas plant and consequently on the power sector's CO₂ emissions.

7. The projections suggest that the UK is well placed to meet its Kyoto Protocol commitments but not to meet its 20% CO₂ reduction target. If the UK is to achieve (or even approach) this target, policy measures already announced will have to deliver the CO₂ emission reductions estimated for them and new measures or the strengthening of existing measures will be needed. Without this it will be much more difficult to achieve the more radical reductions (of around 27–33% in CO₂ emission levels below 1990) the Government believes is needed by 2020 to demonstrate UK international leadership and consistency with the Government's aim of putting the UK on a path to a 60% reduction by 2050. The review of the UK's Climate Change Programme is an opportunity to review the effectiveness of policy but will also need to address whether the UK's 20% target can be achieved without putting secure and affordable energy at risk.

8. Policy needs to be demonstrably capable of achieving the targets set. If it does not this creates uncertainty about future Government action and the risk of late Government policy intervention can undermine investment. If Government does not judge it appropriate to take the necessary measures, for whatever reason, it should adjust its carbon emission targets downwards to ensure policy and targets are consistent, rather than maintain them for presentational reasons.

DELIVERING THE INVESTMENT TO REDUCE EMISSIONS

9. Whatever specific targets are set, energy companies will need to commit substantial investment in technologies—such as renewables, CHP plants or gas-fired combined cycle gas turbines (CCGTs)—to reduce the carbon content of emissions from energy production, or in energy efficiency measures to reduce final energy consumption by customers. Customers of energy will also need to make significant investments in their own right if the radical improvements in efficiency of energy use the Energy White Paper said was required are to be delivered. Creating the right policy framework to encourage this investment to come forward to meet both climate change and security of supply objectives is the most important challenge facing the Government.

10. To achieve this, the policy framework needs to be stable and robust. This will require a closer relationship between Government, energy companies and their customers. Energy companies will need to be assured that policies put in place to deal with global warming will last long enough to reflect the period over which returns have to be made to reward the new investments needed, and that, where change is needed, a transition is provided to avoid undermining existing investments. Similarly customers need strong and long-lasting fiscal and other incentives to reduce their consumption.

11. Energy companies need to show Government that they are investing reasonably against Government policy objectives, minimising costs and managing risks effectively, and that, as good corporate citizens, they re-invest the return not only to reduce emissions further but also to improve social and environmental conditions in other ways at the local and national level.

HOW SPECIFIC CLIMATE CHANGE POLICIES CAN CONTRIBUTE

12. The Government has adopted a wide range of measures to encourage both lower carbon energy production and to improve energy efficiency use amongst industrial and domestic consumers. We believe that priority should be given to ensuring these measures deliver. A number of further steps are needed to ensure that these policies are effective:

Emissions trading

13. The introduction of the EU Emissions Trading Scheme has the potential to deliver emission reductions efficiently and is a central policy initiative in reducing CO₂ emissions. However, the scheme creates an EU wide market and its effectiveness depends mainly on whether Member States as a whole restrict carbon emissions through their National Allocation Plans sufficiently to incentivise investment in carbon abatement. The tighter the scheme, the higher the cost of carbon allowances and the greater the incentive on operators to reduce emissions by fuel switching, building new gas-fired capacity or other investments, although this will also depend on the expected relative price of coal and gas for power generation.

14. Plans submitted to the European Commission suggest that, although the UK has put forward a plan that will require a significant reduction of emissions from the UK power sector (whether through abatement or purchasing allowances) of 5.5 MtCO₂ below business as usual projections, the plans of many Member States do not require reductions in emissions that will put them on course to achieve their Kyoto protocol commitments. The price of carbon in the first phase of the scheme from 2005 to 2007 may therefore be relatively low and ineffective in delivering lower emissions. This is reflected in the current forward price of carbon.

15. It seems unlikely that either the Commission or the UK Government will be able to exert sufficient influence over the content of individual Member States NAPs to alter significantly this overall picture. This reinforces the need to begin to address urgently with industry the design and structure of phase 2 of the scheme (from 2008 to 2012) to ensure that this generates a sufficiently high price of carbon to incentivise shifting from coal to gas-fired generation, while providing for a continuing but reduced role for coal-fired plant operating at low load factors to support security of supply and avoid over-dependence on gas. The rules for Phase 2 need to be established as soon as possible as power station investments will need to be committed in 2005 if they are to begin operation in the early part of the second period. Given the central role of energy companies in delivering this investment, development of Phase 2 of the scheme should be undertaken in close co-operation with industry.

Support for renewables

16. The Renewables Obligation is an efficient mechanism for encouraging the construction of renewable energy in the UK at reasonable cost to the customer. Nevertheless energy companies will view any investment which effectively depends on a Government sponsored mechanism as inherently subject to some political risk.

17. It is essential that Government maintain stability in the RO mechanism and maintains its technology neutral approach. The terms of reference (on which the DTI is currently consulting) for the forthcoming review of the RO should make clear the limits of the review and confirm the Government's support for the RO mechanism as a long-term mechanism for delivering renewables in the UK.

18. A system of capital grants will need to be maintained to provide sufficient support renewable technologies such as offshore wind and dedicated biomass plants which are approaching commercial viability.

19. Until the Government recently issued its revised Planning Policy Statement on renewables—PPS 22—the local planning regime did not provide sufficient support to renewables with a high percentage of projects failing to mature. We welcome introduction of PPS 22 (we sponsored an independent Renewable Energy Planning Panel report as a contribution to its development) which will encourage local planning authorities to clarify how and where renewable energy sources can be most suitably sited within their areas. This should help develop identify suitable sites and avoid abortive work. At the same time developers need to identify ways of engaging more effectively with local communities to get their support. We are doing this through our Community Power scheme which encourages communities to come forward with projects on land which they own. They can then put the rent we pay for the land for community benefits.

Carbon capture and storage

20. Carbon capture and storage (or sequestration) (CCS)—removing and permanently storing in underground reservoirs such as depleted oil fields the CO₂ emitted from fossil-fired power stations—is an important longer term option for contributing to reducing greenhouse gas emissions. It also enables us to make use of fossil fuels, such as coal, which can contribute to security of supply, while avoiding much of the environmental disadvantage. We are actively supporting the Government's efforts to address the legal and technological issues. UK efforts to support the technology should be comparable to those to support longer-term renewable technologies such as wave and tidal power.

21. Estimates vary, but, in broad terms, CCS technologies can be regarded as a “same cost” alternative to nuclear power. Given the substantial upfront capital costs, carbon capture and storage may pose similar problems to nuclear in attracting investment within a competitive energy market. However, CCS has to date not received much public or political attention in the UK, although it offers certain commercial benefits over nuclear power (eg flexibility of operation). Any future consideration of new nuclear build should therefore include CCS as a comparable and possibly complementary option for delivering CO₂ reductions in the medium term.

Nuclear

22. The Government has made clear that it will not consider new nuclear construction without a further White Paper on the issue. Nuclear power has the potential to generate power with relatively little impact on climate change although the high capital cost of the technology and the unresolved issue of disposal of irradiated waste are barriers. We believe the UK needs to maintain the nuclear option but to do so has to identify a publicly acceptable route for disposal of irradiated waste and to address how the investment risks can be managed so that private capital can be attracted to nuclear within a competitive energy market.

Energy Efficiency

23. The Government's energy efficiency action plan explains how the Government expects to achieve energy efficiency savings of 12 MtC by 2010, including 4.2 MtC in the domestic sector. At present the major burden of delivering the target in the domestic sector is placed on suppliers through the Energy Efficiency Commitment programme. While this has proved an effective programme, it imposes costs on suppliers and does little to obtain the engagement of customers.

24. A coherent set of policy measures are needed to provide positive incentives on suppliers and customers to invest in energy efficiency measures. For example suppliers and customers must be allowed to form longer-term relationships which enable both parties to invest in the energy efficiency needs of the customer and stronger incentives on customers to improve the efficiency with which they use energy. The trial suspension of the 28 day rule agreed with Ofgem will help suppliers establish whether there is an effective market for the provision of energy services.

25. However our experience with EEC suggests that, even when subsidised by suppliers, customers are not currently strongly incentivised to accept energy efficiency measures such as cavity wall insulation or other more intrusive measures which have the greatest potential to deliver energy efficiency savings most cost effectively. We believe it is essential that domestic customers are given stronger fiscal incentives to invest beyond the reduced rates of VAT promised for various energy efficient products in the Treasury's recent consultation on fiscal incentives to promote energy efficiency in the domestic sector. This might include banded rates of stamp duty to favour more energy efficient housing. While we recognise tax changes raise difficult political issues, we do not believe that the UK will achieve its CO₂ reduction targets without taking some political as well as investment risks.

Transport

26. The DTI's Updated Energy Projections show that by 2010 transport will become the largest sector emitting CO₂ in the UK and that it is the most rapid area of increase. The Government needs to consider what further steps can be taken in the transport sector to arrest this growth in emissions. We were pleased to hear the Prime Minister argue in his climate change speech on 14 September that aviation emissions should form part of the EU Emissions Trading Scheme second phase.

THE EU AND INTERNATIONAL DIMENSION

27. The UK Presidency of the EU and G8 will enable the UK to help set the international climate change agenda. Concerted international action is essential to tackle climate change effectively. Furthermore without such action the international competitiveness of the UK economy may be put at unacceptable risk. The UK Government should use the EU Presidency to strengthen EU efforts to deliver its own Kyoto protocol commitments and to ensure that phase 2 of the EU ETS is more effective than phase 1. While the UK Government and the EU should continue its efforts to secure international ratification of the Kyoto protocol, the absence of the US is a serious weakness. The G8 should provide an opportunity to explore other approaches to engaging the international community, including the US as the world's largest CO₂ emitter, in effective action.

30 September 2004

Memorandum submitted by The Woodland Trust (U12)

BACKGROUND

1. The Woodland Trust welcomes this opportunity to submit written evidence to the above inquiry. The Trust is the UK's leading woodland conservation charity. We achieve our purposes through a combination of acquiring woodland and sites for planting and through advocacy of the importance of protecting ancient woodland, enhancing its biodiversity, expanding woodland cover and increasing public enjoyment. We own over 1,100 sites across the country, covering around 19,000 hectares (47,000 acres) and we have 250,000 members and supporters.

SUMMARY

2. The Trust regards the forthcoming review of the UK Climate Change Programme as one of the most crucial political events of the coming year. The review will provide an opportunity for renewed focus on the Royal Commission on Environmental Pollution's target of a 60% reduction in CO₂ by 2050, the effectiveness of green taxation as a means of helping business and individuals to reduce CO₂ emissions, the need for synergy between Government departments to make real progress and the importance of public engagement with the climate change agenda. A strong theme of the Trust's evidence is that there needs to be greater recognition of the need for adaptation measures in response to climate change as well as mitigation measures. These themes and others we hope will be reflected in the UK's G8 and EU presidencies in 2005.

THE FORTHCOMING REVIEW OF THE UK CLIMATE CHANGE PROGRAMME

3. Climate change has been described by the Government's Chief Scientific Advisor as a bigger threat than international terrorism¹⁷ whilst the European Commission has described it as "one of the greatest environmental and economic threats facing the planet".¹⁸ The review of the UK Climate Change Programme is therefore one of the most critical political events of the coming year. The Woodland Trust believes that the review must be visionary and not shirk the challenges faced. It must also make every effort to engage the public with the issue through building on the growing awareness triggered by recent extreme climatic events. It must also accord far greater recognition to the need to adapt to the fact that climate change is already with us and recognise that mitigation alone is not enough at the stage we have reached. Our evidence will focus particularly on this theme.

REDUCTION OF GREENHOUSE GAS EMISSIONS AND PUBLIC ENGAGEMENT

4. The UK must at the very least, not be deflected from the pursuit of the 60% reduction target by 2050 put forward by the Royal Commission on Environmental Pollution. As the Prime Minister recently noted, this means significant changes in lifestyle¹⁹ and will require an imaginative approach which genuinely incentivises greener behaviour and business opportunities.

5. Effective communication strategies and use of fiscal incentives by Government are vital to ensuring that these changes are perceived as opportunities rather than burdens. This can be greatly assisted through thoughtful and wider use of green taxation, a tool which has seemingly been relegated in importance following the Government's initial positive noises about its potential upon coming to power. It will also require far bolder action in tackling the extent of the pollution from the aviation industry, predicted to be one of the biggest individual contributors to climate change by 2050.²⁰

6. Particularly apparent, and a major theme during the current review of the UK Sustainable Development Strategy, is the need for far more joined up action across Government with strong leadership required from No 10. The recent move towards the sharing of the PSA target on reduction of greenhouse gas emissions between Defra and the Department of Transport is a welcome but glaringly overdue initiative emerging from Spending Review 2004.

7. The Government's target of achieving a 20% share of electricity from renewables by 2020 should be regarded as a minimum and a more imaginative approach will be needed if even this aspiration is to be met. One area that should be looked at further at a local scale for example is the role of woodfuel, particularly as a short term interim measure to bridge the gap before more sophisticated technologies on other forms of renewables are developed, as long as harvesting is carried out sensitively and respects the biodiversity, scale and cultural importance of the sites involved, especially ancient woods. A higher profile for woodfuel has the potential to bring benefits to woodland owners and the local economy, providing employment opportunities in timber harvesting and transport and supply chains. We favour the promotion of small scale heat and power plants. These schemes should serve local users and use timber from local woods.

CARBON SEQUESTRATION

8. Creating and sustaining woodland also helps to counter emissions of CO₂ through storing carbon (carbon sequestration) and under the Kyoto Protocol countries can offset CO₂ emissions through woodland establishment. Whilst this is helpful it can never be sufficient to counter climate change by itself. For example, the Government is committed to a reduction in emissions by 20% below 1990 levels by 2010 and the present rate of woodland expansion will contribute about 0.25%. The Scottish Forest Alliance, comprised of the Woodland Trust Scotland, RSPB Scotland, BP and Forest Enterprise are currently undertaking exemplar, sustainable forestry management projects in Scotland which, amongst other objectives, are seeking to evaluate, research and demonstrate the contribution of sustainable forest management projects to carbon sequestration in Scotland.

9. However, leaving aside the scientific debate surrounding sequestration, woodland establishment has an important role to play in building public understanding of the issues surrounding climate change through engaging the wider public in action to improve their local environment. This is precisely the kind of activity which can meet the Prime Minister's stated aspiration to re-invigorate Local Agenda 21.²¹

¹⁷ Writing in Science January 2004.

¹⁸ European Commission DG Environment.

¹⁹ Prime Minister Speech on climate change, 14 September 2004.

²⁰ Transport 2000 and the Ashden Trust (2000) *The Plane Truth: Aviation and the Environment*, p 22.

²¹ Prime Minister Speech on Climate Change 14 September 2004.

CITIZEN SCIENCE

10. Another effective way of engaging the public is through “citizen science”—the involvement of the public in recording signs of climate change. The Woodland Trust is a lead partner in the UK Phenology Network (UKPN www.phenology.org.uk) along with the Centre for Ecology and Hydrology (CEH), the largest phenology network in the world. We feel that our success in inspiring thousands of people to get involved and record for themselves the impact of climate change on the plants and animals in gardens, parks and woods is of considerable relevance to the raising of awareness about climate change (and its impact on the natural world.) It provides a simple but meaningful way for people to engage with the issue and make a difference. The scientific data resulting from this research was alluded to in the Prime Minister’s recent speech on climate change.²²

11. We have also just launched www.naturedetectives.org.uk extending phenology to 4–18 year olds. Feedback from our recorders makes it clear that recording really opens their eyes to nature, and how nature is changing, and they are proud to feel part of a community that is really “doing something” to make a difference. A natural next step is to consider one’s own lifestyle, embracing the climate change message, based on what they have seen with their own eyes.

ADAPTATION

12. The reality that climate change is already with us was acknowledged by the Prime Minister in his recent speech: “our activities have come to affect our atmosphere, oceans, geology, chemistry and biodiversity . . . Extreme events are becoming more frequent . . . Animals and plants are responding to an earlier spring, Sea levels are rising.”²³ The UK Climate Change Programme, published in 2000, addressed “Impacts and Adaptation” but this only formed a very small part of a much wider strategy. The need to adapt has become ever more apparent since then. Published scenarios on the likely scale of climate change were not as alarming as subsequent results published more recently. Mitigation efforts, while crucial in tempering the worst effects of accelerating climate change are now widely accepted as being insufficient to prevent climate change taking place. This means that adaptation strategies must be accorded a much more prominent role in the revised strategy.

13. In setting out its terms of reference for its review of the UK Climate Change Programme the Government has stated that: “The UK, through the Climate Change programme can demonstrate to the global community that economic prosperity and reductions in emissions can go together”.²⁴ The Woodland Trust believes that adaptation to the reality that climate change is already with us can also go hand in hand with economic prosperity as well as being a vital policy driver for environmental policy in its own right. As the report, *Climate Change and Nature: Adapting for the Future* put it: “While more aggressive reductions in greenhouse gas emissions are undoubtedly needed, effective and efficient sustainable development depends upon climate change adaptation becoming a part of natural resource policy and practice”.²⁵ It is therefore essential that there is the greatest possible “read-across” between the revised UK Climate Change Programme, the UK Biodiversity Action Plan, the revised UK Sustainable Development Strategy, the implementation of the Water Framework Directive and the land use planning system.

14. The greatest threat faced by biodiversity is climate change and there is a solid body of evidence to show that the effects are already being felt. UK Phenology Network research shows that there is a marked difference in the timing of leafing of oak and ash for example, in the wake of average spring temperatures rising in the last decade. Other data shows disturbing patterns emerging with birds, insects and plants all responding at relatively different rates.

15. In their current state, key habitats such as ancient woodland are simply not sustainable in a time of rapid environmental change, given their fragmented character and the immobile nature of many of their characteristic species, which are locked in by the present environmentally hostile landscape within which such habitats exist. It is now widely accepted that the species compositions of semi-natural habitats will change considerably. The recent research programme MONARCH—(Modelling Natural Resource Responses to Climate Change), undertaken by the Environmental Change Institute at Oxford for a consortium of Government agencies and NGOs, used models to analyse the impact on future location of suitable “climate envelopes” for a number of species. The research clarifies the need to allow for spatial movement of species in response to climate change which, coupled with the existing problems of landscape fragmentation, provide some key pointers for adaptive action which should be at the heart of an expanded adaptation section in the revised UK Climate Change programme.²⁶

²² Prime Minister Speech on Climate Change 14 September 2004.

²³ Prime Minister Speech on Climate Change 14 September 2004.

²⁴ Defra News Release 359/04 Review of UK Climate Change Programme—Terms of Reference Announced.

²⁵ English Nature, IUCN- The World Conservation Union, RSPB, UNEP, WWF, (2003) *Climate Change and Nature: Adapting for the Future*. Information paper for the Vth World Parks Congress..

²⁶ Harrison, PA, Berry, PM and Dawson, TP, (eds), (2001), *Climate Change and Nature Conservation in Britain and Ireland: Modelling natural resource responses to climate change (the MONARCH project)*: Technical Report. UKCIP, Oxford.

16. We must therefore develop and implement strategies that enable the widest possible biodiversity to survive and evolve. All semi-natural habitats need to be part of ecologically functional landscapes, so that wildlife has the space it needs to adapt and evolve in the face of environmental change.

17. This means a focus on significantly increasing the area of biodiverse habitats which are unaffected by surrounding environmentally hostile activities through the restoration of degraded habitats and extensions to existing habitats. This also means continuing and energising the shift towards a landscape- scale approach rather than the site-centred mindset which has dominated conservation policy in the UK. This is a strong example of the kind of requirement for a visionary approach which is often called for by decision makers in relation to mitigation but is also equally important in relation to adaptation. The building blocks of such an approach must be the protection of all semi-natural habitats through the planning system and the facilitation of a landscape scale approach which seeks to marry adaptation strategies for the natural world with sustainable land use planning through Regional Spatial Strategies and Local Development Frameworks.

18. Such an approach entails concentrating on conservation of the areas with the greatest potential to be placed on a more sustainable footing²⁷ and the creation of further semi-natural habitats, both woodland and open ground and more wildlife-friendly land use practices, especially in agriculture. Actions to reduce the intensity of land use in the “intervening matrix” between protected areas will also make landscapes more accommodating to biodiversity and enhance their ability to deliver a wider range of benefits to society. As a recent report summarised it: “Our current biodiversity is seed corn for the future. Protected areas need to be secured as fortresses from which biodiversity can advance out into the wider landscape or seascape”.²⁸

19. This vision is not at odds with society’s needs; as well as being good conservation practice anyway, it can contribute towards rural development, flood alleviation, recreation and tourism and deliver a variety of other benefits to society. In short, through “Working with the Grain of Nature” as the title of the England Biodiversity Strategy has it²⁹, there are enormous opportunities to deliver upon all three strands of sustainable development and this is backed up by a growing body of research. As The Prime Minister put it : “. . .business opportunities as well as protecting the world we live in.”³⁰ Recent research undertaken by ERM and Professor Ken Willis for the Woodland Trust shows that woodland, for example, is able to deliver on 11 of the 15 headline indicators of sustainable development.³¹ This offers a powerful indication of the benefits which can accrue to society from environmental protection and enhancement in the face of climate change. There is a need for further applied research of this kind that can help us to model approaches which deliver such public benefits across the board through sound environmental planning. This is also why the links between the UK Climate Change Programme and the revised UK Sustainable Development Strategy are so crucial.

20. It is essential that climate change is built into many areas of mainstream policy-making. An holistic cross-Government approach to issues surrounding climate change and water policy for example, could help to tackle other problems such as diffuse pollution, biodiversity, recreation and flooding enabling the simultaneous delivery of a wide range of sustainable development indicators. The kind of action needed means it is vital that the revised programme informs action across Government and is not simply seen as the province of Defra. In particular, the commitment of the Treasury and ODPM are crucial to securing the investment, incentivisation and links with land use planning that are required to make effective adaptation strategies a reality.

ROLE OF UK EU PRESIDENCY AND CHAIRMANSHIP OF THE G8

21. We welcome the indication the Government has given of its intention to focus on climate change as a major priority within these roles. There are a number of steps in which it can provide much needed strong leadership and inject urgency into international discussions and action. Among these are the integration of the environment into a wide range of other policy areas across Europe following the publication of the new EU Sustainable Development Strategy, the inclusion of aviation in the EU emissions trading scheme and the moving forward of the recent “Message from Malahide” which identified 18 objectives and related targets to help meet the EU target of halting loss of biodiversity by 2010.

22. The G8 Presidency is an enormous opportunity and we welcome the Prime Minister’s intention to host an international scientific meeting at the Hadley Centre prior to the G8 meeting in order to focus attention on the big questions the G8 summit must address.

30 September 2004

²⁷ See Woodland Trust (2002) “Space for Nature”.

²⁸ “Climate Change and Nature: Adapting Conservation Strategies to Climate Change”.

²⁹ Defra (2003) “Working with the Grain of Nature; a Biodiversity Strategy for England”.

³⁰ Prime Minister 14 September 2004 op.cit.

³¹ ERM and Professor Ken Willis (2004) “Making Woodland Count; Its contribution to our quality of life.”. (Woodland Trust).

Memorandum submitted by Calor Gas Ltd (U14)

SUMMARY

F-gas emissions (mainly hydrofluorocarbons—HFCs) are growing faster than other greenhouse gases (GHGs), with far more powerful global warming potential (GWP). They are manufactured, mostly for use in refrigeration and air conditioning, even though there are better alternative technologies on the market. Between 1992, when Greenpeace demonstrated the viability of alternative hydrocarbon (HC) refrigeration, and 2002, global HFC production increased more than 20-fold. Government allowed F-gases to replace ozone-damaging CFCs; while HFCs do not damage the ozone layer, they have a powerful GWP: the most common, HFC-134a, is 1,300 times worse than CO₂. EU Member States are now deliberating how far and how fast HFCs should be phased out. This is a rare opportunity for action on an EU-wide basis and, if it is missed, the damage done will take years to remedy. The UK's contribution to this effort and these negotiations should be more ambitious than is currently apparent.

SUMMARY OF RECOMMENDATIONS

- The UK should use its influence with the US Administration, building on recognition of global risks from climate change, to secure support for the Kyoto approach, especially regarding HFCs (para 4).
- Action on HFCs is imperative, otherwise there will have to be more drastic reductions in transport and energy emissions (both currently growing fast), measures which may carry economic costs and distortions and test the political will of governments (para 13).
- A clear alternative to even more costly investment either to recover or contain HFCs is not to use HFCs in the first place (para 14).
- The Government should be more rigorous in implementing its commitments over HFCs in the procurement decisions made by Departments and Agencies (paras 18–20).
- Most importantly, in the negotiations and discussions on the EU F-gas Regulation, the Government should put its weight on the side of certain Member States which otherwise face the prospect of the EU over-riding their “greener” domestic legislation; in so doing, the UK will help to achieve more towards phasing out HFCs and encourage the acceptance and use of alternatives (para 23).

INTRODUCTION

1. Calor Gas Ltd has since 1994 marketed the CARE range of hydrocarbon (HC) refrigerants; it accounts for less than 0.5% of the company turnover, which mainly consists of the distribution and retailing of liquefied petroleum gas (LPG). HCs are one of several environmentally friendly so-called “Not-in-Kind” (NIK) alternatives to HFCs—energy efficient, safe and with negligible global warming effects. NIKs include water, air, CO₂, and ammonia. For public policy rather more than commercial reasons Calor has for several years worked alongside environmental organisations, including Globe UK All Party Parliamentary Group and NGOs such as Climate Action Network (CAN) Europe, Greenpeace, Friends of the Earth, and WWF UK in advancing the case of NIKs over hydrofluorocarbons (HFCs).

2. This submission will discuss the role of HFCs in climate change, and pertinent Government policy; the wider elements of the climate change programme will be referred to only in so far as they are relevant to the HFC issue.

THE IMPORTANCE OF THE CLIMATE CHANGE ISSUE: UK POLITICAL COMMITMENTS

3. The UK Government's Chief Scientific Adviser, Professor Sir David King, recently stated, “In my view, climate change is the most severe problem that we are facing today, more serious even than the threat of terrorism.” (*Science*, 9 January 2004).

4. The study “Abrupt Climate Change” (2003), produced by Global Business Network for the US Defense Department, states that climate change “should be elevated beyond a scientific debate to a US national security concern”, with catastrophic climate change—involving flooding, drought, famine, civil disorder and international conflict—as being “plausible” and challenging “US national security in ways that should be considered immediately”. This would suggest that representations made by the UK Government to the US Administration on the Kyoto Protocol generally and HFCs in particular might not entirely fall on stony ground.

5. The UK Climate Change Programme 2000 stated: “HFCs are not sustainable in the long term”. The Deputy Prime Minister confirmed “a clear signal to industry that HFCs have no long-term future” (9 March 2000). Caroline Spelman MP, then Shadow Environment Secretary, said, “The decision to replace CFCs with HFCs was a dirty deal . . . HFCs are a major contributor to the greenhouse effect” (EU Standing Committee A, 14 January 2004, col 16). Sue Doughty MP, Liberal-Democrat Environment spokesperson

said: “The Government seem to have watered down their proposals . . . We need much greater ambition . . . in the end, we just say ‘we will make it less bad’. I would like fluorines to be phased out much faster” (loc cit, cols 7 and 18).

6. The Prime Minister stated on 14 September 2004: “What is now plain is that the emission of greenhouse gases, associated with industrialisation and strong economic growth . . . is causing global warming at a rate that began as significant, has become alarming and is simply unsustainable in the long-term . . . By unsustainable . . . I mean a challenge so far-reaching in its impact and irreversible in its destructive power, that it alters radically human existence. . . . Its likely effect will not be felt to its full extent until after the time for the political decisions that need to be taken has passed” Among several pieces of evidence, Mr Blair cited: “Swiss Re, the world’s second largest insurer, has estimated that the economic costs of global warming could double to \$150 billion each year in the next 10 years, hitting insurers with \$30–\$40 billion in claims.” As a clear indication of further ambition on this issue, he added: “We have to recognise that the commitments reflected in the Kyoto protocol and current EU policies are insufficient, uncomfortable as that may be.”

7. While Mr Blair did not refer to HFCs as such, the Leader of the Opposition, Rt Hon Michael Howard MP, was very specific: “We must be more active in removing the causes of harmful emissions where we are able to. I can announce today that the Conservatives are committed to phasing out the use of hydrofluorocarbons, or HFCs, between 2008 and 2014 . . . HFCs currently account for 2% of the UK’s greenhouse gas emissions and that will have doubled by the end of the first decade of the 21st century. Unless . . . the Government gives a clear lead, then the situation will only worsen.” (13 September 2004)

BACKGROUND

8. Fluorinated GHGs, including HFCs, are used in refrigeration and air-conditioning, including vehicle air-conditioning, foam blowing, solvents, aerosols and other products. These largely replaced chlorofluorocarbons (CFCs), banned under the 1987 Montreal Protocol because of their potential to damage the ozone layer. While HFCs do not damage the ozone layer, they have a powerful GWP. The most common, HFC-134a, is 1,300 times worse than CO₂. HFCs are among the gases which the Kyoto Protocol commits the EU to reducing by 8% overall by 2008–12 compared to 1990. While CO₂, methane and N₂O levels are steady or rising slightly in Europe, HFC emissions are growing very fast—between 2000 and 2010 these may at least double, to represent a third of the UK’s commitment under Kyoto.

9. In Germany, over 95% of domestic refrigerators use HCs: these do not damage the ozone layer, have an almost negligible GWP, are a safe and proven technology and are also cost-effective. Sweden, Austria and Denmark have all proposed both bans and taxes on HFCs; Switzerland has also proposed bans; the Netherlands have developed a tough voluntary system known as STEK.

10. An EU regulation on F-gases is being considered in 2004–05 by EU Member States and the European Parliament. The issue is how far and how fast HFCs should be phased out; it is a rare opportunity for action on an EU-wide basis and, if it is missed, the damage done will take years to remedy.

11. The Regulation relies for its expectations of HFC containment on using a version of the apparently rigorous Dutch containment scheme known as STEK. Not only is the version envisaged in the Regulation weaker than STEK, but there are doubts as to whether this—perhaps effective in a small, well-organised country like the Netherlands—can be rolled out across the whole EU. The information on which it is claimed that STEK has achieved a 4.8% leakage rate comes from voluntary (importantly, not random) responses to a survey in which only 334 of 2,140 registered companies replied!

12. At a conference on climate-friendly refrigeration technologies on 22 June 2004, supported by Greenpeace and the UN Environment Programme, Coca Cola announced it will switch out of HFC foam and that it expects to use natural refrigerants in new equipment from around 2006; Unilever Ice Cream will from 2005 buy only HFC-free freezers; McDonalds is understood to have undertaken to convert 30,000 of its restaurants to alternative refrigeration. However, companies and public authorities will only be incentivised to adopt alternatives if it is clear that, for example, the EU, is committed to a firm programme of HFC phase-out ie one that will impact upon their direct competitors and not leave these companies isolated.

MEETING KYOTO TARGETS: HFCs AND CO₂

13. HFCs currently account for 2% of EU’s greenhouse gas emissions, compared with CO₂’s 80%, but their usage is rising rapidly—particularly with the increased demand for air-conditioning of vehicles and buildings. The HFC industry itself forecasts that HFC production in 2007 will be three times greater than it was in 2001. The 2004 Budget Report stated (para 7.8 and chart 7.1) that UK CO₂ emissions are down only by 8.7% since 1990, and running level or slightly increasing since 1997, well above the Kyoto target for 2010. The International Energy Agency warned on 2 March that, “Energy savings rates across all sectors and in almost all countries have slowed since the late 1980s, as has the decline in CO₂ emissions relative to GDP”. Without action on HFCs there will have to be further reductions in transport and energy emissions (both currently growing fast). Such measures may carry economic costs and distortions and, in view of their unpopularity, will test the political will of EU Governments.

F-GASES LEAK—CONTAINMENT IS NOT WORKING

14. Most HFC emissions come from leakage during use or disposal. The HFC lobby claims that pollution can be minimised by reducing leakage, and this view is favoured both by the EU Commission and the UK Government. However:

(a) *Atlantic Consulting's* study ("HFC Containment has already failed", first produced in February 2004, and published in *Atmospheric Environment*, a peer-reviewed journal, in August 2004) shows that "leak rates of HFC-134a over the period 1990–2000 are the same as they were for its predecessor, CFC-12, in the mid-1980s." *Atlantic* concludes: "Clearly, HFC containment has failed . . . This paper calls into question the use of containment as a policy tool for controlling HFC emissions.

(b) The CFC recycling programme for redundant refrigerators is a costly failure: more than half of all CFCs supposed to be recovered escape to the atmosphere (RAL Quality Assurance Association for the De-Manufacture of Refrigeration Equipment, reported in *RAC Magazine*, March 2004).

(c) The HFC industry has campaigned against the controls proposed on HFC uses in vehicle air-conditioning (MAC). In 1997, only 9% of new cars sold in Europe had MAC: by 2003 it was fitted in 80% of new cars sold in Germany. A 31-fold increase between 1995 and 2010 in MAC-related GHG emissions is predicted. Yet these HFCs were not in replacement of CFCs, but an entirely new use (totally at variance with HMG's commitment). In addition to leakage during usage, there will be the costly problem of preventing leakage when vehicles are abandoned or disposed of.

(d) After a stakeholder consultation by the EU in 2003, industry estimates of leak-rates from MAC were corrected upwards by 40% (Proposed F-gas Regulation, p 4 COM (2003) final).

(e) Every year the UK reports GHG emissions to the United Nations Framework Convention on Climate Change (UNFCCC), with apparently a 2-year lag, ie 1998 emissions reported first in 2000. Furthermore, the UK reports revisions for preceding years: in 2004 the UK revised year 2000 emissions of HFCs, first reported in 2002, upwards by, it seems, 25.6%.

It is thus not surprising that in 2002 atmospheric levels of HFCs measured over Spitsbergen were 20% higher than in 2001 (ENDS Daily 6 February 2004). A clear alternative to even more investment either to recover or contain HFCs is not to use HFCs in the first place.

THE GERMAN EVIDENCE

15. The German Environmental Protection Agency produced in February 2004 a 240 page report identifying, in detail, existing alternative technologies or processes for every use of F-gases in over 20 sectors ("Fluorinated Greenhouse Gases in Products and Processes:—Technical Climate Protection Measures"—Report of the Federal Environmental Agency, Germany 20 February 2004 Federal Environmental Agency <http://www.umweltbundesamt.de>).

16. The report shows that F-gases are not necessary for the following uses: refrigerants in domestic refrigerators and freezers, commercial or industrial refrigeration, stationary air conditioning of buildings or transport, stationary or mobile air-conditioning units (domestic, commercial, industrial); in domestic heat pumps; as blowing agents to make rigid foams for thermal insulation, flexible polyurethane foams, integral skin polyurethane foams or one component foam; as propellant in technical sprays, medical aerosols, aerosols in households and cosmetic aerosols, in aerosols intended for decorative purposes, party supplies and claxons, fire extinguishing, etching semi conductors circuit board production, extinguishing and electrical insulating gas (switch-gear) cover gas for magnesium processing, degasser for secondary aluminium casting and, filling gas for car tyres. (The exceptions are HFCs in pepper sprays and non-domestic insecticides.) It also identifies many new alternatives currently in testing, and measures to reduce emissions.

17. The authors state that future emissions will "increase enormously" owing to replacement of CFCs and that systems which use CO₂ as refrigerant (not HFCs) "are now ready to go into production". Forecasts predict a continued sharp rise in the use of F-gases. In 2020, fluorinated GHGs are anticipated to have a global annual market volume of up to 500,000 t, Europe accounting for up to 100,000 t of this. In Germany HFC emissions and related emissions will have increased between 1995 and 2010 by approximately 270%. Many German cars are being scrapped in countries without adequate CFC or HFC recovery systems. "Taking all aspects into account, it can be concluded that CO₂ is the best refrigerant" for car air conditioning.

REFRIGERATION PROCUREMENT: THE GOVERNMENT RECORD

18. Evidence of the UK Government's disappointing implementation of its environmental commitments is manifested by various recent procurement decisions which, despite specific commitments, use HFCs. Beverley Hughes MP, as Parliamentary Under-Secretary of State for DETR, stated, "Our policy is to switch, where possible, from hydrofluorocarbons (HFCs) . . . to environmentally-preferable substitutes"(WA 9

March 2001), thus reiterating the statement in “Climate Change-The UK Programme” (November 2000) that “HFCs should only be used where other safe, technically feasible, cost effective and more environmentally acceptable alternatives do not exist”.

19. HFCs have been used in the following: refurbishment of No 10 Downing Street, the new GCHQ at Cheltenham, the MOD Whitehall complex and RAF High Wycombe, Great George Street Treasury Building, the Home Office at 50 Queen Anne’s Gate, a building leased by DEFRA in Temple Quay Bristol, and the DFID office, 20 Victoria Street. More recent failings include: the HSE new building in Bootle; MOD Admiralty Arch, London; Romford Hospital PFI project; British Cattle Market Service, Workington (part of DEFRA); Windsor Library, Imperial College; University of London Tanaka & HQ buildings; and Liverpool University Surface Science Building. *The Observer* reported the Meteorological Office’s new £150 million headquarters in Exeter has installed an HFC air-conditioning system (26 September 2004).

20. A Government backbench MP, Jane Griffiths, spoke as follows in 2002: “The Foreign and Commonwealth Office . . . asked about the coolant for the new Government communications headquarters building . . . said that the building will use the refrigerant HFC134A . . . HFC 134A was responsible for 2.61 million tonnes of greenhouse gas emissions in 2000. That is not quite the Government climate change policy of not using HFC unless there is no choice . . . The Secretary of State for Health provided me with a list of 77 building projects currently under way . . . The Department did say that [the] NHS Model Engineering Specification . . . advises that HFC 134A or 407C and its associate blends are used. That is even further from the climate change policy . . . The Lord Chancellor’s Department . . . has a number [of building projects] in the planning stage and . . . [takes] no consideration of climate change impact. Disappointingly, the Government are not doing very well in implementing their own climate change policies,” (*Hansard*, 24 May 2002, cols 570–71).

THE EU REGULATION: AN OPPORTUNITY MISSED

21. The draft Regulation aims to limit emissions of three F-gases controlled by Kyoto: it sets maximum leakage rates and equipment monitoring rules, and phases out HFC-134a. It has been weakened from its original drive against HFCs by heavy lobbying by the well-funded body, EPEE, established by largely US HFC manufacturers and their allies. Now, it requires no use of alternative technologies; it does not restrict HFCs to “essential uses” nor does it impose concrete bans.

22. The Commission proposed to proceed by way of the internal market clause (Article 95) of the Treaty, preventing individual Member States introducing tougher national measures. Several, like Denmark, Austria and Sweden, already possess or are planning tougher legislation, which they might be obliged to roll back. To avoid this, some Member States are arguing for the Regulation to be related to Article 175, the basis of environmental regulation, so that the Regulation would set a minimum environmental target which individual countries might exceed. The UK Government has opposed this.

23. With the expectation that the Regulation would proceed on a single market basis apparent in the autumn of 2004, Calor, supported by environmental NGOs, has proposed the following modest amendments:

(a) To use the Article 175 (environment) legal base for everything apart from mobile air conditioning, which would understandably, as vehicles are traded across the EU, come under the single market clause. Calor understands that the UK Government opposes this option and that even if this option were taken, because of the legal pre-eminence of the single market, Member States would be forced under legal challenge to withdraw tougher measures. (The irony is that this does not prevent individual states—like France—from having restrictive legislation that effectively rules out the use of non-HFC equipment).

(b) To aim to be more ambitious within an Article 95 legal base (ie extending the use restrictions or bans into other areas, with the UK supporting Denmark, Austria, Sweden and Belgium in their possible amendments). Calor understands that the UK Government would oppose any extension of the boundaries of bans or phase-outs because no cost or environmental benefit analysis has been carried out and that it would not be possible to do this before further decisions had to be made at the Council of Ministers meeting in October 2004. Specifically, Calor proposed a restriction on the use of HFCs in domestic refrigerators (as the market was now mainly non-HFC). One advantage would be that this would put an end date to the need to recover HFCs from fridges (under the WEEE Directive). While domestic fridges have low leakage during use, by the time they come to disposal all the gas has usually leaked. (The Government is understood to take the view that as this market is mostly non-HFC, a ban would have little effect—ignoring the symbolic aspect, the WEEE aspect and the fact that the proposed F-Gas regulation will ban HFC applications which have never even been put on the market!)

(c) Calor also proposed HFC restrictions in the field of commercial refrigeration, arguing that without some lead from Government (through regulation), the industry would stay with HFCs; this would act as a disincentive to those companies who had shown that they were prepared to take the initiative (see para 12 above).

24. The UK Government is understood to be opposed to all these proposals. This is a tribute to the strength of the F-gas lobby, which in stakeholder consultation usually musters a very large majority over Calor, perhaps one or two other NIK users (but most HC users are also, and on a larger scale, HFC users)

and green NGOs. It also indicates that, at European Commission level, DG Environment's aspirations have been firmly blocked by DG Enterprise. The same occurred in the UK, where DEFRA is the "lead" department, but has been firmly blocked by the DTI. This, indeed, raises an important political point. The F-gas lobby has a greater share of voice because it represents the majority vested interest "status quo". If Governments had paid attention in the past to share of voice rather than quality of argument, CFCs would never have been banned.

25. Unless the UK Government changes its policy on the Regulation, or other Member States, or the European Parliament, defeat this position, those wishing to encourage alternatives to HFCs will have to wait until the Commission reviews the Regulation some four years after it comes into force—probably in 2010. Allowing then for phasing of any new measures, as one HC producer has commented to Calor "I would say HFCs have got a free run in until at least 2015 and beyond."

30 September 2004

Memorandum submitted by PLATFORM (U15)

PLATFORM is an interdisciplinary organisation working on issues of environmental and social justice. It specialises in research and analysis into environmental, development and human rights implications of the energy economy, with a particular focus on oil and gas corporations.

SUMMARY

It is essential that strategies for addressing climate change are long-term. Given the timescales of energy investment, we need to be thinking decades ahead. For this reason, we have focussed on energy research and development, in which the activities now can lead to energy infrastructure that will last into the middle of this century.

Looking specifically at R&D carried out in the public sector (in higher education institutions), we find an enormous skewing towards fossil fuels. British universities carry out an estimated £67 million per year of R&D targeted at the exploration and production of oil and gas, about £40 million of this funded by the public purse. In contrast, Government spends only £19 million per year on R&D on renewable energy sources, shared between universities and the private sector.

The role of research and development in making industries more competitive is well accepted. The consequence of the imbalance of energy R&D is thus an entrenching of fossil fuels, undermining the possibility of a transition to renewable energy sources.

The policy context is the emphasis of science policy on "wealth creation". Applied in an unqualified manner as at present, this tends to reinforce the status quo in the energy economy, as the larger oil and gas industry has far more resources than nascent renewable energy companies to match government funds and to facilitate application of technologies.

A key element determining the Government's success in addressing climate change will be its ability and willingness to address conflicts in other areas of policy—such as in this case, science policy.

CLIMATE CHANGE POLICY—THE LONG-TERM VIEW

1. The British Government is recognised as a world leader in calling for strong and effective action to prevent climate change. The Prime Minister has indicated that he will use the opportunity of Britain's chairmanship of the G8 in 2005 to press for further international action on climate change. This is a key opportunity not just to raise the issue but also to demonstrate leadership by example through Britain's own actions.

2. Climate change is clearly a long-term issue, with wide-ranging implications. In light of this, it is very welcome that the Government has not only set an ambitious target for emission cuts in the timeframe of the Kyoto Protocol, but also looked at a longer-term framework. In particular, the February 2003 White Paper "*Our Energy Future—Creating a low carbon economy*" set a target of cutting the UK's carbon dioxide emissions by 60% by 2050.

3. In order to achieve this target, changes will be necessary at a systemic and structural level, and not restricted to those areas that are currently considered within the domain of shorter-term action to mitigate climate change. In particular, it will clearly be necessary to reduce the use of fossil fuels. Part of this can be achieved by a reduction in total energy use, such as through efficiency measures and industrial reforms. A transition in energy sources will also be necessary, not just from oil to gas, but also from fossil fuels to renewable energies. Government policy is to increase the share of renewables in electricity generation to 10% by 2010, and 20% by 2020.

4. Energy investment decisions are inherently long-term. The lifetime of new energy infrastructure is measured in decades rather than years. For example, a new oil platform or power station built today might be expected to still be producing in at least 2030, and possibly beyond. For this reason, it is important to be thinking well-ahead. As the White Paper states, "Leaving action until the last minute is not a serious

option . . . We need early, well-planned action to provide a framework in which businesses and the economy generally, including the jobs and skills base, can adjust to the need for change, and encourage new technologies”.

ENERGY RESEARCH AND DEVELOPMENT—EXTENSIVE ACTIVITIES ON OIL AND GAS

5. However the element of energy development that impacts the furthest into the future is in research and development (R&D). Current R&D might lead to new technologies in which the actual investment occurs in 10 or more years’ time, before the productive life of that investment even begins. In the case of fossil fuels, the same applies to geological surveys of available resource.

6. We have carried out considerable research into the R&D and training carried out in universities, in the field of oil and gas. In March 2003, PLATFORM, the New Economics Foundation and Corporate Watch published the report “*Degrees of Capture: Universities, the Oil Industry and Climate Change*”. It was published both as a 30-page policy paper and as a 90-page full report. We would be happy to send these to the Committee if they would assist in its inquiry.

7. Since then, we have met with officials of the Engineering and Physical Sciences Research Council (EPSRC), and corresponded with the Natural Environment Research Council (NERC), the Office of Science and Technology, the Scottish Executive, the Scottish Science Advisory Committee and a number of academics and university Vice Chancellors.

8. Our research found that British universities carry out an estimated £67 million per year worth of R&D targeted at the upstream (exploration and production) oil and gas industry. This is heavily focussed on geological surveying and technological development, which aim to expand existing levels of oil production. Nearly two thirds of this amount—about £40 million per year—is funded by the public purse, largely through the two Research Councils NERC and EPSRC. Only 7% of the R&D addresses the environmental and safety aspects of oil production.

9. Although such analysis is not routinely published, these figures are not disputed by the Research Councils. NERC stated in its response to the “*Degrees of Capture*” report that it accepted that “the facts relating to NERC are largely well researched and correct”.³² Similarly, EPSRC did not challenge the factual content of the report, but argued that the extent of oil and gas R&D is beyond its control, and commented that it is declining over time.³³

CONSEQUENCES OF ENERGY R&D—ENTRENCHING THE FOSSIL FUEL ECONOMY

10. Given the long time frames of R&D and subsequent energy investment, this work in British universities is counter-productive to the aim of cutting carbon dioxide emissions by 60% by 2050, for two reasons.

11. Firstly, oil and gas R&D directly adds to the available oil and gas reserve base, both by finding new fields and by enabling technologies to extract previously uneconomic resources. As such, it pushes out the horizon of continued production. The current global reserves to production ratio is 41 for oil and 67 for gas—meaning that at current rates of consumption, oil and gas reserves will last respectively 41 and 67 years.³⁴ In general, once reserves are classified as proven, they are committed to being extracted: the considerable capital expended “upfront” in exploration and field development is required to be recouped through the income from production.

12. Secondly, oil and gas R&D enhances the competitive position of these energy sources relative to their alternatives, such as renewable energy sources, not just in terms of price, but also in terms of delivery capacity or deployability—such as the gearing of infrastructure and resources to renewable-based production. In other words, R&D that contributes to oil and gas production serves to entrench those fuels’ role in the energy economy.

RENEWABLE ENERGY R&D DWARFED BY OIL AND GAS R&D

13. The Government has made some welcome moves to expand renewable energy R&D. The 2003 Energy White Paper announced the provision to the Research Councils of £8 million of research funding for renewable energy over three years, as part of a £28 million total investment in sustainable energy research.³⁵ According to Department of Trade and Industry figures, the Government spends £19 million a year on renewable energy R&D in total, shared between private sector and universities.³⁶

³² Letter from Andrew Richardson, Secretary to Council, NERC, to PLATFORM, 28 April 2003. Despite accepting the factual analysis of “*Degrees of Capture*”, it criticised the report’s lack of discussion of NERC’s renewable energy funding, as outlined in NERC’s five-year strategy, “*Science for a sustainable future 2002–07*”. Since then we have written to NERC with comments on that strategy [29 July 2003]. A reply to those comments was promised [on 12 August 2003], but never materialised.

³³ Meeting of Greg Muttitt and James Marriott of PLATFORM, with Peter Hedges and Alicia Greated of EPSRC, 30/7/04.

³⁴ BP Statistical Review of World Energy 2003.

³⁵ Energy White Paper, “*Our Energy Future—Creating a low carbon economy*”, February 2003, p 60 (para 4.60).

³⁶ Department of Trade & Industry press release, 22/10/02, “UK needs to catch up with Europe on renewables”.

14. However, these figures are dwarfed by Government funding of oil and gas R&D, even in universities alone. When it is borne in mind that the oil majors carry out far more of their R&D in-house rather than in universities, we see a considerable imbalance in the total innovation investment between fossil fuels and renewables. This is not an imbalance to which the Government needs to contribute.

15. If the approach to technology substitution, from fossil fuels to renewables, is to be a market-based one—as government policy intends—reduction of the costs, and increase of the deployability, of renewable energy sources themselves is not the only thing that is required. Within a market approach, renewable sources are employed in competition with other (conventional) sources, so it is the relative rather than absolute price and deployability that are relevant.

SCIENCE POLICY CONFLICTS WITH CLIMATE CHANGE POLICY

16. As such, there are strong arguments for the phasing out of Government support for oil and gas R&D over the short term, with the exception of those which directly relate to mitigating the negative environmental and safety impacts of operations. This would make sense not just in relation to climate change, but also in the interests of competition and innovation—for small, nascent industries, such as renewable energy to receive more government support in order to get established, than mature, profitable industries such as oil and gas, which have the resources to fund R&D by themselves.

17. The policy context of this situation is the gearing of science policy, especially since 1993, towards industrial applicability—indeed, “wealth creation” is a key element of the mission statements of the Research Councils. Since bigger industries have more resources to match funding for research, and more capacity to commercialise the results, current government research policy is *de facto* biased towards projects that support bigger industries and, as a result, favours oil and gas over renewables.

18. Given the wide-ranging implications of climate change, the key to effective Government policy will be its ability to address conflicts with other policies—in the jargon, to approach the issue in a “joined-up” way.

19. The 2003 Energy White Paper identifies the role of Government as being “to create a market framework, reinforced by long-term policy measures, which will give investors, business and consumers the right incentives to find the balance that will most effectively meet our overall goals.” However, at present, in relation to higher education R&D, science policy considerations are taking precedence over climate change policy. As a result, the opposite incentives are being given to those that will meet the Government’s goals.

20. Following publication of our “*Degrees of Capture*” report, we wrote to a number of Government departments, including DEFRA and DTI. The Office of Science and Technology (OST) replied on behalf of all Government departments. It restated Government policy to ensure “that higher education institutions collaborate with industry and other organisations to achieve long-term economic and social benefits from the work they undertake”. Our concern was not at this policy *per se*, but at its unqualified application, regardless of other priorities.

21. The OST letter suggested that “to provide incentives for, or to discourage activity in, particular areas” would be a constraint on academic freedom. However, this appears to miss the point. Government sets the framework for higher education research priorities, and in particular the focus on industrial applicability—and academic researchers must already make their choices within this framework. A more sophisticated approach is needed, to recognise that not all business applications of university research are necessarily in the public interest.

22. Furthermore, it is not correct to state that particular sectors are not encouraged by the government. For example, pushing for greater oil and gas R&D within universities is one of the key aims of PILOT, the Government-sponsored taskforce on North Sea oil.

CONCLUSION

23. Government science policy is well aware of the role of research and development in contributing to industrial competitiveness. However, in the case of energy, the skewed balance of R&D will enhance the competitiveness not just of British companies over foreign ones, but also of oil and gas over renewables.

24. Oil and gas companies already invest considerable resources in the research and development which underpins their future success. There is a strong case that government support is not required to supplement that, and indeed is counter-productive in relation to climate change policy, and should therefore be phased out within a short timescale.

25. To decline to address the impact on the energy economy of research and development risks locking Britain in to dependence on fossil fuels—and undermining the Government’s commendable moves to address climate change in other areas of policy.

Memorandum submitted by WRAP (Waste and Resources Action Programme) (U16)

INTRODUCTION

WRAP is pleased to have this opportunity to submit written evidence to the inquiry of the Efra Committee looking at climate change.

WRAP was created in 2001 with a mission to accelerate resource efficiency. We seek to do this by creating stable and efficient markets for recycled materials and products, and removing barriers to waste minimisation, re-use and recycling. Operating on a UK-wide basis and funded by Defra, the DTI and the devolved administrations in Scotland, Wales and Northern Ireland, WRAP recently published a Business Plan for 2004–06 detailing the structure and priorities of our work over the next three years and outlining a number of challenging targets.³⁷

WRAP is working with both the public and private sectors to increase markets for six individual material streams: paper, plastics, glass, organics, wood and aggregates. It is also working on major programmes aimed at increasing the procurement of recycled products, improving standards for recycled materials, and is undertaking a series of initiatives to stimulate investment in capacity for processing recovered materials.

THE IMPACT OF THE RECYCLING INDUSTRY IN REDUCING CO₂ EMISSIONS

Within the recycling industry one issue that has become highly relevant in recent years is that of energy saving and the effect that this can have on tackling climate change.

Extensive industry research has revealed that the recycling of a number of specific waste streams has the benefit of not just diverting waste from landfill but also reducing greenhouse gas emissions as a result of the reduced energy required to produce goods in comparison with manufacturing goods from virgin materials. Research to date has calculated the following savings are attributable to the following specific material streams:

ENERGY SAVINGS PER MATERIAL

<i>Material</i>	<i>% Energy saving</i>	<i>Source</i>
Aluminium	95%	(International Aluminium Institute)
Plastics	80%	(Recoup)
Steel	75%	(Corus Group)
Paper	30%	(Oxford Brookes University)
Glass	25%	(Enviros Consulting, 2004 Report)

The following report examines research findings to date and assesses further potential for the reduction of greenhouse gases through an increase in the domestic and commercial rate of recycling.

CO₂ SAVINGS ATTRIBUTABLE TO RECYCLING

Following the publication of the 2001 European Commission report entitled “Waste Management Options and Climate Change”³⁸, WRAP engaged the authors of the report, AEA Technology, to research further the effect of increasing the recycling rate on greenhouse gas reductions for the UK. The results of this work indicated the possibility of substantial CO₂ savings with an increase in the rate of recycling and increases in recycling industry capacity.

The estimation of CO₂ reductions was based upon predicted increases in the recycling of Municipal Solid Waste taking the then current best practice (Daventry Council) and extrapolating it to predict a possible future scenario. A variety of material streams such as aluminium, textiles, wood and putrescibles were considered in addition to the standard streams measured in household recycling statistics. The report concluded that CO₂ savings could equate to 10–15% of the UK’s Kyoto obligation in a best case scenario from recycling.

Recognising that gaps exist in the available data, WRAP decided to undertake its own estimation of CO₂ reduction benefits attributable to the household recycling rate, this is one of the few areas of waste recycling that has accurate material specific recycling data.

The Defra Municipal Waste Survey for 2002–03 gives the latest available data for household waste recycling in England with the level at 14.5%. This data was entered into the table below for the major material streams to calculate the CO₂ savings from using recycle rather than virgin materials in the production of new materials.

³⁷ WRAP Business Plan 2004–2006: <http://www.wrap.org.uk/publications/BusinessPlan2004.pdf>

³⁸ European Commission “Waste Management Options and Climate Change” report (July 2001): http://europa.eu.int/comm/environment/waste/studies/climate_change.pdf

	<i>Recycled (thousand tonnes)</i>	<i>Energy saving (GJ/tonne)*</i>	<i>CO₂ saving (tonnes per MWh)**</i>	<i>CO₂ saving (thousand tonnes)</i>
Plastic	13	31.77	0.425	49
Aluminium	18	50.4	0.425	109
Other metal	404	15	0.425	715
Glass	471	4.97	0.425	276
Paper	1,125	4.8	0.425	638
Total	2,031			1,787

For the year 2002–03 it is estimated that approximately 1.8 million tonnes of CO₂ was avoided as a result of household recycling.

Notes

* Energy saving per tonne for using recycled materials instead of virgin materials in production of new materials. Source: respective organisations quoted in “Energy savings per Material” chart on page 2.

** Where 1MWh = 3600 MJ = 3.6 GJ (1 Watt is 1 Joule per second).

Projecting this forward, the following table is based on modelling carried out by the Prime Minister’s Strategy Unit in the “Waste Not Want Not” report³⁹ in 2002 that looked at the potential CO₂ savings to be gained by achieving the Government’s recycling targets for household waste in England:

<i>Percentage of household waste recycled in England</i>			
14.5%	25%	30%	33%

	<i>Household waste recycled in England (thousand tonnes)</i>				<i>Energy saving (GJ/tonne)*</i>	<i>CO₂ saving (tonnes per MWh)**</i>	<i>CO₂ saving from household waste recycling in England (thousand tonnes)</i>			
	<i>2002–03</i>	<i>2005–06</i>	<i>2010–11</i>	<i>2015–16</i>			<i>2002–03</i>	<i>2005–06</i>	<i>2010–11</i>	<i>2015–16</i>
Plastic	13	87	125	275	31.77	0.425	49	327	467	1,031
Aluminium	18	20	22	24	50.4	0.425	109	116	130	143
Other metal	404	433	482	531	15	0.425	715	767	854	941
Glass	471	784	1,004	1,219	4.97	0.425	276	460	589	715
Paper	1,125	1,924	2,068	2,466	4.8	0.425	638	1,090	1,172	1,398
Total	2,031	3,248	3,701	4,515			1,787	2,760	3,212	4,228

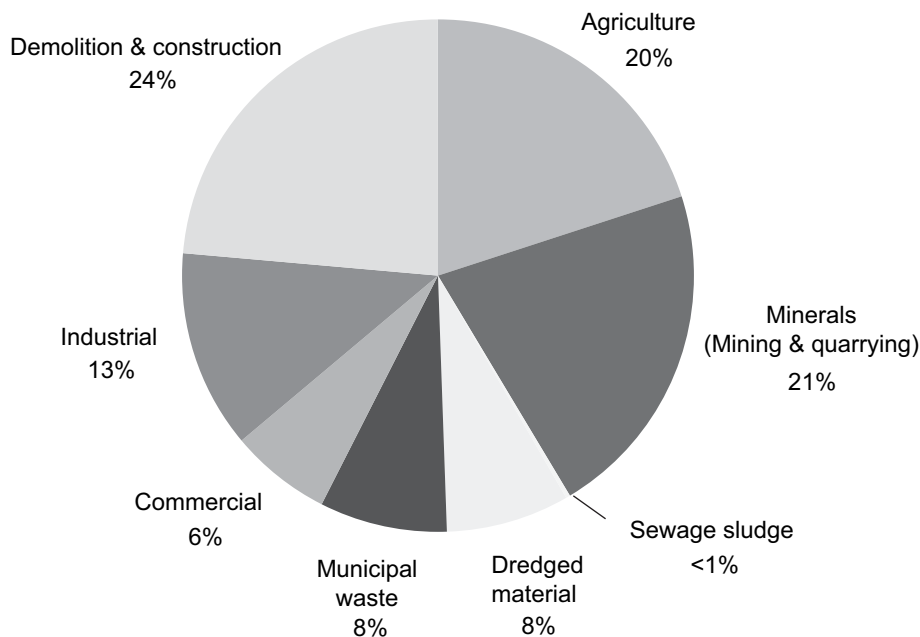
MEETING THE KYOTO TARGETS

The UK’s current Kyoto obligation is to reduce CO₂ emissions by 12.5% based upon the 1990 base year figure by the year 2008. In addition to this the UK Government has set its own target for cutting carbon dioxide to 20% of 1990 levels by 2010.

By extrapolating our current recycling data in line with government requirements for household recycling in England in 2010 we can estimate that CO₂ savings of 3.2 million tonnes would be achieved, this would represent 2.5% of the government’s overall target for CO₂ reduction detailed in the UK Climate Change Programme.

This is a modest but important contribution to the UK Government’s Climate Change Programme. We would also remind the Committee that the above estimate only concerns household waste, which accounted for just 6.6% (25 million tonnes) of total UK waste arisings (375 million tonnes) in 2002–03. The chart below illustrates the composition of total waste arisings and is based upon data ranging from 1998–2002. Household waste is estimated as “making up 80%” of the total of Municipal waste.

³⁹ Strategy Unit report “Waste not, Want not—A strategy for tackling the waste problem in England” (November 2002): <http://www.number-10.gov.uk/su/waste/report/downloads/wastenot.pdf>

Figure 2: Estimated total annual waste arisings by sector

Source: Department for Environment, Food and Rural Affairs; Environment Agency; Water UK

Source: www.defra.gov.uk/environment/statistics/waste/

There are still limitations to the accuracy of material specific recycling data in the majority of the sectors that contribute most to waste arisings, however the CO₂ saving potential is clearly evident when you consider that the CO₂ savings attributable to all paper recycled in the UK in 2003–03 (4.5 million tonnes) was around 2.5 million tonnes alone.

The above research is supported by the conclusion of the most comprehensive research undertaken to date in the field of recycling and climate change, the 2001 European Commission report entitled “Waste Management Options and Climate Change” (referenced on page 2 of this submission), which stated:

“The study has shown that overall the source segregation of MSW (municipal Solid Waste) followed by recycling (for paper, metals, textiles and plastics) and composting/AD (Anaerobic Digestion)(for putrescible wastes) gives the lowest net flux of green house gases, compared with other options for the treatment of bulk MSW.”

With regards to the CO₂ benefits that can be derived from composting of green waste, WRAP will undertake further research in this area in order to establish the magnitude of the emission savings. This will be part of a major new study we are commissioning to fully evaluate the environmental benefits of our work programmes and in particular the CO₂ savings from our recycling and waste minimisation programmes. This will be published in March 2005.

CONCLUSION

WRAP would like the Committee to consider the central message of this submission that the recycling and composting of household waste is having an important impact in reducing CO₂ emissions. While WRAP acknowledges that the energy and transport sectors are the biggest contributors to UK CO₂ emissions and the primary focus of action to tackle climate change, recycling also plays its part. As European legislation, particularly the Landfill Directive, and UK Government policy drives current and future increases in recycling and composting activity, the benefits in terms of CO₂ savings and our collective capacity to quantify this will only increase.

We are encouraged by the Prime Minister’s words during a keynote speech⁴⁰ on climate change in September 2004 in which he said:

“ . . . we will help business cut waste and improve resource efficiency and competitiveness through a programme of new measures funded through landfill tax receipts. We will follow up the report of the Sustainable Buildings Task Group to raise environmental standards in construction.”

⁴⁰ Prime Minister’s Prince of Wales Business and the Environment Programme anniversary lecture in Whitehall (14 September 2004): <http://www.pm.gov.uk/output/Page6333.asp>

WRAP is one of the many organisations working to accelerate resource efficiency and was represented on the Sustainable Buildings Task Group. As mentioned in this report, we are involved in activity to assess how our work is contributing to the Government's wider ambitions on climate change and would be pleased to send the Committee details of this study when it is published next year.

1 October 2004

Memorandum submitted by the South East Climate Change Partnership (U18)

EXECUTIVE SUMMARY

1. The South East Climate Change Partnership promotes adaptive planning for the likely impacts of climate change in our region and has recently published research findings on impacts in key sectors and potential adaptation strategies.

2. Climate change presents twin challenges—the need to mitigate future change and to adapt to unavoidable change as a result of past and current emissions. Awareness of the inevitability of some climate change over the next few decades is poor, and there are a number of dangerous misconceptions about the need to plan now so that we can adapt to this.

3. Considerable research has been undertaken on this—including studies within all regions of the UK—and this knowledge needs to be developed and put into effect by public, private and non-profit organisations. Planning for the impacts of climate change will involve decisions with long-term implications and a wide range of stakeholders, whose actions will impact on each other. Responses need to be strategic and to link with mitigation activities.

4. Organisations will need to call on tools and guidance in planning their adaptation responses and regional partnership are an effective way of developing and delivering this.

5. SECCP recommends that the Committee:

- Reflect the critical importance of climate change adaptation as well as mitigation in its examination of national policy, and thus to lay the ground for strengthening of the adaptation elements of the UK Climate Change Programme in the Government's review later this year and next.
- Give close attention to the extent to which awareness of climate change impacts is addressed explicitly in a range of national policies, and does not confine itself to UK climate change policy *per se*. This examination should reflect differing regional needs.
- Address the need for support to UK industry, public bodies and non-profit organisations to help them work constructively and together towards a climate-resilient society, including adequate resources for effective public awareness campaigns to motivate personal and business adaptation actions. To ensure effective delivery of this support, Government departments should be encouraged to work with each of the regional partnerships, including appropriate financial support for specific activities.

INTRODUCTION

6. The South East Climate Change Partnership (SECCP) brings together a wide range of public, private and non-profit sector organisations to promote adaptive planning in anticipation of the likely impacts of climate change in our region. We welcome the decision by the Committee to examine the policies of the UK Government to address the challenges of climate change, and are grateful for this opportunity to submit written evidence.

7. We have recently published findings from a new research project—commissioned and funded on our behalf by the South East England Development Agency (SEEDA). The South East Climate Threats and Opportunities Research Study (SECTORS) analysed the responses to climate change across eight key sectors in the region and recommended a set of strategic approaches, climate change indicators and areas for further research. This work built on our 1999 scoping study of climate change impacts for the region, *Rising to the Challenge*.

8. Further information on SECCP and our work is provided in Appendix 1 [not printed]. Appendix 2 contains our recent recommendations to the South East England Regional Assembly (SEERA) on climate change criteria for the forthcoming South East Plan, the regional spatial strategy. The need to address adaptation in climate change policy.

9. The UK, like all nations, faces twin challenges from climate change: the need to mitigate future changes, for example through reductions in greenhouse gas emissions; and the need to adapt to levels of climate change which are now unavoidable. Some climate change is inevitable for much of this century because of the legacy of past emissions, the certainty that some emissions will continue—even if much

reduced levels are achieved—and the complexity of the climate system; the climate takes many decades or longer to come into equilibrium at higher concentrations of greenhouse gases and is influenced by a range of natural factors as well as human causes.

10. The case for mitigation has yet to be accepted by all governments around the world—and it is not reflected adequately yet in action on the ground in those countries where it has been acknowledged, including the UK. Nevertheless, the need for action is generally understood and is expressed in international, EU and UK policy and in the policies of an increasing number of public, private and voluntary sector organisations. The current UK Climate Change Programme made an excellent start, but there are doubts as to whether the pace of implementation is adequate. Likewise, public awareness of the importance of climate change and mitigation has grown over recent years—although this is not reflected in an appetite for difficult decisions in our personal, business or political lives. There is a need for effective publicity which links awareness raising with climate change implications for personal lifestyles and business.

11. While it is true that the UK Climate Change Programme recognises the importance of adaptation alongside mitigation, there is comparatively poor awareness among policy makers at all levels—and among professionals and the public—that some climate change is already occurring and that more extensive change is inevitable within the lifetimes of all those alive today. Awareness of the ways in which this will impact on our quality of life and how we can plan now to adapt to the threats and the opportunities is therefore also very low. Government support for promoting adaptation appears to be limited.

12. There has been a tendency to see adapting to climate change—rather than mitigating it—in one (or more) of the following ways:

- as “defeatism”: “Climate change can be stopped and we mustn’t divert attention from the need for mitigation and to engage the USA and Russia in this.”
- as being too difficult: “There is too much uncertainty about future climate change; what exactly should we be planning for? We need better information.”
- (conversely) as not requiring a specific response, because adaptation is an automatic activity: “Everything is always changing and we are always adapting, so we don’t need to plan for climate change.”
- as being unnecessary: “Climate change is all down to natural causes. This is nothing new.”

13. These are all misconceptions. Although concerted global mitigation action will enable us to avoid the most extreme climate change projected for the end of this century, the legacy of past emissions and the inertia of the climate system mean that our climate will continue to change for many decades—and would do so even if all fossil fuel consumption and agricultural emissions ceased across the globe today. The level of uncertainty about future climate change is manageable—in the same way that we manage in the face of considerable uncertainty about basic economic and social trends. However, the first step is to recognise that climate is not merely another variable in our planning. Although there has always been natural climate variability and society has adapted to this in the past (often at social and economic cost over generations), the scale and speed of the change we are facing now is completely unprecedented in human experience, and results largely from human activities. With the interconnectedness of today’s global economy and the rate of development in all societies, more is at stake for more of us if we do not face up to climate change impacts now and plan for them. Climate change will compound existing challenges in global food and energy production, water availability and distribution, economic competitiveness, security and migration.

14. In reality, therefore, the twin challenges of climate change are both urgent and have major implications for sustainable development in the UK and around the world and require clear commitment from policy makers, practitioners and the public. Actions to promote mitigation and adaptation need to be integrated with each other and across a diverse set of agendas and stakeholders.

15. SECCP therefore strongly urges the Committee to reflect the critical importance of climate change adaptation as well as mitigation in its examination of national policy, and thus to lay the ground for strengthening of the adaptation elements of the UK Climate Change Programme in the Government’s review later this year and next.

Climate change impacts

16. Through the work of the Intergovernmental Panel on Climate Change and research centres throughout the world, our knowledge of the probable course of future climate change and of its impacts has improved significantly over past years. The UK has played a leading role in this, not least through the work of the UK Climate Impacts Programme, the Hadley Centre for Climate Prediction and the Tyndall Centre for Climate Change Research.

17. The UKCIP02 UK climate change scenarios demonstrate the seasonal and geographical distribution of changes to key climate variables across a range of possible greenhouse gas emission trends. The scenarios highlight the wide range of impacts: for example, flooding and water shortages, but also including growing seasons for crops and pests, soil subsidence and heave, storm damage and human health and comfort.

18. A growing number of research studies, based on UKCIP02 or earlier scenarios, have assessed the likely impacts on social, economic or environmental concerns, using both “hard science” and the views and practical responses of stakeholders. Much of this work has been commissioned and funded through central or devolved governments, research councils, the private sector or regional climate change partnerships such as SECCP.

19. Each region of the UK has now undertaken a scoping study of the possible impacts for them. In the South East, *Rising to the Challenge* highlighted the issues for managing our countryside, coasts and rivers, heritage and economy. SECTORS has built on this with stakeholder analysis and recommendations for agriculture and forestry, biodiversity, business and economy, emergency planning, health, land use planning, tourism and utilities & infrastructure.

20. Together, this body of work provides valuable knowledge. It is essential that all tiers of government, public agencies, industry and commerce and the non-profit sectors use this and their own expertise to devise and put into practice effective strategies for how they will adapt to climate change—for their own benefit and that of their key stakeholders and the general public. The impacts of climate change will include opportunities as well as threats, and it is important that planning is in place to help us to take advantage of change as well as protect ourselves from increasing risk.

21. Long-term decisions are being taken now—on buildings and infrastructure, trade, and many of the other issues identified in paragraphs 17 and 19—based on projections of future demand, capacity and constraints. Assumptions about climate are built into these decisions—and unless explicit consideration is given to what we now know about climate change, the common assumption will be that the future will bring more of the same. That assumption is highly risky, potentially dangerous and must be addressed through policy, based on the best available research.

22. Regional differences within the UK will play an important part in how climate change actually affects organisations and individuals. The UKCIP02 scenarios show that changes in temperature, precipitation, sea level rise and other key variables will differ—with changes generally more pronounced in southern and eastern regions than in northern and western ones. But vulnerability to impacts will also depend on very local conditions and on the degree to which resilience is already—or can be—built into local services. It is therefore important that policy is able to support flexibility in responding to climate change.

23. SECCP therefore recommends that the Committee give close attention to the extent to which awareness of climate change impacts is addressed explicitly in a range of national policies, and does not confine itself to UK climate change policy *per se*. This examination should reflect differing regional needs.

Adapting our approach to climate change

24. Organisations and individuals will clearly need to adapt to positive and negative impacts of climate change. In addition to an appreciation of the specific impacts for them, this will require an understanding of their own capacity to adapt and, crucially, their relationships with stakeholders. Stakeholders will have their own vulnerabilities and capacities, so any actions that one organisation takes will impinge on the ability of others to respond. In many cases, these responses can be mutually beneficial; in others, there will be potential for conflicting priorities, which could limit our overall adaptation and increase the costs to society as a whole.

25. The cross-cutting nature of climate change across social, economic and environmental concerns, the involvement of a wide range of stakeholder organisations, the requirement for long-term planning and the need to account for the interaction between climate change and other drivers of change all mean that approaches to adaptation must be strategic and must be taken in partnership. This has important implications for action “on the ground” but also for national government. At present, action is somewhat fragmented between departments and there are differing levels of take up (as, for example, in transport policy). There needs to be closer co-ordination and leadership to ensure that all departments adopt fully adaptive planning. Furthermore, central Government needs to make clear to all regional and local bodies the need to account for climate change impacts and adaptation, as well as mitigation, in their policies.

26. A strategic approach should mainly consist of adapting existing or planned policies to take account of climate change, rather than devising new strategies with a specific focus on climate change—although there may be a need for such documents in some situations. Examples of national policies that will need to be adapted (and adaptive) to climate change include the UK Sustainable Development Strategy and Building Regulations; at regional level, spatial and economic strategies; and at sub-regional level, local development frameworks and community strategies. In reality, almost all policies and plans will need to give attention to climate change impacts and adaptation, as well as to mitigation.

27. There is also a need to build adaptive responses into policy at EU and international levels. The UK Government has signalled its intention to highlight climate change during its leadership of the G8 throughout 2005 and of the EU in the second half of the year; it is imperative that this include a focus on adaptation as well as mitigation, because of the global nature of the systems on which climate change will impact and of the agreements on how nations manage investment, trade and security, for example. This

leadership role of the EU and G8 should also include strenuous efforts to persuade members and other nations to recognise the threat that climate change poses, to fall in with Kyoto or similar targets, and consider local impacts of climate change on their communities.

28. In adapting to climate change, there must also be constructive links to mitigation. Effective action now to minimise global greenhouse gas emissions will help to ensure that the worst scenarios for climate change can be avoided—including possible irreversible and catastrophic change beyond this century—thus making it easier for future generations to undertake further adaptation. Conversely, adaptations that need to be planned now should be designed in ways that help deliver future mitigation successes, for example in the design of energy efficiency and renewables into buildings, infrastructure, services and land use planning more generally.

29. Our SECTORS project considered the elements in an adaptation strategy to include: understanding current practices; appreciating how these relate to climate; assessing potential threats and opportunities, including uncertainties; appraising measures to increase resilience to climate change and to maximise opportunities; and prioritising strategies and adopting these in forward planning. An organisation might consider an approach based on its different functions or roles—for example, as an employer, a property owner, a purchaser of goods and services, an investor and also possibly as a role model, educator or influencer: climate change impacts will have implications for each of these activities and should be considered at all stages of planning.

30. In developing their own adaptation strategies, organisations can benefit from tools and support, including: guidance, case studies, training, access to expert knowledge and local services. UKCIP continues to play an invaluable role in developing such tools. Regional partnerships—such as SECCP—work closely with UKCIP and with each other in providing their own programmes and services.

31. Some support can be provided centrally but adaptation must take place “on the ground” at local and regional levels. There is a need for effective and flexible support as close to these levels as possible and regional partnerships provide an effective means to encourage self-support, facilitate exchange between stakeholders and deliver any support that is developed nationally. Stakeholders have already invested significant financial and in-kind resources in such regional initiatives and are committed to their growth and success. National support for such approaches, alongside UK-wide initiatives, should be a means to deliver national, regional and local policy objectives that are in harmony with each other.

32. SECCP endorses the work of UKCIP and wishes to see greater priority given to promoting the programme’s knowledge and tools to public, private and non-profit sector organisations.

33. We recommend that the Committee address the need for support to UK industry, public bodies and non-profit organisations to help them work constructively and together towards a climate-resilient society, including adequate resources for effective public awareness campaigns to motivate personal and business adaptation actions. To ensure effective delivery of this support, Government departments should be encouraged to work with each of the regional partnerships, including appropriate financial support for specific activities.

1 October 2004

APPENDIX 2

SECCP RECOMMENDATIONS FOR CLIMATE CHANGE CRITERIA IN THE SOUTH EAST PLAN

1. With regard to climate change, the overarching aims for local and regional decision takers and stakeholders in the South East should be to:

- (a) work to reduce the extent of future global climate change, through effective measures to reduce net emissions of greenhouse gases within the region;
- (b) work with a changing climate, through adaptation to its impacts (both risks and opportunities) within the region and to manage these for the benefit of present and future generations.

2. The guiding principle for 1a) must be to reduce net emissions of greenhouse gases within the region by:

- (a) designing any new developments to standards of high energy efficiency, low embedded carbon and good accessibility by public transport [eg high levels of insulation; minimal use of plastics; green transport plans for major employers, hospitals etc];
- (b) promoting changes to existing development that will increase the efficiency of energy use in power, heating and transport [eg insulation];
- (c) promoting local services to increase resource efficiency [eg local shops, recycling services etc];
- (d) promoting land uses that serve as carbon sinks [eg community woodlands].
- (e) Encouraging development and use of renewable sources of energy, preferably local [eg PVs, wind power, biomass etc];

- (f) Reducing the amount of waste (particularly biodegradable waste), reducing the volume sent to landfill and maximising capture and use of greenhouse gases, particularly methane [eg waste minimisation, composting etc]
3. The guiding principle for 1b) must be to reduce risks from climate change by:
- (a) guiding any new development to locations that best offer protection from the likely impacts—including flooding and drought, sea level rise, storminess, soil subsidence and heave and implications for supply and demand of essential services [eg preference to locations that have sustainable existing water supply rather than those that require long distance supply];
 - (b) ensuring that the design and layout of new developments (including buildings, open spaces and infrastructure) will be resilient or adaptable to the likely impacts during the development's lifetime [eg designing in flood protection and water-saving features; orientation to take advantage of solar gain for PVs etc];
 - (c) promoting changes to existing development that will enhance its resilience or adaptability to the likely impacts during its lifetime [eg improving site drainage; connecting to neighbourhood SuDS; introducing grey water recycling etc].
4. Within these guiding principles, there are a number of subsidiary principles that will be important in helping planners and other decision takers to take proper account of the causes of climate change and the risks and opportunities from its impacts. Policies and plans should:
- (a) Protect existing land uses from the impacts of sea level rise and flooding only when it can be justified in social, economic and environmental terms, taking account of both costs and benefits;
 - (b) Avoid new development in locations that could constrain or reduce the effectiveness of future options for adaptation [eg development now that is not likely to prevent effective flood management in the future];
 - (c) Enable new development in areas at risk only where the development is itself resilient or adaptable to the likely impacts of climate change, can enhance other local adaptation to these and does not displace the effects elsewhere [eg raising floor levels in flood risk areas];
 - (d) Adopt technical solutions to impacts (for example, flooding and water supply issues) only where necessary and having considered other adaptive options beforehand, including alternative locations in areas at less risk;
 - (e) Locate new development so that it can be supplied with water and other resources in a sustainable manner under changing and variable climatic conditions. Sustainable supply should also include the requirements for water and other resources within the natural environment;
 - (f) Design new development and changes to existing development that are resilient to climate change impacts (eg subsidence);
 - (g) Where new or existing development may arise from responses to climate change, protect existing terrestrial, freshwater and marine habitats from adverse impacts;
 - (h) Seek to compensate for any loss of habitat as a result of climate change or new development by creation of similar habitats in areas that will be suitable under changing climatic conditions;
 - (i) Minimise the negative health impacts associated with climate change [eg through provision of shading];
 - (j) Recognise the relationships between different natural and human activities, including the implications of climate changes responses (adaptation and mitigation) in one area for the ability of other areas to develop their own responses.
5. It is also important that policies and plans should promote development that enhances the natural environment and takes advantage of social, economic and environmental opportunities that may be afforded by climate change impacts or by the need for mitigation. Subsidiary principles here include:
- (a) Promote local goods, services and facilities; and promote accessibility to these via public transport and transport infrastructure that is resilient to climate change impacts [eg farmers' markets, entrepreneurial responses to shifting consumer demand];
 - (b) Seek to create corridors and stepping stones that will allow species to migrate and adapt in response to climate change;
 - (c) Promote agricultural practices that are compatible with and adaptable to the impacts of climate change [eg winter water storage, new crops, farm diversification etc];

Promote social and economic benefits of new habitat opportunities [eg tourism] and other land use changes [eg recreation at reservoirs].

Memorandum submitted by the Joint Nature Conservation Committee (U19)

1. INTRODUCTION

1.1 The Joint Nature Conservation Committee (JNCC) is a forum through which the country nature conservation agencies—the Countryside Council for Wales, English Nature and Scottish Natural Heritage—deliver their statutory responsibilities for Great Britain as a whole and internationally.

2. GENERAL COMMENTS

2.1 Climate change is likely to be the most significant and far-reaching environmental threat to have faced the Earth in its recent history. Greenhouse gas emissions from human activities are accelerating what was a natural process and scientific evidence suggests that we are currently committed to at least 50 years of rapid climate changes (and an average warming of 1.5°C in that time). In the longer-term, the amount of climate change will be determined by decisions made now about the management of the world's greenhouse gas emissions. The Kyoto Protocol has raised the political profile of the need to reduce emissions, but the targets agreed so far are too modest to have any real effect on the warming trend. However, many see such mitigation measures as being the solution to the climate problem; the need to adapt to the more immediate and inevitable impacts of climate change are often overlooked.

3. MITIGATION MEASURES

3.1 Climate mitigation is aimed at driving down greenhouse gas emissions in an attempt to manage atmospheric concentrations of these gases at sustainable levels—both in terms of environmental and socio-economic well-being. But due to the lengthy activity times of greenhouse gases once in the atmosphere, the effects of mitigation measures, although essential in moderating climate change in the long term, are unlikely to be realised until well into the second half of this century.

3.2 JNCC welcomes and supports the commitment demonstrated by the UK in tackling climate change and its mitigation, and the international lead it has taken over many related issues. The UK has a high profile role in international negotiations under the UN Framework Convention on Climate Change and its policy framework is firmly focussed on the achievement of ambitious Kyoto targets.

4. ADAPTATION MEASURES

4.1 JNCC is concerned that the UK has not adequately or explicitly addressed the need for adaptation measures to accommodate the inevitable effects of climate change over the next 50 years or more. The comments which follow essentially relate to this issue.

4.2 The potential effects of climate change are not widely understood. The concept of “global warming” has emerged as a popular euphemism for climate change. But temperature rise is one of a range of consequences of human intervention in the global climate system. Warming is being accompanied by changing precipitation patterns, increasing frequencies of extreme weather (storms, floods, drought) and rising sea levels (as ice sheets and glaciers melt, and as sea water expands in response to higher temperatures).

4.3 Cause and effect relationships, predicted impacts and the urgency with which these need to be addressed, are not widely appreciated by policy/decision makers or amongst the public at large. For many, climate change is seen as a long term problem with no immediate relevance. However, the implications are already evident and will become more acute in decades to come.

4.4 Humankind has no option but to develop measures to adapt to climate change—now. It is already having marked impacts on the environment, societies and economies. Direct effects are being witnessed on, for example, biodiversity, coastal processes, human health, buildings, water resources, rural landuse patterns and the insurance industry. Indirect impacts are influencing other sectors and areas of activity.

4.5 Clearly, to address the more immediate impacts of climate change adequately, adaptation measures should be cross-sectoral, integrated and holistic. Explicit recognition of climate change in spatial policies and environmental protection measures is essential in this context. From a biodiversity perspective, accommodating changing species' distribution in response to climate change will be a key challenge for conservation. By incorporating climate change considerations into spatial planning policies, conservation strategies for protected areas and wider landscapes would be set alongside policies for land use and coastal change and water resource management, providing an effective framework for informed decision making.

4.6 The future impacts of climate change are the subject of a growing field of research. Typically, such assessments use sophisticated computer models to simulate responses under a range of climate scenarios. Simulation models provide increasingly robust output data which should enable policy/decision makers to begin to address “adaptation” in the context of climate change. Whilst not yet being able to ascribe statistical certainty to any one prediction, models are able to provide a range of scenarios (least-worst to worst-worst) against which no-regrets options can be formulated.

4.7 The development of adaptation measures in the UK largely falls within projects carried out under the umbrella of the UK Climate Impacts Programme (www.ukcip.org.uk). JNCC commends its approach and the excellent work carried out by a very small team of dedicated professionals. However, to tackle the mounting challenges which characterise the adaptation agenda effectively, the Programme clearly requires a considerable increase in resources and a commitment to secure funding beyond the somewhat restricted arrangements currently in place.

1 October 2004

Memorandum submitted by the British Cement Association (U21)

EXECUTIVE SUMMARY

1. The cement industry has been one of the sectors in the vanguard of those addressing the challenges posed by climate change and the need to secure a more sustainable future for all. Internationally, the 10 leading companies have established the Cement Sustainability Initiative through the auspices of the World Business Council for Sustainable Development. The UK cement industry has a Climate Change agreement with the Government and will be a participant in the European Emissions Trading Scheme.

2. The UK Government has received a significant degree of international acclaim for its pioneering policies to tackle climate change. The BCA welcomes the introduction of forward-looking approaches to environmental and other measures, but believes that there are important lessons to be learned from the experience to date in a number of areas. In reviewing its climate change programme it is vital that the Government learns and acts upon the experience gained from its own current policies, and those of the European Union.

3. Any future trade and cap measures should only be taken at least at an EU wide level, be well considered and planned and underpinned by clear principles of certainty with sufficient time allocated for proper implementation.

4. UK level measures, implementing either EU schemes, or other UK specific policies should involve all those Government departments with an interest and be integrated with and complimentary to other policies. They should not have a negative impact on the competitiveness of domestic industry.

5. To date, industry has been the primary focus for measures designed to tackle climate change. This base needs to be broadened to include transport and the domestic sectors.

6. Government should procure by example, setting the benchmark for a more sustainable built environment and infrastructure.

7. The UK Chair of the G8 and Presidency of the EU provides a good opportunity to ensure rigour in EU implementation of climate change policies, and to explore opportunities for global trading mechanisms.

THE IMPACT OF CLIMATE CHANGE MEASURES ON THE UK CEMENT INDUSTRY

1. *The UK Cement Industry.* The British Cement Association is the trade and research organisation that represents the interests of the United Kingdom's cement industry in its relations with Her Majesty's Government, the European Union and relevant organisations in the United Kingdom. The members of the BCA (Buxton Lime Industries, Castle Cement, Lafarge Cement UK and Rugby Cement) are the major domestic manufacturers of Portland Cement producing over 90% of the cement sold in the UK.

2. Energy represents approximately 35% of the variable costs of cement manufacture and it is therefore a primary concern of the industry to take all cost effective measures to improve energy efficiency and thereby reduce its emissions of carbon dioxide.

3. The cement industry supports the principle of emissions trading. Through their parent companies, Lafarge Cement UK, Castle Cement, and Rugby Cement are committed to carbon reductions through the World Business Council for Sustainable Development Cement Sustainability Initiative, (WBCSD CSI). In addition, Buxton Lime Industries has undertaken to adopt the commitments within the WBCSD CSI.

4. *UK Climate Change Levy Scheme.* The BCA and its members have Climate Change Agreements (CCA) with government, signed in 2000, which will deliver a 25.6% improvement in energy efficiency over the period from the baseline year 1990 to 2010. At the first milestone reporting in 2002 it was on course to deliver the target with a 13.2% improvement.

5. Ahead of the reporting of the second milestone phase of the Agreement at the end of this year, the targets for 2006, 2008 and 2010 have been reviewed by Government and industry, and revisions agreed. A further review is to be undertaken in 2008.

6. *Trading of Emissions within the UK.* One of the BCA's members, Lafarge Cement UK, is a direct participant in the UK Emissions Trading scheme. Other members have experience of trading carbon through their membership of the Climate Change Levy Scheme.

7. *EU Emissions Trading Scheme, (EU ETS).* The industry is one of the sectors prescribed for mandatory inclusion in the EU ETS, either from its initial implementation in January 2005, or from January 2008 under the "opt out" provisions.

8. BCA and its member companies have been working with Defra, Dti, and their consultants in relation to the development of the EU ETS and its implementation within the United Kingdom. These discussions have taken place with Government and the sector or member company, as appropriate, and have been supplemented by the discussions of the Emissions Trading Group, ETG, with Government. BCA is an active participant of the ETS.

9. At the European level, BCA has been working with other European cement manufacturers, through CEMBUREAU. In addition to the development of common issues, CEMBUREAU is in direct communication with the European Commission.

REVIEW OF THE UK CLIMATE CHANGE PROGRAMME

10. The cement industry welcomes the opportunity to comment on the review of the UK Climate Change Programme. With the prospect of medium- to long-term requirement of greenhouse gas reductions of 60% or more, all sources of greenhouse gases must be addressed at an early stage.

11. The UK Government has received a significant degree of international acclaim for its pioneering policies to tackle climate change. The BCA welcomes the introduction of forward-looking approaches to environmental and other measures, but believes that there are important lessons to be learned from the experience to date in a number of areas:

11.1 Adoption of realistic timetables for development of Green house gas (GHG) reduction scheme and introduction of appropriate measures by the parties concerned.

11.2 Provision of adequate level of certainty to assist industry and others concerned to make the necessary commercial decisions.

11.3 No *ex post* government intervention in established trading markets.

11.4 Ensuring equitable targets from all participants in any given scheme, ie no discrepancies such as in the National Allocation Plans of many other Member States.

12. The Climate Change Levy, (CCL), which was introduced by the UK Government in 2000, was based on improvements in energy efficiency as a way to deliver reductions in carbon emissions. The basis of the EU ETS is the reduction of carbon dioxide emissions. The development of the two different mechanisms for measuring, reporting and verification purposes has placed a significant burden on industry and has introduced the entirely avoidable issue of working out an equivalence between the two schemes, as well as possible opt-out opportunities for UK businesses.

13. UK government was aware that the EU ETS would be introduced in the short- to medium term, yet continued to pursue its policy of introducing the CCA, then its own Emissions Trading Scheme, and now insists in trying to run them in parallel with each-other; it is the most clear cut example of over regulation of UK industry and has had a direct impact on its competitiveness. None of its EU competitors has had to negotiate its way through three separate and incompatible systems within a four year period, instead concentrating on the one EU wide scheme.

14. BCA has commented directly to Defra about the Government's proposal to intervene in the current UK Emissions Trading Scheme. We are concerned at the prospect of intervention into a market-based regulatory instrument. The intention of environmental regulation using economic instruments is to deliver environmental improvement at the lowest cost. It should be left to the market to decide the price and supply of allowances and this enables industry to choose between abatement and trading. With the EU ETS about to start in 2005, any interference in the UK scheme will provide a poor example and send the message that emissions trading does not work.

15. Any future cap and trade mechanism for the other GHGs should have much simpler mechanisms than those developed for the National Allocation Plan as part of the EU ETS.

DEFRA'S FIVE YEAR PROGRAMME

16. BCA understands that Defra is working on a five year programme to be released this year and a new sustainable development strategy for early next year. In drafting these programmes and in considering what new policies it wishes to implement it is essential that Defra and the Government as a whole should avoid any scheme to be imposed on business that is not an agreed EU wide one and learns from the experience to date of UK industry.

17. EU-wide or global trading mechanisms for the other GHGs are the preferred option for the UK cement industry.

18. Although the European Kyoto target is 8%, and the UK's contribution is set at 12.5%, the UK Government has set its own goal of 20% by 2010, with a commitment to implement the recommendation of the Royal Commission on Environmental Pollution's longer term 60% reduction by 2050.

19. These ambitions, although environmentally laudable, fail to take into consideration the way in which they may be achieved. To date, the Government has implemented its programme without considering the impact on the competitiveness of UK business.

20. In implementing a future EU-wide or global trading mechanism for the other GHGs it is vital that there is parity with other European countries and the Government seeks to implement the UK's contribution in an equitable way, which does not have a detrimental impact upon the competitiveness of domestic industry.

21. Although Government has talked of the need to address the contribution of transport and domestic energy usage to climate change, to date it has concentrated the majority of its efforts towards encouraging or demanding efficiencies and behaviour change towards industry.

22. For credibility and fairness governmental action should be broadened beyond this concentration on what industry can deliver to encompass both of these significant contributors to climate change.

23. It is vital that there is a coordinated approach across Government to any review of the Climate change Programme. From the perspective of the cement industry a clear understanding needs to be established by HM Treasury, Defra, ODPM and Dti between environmental taxation, waste policy, construction and building regulations.

24. Defra, ODPM and Dti has already made a start to this process via its *Sustainable Buildings Task Force* which published its report over the summer and the cement industry supports its recommendation for the introduction of a Code for Sustainable Building.

25. Nevertheless, we would caution against the current push for quick-fixes via off-site production of light weight prefabricated buildings. Such solutions are short-term and will not fulfil the future building performance requirements as climate change results in warmer summers. Investment in our build infrastructure should be on the basis of permanence for long-life.

26. As the largest procurer of construction industry services, Government should be setting the benchmark for sustainable construction projects for schools, hospitals, other public buildings, as well as transport infrastructure projects. These too should not be short term solutions, but look to the longer term and be based on whole life performance not just initial or lowest cost. The same principles should be extended to local government.

UK CHAIR OF G8 AND PRESIDENCY OF THE EUROPEAN COUNCIL

27. Holding the simultaneous Chair of both the G8 and the EU provides an ideal opportunity for the UK Government to champion and coordinate its environmental policies. BCA notes that the Prime Minister has already indicated his Government's intention to do so.

28. The Joint Implementation and Clean Development Mechanism (JI & CDM) are important components of the EU ETS and BCA hopes that the UK will use its time in the Chair of these two international bodies to promote and foster their use.

29. There has been much comment, not least from the European Commission itself, on the lack of vigour or ambition in the National Allocation Plans (NAPS) of many member states. The UK should use the opportunity of the European Presidency to reinforce the need for rigorous implementation and regulation of EU wide schemes to help prevent inconsistencies that can distort the internal market.

30. The EU ETS is not alone as an emissions trading mechanism, and other schemes exist outside of Europe. It would be a positive step if the UK Government could work towards true international schemes and markets, especially as the EU starts to consider the other GHGs. Perhaps the UK could explore the possibility of a role for the World Trade Organisation?

1 October 2004

Memorandum submitted by the Environment Agency (U22)

SUMMARY

The Environment Agency is responsible both for regulating emissions that cause climate change and for preparing for the consequences.

Key issues for the new UK Climate Change Programme:

- Climate change may well be an even greater threat than was realised at the time of the original 2000 programme.
- The new programme needs clearer statistics, which avoid potential for double counting and facilitate accountability.
- There are inconsistencies between government policies and indications of a likely shortfall in meeting targets.
- Further action is needed to secure the 20% manifesto target for CO₂, and to work towards the 60% target for emissions.
- The current programme does not take account of the central role that a robust EU Emissions Trading Scheme will play in achieving success.
- There needs to be a much greater focus on adaptation.

- The programme should take account of the essential role of regional and local action to limit and adapt to climate change.

The Environment Agency believes that, with sufficient effort from all players, the national targets for CO₂ reduction can be achieved. This will show international leadership and help to persuade the rest of the world to act.

1. Context

1.1 The Environment Agency plays a major role in respect of climate change and energy. We regulate industries responsible for 40% of UK Greenhouse Gas (GHG) emissions, and are the competent authority for the EU Emissions Trading scheme. We take a lead role for England and Wales in adapting to some of the serious effects of climate change, including flood risk and water resources management.

1.2 Scientific evidence since 2000 suggests that we may need to tackle climate change more intently. New evidence has emerged on concentrations of greenhouse gas emissions, data from ice cores, rates of glacial melting, emissions from peatlands, and the likely implications on species and habitats. We ourselves have unwelcome, fresh operational experience of extreme events, possibly due to increased climate variability, which remind us starkly of the difficulty in dealing with them.

1.3 It is important that the forthcoming review builds on the Energy White Paper 2003, and current understanding about climate change science to set out a clear programme of action addressing both emissions reductions and adaptation to anticipated changes in climate. We would urge that any shortfalls arising in the programme to deliver emissions reductions should be addressed now to ensure we are on path to meet the 2050 goal.

1.4 The public sector has a key role. There must be willingness by Government and Regulators to act quickly to remove any inconsistencies across regulatory regimes and to ensure a consistent message. For example, the Environment Agency is examining its own regulatory practices to see if we impose any unnecessary barriers to increasing renewable energy supplies.

2. Mitigation of Emissions

General

2.1 In terms of emissions projections & trends we are concerned that the UK is not on track to meet its 20% 2010 and 60% 2050 targets. Recent Cambridge Econometrics and DTI forecasts show increases in the projected baseline carbon emissions such that the Government's 2010 carbon reduction target of 20% will be missed. This is due to poorer performance than had been expected in transport, domestic energy consumption, renewables generation, and Combined Heat and Power (CHP) development.

2.2 We are also concerned about data consistency and credibility. To facilitate understanding, and ensure comparisons are possible, we suggest that thought is given on how best to present data consistently in the revised strategy. Wherever possible, all government strategies and related statistical reports should present data in a comparable manner. Data needs to be presented transparently for each gas, sector and measure to avoid double counting. With a likely shortfall in meeting future targets it becomes even more essential that the strategy is made transparent and that some headroom for slippage is built into the next version of the programme.

2.3 Energy consumption, as the major contributor to GHG emissions, must be reduced. It needs to be both easier and cheaper to reduce energy use and GHG emissions, and unpopular and expensive to add to them. Increasing energy efficiency remains the single most cost-effective way to reduce emissions.⁴¹

Energy efficiency

2.4 The scope for greater energy efficiency in the industrial and commercial sector remains great. Agency research⁴² found that industry could cut its energy consumption by a fifth by 2020 if the right policies were put in place. The findings found that without new policy objectives, energy use would only be cut by 10%. Other research⁴³ explored the potential for energy savings from different industry sectors. It showed that savings could be made in chemicals, refineries, food and drink, and paper production—all from adoption of CHP in the near future.

⁴¹ "The cheapest, cleanest and safest way of addressing all our goals is to use less energy. We have to improve energy efficiency far more in the next 20 years than in the last 20" Energy White Paper: *Our energy future—creating a low carbon economy* DTI, 2003.

⁴² *Potential for Energy Efficiency in Industry*, Environment Agency, 2002.

⁴³ *The Environment Agency Contribution Towards Achievement of Greenhouse Gas Reduction Targets*. R&D Technical Report P4-089/TR, Environment Agency 2001.

2.5 We would like to see businesses given more support from Government and others to achieve resource efficiency savings, and to overcome barriers, such as a lack of information or access to capital. Programmes such as Envirowise, with support from the Environment Agency, have proved very cost effective at working with businesses.

2.6 We share concerns that the target for domestic energy efficiency has been downgraded even as its overall share of energy and emissions is expected to grow. The target of 5 MtC in the Energy White Paper has been reduced to 4.2 MtC in the Energy Efficiency Action Plan.

2.7 The growth in vehicle use has resulted in a 62% increase in greenhouse gas emissions (CO₂) from transport, which now accounts for 27% of UK emissions. And aviation emissions (not counted towards Kyoto) may well overwhelm the efforts in other areas unless tackled.⁴⁴

Renewables

2.8 To develop renewable fuels for transport we see promotion of biofuels as important.

The biofuels strategy should:

- Set out a long term vision that does not just focus on current technology or short term blends of existing fuels.
- Make sure decisions taken on biofuels are driven by climate change policy and are not just a substitute for reducing the causes of traffic pollution and congestion.
- Ensure that the interaction between biofuels and biomass for heat and power is fully explored to minimise competition while securing appropriate benefits from both.
- Ensure that the overall environmental impacts of biofuels across their whole life cycle are taken into account.

2.9 The Environment Agency recognises the benefits for the environment of sensitively sited renewable energy technologies. Progress with the Renewables Obligation targets has been steady, but slower than expected. Already a shortfall is likely in the 2010 10% target, which was intended to make 2.5 MtC savings. The UK will need a more rapid adoption of renewables to meet a target of 20% of electricity generation by 2020.

2.10 To increase the use of renewable energy and other low carbon technologies more effort is needed to encourage diversity of sources. This will include support for technology development and commercialisation, eg for buildings-integrated photovoltaics, for tidal energy, and to develop wave power. We also support an improved approach to planning for renewables, which cascades down from regional targets to community level, with increased public participation.

2.11 Developers of new technologies need to know there will be long-term consistency and certainty for investment, to assist their financial planning and for making the business case for projects to sell power. Environmental considerations need to be included at an early stage in the development and application of each technology. Energy grid and system upgrades will need to complement this.

Combined heat and power

2.12 More energy is used in this country in the form of heat, either in space heating, industrial processes or water heating, than any other energy service.⁴⁵ At the same time, the current electricity generation and distribution system discards more heat than the entire heat demand for the country. This highlights the need to accelerate the use of CHP.

2.13 The Climate Change strategy set a target of at least 10 GW of CHP capacity by 2010, but there is every indication of output falling short of the target. The barriers to CHP deployment need to be addressed, and these include:

- Further efforts to ensure whole of life costing of options to address the capital cost barrier from new, quality CHP.
- More support for feasibility studies across mixed land uses and regeneration schemes and where landlord-tenant issues exist.
- Greater attention to the obstacles to promotion of CHP through the planning system and building regulations, where many opportunities are missed.
- Issues around electricity trading and embedded generation, which are system-wide problems for smaller and intermittent generators.

⁴⁴ Government airport plans have a long way to go if the environment is to be protected. Environment Agency press release, date published: 16 December 2003.

⁴⁵ Space heating and hot water accounted for 82% of domestic use of energy and 64% of commercial use of energy in 2000, *Energy Consumption in the UK*, DTI, 2002.

Coal

2.14 At present, a quarter of UK CO₂ emissions are from coal even though its use fell over a third from 1990–2002. The recent growth—due to gas price rises—raised emissions from electricity generation by 6½% in the year 2002–03. If coal is to have a future in energy supply, it should only be medium-term and based on Integrated Gasification Combined Cycle (IGCC) technology. Any long-term future would require reliable techniques for large scale CO₂ capture.

Carbon capture and storage (CCS) technologies

2.15 The use of carbon capture and storage (CCS) technologies was not envisaged when the UKCCP was written. However, the Energy White Paper recognises the potential that CCS could play a useful role. Our North Sea gas fields could store all of UK CO₂ emissions at current levels for up to 15 years. The use of saline aquifers offers capacity that could last hundreds of years. However, CCS activities should be put firmly in the context of an overall vision of a low carbon future. CCS should be regarded as part of an interim approach not as a long-term solution. The development of such technologies should not divert resources from the more sustainable and longer-term solutions.

2.16 There are potential risks from CCS technologies to the local environment and human health and safety. We consider that the environmental impacts are not yet well enough understood and that a programme of research and demonstration is needed to inform the selection of storage sites to minimise the risk of CO₂ leakage with its consequent impacts on surrounding air, land and water quality. A new and robust legal and regulatory framework is also needed that protects the environment and human health, including provisions that address issues of long-term liability and remediation.

Nuclear power

2.17 The Environment Agency believes that an assessment of the role, if any, to be played by nuclear power must take full account of the financial and economic costs of the management and storage of radioactive waste and the regulatory framework. The Agency would, in any case, question the commissioning of new nuclear generating capacity in the absence of a sustainable long-term strategy for radioactive waste management. Until this issue is resolved, and public concern properly addressed, then any major changes of policy to encourage the construction of new nuclear generating capacity would appear to us premature.

EU Emissions Trading Scheme (EU ETS)

2.18 The current UKCCP was written before the introduction of the EU ETS. The 2003 Energy White Paper cites the scheme as a “central plank” of future emissions reduction policies, helping deliver additional savings of 2–4MtC by 2020. It is imperative that the scheme delivers. The Environment Agency is committed to the implementation of a robust trading scheme to help protect the environment. It called for a more stringent cap on emissions from installations covered by the EU ETS during the first phase of the scheme 2005–07. The cap is only consistent with a 15.3% reduction on 1990 levels by 2010, substantially short of the 20% domestic target. Although the Government has made a commitment to raise the cap in the second phase (2008–12) in line with the 20% target, we are concerned that the postponement will necessitate tougher measures to make the 20% target achievable.

2.19 The weakness of some of the caps set by Member States for the first phase undermines the effectiveness of the EU ETS, representing as it does a “business as usual” emissions path. The Dti’s Updated Energy Projections show that, without any action, the power sector will achieve a 30% reduction in emissions between 1990 and 2010. The first phase cap thus represents a significant windfall for the sector as it will be allocated allowances in excess of those it needs to meet its target.

2.20 We note that a recent Carbon Trust report *The European Emissions Trading Scheme: Implications for Industrial Competitiveness*⁴⁶ finds that the EU ETS does not threaten the competitiveness of most industry sectors in Europe, providing the EU Member States take a broadly consistent approach. The electricity, cement and paper sectors are shown to profit under all economic scenarios used in the study. Only the aluminium industry is expected to lose—despite, or indeed partly because of, the fact that it is not within the EUETS system.

2.21 The UK government will need to set a tougher cap in the second phase, taking account the need to achieve the 20% target and the potential shortfall of other measures in the current UK Climate Change Programme. In parallel, the UK should put pressure on other EU Members States to tighten up their National Allocation Plans. A recent study by the environmental consultancy, Ecofys, concludes that only the NAPs of the UK, Germany, Latvia and Lithuania imposed caps consistent with even their national Kyoto targets.

⁴⁶ *The European Emissions Trading Scheme: Implications for Industrial Competitiveness*—Carbon Trust, July 2004.

2.22 We are also concerned that the interaction between existing mechanisms, such as the Climate Change Levy and Climate Change Agreements, and the EU ETS is not well understood. All aim to reduce emissions from the energy and industrial sectors. The Government should review the need for the continued use of the many different policy instruments to tackle emissions of carbon. The second phase of the EU ETS could be the main policy instrument to control carbon emissions provided more parts of the economy are brought under the scheme. At the very least, the Government should ensure that the interactions between the different policy initiatives are understood and accounted for in its review of the UKCCP and that a revised set of projections makes transparent the relative contributions of each instrument to meeting the national targets.

Sustainable Communities Programme

2.23 The Sustainable Communities programme offers an opportunity to implement aspects of the climate change strategy. The standards Government sets for the siting, design, and construction of new homes and associated infrastructure, and their ensuing resource requirements, will set important benchmarks for the future. We would like to see:

- A tightening up of building regulations in order to improve the energy and water efficiency of buildings by 25%, as recommended by the Sustainable Buildings Task Group.⁴⁷
- The proposed Code for Sustainable Buildings to provide a single, coherent and consistent framework for constructing buildings with higher levels of environmental performance than those stipulated by regulation. Such a Code should be used for all public procurement of buildings to drive its adoption by the industry, as well as account taken of the consequences of development in flood plains (see Adaptation).

Changing behaviour

2.24 Changes in public and organisational behaviour are essential. Government should take the lead with a package of regulatory and fiscal measures to drive changes in behaviour, accompanied, where appropriate, by education and awareness initiatives. The over-riding message to the public should be that energy use, as the major contributor to GHG emissions, must be reduced. The focus should be on direct energy use in the home (electricity, oil, and gas) and for transport (car and air travel). Unless energy efficiency is addressed, any gains from switching to low carbon options could be lost through increased energy use overall.

2.25 Further regulation may be necessary, though this will generally act on the public through regulation of business, for example product policy to progressively remove energy inefficient appliances from the market. Economic instruments should be used to reward behaviour that helps achieve reductions targets, and penalise behaviour that hinders them. The Climate Change Levy is a useful instrument, but its is now cheaper in real terms than when it was introduced, so the incentive to act has fallen. The prices of energy flowing through the economy will need to increase overall and taxation is one of the most cost effective means to deliver such changes. Such fiscal measures must be applied in parallel with social instruments to avoid negative impacts on disadvantaged groups.

3. Adaptation

3.1 Whilst we strive to exert global leadership to ensure the world does not have to face dangerous climate change, we shall still need to adapt to some unavoidable impacts already in systems. The Environment Agency has been closely involved in national and regional initiatives to understand climate impacts and to prepare for adaptation. We expect this role to grow as the Government establishes its Adaptation Policy Framework. Our role is central for an effective delivery of measures, which will ensure we are able to cope with unavoidable climate change. Issues concerning the water cycle are related to most of the critical impacts and we have lead responsibilities for both droughts and floods. While flooding has damaging effects on people and property, we must not lose sight of the public health issues associated with more frequent droughts. The environment we regulate in respect to air and water will itself be affected more broadly in relation to temperature change and fluxes and flows, so this is a major issue for our environmental protection responsibilities. Waste management, for example, is likely to have to change significantly.

3.2 We have recently made a full submission to the Committee about water and climate change issues, so will not cover the same ground here but touch on some new developments.⁴⁸

3.3 We will be responding in detail to the new government consultation paper “Making Space for Water” and its new thinking in the means to tackle flood risk and its consequences. The forthcoming Government flood strategy must face up to the scale of the challenge that this facet of climate change adaptation poses, as highlighted in the recent Foresight report. The key messages for us are:

⁴⁷ *Better Buildings, Better Lives*. Sustainable Buildings Task Group Report. DTI. May 2004.

⁴⁸ Climate Change, Water Security, and Flooding—report of the EFRA Committee inquiry, September 2004.

- A far wider range of responses can be applied to tackle this, and an increase in resources is needed or flood risk could grow to unacceptable levels in future, particularly in south-east England.
- Tackling flood risks needs to be undertaken using a broad range of measures, including engineering and other large-scale interventions.
- Policies and measures need to be flexible combining funding, incentives and regulation in order to adapt to accommodate the uncertainties of the future.
- Inappropriate development in the flood plain must be prevented. We need to clarify and update PPG25 and strengthen it. The Environment Agency should become a statutory consultee on flood risk and we advocate its replacement with the proposed PPS25 on Development and Flood Risk, with Technical Annexes, to reflect Defra's strategy on flood risk management.

Water

3.4 Water resources are threatened by both climate change and growing demand. The new strategy should take an integrated approach to managing demand and dealing with projected threats to future resources. A long term view is needed on infrastructure decisions. It is vital that decisions we take now are future-proofed against future changes in climate. It is clear that making better use of existing resources will be essential if we are to have more hot, dry summers. More attention must be paid to leakage control and to demand management, ensuring that we are investing for future generations. The next periodic review must be informed by significantly better analyses of the impact of climate change, and vulnerable water companies must start work on these immediately.

3.5 Potentially, the Water Framework Directive (WFD) could be a way to integrate the management of climate change within the water cycle within catchments. We recognise climate change will require integrated solutions, for example adopting land management measures that can mitigate drought and flood impacts. The WFD will require the integrated management of pressures on the water environment and will provide the opportunity to "join up". There will also be a need to ensure that CAP reforms help deliver complementary land management practices.

3.6 Somewhat surprisingly, the WFD text does not deal with climate change. However, climate change has the potential to affect reference sites and thus the whole concept of "good ecological quality". We have already recognised that failure to factor in allowances for climate change in the implementation stage could lead to failure in meeting the environmental objectives set out in River Basin Management Plans (RBMPs). Also, freshwater species are potentially vulnerable to direct and indirect climate change effects arising from changes in discharge, water temperature, habitat, and physio-chemistry of rivers, still-waters and wetlands. Therefore, we are undertaking research to characterise ecological status in the face of natural variability and changing climate conditions for different emissions and models.

Research

3.7 To cope with unavoidable climate change more effectively, we need more information. Defra and its predecessors have led the world with an innovative programme of research which has led to the establishment of the Hadley Centre and many cutting edge projects. Recently the research councils have established the Tyndall Centre, which has already a crucial role. We would like to see the Climate Change Programme Review provide an improved framework for climate change research within the UK. We are already working with other partners on our research programme and are keen to do more as we develop next stage work. With so many of the Environment Agency's functions affected by climate change this has become a priority in our new science strategy. We have already begun the process of assessing how and where such impacts will fall and the ways our operations and infrastructure will be affected. Our current research programme starts to deliver technical methods and information that can be used for strategic and operational assessments of existing standards, regulated activities and the protection of environments that are potentially affected by climate change.

4. *Local and Regional Action*

4.1 Regional initiatives are well underway which contribute to energy policy and integrate these issues into other strategies and plans: the Environment Agency is a committed player in these throughout England and Wales. In fact we have a unique, integrating perspective by being active on both energy policy actions and adaptation at regional level. Many of the impacts of climate change will be manifest and need to be handled at a regional and local level. Delivery on renewable energy policy needs active participation throughout the country. We are working with the Local Government Association on a protocol that will help frame complementary actions on climate change.

4.2 Better integration across regional plans and strategies is needed. To help make this happen, national planning policy and guidance should require regions to factor climate change into regional documents. This includes making regional contributions to national carbon reduction targets and the need to adapt to climate change impacts. Regional documents should provide a policy framework for climate change mitigation and

adaptation in the region. For example, Regional Spatial Strategies should form the basis of regional adaptation (eg flood resilience and sustainable development) and mitigation (eg better buildings and transport policies).

4.3 The Water Framework Directive (WFD) will establish a catchment-based approach to the management of the water environment. The Agency expects that many of the actions that stakeholders will need to take to meet ecological objectives in the WFD will involve land management and land use planning. In seeking to manage the impacts of climate change, an integrated catchment approach where environmental planning and prioritisation are taken forward in conjunction with investment regimes (CAP funding and AMP) will be required.

4.4 We would like to see local planning policies strengthened in a number of areas relevant to climate change, particularly PPS 1 and PPG25 (Flood Risk—see paragraph 3.3). The Strategic Environmental Assessment Directive is a means whereby relevant public plans and programmes give full consideration to their climate change and other environmental implications.

4.5 In planning and project assessment the full environmental costs of all energy technologies need to be internalised to enable decision-making on a level playing field. The whole life of a development should be used as the basis for decision making. Commitments need to be made about decommissioning facilities after use, whether major power developments or small scale sites and equipment for local generation at the same time as development is approved.

4.6 We suggest that regional bodies concerned with economic development, infrastructure and other functions should be required to “climate proof” their activities. RDAs, in particular, have an influential role to play with the business community and through the services they sponsor. Specific guidance should be prepared for their operations and strategies. This should emphasise that moving to a low carbon economy offers investment, economic and employment opportunities.

1 October 2004

Memorandum submitted by the Northwest Climate Group⁴⁹ (U23)

SUMMARY

1. The Presidency of the G8 and the Council of the European Union presents the UK Government with a marvellous opportunity to push forward action on climate change. The following submission outlines a number of areas where we believe the Government needs to take action if global efforts to reduce carbon emissions are to succeed. The submission outlines the need to lead by example, highlighting some of the areas where, domestically, the Government faces challenges that need to be addressed. These include transport, the move towards a low carbon economy and efforts to change behaviour. We believe that if the Government can succeed in taking forward this agenda in the UK, then its opportunity to lead internationally will be enhanced. The submission ends by focusing specifically on crucial areas for action on the international stage.

LEADING THE WAY

2. It should be recognised that this UK Government has continually been at the forefront of efforts to promote international action on climate change, and the Prime Minister’s recent speech reiterated this. If the UK is to continue to exert influence on this issue, pressing other countries to take action, it is important that the UK itself is seen as a world leader in reducing emissions of greenhouse gases, whilst ensuring that the country is prepared for the inevitable impacts of climate change. Through the Climate Change Programme, the target of a 60% reduction in carbon dioxide (CO₂) level by 2050, and the success of the UK Climate Impacts Programme, UK Government has been setting an example for other countries to follow. However, while the UK’s Kyoto targets are likely to be met, there is increasing uncertainty as to whether the Government’s own target of a 20% reduction in CO₂ from a 1990 baseline by 2010 will be realised. Indeed, such doubts have recently led the House of Commons Environmental Audit Committee⁵⁰ to insist that the Government’s climate change strategy is “seriously off course”. If we are unlikely to meet the 2010 target, this does not bode well for a 60% reduction by 2050.

3. We believe that there a number of significant reasons behind these problems that will need to be addressed if the UK is to continue to lead the way in addressing climate change, and these are outlined below. Clear action by the Government will have innumerable benefits, through acting as an exemplar for other countries to follow and providing a framework within which regional and local actors can pursue their own strategies. Climate change is more than just an environmental issue—it is a sustainable development issue too. Economically, action to mitigate against further emissions and to adapt to inevitable climate change makes compelling. Socially, it is the more disadvantaged in our society, both regionally, nationally and internationally, who will suffer the worst effects of climate change. As with the more broad issue of sustainable development, climate change as an issue cuts across different policy areas and as such needs to

⁴⁹ The Northwest Climate Group is a public/private partnership that aims to ensure that consideration of climate change is central to all decision making within the Northwest region and beyond.

⁵⁰ House of Commons Environmental Audit Committee, 2004, *Budget 2004 and Energy*, Tenth Report of Session 2003–04.

be incorporated into all policy development, not ghettoised in environmental departments. This is something that we believe this Government is committed to and we hope that they will continue to communicate this message globally.

4. Our specific areas of comment follow below and encompass transport, moving towards a low carbon economy, changing behaviour, and a section focused more explicitly on global issues.

TRANSPORT

5. Despite the desires expressed by the Government, CO₂ emissions have risen in recent years, and this growth has largely arisen due to transport. If the current trends continue then the CO₂ targets will not be reached. There is a need for a range of measures to be taken to address this problem. One approach is legislation at the European level, to ensure that car manufacturers continue to develop efficient cars that run on cleaner fuels. The other option is the use of economic incentives. It is essential that in addition to proposed use of road charging, some environmental-based taxation, for example through effective differential vehicle excise duty charges, are utilised. If this is to influence behaviour the differences between bands of charge will need to increase substantially above current levels. The fact that the real costs of motoring have fallen in recent years must be communicated clearly to the wider public. The current reluctance of the Government to raise fuel excise sends out the wrong message.

6. It is recognised that there is a difference between how private and business transport are considered. The Government needs to ensure that businesses in the UK are not put at a disadvantage, compared to European counterparts, due to higher transport costs. The Government should continue to work with industry in the UK to reduce the CO₂ emissions from business transport. For example, schemes such as the Energy Saving Trust Powershift programme need increased levels of funding and improved co-ordination in order to take its aim of getting more cleaner vehicles on the road out into the wider business community. Working to ensure that more Compressed Natural Gas pumps are placed in main brand petrol stations would also help. The Government must work to ensure that such efforts are being made EU-wide.

7. Encouraging citizens and business to use more efficient, cleaner vehicles will help to reduce the carbon emissions from transport, but it is not sufficient on its own. It is imperative that both businesses and citizens have access to reliable, affordable alternative modes of transport. The Government needs to send a clear signal that it values public transport and encourages its use. From a regional perspective, the decision to withdraw funding from the expansion of the Manchester Metrolink is a blow to the development of a sustainable transport system. Good transport links are key to the functioning of a successful economy. Efficient connections can provide access to markets, enhance inward investment, help to stimulate competition and support the mobility of labour markets. As a region, the Northwest suffers from levels of congestion second only to that of London and investment in sustainable transport solutions would not only help bring about a reduction in carbon emissions but would help boost the region's economy.

8. The contribution of air travel to CO₂ emissions cannot continue to be ignored. The recent transport White Paper did nothing to address the impacts that aviation has on emissions. Against the recommendations of the Royal Commission on Environment Pollution,⁵¹ the Government recently gave the go-ahead for a programme of airport development. The Prime Minister's pledge to bring aviation into the European emission trading scheme, is welcome, but will not be sufficient on its own. Relating to the previous point on public transport, the UK is practically unique in that given its size, it relies heavily on domestic flights. Further investment to ensure that the country is covered by a fast, efficient rail service is essential to provide an alternative for air freight and passenger transport if this reliance is to be broken. Under current frameworks, emissions from international flights fall between the cracks with no one taking responsibility for their release. The UK Government should look to take a lead in ensuring that the issue of air transport emissions is addressed at the international level and that all options, including the possibility of a tax on aviation fuel, are considered.

MOVING TOWARDS A LOW CARBON ECONOMY

9. A 60% cut in CO₂ emissions would constitute a move towards a low carbon economy. This will not happen without concerted effort and will require a strong lead from Government. This will need to be embedded in all Government departments, and will have to be a primary consideration in all policy development. Recent changes to planning guidance will help encourage the development of renewable energy. This Government has demonstrated a commitment to the development of renewable energy and this needs to continue and expand. The Prime Minister's call for a green technology revolution needs to be bolstered with investment so that technologies not currently deemed to be economically viable are encouraged.

10. Economic measures to ensure that industry takes action to reduce greenhouse gas emissions are welcomed. However, these need to be carefully monitored if they are to bring real success. For example, the Environmental Audit Committee highlighted a concern about the effectiveness of Climate Change Agreements. We support the Committee's call for independent monitoring (or audit) of these measures, with

⁵¹ Royal Commission on Environmental Pollution, 2002, *The Environmental Effects of Civil Aircraft in Flight*, Special Report.

the full publication of the results. Advice to industry on measures that they can take to reduce energy consumption must continue, and should be expanded where there are gaps. The increased support for the Carbon Trust is welcomed here.

11. Efforts are also needed to reduce household carbon emissions. Support for the promotion and implementation of energy efficiency measures needs to be at the core of this and more resources should be directed to support initiatives that are already under way (regarding public awareness see paragraph 14 below). In addition consideration should be given to measures such as differential pricing for energy, depending on its source.

CHANGING BEHAVIOUR

12. Underpinning any serious moves towards the Government's aspirational target of a 60% reduction in CO₂ emissions is the need for behavioural change of industry and the wider public. The Government needs to be taking the lead and this will not involve easy options.

13. As recognised in "Climate Change: the UK programme", current levels of consumption are unsustainable. One problem is that the true environmental costs of many activities and products are not currently reflected in their price. Environmentally driven taxes provide one approach towards redressing this imbalance but this is not something that is being taken forward with sufficient vigour. The failure of the Government to initiate any meaningful debate on the need for taxation to help reduce emissions needs to be addressed.

14. The Government needs to improve engagement of the wider public on the threat that climate change poses and, importantly, the actions that need to be taken in response. A recent survey in Wales⁵² showed that while people are concerned about climate change, many still do not know what actions they can take to help to reduce emissions. The Chief Scientist has talked of climate change as a bigger threat than terrorism. The Government has recently circulated a document on how to respond to a terrorist attack to every household in the UK. Perhaps the time has come for a similar exercise to help people understand the full range of the potential impacts of climate change, including increased insurance premiums, increased risks of flooding, health risks etc. Such awareness-raising tools need to make clear what actions individuals can take to respond. This could cover actions that people can take in their day-to-day lives, and also present a clear picture of the options that we are faced with as a society. The current unsustainable use of transport could be highlighted with the true cost of motoring outlined. Equally, the choices that we face in terms of energy generation could be discussed. Do we continue to invest in renewable forms of energy generation (which in the short term will mean more wind turbines)? Do we invest in nuclear generation? Do we expect individuals to make large cuts in their energy use?

INTERNATIONAL ACTION

15. The Government needs to work to ensure that the EU as a whole takes action that goes beyond the Kyoto agreements. The goal of the EU to be the most competitive economy globally does not take into account the three pillars of sustainable development and this should be rectified. Such commitment is necessary if the EU is to lead the world in addressing climate change, a lead that is particularly important in light of the absence of concerted US action.

16. The UK Government needs to continue to use whatever influence it has to persuade the US Government of the necessity of taking action over climate change. It is imperative that the US is brought back into the Kyoto fold. At the same time, efforts need to be made to ensure that recent moves by Russia towards ratification of the Kyoto Protocol are followed through.

17. The G8 includes many of the top greenhouse gas emitters, and the Presidency gives the UK the chance to begin to discuss and generate consensus on post-Kyoto measures. The UK Government should try and translate the goals that it has set for itself, a 60% reduction in CO₂ emissions, into an international framework. Serious consideration should be given to approaches that will ensure greater equity between the developed and developing world, for example the "contraction and convergence approach".

18. The Government has identified two priorities for the presidency of the G8—climate change and Africa. While these can be treated as separate issues they are highly intertwined and the links need to be explored and clearly explained. As the Prime Minister recognises, it is in the developing countries where the greatest effects of climate change will be felt. One area where the UK has led the world, through work co-ordinated by UKCIP, is in the study of measures to adapt to climate change. Irrespective of actions taken now to mitigate carbon emissions, some level of climate change is inevitable. The development of a co-ordinated international programme that would enable research on impacts of climate change in developing countries to be undertaken, and for possible adaptation measures to be identified, would be welcomed. This would have to be backed by concrete financial support and/or technology to implement appropriate measures.

⁵² Friends of the Earth Cymru and the Welsh Consumer Council, 2004, *Climate Concern: attitudes to climate change and wind farms in Wales*.

19. In terms of development issues, we were pleased to see the recent statement from the Department for International Development, on the World Bank response to the Extractive Industries Review. The benefit that increased investment in renewable energy could bring to communities in the developing world could be enormous. As a major donor to the World Bank, the UK Government is in a very strong position to influence the approach that the Bank takes. By working through the G8, persuading others of the value of its arguments, the weight of influence would be unstoppable. Investment in community-based renewable energy provision in the developing world would have strong knock on effects for the UK Government as it continues to try and lead the international community on issues such as debt relief and poverty reduction.

1 October 2004

Memorandum submitted by the Environmental Services Association (U24)

The Environmental Services Association (ESA) is the sectoral trade association for the United Kingdom's waste and secondary resource management industry, a sector contributing more than £5 billion per annum to GDP.

ENCOURAGING RENEWABLE ENERGY: REALISING THE POTENTIAL OF WASTE

Indigenous carbon-based energy reserves are predicted to decline sharply in the future. The Institute of Civil Engineers⁵³ has suggested that the UK could be importing more than 80% of its energy by 2020 raising serious concerns about cost and national security.

In addition to using energy more efficiently, the UK will need to generate much more renewable energy if the UK is to meet its targets on greenhouse gas emissions. The Energy White Paper recognises that against a current total installed capacity of 1,200 MW, an additional 1,250 MW of renewable energy capacity will need to be installed in the United Kingdom each year until 2010 to deliver the 10% renewable energy target.

ESA's Members already make a significant contribution: of the 3% of electricity generated from renewable sources in the UK in 2003, 43% was derived from waste:⁵⁴

- 30.8% was generated from landfill gas
- 9.1% was generated from municipal solid waste incineration
- 3.2% from sewage sludge digestion.

A further proportion was derived from the incineration of wood wastes, farm waste digestion, poultry litter combustion and meat and bone combustion.

According to the Digest of United Kingdom's Energy Statistics, the renewable energy produced from landfill gas in 2003–04 was equivalent to over 1 million tonnes of oil.

Nevertheless there is much greater potential to use waste to generate renewable energy. Defra has estimated that meeting the biodegradable municipal waste (BMW) targets of the Landfill Directive will require 13 million tonnes of BMW to be diverted from landfill by 2020. The European Environment Agency has suggested that this figure could be as high as 26 million tonnes. Extracting energy from this waste is part of a balanced waste management strategy: European countries like the Netherlands and Denmark have demonstrated that the extraction of high levels of energy from waste can coexist with high rates of recycling.

BARRIERS TO REALISING THE POTENTIAL OF WASTE

(a) Financial

The Government has weakened rather than strengthened the financial incentives to generate energy from waste, even when recyclable material has been removed. For example, despite reporting energy from waste as renewable energy to the EU, the Government does not include energy generated from the biogenic fraction of mixed waste for support under the Renewables Obligation. This makes it difficult for companies to satisfy the requirements of financial institutions for project finance and few companies, other than large utilities, have the ability to finance new infrastructure on their balance sheets.

(b) Planning

The planning process is a major barrier to increasing the UK's renewable energy output and we welcome the publication of new national planning policy on renewable energy developments. Renewable energy projects need to be supported at national, regional and local levels.

⁵³ The State of the Nation 2003, Institute of Civil Engineers.

⁵⁴ Calculated from Table, 7.4 Digest of UK Energy Statistics Dukes 2004. http://www.dti.gov.uk/energy/inform/energy_stats/renewables/dukes7_4.xls

(c) *Institutional*

The PIU's report "Making More with Less" identified climate change and waste generation as the first and second environmental priorities for Government. Unlike other EU Member States, the UK's waste management and energy policies often appear to be developed in isolation of one another. For example, whilst there are references to waste in the Energy White Paper, there is no specific recommendation on how waste and energy policy can be better integrated.

1 October 2004

Memorandum submitted by the Association of British Insurers (ABI) (U25)

Climate change will have a direct impact on the property insurance market, because it will increase the frequency and severity of extreme events, such as floods, windstorms, and very dry summers (higher subsidence claims)—exactly those occasional, unexpected events for which insurance provides financial protection. Over the past six years, storm and flood losses in the UK have exceeded £6 billion—twice the previous period. Initial calculations suggest that future claims costs could be two or three times higher than today's levels unless we begin to action to prepare for climate change.

Adaptation to climate change needs to take place in parallel with efforts to mitigate the causes (greenhouse gas emissions). We are already locked into a significant degree of climate change, no matter what we do to reduce emissions of greenhouse gases. The long lifetime and high cost of buildings and infrastructure means that we need to start thinking right now about preparing for the impacts of climate change.

Government policies should take explicit account of climate change to reduce future costs and damages to society, including building an allowance for climate change into:

- Building regulations and voluntary building codes.
- Planning and development control.
- Design of coastal flood defences.
- Design of sewer drainage systems.

Ultimately, climate change can only be solved through concerted and coordinated global action to reduce emissions of greenhouse gases, so that carbon dioxide levels in the atmosphere are stabilized in the long term. The UK insurance industry could be influential internationally to promote global action on climate change, and would be pleased to work with the Government using existing international links to encourage global action on climate change.

1. The Association of British Insurers (ABI) is the trade association for insurance companies operating in the UK. It represents over 400 members who, between them, transact around 95% of UK insurance business. It is estimated that the insurance industry accounts for 20% of investment in the stock market.

CLIMATE CHANGE AND INSURANCE

2. The insurance industry has been concerned about the impacts of climate change for a number of years.⁵⁵ Insurers recognise that unless we take action to tackle climate change, we could face rising costs of weather damage in the future.

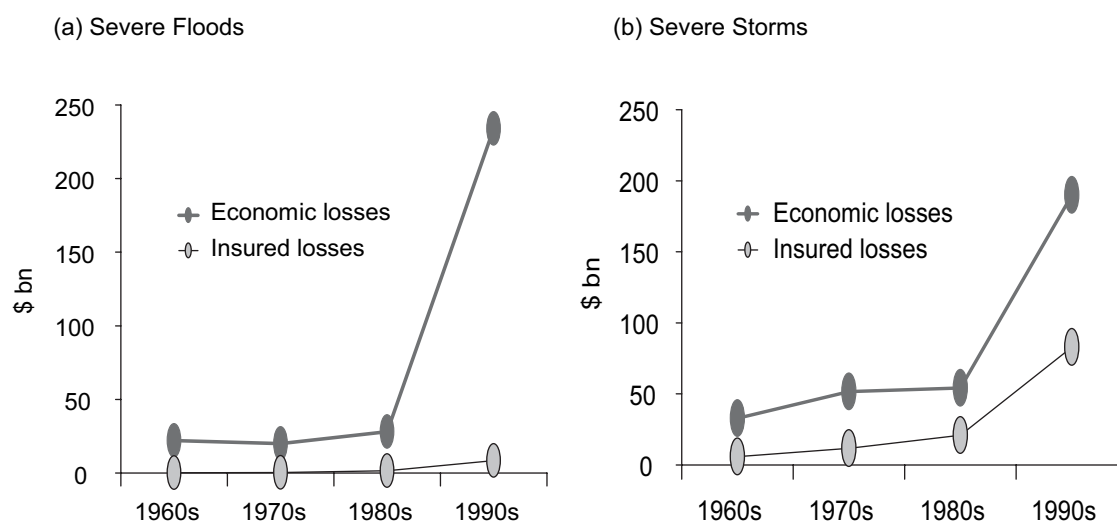
3. Climate change will have a direct impact on the property insurance market, because it will increase the frequency and severity of extreme events, such as floods, windstorms, and very dry summers (higher subsidence claims)⁵⁶—exactly those occasional, unexpected events for which insurance provides financial protection. By increasing the risk and cost of weather damage, climate change could threaten the ability of insurance products to act as an effective mechanism for risk transfer.

4. On a global scale, we have already seen that economic losses due to natural weather catastrophes have increased ten-fold in the last 40 years (Figure 1). Losses caused by natural disasters worldwide in the last 15 years have totalled \$1,000 billion, about three-quarters of which are directly linked to climate and weather events.

⁵⁵ Climate change and the financial services sector: an appreciation of the UNEPFI study, A Dlugolecki and T Loster (2003), Geneva Papers on Risk and Insurance 28, 382–393.

⁵⁶ Press Release WMO No. 695, World Meteorological Organisation, 2003, <http://www.wmo.ch/web/Press/Press695.doc>

Figure 1. Weather-related global economic losses for (a) Flood, and (b) Windstorm in 2004 prices.



Source: Munich Re.

5. According to a recent study by the ABI,⁵⁷ risks from weather damage are already increasing by 2–4% per year on insurers' property accounts due to changing climatic conditions. Over the past six years, storm and flood losses in the UK have exceeded £6 billion—twice the previous period.

6. The underlying risk from extreme weather will continue to increase in the future, and more than likely at an accelerated pace. Initial calculations suggest that future claims costs could be two or three times higher than today's levels unless we begin to action to prepare for climate change (Table 1).

THE NEED FOR ADAPTATION

7. Adaptation to climate change needs to take place in parallel with efforts to mitigate the causes (greenhouse gas emissions). We are already locked into a significant degree of climate change, no matter what we do to reduce emissions of greenhouse gases. National and international efforts to reduce greenhouse gas emissions may lessen the degree of climate change in the coming century, but they will not prevent it completely.

Table 1

**PRELIMINARY ESTIMATES OF FUTURE COSTS OF WEATHER INSURANCE CLAIMS
(£ MILLION IN 2004 PRICES).**

	Today		2050	
	Annual average	Extreme year	Annual average	Extreme year
Subsidence	30	600	600	1,200
Storm	400	2,500	800	7,500
Coastal flood	—	5,000	—	40,000 (London affected)

Source: A Changing Climate for Insurance, ABI, June 2004.

8. According to model runs by the Hadley Centre, even if we are able to prevent any further increase in carbon dioxide concentrations in the atmosphere, something which would itself involve a 70% cut in emissions with immediate effect, the inertia built into the climate system means that we are already committed to an eventual 1.5°C rise in global temperature and a 1-m rise in sea-level.

9. This message was brought home recently by the Government's Foresight report,⁵⁸ which showed that building climate change into flood risk management policies and plans today could reduce the costs of annual flood damage from £21 billion to £2 billion, while a low-emissions scenario only reduced costs of flooding by 25% compared to a high-emissions scenario.

⁵⁷ A changing climate for insurance, Association of British Insurers, June 2004, <http://www.abi.org.uk/climatechange>

⁵⁸ Future Flooding, Office of Science and Technology Foresight Programme, April 2004, <http://www.foresight.gov.uk/fcd.html>

10. The long lifetime and high cost of buildings and infrastructure means that we need to start thinking right now about preparing for the impacts of climate change. Many impacts of climate change can be minimised by comparatively small expenditure during planning, construction, and renovation, so it is important to build adequate protection into plans at an early stage.

11. A recent ABI study⁵⁹ examined the costs of installing flood-resilient measures into a property after a flood or during the normal course of renovation, and compared these with the damages saved after the next flood. Many measures paid for themselves after a single flood, for example:

- Replacing untreated wood floors with tiled concrete.
- Replacing chipboard kitchen and bathroom units with plastic or ceramic.
- Replacing gypsum plaster on walls with lime-based or waterproof render.
- Moving service meters, boiler, and electrics well above likely flood level.
- Installing one-way valves in pipes to prevent sewage back-up into property.

GOVERNMENT POLICY AND ADAPTATION

12. In the Climate Change Programme,⁶⁰ the UK has already set priority policy areas for adaptation, focusing on sectors that are vulnerable to changing weather patterns and where long planning horizons mean that decisions taken today will leave a legacy in the country's future climate, eg spatial planning and building design.

13. Now that we have relatively advanced predictions about the changes in climate this century, it is important that these policy areas take explicit account of climate change.

- Changing building regulations and voluntary building codes (eg new Code for Sustainable Building), so that they use future climate instead of historic weather patterns to set standards. Buildings constructed today will typically still be in place when the most serious impacts of climate change begin to be felt, but they will not have been designed to be resilient to these impacts, unless these effects are incorporated into the building regulations and building design codes.
- Developing a stronger and more transparent planning system, so that development in the floodplain is curtailed. Since land use planning plays such a key role in the sustainable management of flood risk in the long term, particularly with the added pressure of climate change, ABI would like to see current Government guidance (PPG25) strengthened. The sequential planning test set out in PPG25 should include explicit allowance for climate change, and the Environment Agency should be made a statutory consultee on all planning applications in flood areas.
- Flexibility should be built into the design of coastal defences to take account of potential increases in storm surge heights due to climate change (Figure 2). Climate change could add more than 1 metre to present-day storm surge heights along parts of the coast,⁶¹ although there is considerable disparity between different models about where these effects will be manifested. Nevertheless, ABI would like to see greater allowance for the impacts of climate change on storm surges included in coastal defences works—particularly for East Coast locations where the potential consequences of a significant storm surge are very serious.
- New sewers should ideally be designed with sufficient capacity to cope with the increased heavy rainfall we will experience as a result of climate change. In the current pricing review, Ofwat should enable water companies to include an allowance for climate change in the costs of any new capital scheme. Climate change will not just increase the quantity of rainfall but also its intensity, perhaps by up to 20%⁶².

⁵⁹ Flood Resilient Homes, Association of British Insurers, April 2004, http://www.abi.org.uk/Display/File/Child/228/Flood_Resilient_Homes.pdf

⁶⁰ The UK Climate Change Programme, Department of Environment, Transport and the Regions, November 2000, <http://www.defra.gov.uk/environment/climatechange/cm4913>

⁶¹ Climate change scenarios for the United Kingdom, UK Climate Impacts Programme (2002) [<http://www.ukcip.org.uk/scenarios>]

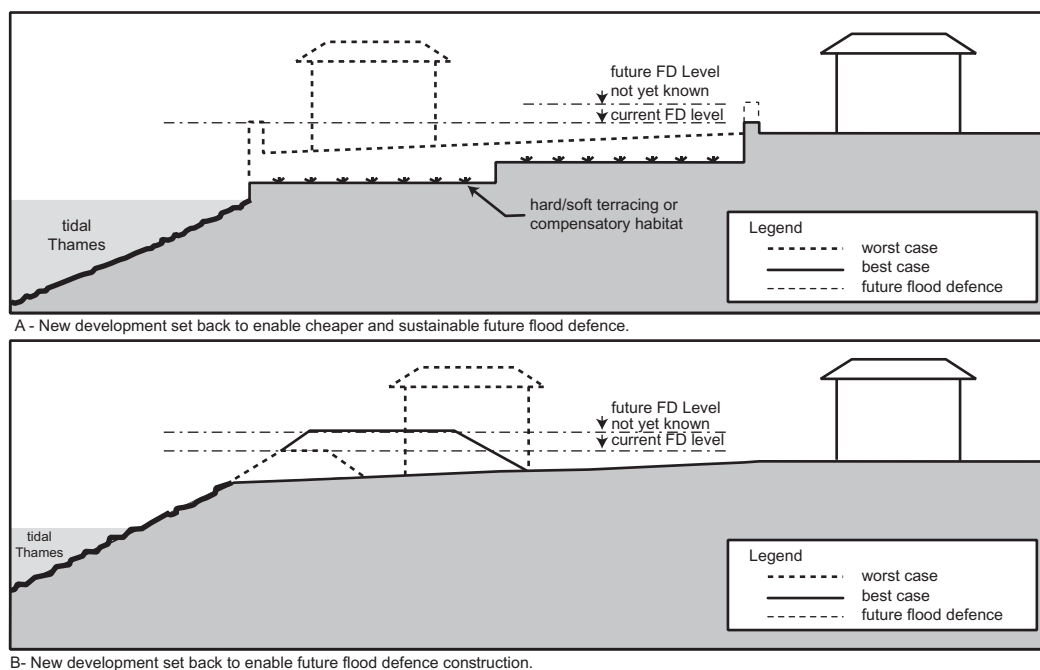
⁶² Climate change scenarios for the United Kingdom, UK Climate Impacts Programme (2002) [<http://www.ukcip.org.uk/scenarios>]

INTERNATIONAL CLIMATE CHANGE POLICY

Figure 2: The need to set new development back from existing defences to include some flexibility to incorporate further allowance for climate change in the future.

Uninterrupted lines represent good practice, and dotted lines represent bad practice.

Source: Environment Agency (2003), *Thames Gateway and Flood Risk Management - A Preliminary assessment*.



14. Climate change is a key policy issue for the current Government. Tony Blair has pledged his personal commitment to tackling climate change during his time as Prime Minister, and has set climate change as one of two top priorities for the Government as Chair of the G8 and as President of the European Council in 2005.

15. Ultimately, climate change can only be solved through concerted and coordinated global action to reduce emissions of greenhouse gases, so that carbon dioxide levels in the atmosphere are stabilized in the long term.

16. Insurance is now a global industry, and a powerful financial force in many developed and developing countries. The UK insurance industry could be influential internationally to promote global action on climate change, and would be pleased to work with the Government using existing international links to encourage global action on climate change.

1 October 2004

Memorandum submitted by the Institution of Civil Engineers (ICE) (U26)

INSTITUTION OF CIVIL ENGINEERS

The Institution of Civil Engineers (ICE) is a UK-based international organisation with over 75,000 members ranging from professional civil engineers to students. It is an educational and qualifying body and has charitable status under UK law. Founded in 1818, ICE has become recognised worldwide for its excellence as a centre of learning, as a qualifying body and as a public voice for the profession.

SUMMARY

The Institution commends the actions taken to date to reduce the emissions of greenhouse gases, but expresses concern that much more needs to be done to maintain these reductions in the longer term. The problem encompasses domestic, commercial and industrial energy use, as well as changes in energy production. Renewable generation is only likely to account for a small proportion of the national energy requirement unless large-scale projects are considered. Other forms of generation, with low emissions will be required to achieve substantial reductions in greenhouse gases.

1. *Introduction*

1.1 Climate change is a key part of the debate on sustainability and it is now commonplace to ascribe exceptional weather conditions as being caused by global warming. The evidence suggests that these issues affect all parts of our lives. Climate change gases arise directly from the various energy industries as well as transport, other industries, commercial operations and domestic life. Nature itself can also produce climate change gases in such examples as volcanic eruptions and coal bed methane. So the problem is widespread and must be considered in terms of the sum of many parts.

1.2 We can either accept that the climate is changing and attempt to deal with the changes as they arise, or we can try to prevent or minimise the changes in climate.

1.3 The UK has accepted the policy of prevention, or reduction in climate change, but as the UK only contributes about 2% of climate change gases, we must use international persuasion to influence the producers of the other 98%.

2. *Energy resources*

2.1 The world has ample resources of coal and uranium, and sufficient significant remaining resources of natural gas and oil, and of course renewable resources such as wind, solar and tidal. We might conclude that there is no shortage of energy sources, either now or in the years to come. But the issue now is that of the financial and environmental cost of energy conversion. Converting fossil fuel to heat or electrical power is of relatively low financial cost, but the environmental burden created by emissions is substantial. To compound this, energy growth per head is increasing, population is increasing and the peak demand for power is increasing. The challenge now is to reduce the environmental burden of energy conversion at a cost that is acceptable to society. A key part of this will be to reduce individual energy consumption.

2.2 The substantial price rises during the summer of 2004 (leading to some of the highest prices ever) suggest that the world is facing short-term energy shortages. Some reports suggest that oil resources are only sufficient for another 40 years and gas for 60 years. The current shortages are exasperated by the demand from China and the Far East. It is usually difficult to notice the peak of a curve until the cliff edge is reached, but our planning should recognise that a peak in the oil and gas industries must be imminent. The USA is now acknowledging that it is now an energy importer and this will also drive up the price of raw energy. The costs of production of the remaining stocks of oil and gas will continue to rise.

2.3 Although coal resources are extensive, (perhaps up to 200 years)—“environmentally friendly coal” with low NOX and SOX content is limited and so the price of coal has also reached unprecedented levels. The LCPD (Large combustion plant directive) in the UK restricts the choice of coal sources—and countries who choose to implement similar environmental constraints to the UK will be forced to follow suit. This will raise demand for clean coal and increase the costs. Although this will benefit the environment in the long-term, it will impact UK industry, commerce and society in the short and medium term.

2.4 Recognising the priority for minimising climate change, we should seek to adopt other sources of energy during the planning period up to 2050.

3. *CO₂ Reduction*

3.1 The UK Government’s policy to meet its targets for CO₂ reduction depends for a large part on increasing the proportion of renewable generation for the production of electricity to 10% by 2010 and onwards. The Institution is concerned that these targets are unrealistic and thereby setting a false hope that the nation will decrease its emissions.

3.2 Overall energy consumption is increasing. Almost as fast as energy efficiency is introduced, more and more demands are placed on the electricity network, both domestically and in the work place. The National Grid has had to revise upwards its forecast for generation capacity.⁶³ It is very unlikely that the UK will be able to satisfy its increased demands for electricity solely from the expected growth in windpower. Other forms of renewable generation, such as solar pv, and geothermal do not offer a credible solution for providing more than a few per cent of the nation’s electricity. We welcome initiatives to increase the adoption of solar pv both in the UK and worldwide, but nevertheless the Institution continues to press for a debate on the longer-term security of supply issue. This debate must consider renewal of the nuclear power industry and serious consideration of tidal power barrages.

3.3 There is an additional requirement to differentiate between energy production and power requirement. Even if the UK could produce more than 20% of its electrical power from renewable resources, there would need to be major changes in the electrical infrastructure for electrical energy storage to make the power available when required. To put this simply, more generation is required than would be calculated directly from the theoretical annual production from renewable resources.

⁶³ National Grid Transco, Seven Year Statement 2004.

3.4 The UK's reliance on imported natural gas is an insufficient response. It was a fortuitous co-incidence that a large proportion of power generation switched from coal to natural gas during the early 1990's. This brought together several threads: improved combined cycle gas turbine efficiency (CCGT), the lifting of the embargo on generation from natural gas and the privatisation of the power industry. The reductions in emissions have now been obtained, and there will only be marginal gains from natural gas. The UK is close to its 12.5% Kyoto target. CO₂ decreased by 7.5% between 1990 and 2003 despite an 8% rise in consumption. We do note that there was a 1.5% increase in CO₂ emissions in 2003. The switch to natural gas is also reflected in the average figures for the EU.

3.5 The UK Government's aim of reducing CO₂ by 20% by 2010 hinges crucially in reducing coal burnt in power generation. Reductions to date have all come from a switch from coal to gas burn for electricity generation—the other sectors totalling 82% of energy use, in commercial and domestic heating and transport have achieved no real savings. The split of the latter two is roughly 40% each of the total. CO₂ from domestic and commercial heating and vehicles are inexorably rising with no likely curtailment in the short term. We agree with a journalist from the Guardian who states “we are on-track to miss by a mile our commitment to reduce emissions by 20% by 2010, although we would easily meet the far lower target required under the still un-ratified Kyoto agreement.” Cambridge Econometrics say: “Emissions from power generation are likely to drop by 5.5%, largely because of the investment in wind power, but those from domestic and transport sources are rising steeply undermining the push to renewables. Emissions from road transport will, by 2010, rise by 14% from 1990 levels.”

3.6 The environmental audit committee of the Commons reported in August 2004 that the Government's energy strategy was now “seriously off course” and “that more imaginative and radical” policies were needed for transport. Transport's share of UK emissions, it says will rise from 18.7% to 26.3% in 2010. Air transport has almost doubled between 1990 and 2002. The government since taking office has presided over a 17% increase in road traffic. There is very little enthusiasm within the UK for the preparation of liquid fuels such as bio-diesel made from renewable resources, which might show some small savings.

3.7 Europe is on course to fail to meet even its low Kyoto target of 5.2% cuts in emissions on 1990 figures by 2012. According to the European Environment Agency, overall emissions are only 2.1% lower than in 1990. Only France, Germany, Sweden and the UK are likely to meet their targets whilst Spain, Portugal, Ireland, Austria, Italy, Denmark and Greece are all expected to overshoot—some substantially. Most OECD countries have the same problems as Britain: carbon dioxide emissions from vehicles in Europe will rise by 30% by 2010. Energy conservation particularly in road and rail transport will therefore be key to reducing CO₂ emissions.

3.8 Although the wind development programme is key to the success of a worthwhile renewable programme in the UK and the programme has been enhanced by the introduction of ROCs, other large scale renewable generation needs to be considered in order to extend our energy resources. The next wave of renewable energy sources is in the marine sector, in particular tidal flow and wave energy. The UK should be persuaded to invest heavily in this area and bring forward commercially viable technologies that could fall within the ROC catchment for energy companies and the utilities to implement. This will not be possible without significant investment and R&D into this fledgling industry—with significant long-term downstream benefits to UK's civil/marine engineering industry as well as to the nation's energy resources.

3.9 Renewables may not address all of our concerns about the security of our energy supplies—but they are wholly indigenous once constructed, which is increasingly not the case with conventional generation. The Institution continues to argue for the UK to adopt as broad a fuel mix as possible as the cornerstone of its energy strategy.

3.10 The hydrogen economy is still many years away. Hydrogen should be seen as an energy vector, and not as a fuel source. As an energy vector it currently has a low through efficiency. Unless the hydrogen is produced from totally non-emitting sources, such as hydrolysis using wind power or hydro power there is little to be gained. We are also concerned that the effects of hydrogen in the upper atmosphere are not understood. Estimates of hydrogen leakage vary from 0.1% to as much as 10% when transported. We also note that despite widespread research on the development of the hydrogen infrastructure, there has been little attention paid to the use of the oxygen that is also produced during the hydrolysis process. It is claimed that hydrogen would offer a credible form of energy storage, but there is not yet sufficient evidence to conclude that problems would be solved by use of a hydrogen infrastructure. The PIU reported⁶⁴ that to produce sufficient hydrogen for transport in the UK would require more energy than our present electrical consumption. Even a small proportion of the worldwide speculative investment in fuel cells and hydrogen infrastructure would make a significant difference to stimulating development of other more near term renewable resources.

3.11 Although hydrogen is seen as replacement fuel for road transport, care needs to be taken that the problem is not simply shifted from the city centre to an electrolysis plant. For unless the hydrogen is produced from surplus renewable energy, its value in displacing CO₂ is doubtful. There is a small societal credit to be gained from encouraging individuals to behave more responsibly, but large savings in CO₂ production are not likely in the short term.

⁶⁴ Cabinet Office, Performance and Innovation Unit, Energy Review, February 2002.

4. *International Participation*

4.1 The UK is not the only participant in the programme to minimise climate change, and international agreements are therefore a necessary activity. However the record of participation in international agreements is not good. Several countries are seeking to increase their emissions under the Kyoto agreements, and many countries are taking little action to participate. This means that if the UK takes its responsibilities seriously, it is penalising itself through additional economic and technical burdens against its competitors who are avoiding such action. This should not mean that the UK withdraws from these agreements, but we should redouble our efforts to not only meet the targets, but also persuade other countries so to do, and furthermore, encourage British industry to benefit in the process.

4.2 It is very noticeable that EU legislation is often conveniently ignored. A survey of environmental compliance indicated that no single EU state (as of January 2004) meets the 1.5% implementation deficit target for environmental internal market directives.⁶⁵ Only two out of the 15 have improved their performance since late 2002. In the two most dramatic shifts, Sweden's deficit has expanded from nothing to nearly 6%, while the Netherlands' has spiralled from 1.2% to 10.6%.

INTERNAL MARKET DIRECTIVES NOT IMPLEMENTED

	—Environmental laws		—All laws
	October 2002	January 2004	January 2004
Greece	5.9%	11.8%	3.1%
Belgium	9.4%	11.8%	3.5%
Netherlands	1.2%	10.6%	2.6%
Germany	5.9%	10.6%	3.5%
Italy	7.1%	9.4%	3.0%
France	7.1%	9.4%	3.5%
Spain	9.4%	8.2%	0.9%
Sweden	0.0%	5.9%	1.6%
Portugal	1.2%	5.9%	2.2%
Luxembourg	7.1%	5.9%	3.4%
Finland	1.2%	4.7%	1.4%
UK	4.7%	4.7%	1.4%
Ireland	4.7%	4.7%	1.4%
Austria	3.5%	4.7%	2.5%
Denmark	1.2%	2.4%	0.3%
ALL EU	4.6%	7.5%	2.3%

4.3 Nine member states have still not implemented the EU's 2001 directive on deliberate release of genetically modified organisms. Eight have not implemented the 2002 ozone pollution directive. Meanwhile, six each have not implemented the 2000 end-of-life vehicles directive, the 2000 waste incineration directive and the 2001 national emission ceilings directive.

4.4 Radical agendas require radical measures. Wide ranging legislation across a wide variety of topics appears to lead to widespread avoidance of compliance. Using EU directives as a means of stabilising climate change simply adds to the burden of red tape affecting industry and commerce. Changing the industrial lifestyle will require more than restrictive directives. Leaving choice to the market is also likely to be ineffective.

5. *Renewable generation, efficiency and reduction in GHG emissions*

5.1 The UK's renewable generation programme grew rapidly as a result of the Non Fossil Fuel Obligation NFFO. A small subsidy was paid to renewable generators in response to requests for proposals for renewable generation. This had a positive effect on encouraging technology introduction and ongoing technology improvements. More recently, trading in ROCs (Renewable Obligation Certificates) has encouraged a market that looks beyond the core technology, but into the value of CO₂ free generation. Logically this should be extended beyond the classic forms of renewable generation so that it covers all non CO₂ energy producers.

5.2 Substantial reductions in CO₂ and other GHG can only be achieved by substantial switches to other fuel sources. Nuclear power is one such obvious choice. Tidal barrages should also be considered. The UK government's support for large-scale generation switches to alternative technologies should be reflected by

⁶⁵ European Commission <http://europa.eu.int/comm/index—en.htm>, tel: +32 2 299 1111 and 12 January press release <http://europa.eu.int/rapid/start/cgi/guesten.ksh?p—action.gettxt=gt&doc=IP/04/33...0...RAPID&lg=EN&display=>.

an increase in industrial activity in the nuclear and tidal engineering industries, both to service the home and overseas markets. There is a requirement not only to plan future capacity to meet increases in generation, but also improved capacity to match plant retirements.

5.3 We are also concerned that energy efficiency and energy use reduction needs to be developed and understood. Although for example, motor vehicles become more fuel efficient, there is no reduction in the number of motor journeys made in the UK, thereby leading to a net increase in fuel use and GHG emissions. Energy consumption per capita is increasing at an annual rate of about 0.7% across the EU, and at a much higher rate in the recent accession countries to the EU. We expect this trend to be reflected amongst other regions in the world—in Asia, South America and Africa—as development relies on energy.

Domestic and Commercial Building sectors

5.4 The use of energy within both domestic and commercial buildings is largely un-controlled. With the growing use of home computer based systems and additional domestic electrical appliances, electricity consumption will continue to rise without any foreseeable controls.⁶⁶

5.5 New building regulations such as Part L for the commercial and domestic sector, do not ensure a minimum energy profile for any new building. The developer's lead is still to build to the lowest cost and not the lowest energy. Current building projects and approved developments as part of the massive UK expansion in Town Centre developments (supported in most part by English Partnership funding) do not come anywhere near the low energy options that are well-tried and available now. This includes, better low energy lighting systems, better control and the use of natural ventilation and free cooling options. The planning process does not allow for the selection of low energy options, it just relies on Part L, which is definitely not the only solution. Energy options and energy reductions in new buildings will need to be re-addressed during the buildings' lifetimes and constraints imposed now are reducing the opportunities for improvements later. For example the better integration of local CHP to serve the development of both gas fired and renewable energy are not being fully explored or implemented. We see this compounding the problems for improving our future energy use.

Generating capacity

5.6 It is particularly noticeable that in the recent EU accession countries, generating capacity has increased dramatically. This reflects the lack of investment over many past years as well as the need to increase the overall generating capacity to meet expected peak demands. However new generation has improved efficiencies, and this, together with a very modest switch to some renewable generation has led to a fall in CO₂ emissions.

	EU 1985	EU 1997	EU 2001	EU Increase 1985–2001	EU ⁶⁷ candidates 1985	EU candidates 1997	EU candidates 2001	Increase 1985–2001	USA 1985	USA 1997	USA 2002
Generating capacity per inhabitant kW/person	1.34	1.5	1.56	16%	0.55	0.77	0.87 ⁶⁸	32%	2.94	2.95	3.5
Electricity generated per inhabitant kWh/person	5355	6487	7029	31%	2883	3012	3181	10.3%	10659	13754	13778
CO ₂ emissions per inhabitant tonnes/person	8.3	8.1	8.3	0	7.5	5.5	7.5	0	19.6	20.7	21.3

Source: EU, Eurostat, EIA and private estimates

5.7 Although transport is a major energy consumer, tariffs on transport are seen as a tax raising activity rather than an incentive to restrict demand. Industry requires an efficient transport network for movement of goods as well as personnel transport. Road improvements to prevent congestion usually lead to transfer of the problem elsewhere, and transfer of goods from road to rail or water is restricted because of limited trackside access and a high land cost which discourages open space. New housing developments are built frequently without garage or car parking space, making it impossible to retrofit an infrastructure for charging electric vehicles.⁶⁹

5.8 Paradoxically, for many people energy is too cheap. Fuel consumption is of minor concern for the purchasers of many new cars. Recent fuel surcharges on air tickets has not dampened demand. Even the use of outdoor patio heaters demonstrates a lack of understanding of the social consequences of a spendthrift

⁶⁶ Many domestic devices are designed to be "on" or "standby" continuously, which adds to the demand for both energy and capacity. Standby domestic power consumption is about 10% of the total. Source IEA 2001.

⁶⁷ Accession countries and candidate countries.

⁶⁸ Estimate.

⁶⁹ Note that many family houses and flats are built without sufficient space to store 2 or more bicycles, placing more limitations on the adoption of alternative transport methods. Off road charging of electric vehicles is also very difficult.

attitude to energy consumption and the environment. At the other extreme, we recognise the special difficulties of those on restricted incomes for whom every heating bill is a major financial worry. Controlling energy use at the point of demand is likely to be counterproductive and may reduce GHG by only small quantities in comparison to the larger savings that would be achieved by addressing the power generation and transport portfolios.

6. *The effects of climate change*

6.1 The Institution of Civil Engineers has recently presented both written and oral evidence to the EFRA Committee on Climate Change, Water Security and Flooding. In our evidence we drew attention to many issues which affect the water environment of this country as a direct result of climate change. The ICE has not debated the reasons for the current climate change scenarios, for example how much of the predicted climate change might be attributed to global weather patterns and how much to greenhouse gas emissions. However, it is essential that all governments take note of the impact of climate change upon the water environment and take action accordingly. Whilst the effects upon this country are profound, the possible effects of changes in weather patterns to higher temperatures, longer droughts and more extreme flooding events will have a devastating impact in parts of the world where already death from water related problems exceed those from any other cause. With over 1 billion people not having access to clean drinking water and over 2 billion people not having proper sanitation, climate change will only make this situation worse.

6.2 The second point raised in the Terms of Reference is, we believe, of particular note. In their roles as Chair of G8 and President of the EC the government should use the evidence presented by ICE to the earlier Committee to emphasise the impacts of climate change upon these essential aspects of everyday life in developed countries and thereby draw attention of other world leaders to the probable impacts upon developing world. The UK is fortunate in having a number of centres of excellence and world class research into climate change. It is essential that the UK Government builds upon this platform.

6.3 The ICE recognise that previously submitted evidence is not usually considered at a subsequent committee, however the closeness of the subjects and the inter-relationship between water and climate change leads us to believe that the committee should take our previous evidence as being suitable for the terms of reference under Climate Change—Looking Forward.

7. *Recommendations*

7.1 We therefore recommend a review of national policy in the following areas:

- 1. Reduction of UK GHG emissions: Incentives for power generation from renewable sources and non GHG emitting sources such as nuclear and tidal barrage.
- 2. Incentives for the reduction of energy use in industry, commerce and domestically through demand reductions, energy conservation and improved energy efficiency.
- 3. Infrastructure improvements to reduce GHG in transport by a more rational use of public or shared transport, improved traffic handling and changes in primary fuel.
- 4. Adoption of a national strategy for energy, which includes multiple energy sources to ensure security of energy supply as its priority.

7.2 We also suggest that the UK should use its chairmanship of the G8 and European Presidency to ensure that debate on climate change is turned into actions. Incentives and motivation will be needed to influence other countries and the debate must not degenerate into international disputes about economic growth. There is no right to deny growth to other nations, but as inheritors of a common planet we must share together in the creation of an infrastructure of common ownership.

7.3 We urge the Government, and other non Governmental agencies to emphasise the impacts of climate change upon our everyday life and thereby draw the attention of other world leaders to the probable impacts upon the developing world.

7.4 We recommend that the UK continues to build its centres of excellence and its world class research into climate change.

7.5 We also urge the appointment of an independent Chief Engineering Adviser to ensure a co-ordinated, long-term, sustainable approach to infrastructure planning, which encompasses power supplies, energy use and its interactions with the environment, rather than decision-making being dominated by shorter-term political pressures. The Institution believes that the position should be similar in remit to the Government's Chief Medical Officer or Chief Scientific Adviser.

Memorandum submitted by the Soil Association (U27)

EXECUTIVE SUMMARY

- The Government’s figures for the agricultural emissions of greenhouse gases (GHG) should include indirect sources (4–6).
- In particular, the impact of fertiliser use must be recognised as this accounts for 54% of agriculture’s use of energy (7–10, 38).
- Past and on-going declines in soil carbon levels due to changes in agricultural practices must be quantified (12–18, 38).
- The current focus on the role of soil cultivation is misleading. The abandonment of organic matter as the base of agriculture, the increase in ploughing depth, and the increase in livestock densities need to be considered (14–18).
- The role of agricultural soils in atmospheric methane levels needs recognising (19–20).
- The impacts of food and feed miles need quantifying and including in the impacts of agriculture and national inventories (21–22, 38).
- Organic farming has many major proven benefits for climate change policy including a 50% reduction in energy efficiency per unit of food and substantial soil carbon sequestration potential (23–30, 37).
- The role of energy crops needs reassessing as the environmental impacts may not be positive (31–33).
- Localised food economies need to be promoted, and the current policy barriers to their development need removing (34, 38–39).

A. Introduction

1. The Soil Association is the main certifier and promoter of organic food and farming in the UK. The founding objectives of organic farming are environmental sustainability and the production healthy food. Organic farming accounts for 4% of UK farmland and the UK organic food market is now worth over £1 billion, of which the Soil Association certifies about 70%. Localised food economies are also a goal of the organic movement, and the Soil Association has a department dedicated to the development of local food economies around the UK.

2. Scientific evidence shows that organic farming is by far the most sustainable farming system that is also applicable through the country. Considerable research in recent years has shown a range of environmental benefits—Defra have published a major paper setting these out. Because of its benefits the Government has committed to expanding organic farming. An increase in the area of organic farming is one of the Government’s “quality of life” indicators. A Defra action plan for the development of organic farming was adopted in summer 2002. This includes a Government’s target for 70% of the organic market to be supplied by UK farmers by 2010 (up from 35%), and for public food procurement to involve the purchasing of organic food.

3. In this evidence, we concentrate on the agricultural impact on climate change, which is an area that we are currently researching. We would appreciate the opportunity to give oral evidence to the committee to discuss the significance of the issues we raise, by which time we also expect to have progressed our research.

B. Estimates of the Agricultural Contribution to Climate Change

4. We believe that the Government’s figures for the contribution of agriculture to climate change should include the emissions from all major sources, including indirect as well as direct sources. This is not currently the case, which is very misleading to the public and industry and unhelpful for policy-making.

5. The UK Climate Change Programme says the total GHG emissions from agriculture, land use and forestry in 1990 were c. 12% (24.8 million tonnes of carbon) of the UK’s total GHG emissions (212 MtC). As land use change contributed 8.7MtC, and as forestry was a net absorber of CO₂, we assume that agriculture accounted for the rest, around 7.5% of total UK GHG emissions. However, apparently all the indirect use of energy in agriculture has not been included in this.

6. There is a particular problem with the CO₂ estimates. The UK Climate Change Programme says that the UK’s total carbon dioxide emissions in 1990 were 168MtC. The Defra report, “Climate Change and Agriculture in the UK” states: “Fossil fuel and lime use on farms accounts for less than 1% of UK emission of CO₂ in 1990, though the sector also contributes to CO₂ emissions through soil cultivation and indirectly through demand for manufactured fertiliser and transport of agricultural goods”. These omissions are very significant contributions and directly affected by agricultural policies and industry developments. We urge the EFRA committee to advise Defra to ensure that their official emission figures for agriculture include all of the following important indirect sources.

GHG emissions from the manufacture of fertilisers

7. Our greatest concern with the UK's climate change policy in the field of agriculture is that the single most important factor is being ignored: the impacts of fertiliser use.

8. As it excludes indirect sources, the Government's "less than 1%" figure for agriculture's contribution to the UK's total CO₂ emissions is a very significant underestimate. Using Defra's data, we believe that actually the contribution of agriculture to total UK CO₂ emissions could be roughly of the order of 4%. We used figures for energy use as an indicator of the figures for CO₂, as we were not able to find the figures for CO₂ emissions for indirect sources.

9. ADAS figures on the Defra website say the total energy consumption of the UK agricultural sector was 188.5 petajoules in 2002. Of this, only 44.9 petajoules (24%, just under a quarter) were attributed to "direct energy". The rest, 76%, came from "indirect inputs".⁷⁰ From this, we conclude that the total figures for CO₂ emissions would also be very roughly of the order of four times as much as stated were indirect sources included, ie c. 4%, instead of "less than 1%".

10. The indirect factors that are being excluded in UK climate change policy documents include the energy use from fertiliser which according to ADAS accounts for 101.2 petajoules, 54% of the total agricultural energy use; and also the energy from pesticide manufacture which is given as 9.4 petajoules, or 5% of the total. The contribution of fertilisers are so high as they are produced from fossil fuels. Together the use of agro-chemicals accounts for about 59% of total energy used in agriculture, but this is not being represented in the UK Government figures in its current Climate Change Programme.

Soil carbon emissions from changes in agricultural methods

11. It is well recognised that soils are major stores of carbon, containing approximately twice as much carbon as the atmosphere. So, even minor changes in soil carbon levels have a disproportionate effect on atmospheric levels of carbon and on progress towards emission reduction targets. According to a 1997 DETR document, soils in England, Wales and Scotland contain some 21.78 billion tonnes of carbon, of which 16.4 btC is in Scottish peat uplands⁷¹, leaving 5.4btC in the soil of the remaining UK land where agriculture is the primary land use. Most of this is contained in grasslands. Arable soils in the UK contain 592 MtC (Smith et al).

12. There is currently considerable interest among policy makers in soils as potential carbon sinks. However, we are concerned that the past and on-going downward trend in agricultural soil carbon levels and the factors involved are not being adequately recognised. We believe that falling level of soil carbon due to changes in agricultural practices may be an important driver of climate change that is being neglected.

13. Worryingly, the carbon content of UK soils is falling. Defra's latest statistics from the National Soil Inventory show the organic content of soils in England and Wales has fallen from, in 1979-81, 22% of soil having an organic matter level of over 7%, to only 13% of soil having over 7% by 1995. The proportion with an organic matter level of less than 3.6% increased from 31% to 41%. In "Towards Sustainable Agriculture", MAFF stated that the organic content of our soil has decreased by 0.49% in the last fifteen years. Interestingly, between 1945 and 1986, the amount of carbon being released from the land tripled, with the most dramatic increase being between the mid '70s and mid '80s (Houghton *et al*). This coincides with the period of intensification of crop production.

14. Losses of soil carbon are mainly attributed to the ploughing up of grassland and other land use changes, and soil cultivation. However, emissions from changes in agricultural methods do not seem to have been recognised by the UK Government. The European Climate Change Program set up a working group on carbon stores related to agricultural soils. Their conclusions last year were that "there is evidence that under current agricultural practices, many European soils are losing organic carbon and thus constitute sources of atmospheric CO₂ rather than sinks".⁷² This urgently needs to be recognised and addressed by the UK Government.

15. One factor must be the abandonment of the use of organic matter (such as farmyard manure) as the basis of agriculture in favour of inorganic fertilisers as the main fertility source. This fundamental change in agriculture occurred mainly last century. A second major factor would be the increase in ploughing depth from the traditional 6 inches to 12 inches. This releases more soil carbon and requires more energy to be used in terms of machinery. Some experts have stated that this increase in ploughing depth has been mainly driven by the availability of more powerful agricultural machinery rather than by any agronomic need. A

⁷⁰ ADAS report for Defra using: Digest of UK Energy Statistics, Agriculture in the UK, Fertiliser Manufacture Association, Agricultural Engineers Association, Crop Protection Association.

⁷¹ Indicators of Sustainable Development in the UK, DETR, 1997.

⁷² Final Report on Working Group on Sinks Related to Agricultural Soils, Second ECCP Progress Report—Can we meet our Kyoto targets? European Climate Change Programme 2003.

third factor would be the considerable increase in the density of grazing livestock in grassland areas. Studies in North Wales have shown that soil carbon density is significantly affected by the intensity of sheep grazing.⁷³

16. We believe that the Government and industry's current focus on the role of soil cultivation (ploughing etc) is misleading. Agriculture has been using the plough for thousands of years, but atmospheric carbon levels have increased significantly only in recent years. There is little or no problem with ploughing practices in traditional and organic systems, where organic matter is regularly added and soil carbon levels are generally far higher than in intensively farmed systems. In our view, the problem is not necessarily ploughing *per se*, but (i) the general abandonment of the application of organic matter which previously would have replaced carbon lost from ploughing, and (ii) the unnecessary modern use of deep ploughs.

17. If it is true that these changes in agricultural practice have caused major historic and continuing releases of soil carbon, then this should change the implications for climate change policy in the field of agriculture considerably: the soil carbon bank should not be seen just as an interesting way in which climate change could be mitigated, but as an on-going climate change driver which must be addressed.

18. Firstly, there is an urgent need to quantify the past and current contribution of falling agricultural soil carbon levels to the UK's total CO₂ emissions. Secondly, this needs to be included in the UK's data for the agricultural contribution of CO₂ emissions, which currently apparently exclude all soil carbon emissions. Thirdly, there needs to be an attempt to properly quantify and recognise all the potential key factors involved here (not just focus on cultivation): the introduction of inorganic fertiliser, ploughing depth, and livestock stocking densities.

Soil breakdown of atmospheric methane

19. There seems to be no recognition of the agricultural impacts on soil on atmospheric methane levels. Methane has a global warming effect 21 times stronger than carbon dioxide (IPCC) and its atmospheric concentration has more than doubled over the past 100 years. It is produced by anaerobic decomposition of organic material and by the guts of ruminants, but is also being constantly destroyed by oxidation. Defra's figures say that in 1990 agriculture accounted for 28% of the UK's methane emissions, and due to changes in other sectors this proportion was projected to increase to 48% by 2010. However, the role of agriculture in the breakdown of methane is not being recognised.

20. Whilst most oxidation takes place in the atmosphere (85%), research by the IACR-Rothamsted has discovered that a significant amount is carried out by soil microbes, which use it as an energy source.⁷⁴ The researchers found that agriculture decreases natural soil oxidation rates by up to 80%. In particular, they found that the use of ammonium based N fertilisers causes a major reduction in soil oxidation rates. (In contrast, the repeated application of cattle manure had little effect). The decrease in oxidation rate was proportional to the amount of fertiliser applied. This contribution needs quantification and inclusion in the UK's figures for the impacts of agriculture on climate change.

Food and feed miles

21. One area which has received next to no mention in any official agricultural data source or climate change policy document has been the carbon dioxide emissions as a result of the transport of food, animal feed and agro-chemicals around the country. It is clear that the centralised food distribution which characterises the modern food industry contributes significant amounts to carbon dioxide emissions through the transport of food around the country, as well as the huge amounts of food exported and imported. It is often cited that approximately 25% of all road transport is accounted for by food transport. However, including other agricultural products, such as feed, swells this proportion even more. Government figures for the self-sufficiency of UK in food are very deceptive as modern intensive livestock farming is heavily dependent on the import of the large quantities of animal feed which is being produced on farms in other countries (such as soya from South America).

22. In 2003, 34.4 billion tonnes km of foodstuffs and animal feed were transported around the country by road (the unit is a function of goods moved—the weight of the goods multiplied by the distance travelled). The figure for agricultural products and live animals was 13.2 billion tonnes km, and for the transport of fertilisers, 1.2 billion tonnes km. In total, these three categories accounted for 49% of all domestic freight moved in 2003.⁷⁵ There appears to be little attempt at addressing these figures in UK climate change or agricultural policy.

⁷³ "Wales' carbon—managing climate change", John Farrar, Chris Freeman and Davey Jones, University of Wales, Bangor, July 2003.

⁷⁴ "Farming, Fertiliser and the Greenhouse Effect", T Willison, K Goulding, D Powlson and C Webster. Outlook on Agriculture, Vol 24, No 4.241–247 (1995).

⁷⁵ Transport Statistics for Great Britain 2004. Department of Transport.

C. *Policies to address the climate change impacts of agriculture*

More sustainable systems of agriculture—organic farming

23. Current UK climate change policies are very limited in the field of agriculture. We would like EFRA to promote a wider and much more ambitious approach in the next Climate Change Programme. In particular, we would like EFRA to acknowledge the benefits of organic farming and consider the potential role that this sector can play in the future. Organic farming offers the following automatic benefits for climate change policy:

24. (i) Far greater energy efficiency in food production—A Defra desk-study found that organic farming is much more energy efficient than non-organic farming both on an area and yield basis.⁷⁶

For example, organic arable production is about 35% more energy efficient and organic dairy production about 74% more efficient per unit of output than non-organic production. In general, it is considered that organic farming use about 50% less energy than conventional agriculture for the production of the same quantity of food. This is because organic farming harnesses natural biological processes, which are driven by the sun's energy, rather than using artificial agro-chemicals which are produced from and distributed with the use of fossil fuels.

25. (ii) Substantial potential for soil C sequestration—organic farming is based on the maintenance of the soil carbon bank. This is its fertility source as inorganic fertilisers are not used. The long-term comparative study of organic and non-organic farming by the Rodale Institute in the US, found that organic farming increased soil carbon levels by about 15–28% (from about 1.8% to about 2.3%), while conventional farming showed no significant increase in soil carbon over the same period. Importantly, this result was despite the fact that the conventional system returned a higher level of plant biomass to the soil—some supporters of conventional farming have tried to suggest that as conventional farming produces higher yields it would cause a greater build-up of soil carbon. This trial showed that the organic practices of using organic matter as the basis of the system instead of inorganic fertiliser and having a diverse crop rotation are key to building up soil organic matter. In the trial, the additional carbon retention of the organic system amounted to 2–4 tons per acre. If organic farming was adopted nationally, the researchers calculated that this would absorb 1 to 2% of the carbon dioxide released from the combustion of fossil fuels in the US.

26. (iii) Reduced livestock grazing density—there are limits on livestock grazing density under organic standards. Densities are roughly 25% lower in organic farming than non-organic farming. This would reduce the soil carbon losses from the large grassland areas of the UK.

27. (iv) Non-use of fertiliser—the non-use of inorganic fertilisers in organic farming means that nitrous oxide emissions are reduced and the ability of the soil to breakdown methane is increased.

28. (v) Reduced feed and food miles—organic farming systems are more self-sufficient in terms of animal feed (more is produced on-farm) and also require less animal feed grains anyway, as there is a requirement for at least 60% of cattle feed to be forage (grass based). Local food marketing is also a much more significant feature of organic farming than non-organic, with many organic farmers marketing their produce through farm shops, vegetable box schemes and local farmers' markets.

29. (vi) Greater resilience to climatic extremes—many organic farmers have noticed that their crops are more resilient to climatic extremes such as drought or heavy rainfall because of the better quality of their soils. This has been proven by the long-term comparative trial by the Rodale Institute in the US. It found that while the yields from conventional farming were substantially affected by drought, organic farming was not affected in the same way and substantially out-performed the non-organic system in these years. For example, in the four drought years for maize during the trial, the organic system yielded 16–37% more than the conventional system. This resilience of the organic system is because of the higher organic matter levels and better structure of the soils which mean it retains more moisture. The better soil structure means organically farmed land also absorbs water more quickly. For example, at the Rodale trial in 1995, the water infiltration rates were twice as high in the organic system than the non-organic. Resilience to drought and flooding should be an important consideration for agricultural policy as climate instability will increasingly affect agriculture.

30. It is important to note that organic farming also has other proven environmental benefits including: significant increases in farmland wildlife, and reductions in agrochemical pollution and waste.

Energy crops

31. We are concerned that the Government is intent on the widespread growing of energy crops. The Climate Change Programme says “The most effective way for the agriculture sector to contribute to reductions in greenhouse gas emissions is through the production of energy crops”. We urge the Efra committee to take Defra up strongly on this. First of all, the most important way in which agriculture could reduce its GHG emissions is through a major reduction in the use of inorganic fertilisers, which are produced from fossil fuels. Secondly, there are some major concerns with energy crops.

⁷⁶ “Energy use in organic farming systems”, Defra, 2000.

32. Energy crops are not carbon neutral as claimed. Agriculture is currently a very energy intensive way of producing material, reliant on fertilisers and other agro-chemicals which use large quantities of fossil fuels in their production and transport. Fertilisers alone account for 54% of the energy used in farming. This means energy crops could actually have a negative impact on climate change. For example, a study by Cornell University estimated that it takes 1.7 litres of fossil fuel to produce 1 litre of ethanol (study by David Pimental, who chaired a US Department of Energy panel on energy, economics and environmental aspects of ethanol). Non-organic farming also causes declining soil carbon levels, pollution of water-courses and less farmland biodiversity. All this needs to be taken into account. The whole production chain therefore must be certain to produce significant net energy gain, before any plans for large-scale energy crop production in the UK can be considered. As a minimum, energy crops would have to be organically produced.

33. Secondly, there is only a finite amount of farmland and we believe sustainable food production must be the priority for agriculture. While healthy, sustainable food can only be produced from land, renewable energy can be produced from many non-crop sources: wind, solar, tidal and hydrogen. Energy crops would require a very large land area to make even a small contribution to the UK's energy use. But there is already an urgent need to de-intensify food production to make it sustainable and to grow more animal feed domestically to reduce our reliance on imported feed. This means that we cannot afford to dedicate large areas of farmland to energy crops. Large-scale energy crop production would mean more food and feed being imported, increasing fossil fuel use and our dependency on other countries for our basic resources.

Food transport

34. Localised food economies are key to reducing food miles and the related carbon dioxide emissions. Local food is currently recognised by the Government as a way of reconnecting consumers with the way food is produced. But more urgently, it should be seen as a priority for reducing the current very high food miles for climate change reasons.

D. Government activities in the international arena

35. We suggest that the following should be the priorities for the Government in its forthcoming international roles.

Promoting accurate estimates for agriculture and the food sector

36. The UK Government should push for much more accurate estimates by climate change modellers working for the key institutions (eg. the IPCC and the Kyoto Protocol) for the contributions of the food and agriculture sectors to climate change. In particular, the major contribution from fertilisers should be recognised; and the past and on-going reductions in soil carbon levels from changes in agricultural practices need to be recognised. Also, the contributions of international trade in food and feed need to be included in national inventories—we understand this is currently omitted because a decision could not be made on how to allocate the contributions, whether to exporting or importing countries. This situation is unacceptable.

Promoting sustainable agricultural systems

37. Agricultural systems which have scientifically proven benefits for climate change policy and other aspects of the environment should be promoted internationally, such as organic farming. It is unacceptable that agrochemical and hence fossil-fuel dependent farming is being promoted abroad by the Government and international institutions.

European and international food trade

38. The UK Government needs to start a serious debate on the impacts and continued suitability of promoting international trade in food. The UK, European Union, and many other countries have been pursuing a policy of increasing food trade through trade negotiations and institutions such as the WTO. There is almost no official recognition, let alone action, of the substantial environment cost of this policy. This needs to change. In future, assessments of the benefits of trade agreements must consider the environmental costs of the increased transport of food that results from replacing local and regional food trade with international trade.

39. Secondly, the current trade policy barriers to developing more localised food distribution systems need to be seriously looked at. For example, because the EU is founded on the concept of promoting a single market, it is impossible for public authorities to overtly adopt local food purchasing policies on environmental grounds even though they are encouraged to consider the environmental impacts of their policies. This is clearly an nonsense. Also, "protectionism" is seen in only a wholly negative way by

Governments. However, the environmental and food security (which will become more important as climate instability sets in) aspects of nationally-orientated agricultural policies are rarely considered. The UK should take a lead in opening the discussion on these issues.

19 October 2004

Memorandum submitted by the Campaign for a Hydrogen Economy (CHEC) (U30)

CHEC proposes two ideas both of which relate to some degree with both the areas of interest detailed in the Terms of Reference of the consultation (ie UK policies on greenhouse gas reductions and role of UK Government as Chair of G8 and President of the European Council).

1. NEED FOR POLICIES AND LEADERSHIP FOR THE DEVELOPMENT OF RENEWABLE ENERGY RESOURCES (SOLAR THERMAL AND WIND) OF SAHARAN AFRICA

1.1 The Sahara has a massive cost-competitive solar energy resource (solar thermal as distinct from more costly PV). Solar thermal collectors, essentially mirrors and their structures, covering just over 1% of the area of the Sahara could supply the equivalent of all global electricity. Significant quantities of drinking water would also be produced in the process.

1.2 The western plateau in Morocco is a region where there are relatively high wind speeds. The region could supply about 40% of the European Union's electricity.

1.3 The electricity produced by both solar thermal and wind schemes would be transmitted in both cases by the same cables which would form a Trans-Mediterranean Grid with low-loss (high voltage dc cables passing underneath the Mediterranean Sea at several locations).

1.4 The scale of the resource would enable Europe to meet much of its energy needs of the future. The electricity could be used to generate hydrogen for transport (including next-generation hydrogen powered aircraft) and for storage as necessary.

1.5 The development of the Saharan renewable energy resources could significantly improve the environmental performance of Europe and the economic development of Saharan Africa and further afield. Such development could reduce tensions and unwanted migration between Africa and Europe.

1.6 Much research has been conducted by the "TREC" Development Group (details and pdf below). Note the group includes various partners from the African/Middle Eastern countries rather than a European-led initiative which may be seen as exploitative. Secretary of State Margaret Beckett referred to this issue at the DEFRA conference on Sustainable Development in London earlier this year in a response to a plenary question by the Chairman of CHEC.

Trans-Mediterranean Renewable Energy Cooperation TREC Paper for Arab Thought Forum and Club of Rome, Amman 2003.

Trans-Mediterranean Renewable Energy Cooperation "TREC" for development, climate stabilisation and good neighbourhood

The TREC Development Group

Formed by initiative of the German Association for the Club of Rome, and of the Hamburg Climate Protection Foundation

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See the German Aerospace Centre website for research into solar thermal technologies and African/European grid connection schemes:

<http://www.dlr.de/DLR-Homepage>

Author: dlr-infomaster@dlr.de

2. POLICY TO SUPPORT THE DEPLOYMENT OF “TIDAL LAGOON” SCHEMES AROUND THE UK

2.1 There is a substantial resource of tidal energy (height as distinct from stream) particularly in the Severn Estuary, Liverpool Bay and the Thames Estuary which could be exploited by tidal lagoon schemes, a technology proposed and patented by Tidal Electric Ltd. A small number of large lagoons in the Severn Estuary alone could supply about 6% of UK electricity.

2.2 The company’s technology has been reviewed positively by AEA Technology and very recently WS Atkins /ABP (MER). However the technology has been severely hampered by a secret and inaccurate DTI cost briefing to politicians (including Lord Sainsbury, Stephen Timms MP and Welsh Assembly ministers). The inaccurate briefing was based on the estimated output costs of a tiny lagoon scheme proposal in a remote area of Alaska.

2.3 The economies of scale of the Severn Estuary could not be more different. A small (60MW) scheme is being proposed for Swansea Bay with a generation cost of about 3–3.5 p/kWhr. Larger schemes would likely be in the 2–3 p/kWhr range. Lagoons in the Severn Estuary are considered to be a far preferable option than the Severn Barrage by at least one major environmental group

2.4 TE Ltd would like at least some positive comment from the DTI to at least not dissuade investor interest or discourage the Crown Estate’s co-operation. However, if capital funds were available for specific scheme environmental assessment at least or some policy which could enable a government LOAN for a 10 year pay-back period then the available resource might significantly be developed before 2020.

2.5 The construction of any particular scheme would be dependent on an environmental assessments and other planning and navigational considerations. Lagoon structures could actually provide wildlife habitat and a coastal defence role.

2.6 For further information about tidal lagoons and the company Tidal Electric Ltd contact: ullman@tidalelectric.com. or visit the Tidal Electric website.

Brief History and Aims of THE CAMPAIGN FOR A HYDROGEN ECONOMY (“CHEC”)

Inception: CHEC was founded in 2001 (initially as the now superseded HEAUKI) as a first attempt in the UK (and Ireland) to highlight the central role which hydrogen must play in reducing our dependence on carbon-rich fossil fuels. The aim has always been to bring to the attention of all concerned—the voting public, specialists in climate, oceans, biodiversity, energy and the associated politics—the increasing threat which such fuels pose to the whole earth system (and hence to ourselves), and to make the case for renewably generated hydrogen as the fuel of choice for all human needs.

CHEC gained a properly devised constitution in November 2002, limited company status in February 2003 and registered charity status in November 2003. In June this year we established our website: www.hydrogeneconomy.org.uk. This site is at an early stage, but we have secured the help of an experienced and sympathetic web designer to develop and enhance this site. We now have a committee of nine with a wide spread of age, skill and background. We are united in basing our belief in the future of hydrogen on its importance in the protection of the climate and the hydrosphere, the improvement of air quality and the role it must play in reducing political conflict and enhancing collaboration across borders.

Activities 2003–04: We have divided our time and efforts between education, publicity, knowledge-gathering and climate activities.

Education: We have given seminars at school and university level on climate change and its necessary relationship to the hydrogen economy. We have given courses to senior citizens groups, and run two 12 week courses on climate change (and hydrogen) as an evening class for the people of Manchester.

Publicity: To the best of our ability we have “pushed” the notion of the hydrogen economy at the media both nationally and locally. CHEC is now known as a point of reference to several local radio stations, and has endeavoured, not always with success, to place letters and articles in the print media.

Knowledge-gathering: We consider it an important part of our remit to survey the whole environmental field, and all the associated issues which arise. We have participated in a revealing (and alarming) conference (2003) in Brussels on the future of the EU’s energy supplies (almost entirely natural gas, apparently), and attended many events concerning renewable energy (eg the British Wind Energy Association July 2004, the Building Research Establishment June 2004, the Grove Fuelcell Conference 2003). And we have ensured that the results of these visits are available and accessible at the CHEC office. They will certainly be put onto the website, in abbreviated form, in the near future.

Climate activities: one of the founding “energies” for the creation of CHEC was the realisation that delegates returning to the UK from the annual unfccc conferences (eg Kyoto 1997, the Hague 2000) had heard nothing (and said nothing) about the promise of hydrogen as a climate-friendly fuel. Even (and perhaps above all) the environmentally aware groups such as WWF, Greenpeace, RSPB and the Climate Action Network) simply refused to take hydrogen “on board”. Since then it has been CHEC’s aim to attend all these major conferences. Of the four conferences since then, we have had a presence at Bonn (2001), Marrakesh (2001), and Milan (2003), only omitting (because of expense) New Delhi in 2002. We are now raising funds to facilitate the attendance of three or four delegates to the next unfccc conference, in Argentina in December 2004.

Plans and projects for 2004–05: The committee now aims to build on the experience of the past three years so as to become effective at the level which counts most in a democracy—the electoral level. It strikes us as supremely important that the voting public should be aware of the following features of our climate, air quality and related fuelling systems:

- (1) The near certitude that climate change is an established fact, that it will incur damaging changes to our total environment, to all the “spheres”: atmosphere, hydrosphere, cryosphere, biosphere and so on.
- (2) The air quality (indoors and outdoors) of our towns, cities and countryside is threatened by the same overriding menace as is our climate—the direct and indirect effects of the use of fossil fuels.
- (3) Our present dependence on fossil fuels is a historical accident, and not a necessity ordained by nature and technology. The alternative—renewably generated hydrogen, which lends itself to energy storage, combustion energy, electrical energy and mechanical energy—is already within reach, and merely requires investment, development and political commitment for it to come into being.

AIMS

It is our aim in 2004, 2005 and thereafter to:

- (1) Gain official accreditation to the unfccc (UN Framework Convention on Climate Change), so as to attend all its conferences as named hydrogen-based campaigners rather than as guests of less focused umbrella organisations. The first moves to acquire this status have already been taken.
- (2) Build an effective website so as to reach out to the citizens of the UK and beyond with the hydrogen “message”. This site will comprise data, opinions (including “dissident” opinions), an FAQ section and occasional pieces written by interested parties. It will also contain easily downloadable A4 “sheets” for teachers to have free instructional material at school level.
- (3) Construct improved demonstration machinery to show the public (i) how a carbon dioxide-rich volume of air responds to incoming infrared rays, and (ii) how easy it is to generate hydrogen from water by solar radiation and by other forms of renewably generated electricity, both on land and marine. This machinery will be scrupulously arranged so as not to “cheat” its way into an audience’s appreciation; its role as an indicator and its limitations will be carefully set out.
- (4) Build closer relationships with policy makers, politicians and their advisers so as to increase their level of “hydrogen awareness”.
- (5) Cultivate a special relationship with Africa. In the view of CHEC it is in the interests both of Africa and of Europe to work together to develop an interlocked hydrogen economy. For Africa there would be the opportunity to gain a powerful indigenous tool for development—clean and inexhaustible renewable fuel and electrical energy, and a permanently tradeable commodity—and for Europe a generous supply of energy to meet her already heavy demands. CHEC would undertake to examine the ramifications of such an arrangement regarding the EU, the WTO, TRIPS, the larger fossil fuel companies, African countries which already gain foreign exchange from the export of oil and gas, and so on. CHEC has already established contacts with African delegates to unfccc conferences, and will work to make these contacts fruitful.
- (6) Undertake the search for funding and staffing which would facilitate the aims above. CHEC has already benefited from several funders who have supported the running of the office over three years, but not (so far) with enough money to pay for salaries and expansion. We are now confident that we will attract the resources which we need.

1 October 2004

Memorandum submitted by The Royal Society for the Protection of Birds (U31)

SUMMARY

It is increasingly clear that the measures in the UK Climate Change Programme (CCP) are insufficient to achieve the UK’s target to cut carbon dioxide emissions by 20% from 1990 levels by 2010. To achieve our 20% target we need to cut carbon dioxide emissions by 33 MtCarbon per year in 2010 but we are likely to be about eight MtC short of this figure. This shortfall needs to be addressed in the forthcoming review of the UK CCP.

The EU will be even further from its target with a projected 2.9% reduction by 2010, as opposed to 8%. The UK Presidency should address this issue by initiating a review of the adequacy of EU policies and measures.

Road transport and aviation emissions are rising especially rapidly and thus need to be limited as a matter of urgency. Further cuts should also be made in other sectors, especially those covered by the EU emissions trading scheme (EU ETS) for which the first phase UK National Allocation Plan (NAP) was very weak, as were NAPs from other EU countries. The RSPB believes that measures that should be strengthened or newly introduced in the UK Climate Change Programme include:

- strengthen the EU voluntary agreements with motor manufacturers;
- introduce an EU-wide emissions charge on aviation and later opt aviation into the EU ETS;
- introduce a well-to-wheel carbon tax on road vehicle fuels, preferably across the EU but certainly in the UK, replacing existing fuel taxes over time;
- strengthen the 2005–08 Energy Efficiency Commitment (EEC) to 200 from 130 TWh and plan to strengthen the 2008–11 EEC; and
- set a much higher target in the UK NAP for 2008–12, at least five MtC per year, and, as EU President, harmonise target setting for all EU NAPs.

For the UK's Chairmanship of the G8, by far the biggest single issue is starting international talks on how to limit emissions after 2012, the end of the Kyoto Protocol's first commitment period. To be effective in the longer term, the G8 must focus on this issue and not be distracted by side issues. The G8 and rapidly industrialising developing countries should together initiate the review of the adequacy of the commitments in the Climate Change Convention.

INTRODUCTION

1. The RSPB is Europe's largest wildlife charity with over one million members, and is part of the BirdLife International partnership, a global alliance of independent national conservation organisations working in more than 100 countries worldwide.

2. We consider that human-induced climate change poses the biggest long-term threat to global biodiversity. A recent paper in *Nature* by a large group of scientists indicates that in a sample region covering about 20% of the Earth's land surface "15 to 37% of species . . . will be 'committed to extinction' as a result of mid-range climate warming scenarios for 2050."⁷⁷

3. To avoid such a catastrophe, greenhouse gas emissions need to be cut hard and rapidly. We therefore support policies and measures which reduce the anthropogenic greenhouse gas emissions that cause climate change. We strongly support the large raft of measures that the Government has put in place to achieve this end as part of the UK Climate Change Programme (CCP).

4. However, it is increasingly clear that the current CCP measures are insufficient to achieve the UK's target to cut carbon dioxide emissions by 20% from 1990 levels by 2010, even with the new Climate Change Agreements (CCAs), the strengthened Energy Efficiency Commitment (EEC) and the first phase of the EU Emissions Trading Scheme (EU ETS). Indeed, new projections suggest we are moving away from, not towards, our target. This shortfall needs to be addressed in the forthcoming review of the UK CCP.

5. The UK's Presidency of the EU and Chairmanship of the G8 in 2005 present excellent opportunities for the UK to re-invigorate the international talks on climate change and to strengthen the EU's increasingly wavering commitment to taking action. We thus welcome the Prime Minister's intention to make climate change a central theme of both. However, initiatives within the G8, in particular, need to be highly focused on a few key issues, notably the resumption of negotiations on what action to take post-2012. There is a danger that a host of well-meaning but comparatively less important agenda items will be tabled, ultimately leading nowhere and detracting from more important issue.

REVIEW OF THE UK CLIMATE CHANGE PROGRAMME

Emission projections

6. The Government is currently revising its emission projections but it is clear from the latest DTI figures (developed and used to draw up the UK National Allocation Plan for the EU ETS) that the UK will miss its 20% target by more than previously thought. The latest published forecasts indicate that, with all existing and planned measures including the first phase of the EU ETS, the UK will only reduce its carbon dioxide emissions by 15.2%, as opposed to previous forecasts of 16.3%.⁷⁸

7. In other words, to achieve our 20% target we need to cut carbon dioxide emissions by 33 MtCarbon per year in 2010, from 1990 levels, yet we are likely to be about 8 MtC short of this figure.⁷⁹ Eight MtC is a large amount of carbon. For comparison, the emission reduction from the first phase of the EU ETS will be just 1.5 MtC per year. The review of the UK Climate Change Programme thus needs to either strengthen existing measures considerably, or introduce new measures or, possibly, both.

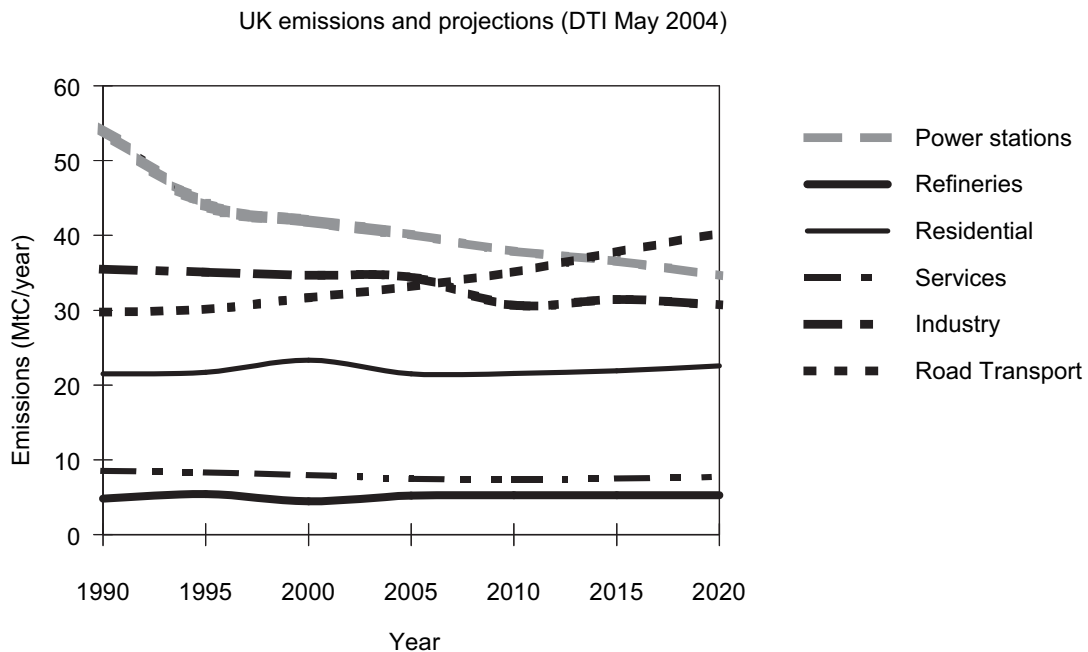
8. Some potential candidates for increased measures to reduce emissions are obvious from the figure below (from table 6 of the DTI working paper on updated energy projections, May 2004). Road transport is a rapidly growing emission sector, with air transport growing even more rapidly. The residential sector

⁷⁷ Chris D Thomas *et al*, Extinction risk from climate change, *Nature*, 8 January 2004.

⁷⁸ Working Paper on Updated UK Energy Projections, DTI, May 2004.

⁷⁹ In this paper, all emission estimates are given in MtCarbon, rather than MtCarbon dioxide because these are the units used in the UK forecasts. To convert for MtC to MtCO₂ multiply by 44/12.

also stands out as having a flat, rather declining emission profile. In addition, although emissions from power stations and industry have declined there remain far more gains that could be made in these sectors, and the phase II NAP must reflect this.



Strengthening and adding to climate change measures

Road transport

9. Road transport emissions have proved hard to constrain, in spite of efforts by successive governments. Vehicle fuel is heavily taxed, vehicle excise duty (VED) is graduated according to carbon dioxide emissions, the 10 Year Transport Plan aimed to make more use of public transport, an increasing number of towns are introducing congestion charging, and the voluntary agreement between the EU and car manufacturers in the EU, Japan and Korea to lower fleet emissions appears to be working—yet emissions continue to rise.

10. The Government is currently pinning its hopes for constraining, if not reducing emissions, mainly on road user charging, more switching to public transport (at least in major towns) and strengthening the EU voluntary agreements with motor manufacturers. We would be supportive of both road user charging and, especially, extending the EU voluntary agreements. Currently their effect is estimated to be a saving of 2.6 MtC (including the comparatively minor effects of VED and company car taxation). A significant revision of the agreements could yield reduction of a similar magnitude, and is technically and economically entirely possible. VED differentials could also be increased significantly.

11. A difficulty is, however, that the present timetable for introducing road user charging is too slow to achieve significant emission reductions by the 2010 target date, so should be accelerated. It is anyway a blunt and uncertain instrument for achieving emissions reductions and must be used with caution for that purpose and only as an ancillary measure. Although they are likely to be more effective in reducing emissions, a difficulty with the voluntary agreements is that they run until 2008 and so any new agreements would be unlikely to have a significant effect by the UK's target date of 2010.

12. Additional measures are thus needed. One that could have a large effect on emissions is a well-to-wheel carbon tax. This would tax vehicle fuel on the basis not only of its own, inherent carbon content but also take into account emissions from processing and, as far as possible, transportation. It would have several advantages. It would encourage many different types of "green" fuels, from biofuels to hydrogen, as opposed to the Government proposal for a biofuels obligation that would be fuel-specific. It would also be perceived of as fair, because it would be levied in direct proportion to pollution, with zero carbon fuels attracting no tax and high carbon fuels a high tax. In addition, a carbon tax could replace the complex system of fuel taxation currently in place which give tax breaks to some fuels of uncertain environmental benefit, such as liquid petroleum gas (LPG). If structured correctly, it could result in no loss of revenue to the Treasury. While it would be strongly preferable to introduce such an instrument at EU level, it could be introduced, without significant competitiveness implications, within the UK. No transportation fuel should be certified for vehicle use if the direct and indirect environmental impacts of its production and use are unacceptable.

13. Introducing a well-to-wheel carbon tax would clearly represent a major revision of the current system of vehicle fuel taxation but it could be phased in over time as current taxes were made, first, less distorting in carbon terms and then phased out.

14. A further measure that would be easy to introduce would be to impose an upper limit on emissions from new cars. Whilst this would not have a large effect immediately it would send a clear signal that personal vehicles with extremely heavy fuel consumption are not acceptable.

15. We understand that, in anticipation of the introduction of an EU car-labelling scheme, agreement has been reached to introduce a voluntary labelling scheme in the UK, a move we strongly support.

Aviation

16. Aviation emissions are forecast to rise by 7.32 MtC per year between 1998 and 2010, a rate that would swamp emissions savings from the Renewables Obligation by roughly three times.⁸⁰ Indeed, the situation is actually worse than this because carbon dioxide emissions at high altitude are about three times more damaging than those released from the ground.⁸¹ In terms of the effect of emissions on climate change, the rise in emissions from aviation by 1990 is thus likely to nullify not only the Renewables Obligation but most of the other measures taken so far in the business sector, such as the CCAs and the EU ETS.

17. Currently, the only tax on aviation is the Air Passenger Duty (APD). Aviation fuels are duty free and, more generally, aviation receives a number of indirect subsidies. An obvious means of limiting demand for aviation is thus by taxing fuel, particularly as the DfT's own sensitivity analysis on their Air Traffic Forecasts 2000 indicate that merely keeping air fares constant would halve forecast demand. (The forecasts assume an annual price fall of 1% per year.)

18. However, tax on aviation fuel used in international flights is prohibited by the 1944 Chicago Convention and by a host of bilateral "Air Service Agreements" that the UK has with other countries. The best way to tackle the problem globally would thus be via a cap and trade scheme that included aviation emissions, ideally within the Kyoto trading regime but this would be strongly opposed by some countries, notably the USA. It would thus take some time, perhaps a decade or more, to put a comprehensive, international cap and trade scheme in place.

19. In the meantime, other measures should therefore be considered at the UK and EU levels. These should include an emissions charge on EU internal flights and, in the longer term, opting aviation emissions into the EU cap and trade scheme in its second phase from 2008 to 2012. (Neither emissions trading nor an emissions charge are prohibited by the Chicago Convention because neither had been thought of in 1944 when the treaty was concluded.) Such measures should be accompanied by other indirect ones, such as auctioning take-off and landing "slots", the introduction of a "dual till" approach at airports and increased, emissions-related APD.

Domestic emissions

20. The Building Regulations (England and Wales) and the Energy Efficiency Commitment (EEC) are currently being revised. Both could be strengthened considerably more than is envisaged in the government consultations associated with them.

21. For example, the target envisaged for the EEC in the period 2005 to 2008 is 130 TWhr, representing a further saving from the EEC of 0.7 MtC, in addition to the 0.4 MtC from the 2002–05 EEC. This should be strengthened to at least 200 TWhr, yielding a carbon saving of about 1 MtC per year, which should be achievable at net financial benefit. (Defra's original intention was to treble, rather than double, the obligation.) The next, 2008–11, EEC should be strengthened further and, potentially, extended to the small business sector.

Emissions from power stations and industry

22. The sectors included in the EU ETS encompass nearly half of all UK carbon dioxide emissions. The trading scheme is thus the prime candidate measure for cutting UK emissions. Moreover, the industries covered by the scheme came off very lightly in terms of emission cuts in the first UK National Allocation Plan (NAP). In fact, all other EU member states set lax NAPs and the UK's plan was little better. Carbon prices are thus certain to be so low as to make lack of competitiveness a trivial consideration for most industries, except some very energy intensive ones.⁸²

⁸⁰ Figures on aviation from the DfT's Air Traffic Forecasts 2000 and for the Renewables Obligation from the UK Climate Change Programme.

⁸¹ 2.7 times is the average value quoted by the Royal Commission on Environmental Pollution in their latest report on aviation.

⁸² For further information on competitiveness in the EU ETS see, The European Emissions Trading scheme: Implications for Industrial Competitiveness, The Carbon Trust, 2004.

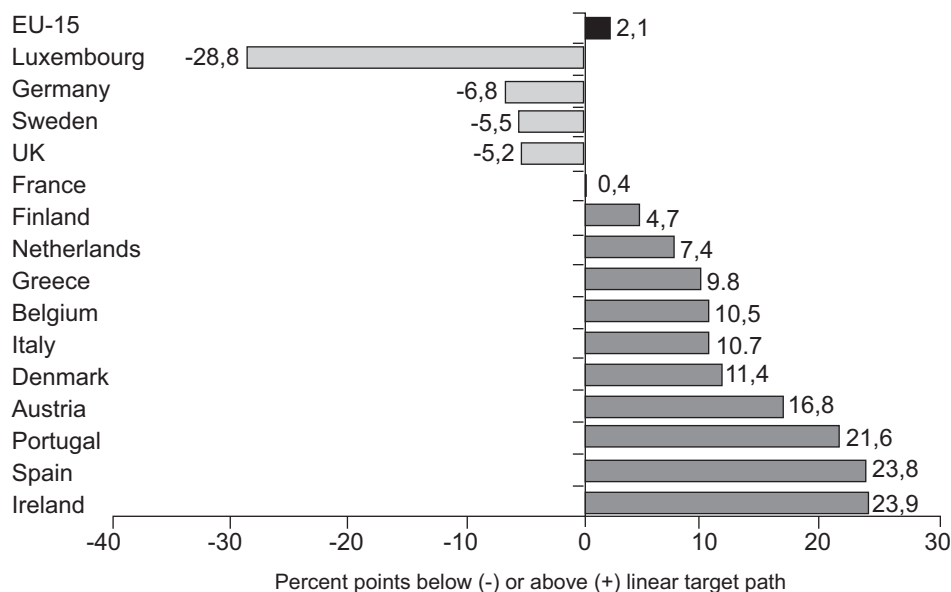
23. In the UK plan, all sectors except electricity generation were allocated emission allowances on the basis of business as usual projections which, in some cases, may have been inflated. Electricity generation was singled out for a cut of 1.5 MtC from business as usual, on the grounds that it is not subject to international competition, as some other sectors are, and would consequently not lose competitiveness if other countries set lax NAPs.

24. For the second period of the EU ETS it is imperative that both the UK and other EU states set far larger targets in their NAPs. The UK could easily double or triple the emission reduction. 5MtC rather than the current 1.5 MtC would seem a reasonable reduction if we are to have any hope of reaching our 20% carbon dioxide target. It is also politically more straightforward, and probably cheaper, to target further reductions from the industrial sector, than from the domestic and transport sectors.

UK presidency of the EU

25. The latest available data for 2002 shows that the EU 15 has achieved only a 2.9% reduction in greenhouse gas emissions from 1990 levels. As a result, the EU is not on course to meet its Kyoto target of 8% by 2010, let alone a 21% target, and clearly needs to do much more if it is to achieve it, both by strengthening existing policies and measures and introducing new ones. The figure below, from the European Environmental Agency, shows how well, or badly, the EU 15 countries were performing in attaining their burden-sharing targets in 2001.⁸³

Figure 4: Distance-to-target (burden-sharing targets) for EU Member States in 2001, based on domestic policies and measures alone



26. A key task for the UK's Presidency of the EU is thus to review its progress towards meeting its emission reduction targets and initiate a process for ensuring that existing EU policies and measures are fully implemented in member states, strengthening those measures and developing new ones.

27. The UK will have strong legal grounds for conducting a thorough review of policies and measures during the Presidency. By 2005, the developed country parties to the Kyoto Protocol are obliged to have made "demonstrable progress" in achieving their commitments under the protocol. A review of both implementation and of the adequacy of policies and measures is clearly essential in demonstrating progress, or not. (The EU inserted the "demonstrable progress" text (Article 3.2) into the Protocol and so it is particularly important that the EU shows leadership in implementing it.)

28. Measures that require strengthening and adding to at the EU level are similar, or in some case the same, as those at UK level. In particular, a key task will be to ensure that methods used in drawing up National Allocation Plans for the EU ETS are far better harmonised, firmly set cap so as to ensure that competitiveness concerns are minimised and more challenging NAPs are set for the second phase of the scheme. (The Emissions Trading Directive already allows for such harmonisation.)

⁸³ Greenhouse gas emission trends and projections in Europe 2003, European Environment Agency, 2003.

29. As at home, the UK should also do much more to restrict transport-related emissions during its presidency of the EU. The UK should work to put in place an EU-wide emissions charge on aviation and set in train a process for opting aviation emissions into the EU ETS. They should also strive to put in place an EU-wide well-to-wheel carbon tax on all road vehicle fuels.

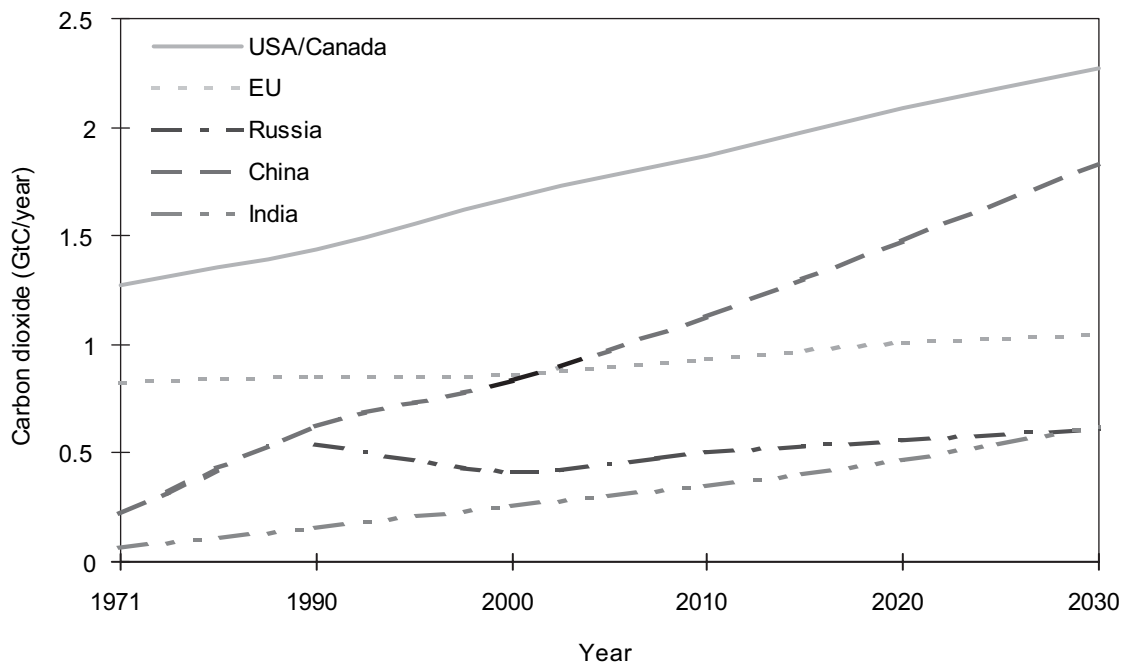
UK chairmanship of the G8

30. The Prime Minister has already announced that his priorities for the G8 will be climate change and Africa. We strongly support this choice but are concerned that the G8 agenda will fill up with numerous worthwhile but ultimately less important matters, diverting attention from the big issues.

31. On climate change, by far the biggest single issue is starting international talks on how to limit emissions after 2012, the end of the Kyoto Protocol's first commitment period. To be effective in the longer term, the G8 must focus on this issue and not be distracted by side issues, such as a further renewables conference with voluntary targets, linking emission trading schemes, encouraging biofuels as part of WTO and CAP reform, and a host of other worthy but less important matters.

32. To make progress on tackling climate change a binding international agreement to cut emissions is essential. Without such an agreement, countries will always pull back from making substantial emission cuts because of fears of loss of competitiveness, as we have recently seen in the race to the bottom by EU countries in setting targets for the EU ETS. Also, even to begin to stabilize atmospheric concentrations of greenhouse gases, and hence limit global temperature rise, all countries need constrain their emissions, certainly the larger emitters, as the figure below illustrates.⁸⁴ The USA and China, for example, clearly have to be part of any solution.

**Country carbon dioxide (fossil fuel) comparison
(from IEA World Energy Outlook)**



Political background

33. Involving all countries in a global agreement may be essential but it will be hard to achieve, as is shown by experience of the Kyoto Protocol. Not only has the USA left the Protocol but none of the developing countries, including the rapidly industrialising ones, have commitments to limit their emissions. Ethically, it is right to say (as the UN Climate Change Convention does) that developed countries have a historical responsibility for causing the problem of climate change and that they should take the lead in clearing it up. However, this does not solve the practical problem of limiting climate change. If developed country emissions are not cut hard and developing country emissions at least constrained, climate change will continue indefinitely and catastrophically.

34. In the USA, much opprobrium has been heaped upon the Bush Administration for pulling out of Kyoto but it is sometimes forgotten that even if the President asked the Senate to ratify the agreement then the Senate would probably refuse. The Byrd-Hagel Senate Resolution of 1997 clearly stated, just prior to

⁸⁴ From World Energy Outlook 2002, International Energy Agency, OECD/IEA, Paris, 2002.

the Kyoto meeting which led to the Protocol, that the Senate would not ratify a treaty on climate change that did not include “meaningful participation” by at least some, more developed, developing countries. The Senate passed the resolution by a vote of 95 to 0. The issue of rapidly industrialising country participation is therefore not simply a practical matter of reducing emissions but it is of key importance in achieving US engagement in any agreement.

35. Moreover, since 1997, the USA has done very little to limit its emissions and they have continued to climb steeply under both the Clinton and Bush Administrations. It is thus arguable whether it is now possible for the USA to achieve its Kyoto targets, and any US administration, and probably any Senate too, would argue that it is not.

36. It is also extremely unlikely that any developing country will take on legally binding emission reductions in the near future. All of the major, rapidly industrialising countries are parties to the Kyoto Protocol, under which they have no obligations to limit emissions, certainly before 2012. Moreover, the developing country negotiating bloc (the G77 and China) firmly adheres to the position that developed countries should take the lead in reducing emissions.

37. Until 2012, the end of the first Kyoto Commitment period, the prospects of either the USA or major developing countries agreeing to limit their emissions under an international treaty are therefore slim. It has been argued that an agreement other than Kyoto might be set up, in the form of a “coalition of the willing”, but this has a number of serious disadvantages. It could potentially undermine both the Protocol and, more importantly, its parent convention, the UN Framework Convention on Climate Change (UNFCCC) to which almost all countries belong, including the USA. Also, a coalition of the willing is, by its nature, likely to achieve little more than its members would do anyway. It is the unwilling that need to be persuaded into agreement.

38. For the post 2012 period, however, the prospects of agreement look better. Most US politicians from both parties now accept that climate change is a serious problem, as is shown by the climate-related measures being taken by Governor Pataki in New York State, Governor Schwarzeneger in California and by Senator McCain (Republican, Arizona) and Senator Lieberman (Democrat, Connecticut) who tabled the “Climate Stewardship Act” that narrowly failed to pass through the Senate by 43 to 55 votes in October 2003. (McCain and Lieberman will resubmit the Bill.)

39. Rapidly industrialising countries, especially China, also take climate change increasingly seriously. Qin Dahe, head of China’s Meteorological Administration, recently told the Chinese Academy of Sciences that “global warming brought about [an] unbearable, irreversible and sustained effect to the Chinese economic and social development.”⁸⁵

Initiating post-2012 negotiations

40. Next year’s G8 meeting is an almost ideal time to initiate talks about action on climate change post-2012. That date is still a long way off in terms of the typical governmental timescale of four or five years and so even wary governments may be willing to start talks as long as there are no preconditions about commitments. A climate-skeptical US Administration and major developing country governments that fear taking on emission reduction targets could, at a high level, agree to start talks.

41. The high level commitment is, however, important because, without it, executive officials are likely remain mired in their present, “do nothing” positions as they have for three or four years now. It is also vital that the UK Chair of the G8 engages not only the G8 members but also major developing countries in any G8 decision. A G8 resolution without the active involvement of at least some major developing countries is likely to raise suspicion and antagonism. One idea is to hold a “G-10” or ideally “G12” meeting of the G8 leaders together with those from China, India, Brazil and South Africa.

42. A G8 and developing country decision should not be complex. At its most basic, it need only call upon the parties to the UNFCCC (to which all G8 members and all major developing countries belong) to conduct a review of the adequacy of the commitments in the Convention. The Convention specifically provides for such a review. Indeed, it is overdue. Article 4.2.d. of the Convention says that it “shall take place no later than 31 December 1998”. The review, even if based only slightly in reality, should conclude that the commitments in the Convention are inadequate and act accordingly to take corrective action. (The first review of the adequacy of commitments in 1994 concluded that the commitments were inadequate and led directly to the process that concluded with the Kyoto Protocol. It would be inconsistent to conclude that the commitments were adequate now when they were not in 1994.)

⁸⁵ “Scientist suggests to set up national policy on climate change”, People’s Daily Online, 7 June 2004, http://english.peopledaily.com.cn/200406/07/eng20040607_145499.html

43. It is particularly important that no attempt should be made by the G8 to impose preconditions on the negotiations, especially in the form of organising principles, such as “contraction and convergence”. These should emerge during negotiations, not before them, and preferably from developing countries rather than the G8. The only guiding principle that should be employed is one that is already agreed as the ultimate objective of the Convention which is:

... stabilisation of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system. Such a level should be achieved within a time-frame sufficient to allow ecosystems to adapt naturally to climate change, to ensure that food production is not threatened and to enable economic development to proceed in a sustainable manner.”

44. At present, it seems unlikely that this globally agreed objective will be met. As may be seen from the figure on emission projections for major countries, stabilisation of atmospheric concentrations at any level at all is clearly not going to occur without significant global cuts emissions. According to the Intergovernmental Panel on Climate Change:

“natural systems can be especially vulnerable to climate change and some will be irreversibly damaged or lost, and [there will be] a general reduction in crop yields in most tropic, sub-tropical and mid-latitude regions.”

4 October 2004

Memorandum submitted by the Climate Group (U32)

1. THE CLIMATE GROUP

The Climate Group, officially launched by Prime Minister Tony Blair in April 2004, was formed to convene a leadership group of corporate and governmental organisations committed to reducing greenhouse gas (GHG) emissions. In the past such “leaders” have been operating in isolation, without the benefits of effective networking and collaboration with their peers.

The Climate Group seeks to capture and share the lessons learned from successful strategies and policies. These leadership actions demonstrate that GHG reduction is possible and in many cases profitable. We believe the dissemination of this knowledge will positively affect the international debate on addressing climate change.

2. THE UK GOVERNMENT AND CLIMATE CHANGE GOING FORWARD

2.1 *The UK as a leader*

The world is at a crossroads on climate change. Whilst progress on international agreements has been slow, many corporations along with city, state and national governments are already taking action to meet and exceed what is required of them under the Kyoto Protocol, often reaping economic and other benefits as a result. The UK Government is well established amongst this leadership group, having developed from the framework of a long term climate change strategy, ambitious goals for renewable energy and a progressive 60% reduction aspirational target. The result of this, to date, has been stabilisation of and even reduced greenhouse gas emissions coupled with sustained economic growth. A unique window of opportunity now exists for the UK to use this platform to drive forward a wider political consensus that will lead to the deeper emissions cuts that the scientific evidence shows are necessary.

2.2 *The Right Moment*

Domestic achievements and the development of private and public sector institutions with considerable expertise on climate change and emissions reductions have lent the UK authority on the global stage and positioned the country at the heart of international negotiations. With upcoming presidential elections in the US, high expectation that Russia will ratify Kyoto in the near future and the upcoming start of the EU emissions trading system the political landscape of emissions reduction is likely to shift. A short but decisive window of opportunity exists to drive the policy debate forward. In 2005 the UK takes on the EU and G8 presidencies and Prime Minister Tony Blair has stated that climate change will be a top priority. 2005 is also the official year for launching negotiations on the next commitment period of the Kyoto Protocol and there is real potential for the UK to positively influence the outcome.

2.3 *A “leadership” alliance to engage key players*

The UK’s leverage could be effective in many areas. Engaging the 15 key countries currently responsible for two thirds of the world’s greenhouse gas emissions will be crucial. Germany has also demonstrated its leadership credentials on climate change and an Anglo/German partnership which works to ensure that the

EU successfully implements its Kyoto commitments, showing that the current portfolio of policies in the EU produces an innovative and competitive economy, will provide convincing arguments to bring these players to the table.

Illustrating the benefits of leadership is a message that can be taken to governments at all levels (national, state, regional and city) as well as corporates. Pushing forward a coalition of the committed, working with organisations such as the recently formed Climate Group, is a compelling idea. This approach might be particularly powerful in the area of new technology development, which has the potential to reengage the US and which will be a key part of the G8 process. Ultimately, however, this can only work in of the context bringing into force long term and internationally binding emissions caps for the world's largest emitters, based on the scientific guidance given by the IPCC; this should be the UK's overriding priority for the coming years.

2.4 *Continued leadership at home*

It is achievements at home which have given the UK credibility on the international stage and helped to open this window of opportunity. This will close, however, unless the UK continues to show leadership through domestic policy and strives to meet its aspiration of a 60% reduction in emissions by 2050. Critical steps will include:

- Formalising progressive long-term targets and breaking these down into small, achievable steps applicable to all sectors of society.
- Establishing ambitious goals for the UK's National Allocation Plan for the 2008–12 period of the EU emissions trading system.
- Engaging with leaders on emissions reduction from business/local government to learn about the range of creative and practical solutions which have already been introduced and the factors surrounding their success (for example, congestion charging in London, internal emissions trading at BP).
- Working with financial institutions to provide innovative solutions on energy efficiency, new renewable energy and distributed generation.
- Developing a greater awareness of the scope for emissions reduction beyond traditional sectors such as energy generation—for example, engaging consumers by focusing on products and brands.
- An effective communications programme on climate change to capture the imagination of energy users nationwide.
- Cultivating support for the climate change issue both within the government and across opposition parties so the issue can be dealt with appropriately over a long-term time frame.

Together, these domestic actions and international leadership will position the UK ideally drive forward a framework that is good for both the climate and the economy and allow UK businesses to benefit from the opportunities that will arise from it.

5 October 2004

Memorandum submitted by the Environmental Industries Commission (U33)

I write, on behalf of the Members of the Environmental Industries Commission (EIC) Climate Change Group, on the subject of the UK's Climate Change Policy and upcoming leadership of the EU and G8.

With over 240 Member companies, including over 70 providing products and services related to energy efficiency, EIC has grown to be the largest trade association in Europe for the environmental technology and services industry. It enjoys the support of leading politicians from all major parties, industrialists, trade union leaders, environmentalists and academics.

We appreciate the opportunity to participate in this inquiry. We start with comments on domestic policy, and then move to measures that should be taken at an EU and international level.

1. ENHANCED CAPITAL ALLOWANCE SCHEME

The Enhanced Capital Allowance Scheme to incentivise energy efficient technology has now been running for some time. EIC was instrumental in promoting the introduction of fiscal incentives for companies purchasing environmental technologies and our Members provide many of the items of equipment on the list.

EIC Members' experience is that the scheme has been a success in the construction sector but has had much less impact in the commercial buildings sector. The chooser of plant items for commercial construction projects is invariably NOT the end user but an installation contractor or design consultancy practice who receive no gain for using the scheme. The end user is also usually capital cost driven, consequently the take up of these allowances, and the subsequent use of energy-efficient equipment is limited. In addition the financial advantage for 100% capital allowances adds up to a relatively modest incentive in most cases.

Furthermore a complete sector of the economy, namely any organisation not paying corporation tax, eg NHS Trusts, Local Authorities and other non-profit organisations, cannot claim ECAs, and consequently have no incentive to use equipment on the Energy Technology List.

EIC is therefore recommending to Treasury, Defra and the Carbon Trust the following measures to develop the scheme:

- Increase the allowance for the most energy efficient products to 150%. This will undoubtedly stimulate end users much more to insist on ECA listed equipment being used as part of an overall building specification.
- Provide an Inland Revenue certificate to accompany sales of ECA registered equipment to be sent to building owner in order to address the problem of information being transferred along the sales chain by simplifying the documentation required.

2. PUBLIC PROCUREMENT

The Energy White Paper commits the Government to encouraging energy efficiency through public procurement. EIC greatly welcomes the fact that the “Quick Wins” for environmental procurement in the public sector, developed by the Office of Government Commerce, includes reference to the Energy Technology List. To ensure this has the maximum impact we recommend that:

- The Government monitors and reports on whether Departments are choosing items on the Energy Technology List.

One area where EIC Members have found little attention is paid to energy efficiency is in PFI contracts (which are often major projects). They have informed EIC of a number of occasions when the most polluting equipment has been purchased, for example in schools and hospitals, because the PFI contractor is not responsible for energy bills and therefore has no incentive to consider the whole life costs of equipment in terms of its energy use. There is no shortage of guidance recommending consideration of whole life costing and energy efficiency, but it appears to have little effect in practice. Given that the Prime Minister has pledged in his recent speech on Climate Change to make all new schools “models for sustainable development”, EIC recommends that:

- The Government moves beyond guidance and suggestion to set and enforce challenging energy efficiency criteria for all new PFI contracts.

3. CLIMATE CHANGE AGREEMENTS

The Climate Change Agreements under the Climate Change Levy have incentivised energy efficiency measures in some sectors. However, the low price of carbon in the UK emissions trading scheme demonstrates that the level of greenhouse gas emissions reductions required have been set too low and many sectors have been meeting these emission levels, and gaining their 80% discount on the Levy, with little effort. EIC therefore recommends that:

- The current review of Climate Change Agreements, as well as the negotiations for the extension of the Agreements into new industry sectors, ensure they are set to drive challenging reductions in greenhouse gas emissions.

4. ENFORCEMENT OF BUILDING REGULATIONS

The Government is now reviewing Parts F and L of the Building Regulations, which, with the implementation of the Energy Performance of Buildings Directive, could serve as an important driver for efficiency measures in existing buildings. However, the country is suffering from a shortage of properly trained inspectors, and our Members’ experience is that inspectors place a low priority on energy efficiency when enforcing the existing Building Regulations. This risks undermining the impact of these important measures. EIC therefore recommends that:

- The enforcement of Building Regulations be given a high priority.
- The verification of a building’s energy performance be made a prerequisite for registration of interest with HM Land Registry.

5. VAT

EIC has responded to the Treasury consultation on home energy efficiency identifying reduced rates of VAT as the most effective economic instrument for encouraging energy efficiency. This should be applied to: DIY energy saving materials; commercially installed energy efficiency products or materials in non-grant schemes; and to energy efficient equipment. EIC therefore recommends that:

- The UK engages with other EU Member States to work for an extension to the list of goods and services which Member States are allowed to apply reduced VAT rates to include these energy saving products.

6. EMISSIONS TRADING

EIC has supported the EU Emissions Allowance Trading Scheme (EATS), in principle. However the UK and other EU National Allocation Plans (NAPs) have over-allocated allowances and damaged the scheme.

The EATS will limit the scope of the Integrated Pollution Prevention and Control (IPPC) regime in regulating emissions of the basket of six greenhouse gases. It will therefore weaken existing EU environment regulation as it does not match the IPPC regime requirement for “best available techniques” to be used.

We are disappointed that greater effort was not made to ensure that the UK NAP contributed significantly to our domestic target to reduce carbon dioxide emission by 20% from 1990 levels by 2010. We are even more disappointed that the UK’s route to achieving its Kyoto target now even looks to be in doubt.

As Table 1 of the NAP submitted to the Commission clearly shows, the emission reduction for the first trading period is only 0.5 MtCO₂, a target of just 0.2%, as opposed to 5.8% in the draft NAP. An undemanding NAP means either:

- (i) unrealistic reliance is being placed on alternative emissions reductions measures; or
- (ii) the cuts to be delivered by the UK’s NAP for the first five year period in the second phase of the EATS will have to be much harsher.

The ground given in response to pressure in respect of the first phase NAP gives no confidence that a second phase NAP will be able to make up the lost ground.

EIC therefore recommends that:

- The Government now makes a firm commitment that the second phase of the EATS will deliver emissions reductions in line with the domestic target to reduce carbon dioxide emission by 20% from 1990 levels by 2010.
- The UK work urgently with the Commission and other EU Member States to ensure tight and challenging National Allocation Plans, wide participation in the scheme, and enforcement of non-compliance.

Merlin Hyman
Director

5 October 2004

Memorandum submitted by the Country Land and Business Association (U37)

1. The CLA welcomes the opportunity to give evidence to the Efra select committee on the challenges of future climate change. We are a membership organisation, representing 40,000 rural land managers and business, who between them own and manage about half of the rural land in England and Wales. Their interests vary between agricultural and other rural businesses, to woodlands, biodiversity and recreation. All land-based industries are, and will continue to be, literally on the front line of climate change—we therefore have a great interest in any new climate change policies that arise through the review of the climate change programme. Our publication on *Climate Change and the Rural Economy*—www.cla.org.uk/climate addresses climate change from a land management and rural business perspective.

REDUCING GREENHOUSE GASES

2. We recognise that agriculture and land use change emit a proportion of the total emissions of greenhouse gases through the tillage of the soil, the keeping of livestock and the application of nitrogen fertilisers—all part of the everyday activities of farming. Changes in the CAP will undoubtedly have a positive effect on these emissions through de-coupling of payments with production, and linking them to environmental conditions.

3. Whilst this will go along way to reducing emissions from rural land use it should be recognised that there is much more potential for rural land to contribute to the debate, in particular by providing renewable energy and by storing carbon in soils and timber.

4. Renewable energy has enormous potential to reduce UK GHG emissions, given the right policy framework. If the UK is to meet its Kyoto commitments, and go further to address the recommendations of the Royal Commission on Environmental Pollution (RCEP) for deep and lasting cuts in GHG emissions, policy action is required on all fronts. RCEP has recently published a report on the failure of the biomass sector to deliver, pointing the finger firmly at a lack of joined up thinking in Government. Moreover, choosing renewable transport fuels offers an environmentally friendly way of reducing the impact of car use, without attacking the motorist. For more detail on CLA policies for renewable energy see the Annex.

5. Climate change policies have so far mainly concentrated on reducing greenhouse gases (GHGs). We advocate a twin track approach of emission reductions and the use of carbon sinks to reduce these gases. To date, there has been little research done on storing carbon on rural land, in soil, timber, hedgerows and field margins and we consider that much more should be done. It has great potential not only to reduce carbon, but also have a knock on positive effect on soil organic matter and therefore the stability of soil,

which in turn reduces its erodability. As rainfall is expected to become more intense and more frequent, the ability of soil not to erode will become an important issue for water quality—ie in terms of sediment, nutrients and pesticides entering water courses. The aim of the Water Framework Directive to reach good status by 2015 could therefore be jeopardised by climate change: soil, water and climate change policies must be joined up to recognise this. Furthermore, to appreciate how important soil carbon is, consider that globally soil contains $1.5 \times 1,012$ tonnes of carbon—global emission of carbon from fossil fuels and land use change are only 0.5% of that figure. Hence only small changes in soil carbon are needed to have a profound effect on carbon emission. This is of concern as temperatures are expected to increase in the future which will release more carbon emissions from soil—soil management is therefore key, and more research and technology transfer through advice and incentives to land managers is needed.

6. The CLA is developing the Greenhouse Gas Audit for land managers, which calculates the GHG emissions on farm and balances them against the amount sequestered in timber and soil. As well as giving an assessment of the GHG balance on farm, it will also raise awareness of GHG and climate change amongst land managers and can be used to highlight where they could be more efficient, for example in applying nitrogen fertiliser to reduce nitrous oxide emissions, and where they could reduce their emissions through soil and timber management.

7. We consider that more research is needed on how to reduce the methane emissions of livestock as this is a large contributor to agricultural GHG emissions.

ADAPTATION TO CLIMATE CHANGE

8. There is as yet a largely unrecognised potential of land management, which is to mitigate the negative impacts of climate change, such as flooding, and isolation of biodiversity. Land managers have a great deal to offer, for example, washlands which reduce urban flooding downstream; and biodiversity corridors to allow wildlife to move as the temperature rises. However the right policy framework for these measures to work efficiently does need to be in place. Below we set out examples of land management activities which would help to mitigate negative effects that arise from future climate change.

WATER

9. It is expected that water will become increasingly diminishing resource at some times of the year in certain areas—Land managers could be encouraged to construct reservoirs to ensure water security for their businesses and national food security, as well as possibly being a source of public water supply in times of drought.

SOIL

10. Soil is vital to biodiversity, acts as a carbon sink, retains water and underpins food production. Policies that promote sound soil management are essential to the nation's sustainability. There is considerable potential to utilise soil as a carbon sink and an immediate priority should be to support soil management practices to sequester carbon.

ARABLE AND LIVESTOCK FARMING

11. By 2010, greenhouse gas emissions from UK agriculture and forestry are expected to have reduced by 23% compared with their 1990 levels, reflecting structural change in farming and change in land use. Arable and livestock farmers could be encouraged to complete an on-farm greenhouse gas audit if provided with advice and information which could assist them in reducing their on-farm emissions.

ENERGY

12. Climate change has significant implications for all energy producers and users. There is huge potential for carbon-neutral renewable energies, such as biomass (eg short rotation coppice, oilseed rape and perennial grasses) and wind, to take the place of the non-renewable fossil fuels. Effective support for the growth and use of renewable energy systems, including transport fuel, is a priority.

FORESTRY

13. Forestry can directly mitigate climate change by acting as a carbon sink, and indirectly by substituting quality timber for other more energy-intensive materials. Priorities for action include supporting forest management practices to sequester carbon and the growing and use of quality timber in place of synthetic materials.

FLOODING

14. Inundation, whether by the sea or rivers, puts agricultural land, property and important wildlife habitats at risk. Priorities should be to develop incentives for managed realignment of the coast and managed re-creation of floodplains, primarily as tools to control flooding and to complement schemes designed primarily for environmental benefit.

BIODIVERSITY

15. Climate change is expected to increase the vulnerability of some species and habitats. Land managers can play an active part in mitigating those adverse effects by providing wildlife corridors—supported through agri-environment schemes—to allow wildlife to migrate northwards and adapt to change.

Annex

A CLA INTRODUCTION TO RENEWABLE ENERGY POLICY

For many years, Government and most commentators (including environmental NGOs) have confused renewable energy generation with renewable electricity. All supply side efforts have been addressed at the electricity sector, and the prospects for renewable heat and transport fuels have been largely ignored. Policy in these sectors has been addressed at efficiency of use and savings, rather than in new, renewable sources of supply.

This is particularly disappointing as in the UK the residential and tertiary building sectors have been shown to be the largest overall end users of energy, mainly for heating, lighting, appliances and equipment. The energy consumed in buildings in the UK amounts to 46% of the national total (27% from the domestic sector and 19% from the non-domestic sector). This equates to about 235 million tonnes of carbon dioxide every year—or about 63.5 million tonnes of carbon per year (MtC/year).

Renewable road transport fuels have largely been ignored in UK policy to date, partly owing to a confusion about the land use implications. Government seems to be willing to incentivise growing biomass for electricity production, and to harbour concerns that if biofuels were also taken up, this would in some way conflict with land availability for Short Rotation Coppice and Miscanthus. Given the need for new and profitable non food uses for land, the potential CO₂ savings from biofuel use, and the income opportunities it offers to growers, the CLA considers these concerns to be misplaced.

Further, recent concerns over security of supply, together with the EU Biofuels Obligation has pushed the renewable transport fuels debate to the top of the agenda.

CURRENT ELECTRICITY POLICY

1. The Government has adopted a target that 5% of all electricity shall be produced from renewable resources by the end of 2003, and 10% by 2010. Technology has improved so that the pollution caused by traditional electricity generation can be reduced through the treatment of flue gases to reduce acid rain, but CO₂ is an inevitable by product of burning hydrocarbons and is believed to be the main contributor (by volume) to global warming. The true cost of nuclear power is still uncertain: whilst the generation of power is claimed to be cheap, and does not involve CO₂ emissions, the costs of decommissioning closed power plants and the storage of nuclear waste are, as yet, unquantifiable. The Cabinet Office Performance and Innovation Unit recommended that options for future nuclear electricity generation should be kept open, but made no firm proposals for replacement of the existing nuclear power stations, which are due to be decommissioned in the next 10 years.

2. The use of coal, the traditional source of energy for electricity generation, has been much reduced over the last decade, which has involved the restructuring of the coal industry and significant price reductions. There is currently an abundance of natural gas but reserves are limited in the medium to long term. The technology to allow it to be used for the generation of electricity (in Combined Cycle Gas Turbines or CCGT) at a competitive price has been developed, and accordingly it is becoming a major source of power. Its waste emissions are much less polluting than those of coal (though greenhouse gases are still produced). Whilst this source will help to address the pollution limits in the short term; the position for the longer term remains uncertain. Moreover, uncertainty over supplies contributes to price volatility, which saw bulk prices for gas jump by 100% in 2000–01, and directly lead to a fall in electricity generated from gas, and an increase in coal fired generation. This increased the CO₂ emissions from the sector in 2002–03.

3. During the 1980s and 1990s, Government provided limited encouragement for more environmentally friendly, renewable sources of energy through the “non fossil fuel obligation” (NFFO). This allowed renewable energy promoters to bid for renewable electricity supply contracts at premium prices to overcome the inherent risks of the high capital cost of new and emerging technology and uncertain performance of alternative energy projects.

4. This mechanism was replaced under the Utilities Act 2000 by a new procedure, the “Renewables Obligation”. This (briefly) provides that any retail seller of electricity is required to source a percentage of what it sells from renewable resources. The first Renewables Order (RO) was made in April 2002.

5. It is estimated that the majority of the Government's target of 10% renewable electricity by 2010 may be created in the form of wind energy. A significant proportion will be offshore, subject to sufficient grant aid with the additional costs of offshore generation being made available, but most will be land based turbine proposals. DTI projections include a significant place for biomass electricity in the mix. Unless biomass generators come forward, it is likely that the Government's 10% target will not be met.

6. At the same time, the Utilities Act made provision for the replacement of the electricity trading and pricing mechanism. Previously, the "Electricity Pool" produced a half-hourly price determined by the seller's cost of generation. The top bid that satisfied market demand became the pool price for contracts made in that period. Smaller generators (like biomass and wind) were able to make sales contracts by reference to the pool price, which offered administrative convenience and secure returns.

7. The New Electricity Trading Arrangements (NETA) are far less advantageous to small scale generators, and particularly bad news for small scale combined heat and power generators. Under NETA, bilateral contracts are the norm, with balancing of supply and demand taking place only at the margins. Government aims to ensure by this that electricity retailers will be able to negotiate cheaper prices for their customers for guaranteed supplies. Unfortunately, in the nature of things CHP electricity is an intermittent resource and is penalised on price under the marginal trading arrangements. It seems likely that CHP generators will seek to bundle their output with other renewable resources (such as wind or hydro) in order to be able to offer a more stable renewable electricity supply to the market. However, such bundling services are only now being made available and inevitably involve an additional cost. In the interim, the electrical generation output of CHP in the UK has actually fallen, and many environmentally beneficial CHP projects have been abandoned or shelved. The electricity regulator, Ofgem, was asked by government to look at the impediments that NETA throws in the way of the development of renewable energy, but failed to deliver.

8. One of the key issues for potential renewable generators is whether the value they can appropriate from the Renewables Obligation plus the CCL exemption (see below) is sufficient for renewables generation to be commercially viable. The Renewables Obligation works through a mechanism under which electricity suppliers require renewable certificates to cover the statutory level of renewable production, otherwise they must pay a fine of 3p/Kw Hr. This "buy-out" price has been set at a level which enables wind generation, but not other forms of renewables. Moreover, in the competitive market, renewables generators are not able to appropriate all of the value of the buy-out price or the CCL exemption. In addition, there wider cost reductions have driven down the market price for electricity. These risks mean that other technologies are currently simply not viable.

9. As against this, further developments in the field of electricity contracts may improve the long-term viability of renewable generation. The first is the development of a "green electricity", where consumers are offered the opportunity to purchase electricity generated from renewable sources and delivered via the grid. A number of regional electricity retailers are offering green tariffs, but they have not penetrated mass markets.

10. The second is the ongoing work to ensure that generators will be offered a credit for delivering energy into the grid at a point closer to its consumption, rather than on the standard access charge which takes account of the preponderance of conventional generating capacity based on large scale coal and nuclear fired plant in areas remote from the demand for the power. This is a key issue as well-located generation capacity can reduce the need for unsightly long distance transmission pylons. At the same time, if "net metering" is introduced it will revolutionise the economics of small scale self generation projects. (net metering gives the small scale generator a credit for the electricity exported to the grid at the same price as the electricity purchased for consumption).

11. CLA has long argued that there is significant market failure in that the specific wider public benefits of biomass energy (described in the CLA Biomass handbook) are not recognised. The current Renewables Obligation, combined with NETA, imposes a "one size fits all" or technology blind approach to renewable electricity. This is directly resulting in several damaging outcomes, in our view.

12. These include:

- Increased requirements for public expenditure by way of direct grant aid necessary to incentivise biomass developments.
- A lack of consumer choice in how renewable energy is delivered, and increasing concern amongst communities threatened by inappropriate land based wind turbines.
- A failure to deliver the benefits to the rural economy from biomass jobs and incomes.
- A failure to deliver the prospects for market driven conservation and environmental improvements from the increase in woodland cover.
- A failure to capitalise on UK engineering excellence, leaving the field (and huge potential export markets) to foreign competition.

13. The CLA has long argued that a more rational approach would be to "band" the Obligation, so that different technologies could compete with each other within the separate bands, each having a buy-out price that recognises the emerging technology costs and wider benefits they deliver.

Current Heat Policies

14. Given that the consumption of energy (and the current contribution to greenhouse gas production) comes largely from the use of heat in domestic and commercial premises, Government has been slow to address the question of renewable heat production. The combined GHG output of domestic and industrial energy use, largely by way of heat, amounts to about 50% of the UK total.

15. Policies introduced to date include the Climate Change Levy (CCL), the development of the Carbon Trust (and the grants it is able to offer for energy saving) together with the Energy Savings Trust Community Energy schemes and housing policies providing grant aid for insulation.

16. The CCL is a flawed policy tool, from the point of view of the environment, of rural business and of prospects for biomass heat generation:

- First, in that it applies only to business use of energy, and therefore fails to address the very large domestic contribution to GHG emissions.
- Second, in that intensive energy users have been able to negotiate reductions, but the basis for these has not been transparent.
- Third, that the revenue raised has not been redistributed evenly, the National Insurance bills of manufacturing being lower than those of the service sector.
- Fourth, that the CCL does not apply to heating oil, which is covered by other taxes.

17. Under the CCL, rates currently payable (2002) are:

Electricity:	0.43p/KWh
Natural gas	0.15p/KWh
Solid Fuel (coal coke etc)	1.17p/Kg
LPG	0.96p/Kg

18. For more details on CCL, contact the HMCE climate change levy helpdesk—Tel 0161 827 0332, or visit www.hmce.gov.uk/business/othertaxes/ccl.htm.

19. In the context of renewable electricity, generators need to seek levy exemption certificates from Ofgem. For direct supply of biomass, or heat contracts using renewables, no levy is payable, which provides a direct saving to the customer. The savings that business customers enjoy may be captured by the energy supplier, or shared with the customer.

20. The Carbon Trust is tasked with supporting the transition to a low carbon economy in the UK.

Particular initiatives that the Carbon Trust are operating include the long standing energy efficiency best practice programme—(see www.energy-efficiency.gov.uk) and it is launching a new initiative—the Foundation element of the Low Carbon Innovation Programme. The aim of this programme is to assist developing technologies overcome technical and non-technical barriers across the innovation chain.

Details are available at www.thecarbontrust.co.uk/foundation.

For details of the work of the Carbon Trust contact:

The Carbon Trust
3 Clement's Inn
London
WC2A 2A
Tel: 020 7170 7048
Fax: 020 7170 7020

18. Businesses can make very substantial savings in heat and energy usage, and the Carbon Trust has recently set up a free advisory service—www.actionenergy.org.uk/—which is specifically aimed at providing assistance in this area

19. The cumulative effect of current support for heat is wholly inadequate for the task in hand. Energy used to provide space heating requirements remains one of the largest sources of GHG.

20. Thus the CLA has joined with many other organisations, including the Renewable Power Association, Slough Heat and Power, the Friends of the Earth, the NFU, British Biogen and the Combined Heat and Power Association to argue for the early introduction of a Renewable Heat Obligation, modelled on the Renewable (electricity) Obligation

21. A heat obligation, if introduced, promises significant carbon savings at approximately one third the cost of the RO.

22. Meetings have been held with DTI Ministers and we are determined to drive the agenda forward.

CURRENT RENEWABLE TRANSPORT FUEL POLICY

23. Government has argued that the relatively high level of road fuel duty, and the differentiation between the rates for leaded and unleaded fuels, together with differential rates of road fund licence rates address the environmental outputs of road transport.

24. Many commentators seek to downplay the role for renewable transport fuels by promoting the prospects for hydrogen powered cars. This, however, fails to recognise the very significant CO₂ output of road transport (approximately 25% of all UK emissions) and the long time frame and huge investment required to switch from petrol and diesel to hydrogen. Moreover, creation of hydrogen requires huge amounts of electricity, and unless this is generated from renewable resources, no CO₂ savings are made.

25. Policy on urban air quality has led to the “powershift programme”, which provides incentives (including capital grants and a significantly reduced rate of fuel duty) for those willing to switch their vehicles to Liquid Petroleum Gas (LPG) or Compressed Natural Gas (CNG).

26. Only in the 2002 budget was a concession made for renewable fuels. Biofuel now attracts a 20p/litre reduction from standard duty rates. Unfortunately, this is not enough to bridge the gap between the costs of production of biofuels (biodiesel and bioethanol) and those of fossil fuels, so is unlikely to create a significant demand for biofuel crops. The current rate may encourage production of biofuels from recovered vegetable oils (from catering establishments) but there is only a limited supply of material.

27. Government, under considerable pressure from lobbyists (including the CLA), undertook research into the environmental benefits of growing biofuels and this is available at the sheffield hallam website (<http://www.shu.ac.uk/rro/reports.html>). This shows that biofuels save up to 70% of GHG on a whole life cycle basis and improve air quality in addition.

28. At the same time, Government (DfT) has this month responded to the European Commission Biofuels Directive. Member states have a wide discretion, and some encouragement, to set targets for biofuel production and provide tax incentives to make it happen. The EU has set a quality standard for biodiesel, which is not yet in place in the UK. This causes concern, as poor quality fuels on sale will tend to undermine the potential market.

29. Other European competitors are already well down this road, and biofuel is already commercially available in many EU countries. At the same time, Brazil production from biomass (sugar cane) peaked at just over 50% of “petrol” consumption, or 30% of its road fuels, and currently lies in excess of 35% of “petrol” use. The USA is (2002) massively increasing its investment in this area. In some mid-western states, substitution of biofuels from maize in petrol already exceeds 20%.

30. Whilst there are technologies for small scale conversion of home-grown crops to road transport fuels, it is expected that, if Government provides suitable incentives, the market will develop quickly through conventional channels.

31. DfT has recently consulted on a draft Biofuels strategy, and we append our response at the annex. The CLA has welcomed the DfT consultation, urged early action to introduce a Renewable Fuel Obligation with appropriate environmental safeguards (not extending to carbon accounting) with a binding obligation applied to suppliers on a rising scale, starting at 2% in 2006, increasing in steps to 5.75% by 2010 and reaching at least 10% by 2020 and argued this should be accompanied by the maintenance of the existing fuel duty reduction to avoid unacceptable fuel price increases.

32. The CLA also supports increased grant aid at regional and national level to provide assistance to the infant renewable fuel processing industry in face of established competition.

CONCLUSIONS

33. If the UK is to meet its Kyoto commitments, and go further to address the recommendations of the Royal Commission on Environmental Pollution (RCEP) for deep and lasting cuts in GHG emissions, policy action is required on all fronts.

34. RCEP has recently published a report on the failure of the biomass sector to deliver, pointing the finger firmly at a lack of joined up thinking in Government.

35. Moreover, choosing renewable transport fuels offers an environmentally friendly way of reducing the impact of car use, without attacking the motorist.

Further information on these issues are available on the CLA website, www.cla.org.uk

Recent CLA responses to Government consultations are to be found under “policy” “Government responses” and include:

- Response to draft PPS22.
- Response to Renewable Fuels consultation.
- Response to The Renewable Obligation consultation.
- Response to the Energy White Paper Review.

CLA handbooks (priced publications) for businesses interested in developing renewable energy include:

- CLA 25: Wind Farms and Wind energy as an enterprise.
- CLA 30: Biomass: energy from the land as an enterprise.

11 October 2004

Memorandum submitted by Research Councils UK (U38)

INTRODUCTION

1. Research Councils UK (RCUK) is a strategic partnership that champions the research supported by the seven UK Research Councils. Through RCUK the Research Councils together with the Arts and Humanities Research Board (AHRB) are creating a common framework for research, training and knowledge transfer. Further details are available at www.rcuk.ac.uk.

2. This memorandum is submitted by Research Councils UK on behalf of four of the Research Councils, and represents our independent views. It does not include or necessarily reflect the views of the Office of Science and Technology (OST). RCUK welcomes the opportunity to respond to this inquiry from the House of Commons Environment, Food and Rural Affairs Committee.

3. This memorandum provides evidence from RCUK relevant to the terms of reference of the inquiry, in addition to supplementary background material from the following Research Councils:

Biotechnology and Biological Sciences Research Council (BBSRC)	Annex 1
Council for the Central Laboratories of the Research Councils (CCLRC)	Annex 2
Engineering and Physical Sciences Research Council (EPSRC)	Annex 3
Natural Environment Research Council (NERC)	Annex 4

COMMENTS

4. RCUK notes that the Committee intends to focus among other things on Defra's review of the UK Climate Change programme, and on policies for reducing greenhouse gas emissions. Defra's recent publication "Scientific and technical aspects of climate change, including impacts and adaptation and associated costs" demonstrates the urgent need for the Government to adopt and promote national and international policies that will effectively combat climate change. The Defra publication also highlights the need for more scientific study to improve estimates of likely changes and to support the development of alternative, eg low-carbon, technologies.

5. RCUK welcomes the fact that the Government recognises the challenge of climate change and the importance of technological innovation to reduce its severity and to adapt to new climatic extremes. Climate change is a particularly strong driver of innovative research and development in renewable-energy technologies, energy efficiency and options such as the hydrogen economy and carbon sequestration. There is a clear need for continued Government support for research in these areas.

6. The Research Councils support many initiatives and projects addressing both the study of climate change and the technology and behaviour required to combat and adapt to it. Some of these initiatives are described below.

7. Three Research Councils (EPSRC, ESRC (Economic and Social Research Council) and NERC) fund, and another (CCLRC) participates in, the Tyndall Centre for Climate Change Research⁸⁶. This UK centre for trans-disciplinary research on climate change focuses among other things on policy development. The Tyndall Centre is responding separately to this inquiry to provide policy suggestions addressing issues such as the predicted growth in air traffic and the need to adopt more energy-efficient building technologies.

8. Another of the most significant Research Council initiatives relevant to climate change is the "Towards a Sustainable Energy Economy Programme"⁸⁷ (TSEC) funded by the EPSRC, ESRC and NERC, with the participation of the BBSRC, CCLRC, DTI, Defra, the Carbon Trust and others. The TSEC programme is interdisciplinary and supports a whole-systems integrated approach to energy research, including research into renewables, carbon management and keeping the nuclear option open.

9. The TSEC programme builds on another cross-Council programme known as SUPERGEN (Sustainable Power Generation and Supply)⁸⁸. This was initiated by EPSRC in 2003 with an anticipated investment of £25 million over five years, with the aim of establishing research consortia to tackle key challenges in improving the sustainability of the power supply industry. The activities have been expanded

⁸⁶ <http://www.tyndall.ac.uk>

⁸⁷ <http://www.nerc.ac.uk/funding/programmes/sustenergy/tsecao2.shtml>

⁸⁸ <http://www.epsrc.ac.uk/ResearchFunding/Programmes/InfrastructureAndEnvironment/Initiatives/SustainablePowerGenerationAndSupplySUPERGEN.htm>

into the social, environmental and life sciences, and the programme is now a collaborative activity supported also by BBSRC, ESRC and NERC. The programme has initially funded research into biomass, wave and tidal power, hydrogen generation and storage, and future distribution networks.

10. Through the TSEC programme the Research Councils have set up the UK Energy Research Centre (UKERC)⁸⁹. The UKERC will bring coherence to the diverse range of UK energy research activities through the establishment of a National Energy Research Network. It will support a multi-disciplinary approach to research in the area of sustainable energy, contributing to the development of alternative, low-carbon technologies.

11. Other relevant Research Council programmes and projects are detailed in Annexes 1–4. Data from these and from the programmes described above will help inform Defra's Review of the Climate Change Programme, as well as policy development generally, a process which obviously requires ongoing feedback from the research community.

8 October 2004

Annex 1

Memorandum from the Biotechnology and Biological Sciences Research Council (BBSRC)

BACKGROUND

1. The Biotechnology and Biological Sciences Research Council's (BBSRC) remit covers all aspects of the biosciences and biotechnology. BBSRC has a three-fold role in supporting UK biosciences by funding research and research training that provides:

- (i) basic and strategic research that pushes back the frontiers of human knowledge about how living things work;
- (ii) longer term strategic research that informs policy, particularly in animal health, food quality and safety, agriculture and land use; and
- (iii) a broad base of enabling research from molecular and cell biology to whole organism physiology and populations, that underpins applied research.

COMMENTS

2. The Inter-Agency Committee on Global Environment Change (IACGEC) supplementary report to the Chief Scientific Adviser (May 2000) highlighted three areas of BBSRC-funded research of particular relevance to increasing the understanding of the impact of climate change⁹⁰:

- Stress tolerance in individual species.
- Soil biological processes and their effects.
- The role of soil processes in global change (addressed through "Soil biological processes and their effects").

3. BBSRC currently supports work in these areas through responsive mode funding and its sponsored institutes⁹¹. Support in responsive mode is largely through the Plant and Microbial Sciences (PMS) Committee. Recent and current examples of activities include:

- BBSRC Council has recently agreed a cross-Institute Soil Science programme. Drawing on expertise at various BBSRC-sponsored Institutes the programme will provide a co-ordinated approach to soil science—an aspect of which will be the impact of climate change;
- BBSRC participates in the "Sustainable Power Generation and Supply" (SUPERGEN) Initiative⁹² described in the introductory text, which includes research into biomass and biofuels.
- PMS Committee theme of "Soil and Rhizosphere Biology"⁹³. Grants are supported which provide improved understanding of the rhizosphere and bulk soil microflora and their key influences on plant productivity with effects including cause and suppression of soil-borne diseases, determination of nutrient supply, production of plant growth-promoting substances and influence on plant-soil-water relations.

⁸⁹ <http://www.ukerc.ac.uk/about.htm>

⁹⁰ IACGEC "The UK National Strategy of Global Environmental Research" (1996) ISBN #1-85531-1658 [drawing on BBSRC's response to the Hoskins report].

⁹¹ <http://www.bbsrc.ac.uk/about/centres/Welcome.html>

⁹² <http://www.bbsrc.ac.uk/science/initiatives/supergen.html>

⁹³ <http://www.bbsrc.ac.uk/science/areas/pms/themes/soil.html>

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- The AgriFood Committee currently has a priority area of “Integrative Behaviour of the Soil-Plant System”⁹⁴ designed to build partnerships with the necessary range of expertise to develop a truly integrative understanding of the soil-plant system and developing innovative tools and conceptual approaches to meet the challenges of an integrative understanding of the soil-plant system.
 - PMS committee is about to introduce a new priority area for “Carbon Substitution: Biomass and Biosynthesis”. Full text for the priority area is currently being finalised.

4. While BBSRC is not part of the Towards a Sustainable Energy Economy cross-Council Programme (TSEC), we remain involved in the development and management of the programme through representation on the TSEC Programme Management Group (PMG). BBSRC is also represented on the High Level Energy Group (HLEG).

Annex 2

Memorandum from the Central Council for the Laboratories of the Research Councils (CCLRC)

BACKGROUND

1. The role of the Central Council for the Laboratories of the Research Councils (CCLRC) is to provide the primary portal for UK scientists to access major national and international experimental and computing facilities and associated centralised expertise of a scale well beyond those normally available at individual universities. This role therefore provides cost-effective, efficient and peer-reviewed access to major facilities in the UK, primarily at the CCLRC Rutherford Appleton (RAL), Daresbury (DL) and Chilbolton (CL) Laboratories, and also at international laboratories including ILL and the ESRF at Grenoble. Over 10,000 users access these facilities per year.

2. CCLRC currently employees 1,750 staff, distributed primarily across eight scientific and technical Departments:

- Synchrotron Radiation.
- Computer Science and Engineering.
- Space Science and Technology.
- Central Laser Facility.
- Business and Information Technology.
- ISIS—Pulsed Neutron Radiation Source.
- Particle Physics.
- Engineering and Instrumentation.

COMMENTS

3. The CCLRC’s role in climate change is working and leading on major national and international research projects by:

- Providing technical expertise.
- Undertaking instrument development.
- Undertaking modelling and simulation.
- Providing data analysis and hosting data storage facilities.
- Developing metadata and data management.
- Developing access methodologies and security.

4. Working through Space the Science, Business and Information Technology and Computer Science and Engineering Departments, the CCLRC works on monitoring climate change through a number of national and international projects. The Council also works on projects with the Tyndall Centre and the UK Energy Research Centre. All these projects underpin the data capture required for the long-term monitoring of atmospheric content in line with the Kyoto Protocol. It is essential for understanding climate change that funding is available for capturing, monitoring, storing and simulating meteorological data.

5. What follows is an overview of some of the activities the CCLRC is involved in, which are essential in providing the data and simulations for monitoring climate change. The projects are funded through a variety of organisations, such as Defra, NERC, European Space Agency (ESA) and the Organisation for the Exploitation of Meteorological Satellites.

⁹⁴ <http://www.bbsrc.ac.uk/science/areas/af/priorities/ibss.html>

*The Along Track Scanning Radiometer (ATSR) Programme*⁹⁵

6. The ATSR instruments produce infrared images of the Earth at a spatial resolution of one kilometre. The data from these instruments provide information for scientific studies of the land surface, atmosphere, clouds, oceans, and the cryosphere. The programme has included the launch of three satellites since 1991, two of which are still operational. The information and images provided through these measurements, such as monitoring the sea surface temperatures, imaging deforestation and cloud formations, are used to monitor climate change.

Michelson Interferometer for Passive Atmospheric Sounding (MIPAS)

7. Atmospheric composition can be determined through the MIPAS project. The MIPAS instrument operates in the near- to mid-infrared where many of the atmospheric trace gases playing a major role in atmospheric chemistry have important emission features. MIPAS has been used extensively to:

- obtain simultaneous and global measurements of geophysical parameters in the middle atmosphere:
 - Stratospheric chemistry (ozone, water vapour, methane, nitrous oxide and nitric acid);
 - Climatology (temperature, ozone, methane, nitrous oxide);
- study the chemical composition, dynamics, and radiation budget of the middle atmosphere;
- monitor stratospheric ozone and chlorofluorocarbons.

*NERC British Atmospheric Data Centre*⁹⁶

8. The British Atmospheric Data Centre (BADC) is NERC's Designated Data Centre for the Atmospheric Sciences. BADC assists UK atmospheric researchers to locate, access and interpret atmospheric data and to ensure the long-term integrity of atmospheric data produced by NERC projects. Data suppliers include the UK Meteorological Office, the European Centre for Medium-range Weather Forecasts and NASA.

*NERC Earth Observation Data Centre*⁹⁷

9. The NERC Earth Observation Data Centre (NEODC) is the curator of NERC's airborne remotely-sensed data and of satellite data acquired by NERC from commercial sources. Data are held securely and distributed in response to customer requests. The Data Centre ensures Earth observation data acquired by NERC are managed for the environmental research and survey community.

10. The NEODC acts as a portal for Earth Observation data and information and also provides advice and guidance on matters of copyright, policy and strategy with regard to NERC Earth Observation data resources.

*NERC DataGrid*⁹⁸

11. The NERC DataGrid, hosted by the CCLRC, allows grid-based visualisation services to access a wide variety of data held at the BADC and the British and Oceanographic Data Centres⁹⁹, as well as on individual storage systems belonging to groups which register their data with the NERC DataGrid. The NERC DataGrid supports specific datasets within the meteorological and oceanographic community. The technology is extensible and is designed to allow appropriate data which are held across all the NERC disciplines to be available via the NERC DataGrid.

Millimetre-wave Airborne Receiver for Spectroscopic Characterisation of Atmospheric Limb—Sounding (MARSCHALS)

12. MARSCHALS measures gaseous components of the Earth's atmosphere from high altitude in the Upper Troposphere/ Lower Stratosphere (UTLS). This is a major focus for atmospheric research due to the importance of this region to climate radiative forcing, stratosphere/troposphere exchange, stratospheric ozone depletion and tropospheric chemistry. In response to a growing need for information about the UTLS, ESA has defined a programme to develop and deploy MARSCHALS.

⁹⁵ www.atsr.rl.ac.uk

⁹⁶ <http://badc.nerc.ac.uk/home/>

⁹⁷ <http://www.neodc.rl.ac.uk/>

⁹⁸ <http://ndg.nerc.ac.uk>

⁹⁹ <http://www.bodc.ac.uk/>

*Molecular Spectroscopy Facility (MSF)*¹⁰⁰

13. The MSF at the CCLRC enables researchers to simulate atmospheric events and gases to look at their potential global warming effects, and is available to UK and international customers for a wide range of scientific research and development applications. The Facility offers world-class scientific equipment combined with scientific and technical support from qualified and experienced staff. The MSF aspires to meet the needs of academic and industrial researchers by:

- operating in the far-infrared, mid-infrared, near-infrared, visible and ultraviolet regions of the spectrum;
- measuring absorption, extinction, reflectance and emission spectra; and
- studying solid, liquid, aerosol and gaseous samples.

*The High Resolution Dynamics Limb Sounder (HIRDLS)*¹⁰¹

14. The HIRDLS instrument is an international joint development project between the USA and UK and was launched on the 15 July 2004. HIRDLS is a multi-channel limb-viewing infrared radiometer for high-resolution monitoring of upper tropospheric, stratospheric, and mesospheric temperature, trace chemicals, and geopotential height gradients. These are the key elements that are needed to understand the chemistry and dynamics of those regions, including the roles of planetary and gravity waves in transporting and mixing radiatively and chemically active species that are important to climate change.

The Global Ozone Monitoring Experiment (GOME)

15. The GOME¹⁰² instrument is onboard the ESA satellite ERS-2 and is a moderate resolution spectrometer which measures the radiation reflected and emitted by the Earth. From this information it is possible to infer, to various degrees, the distribution of different trace gases within the atmosphere. In particular, the work of the CCLRC, funded by NERC, has been retrieving the vertical distribution of ozone in both the stratosphere and troposphere. GOME is the first satellite instrument which is able to do this on a global scale.

16. Following the success of GOME, an improved instrument, GOME-2¹⁰³, is intended to provide a continuous record of global observations from 2006–20, designed to measure the total column and profiles of atmospheric ozone and the distribution of other key atmospheric constituents. GOME-2 will measure the radiance back-scattered from the atmosphere and the surface of the Earth in the ultraviolet and visible range. Although designed primarily for the measurement of profiles of atmospheric ozone, the instrument detects and measure several atmospheric trace gases. These include nitrogen compounds, halogen compounds and sulphur dioxide. Furthermore, the wide wavelength coverage permits monitoring of aerosols and polar stratospheric clouds.

Scanning Imaging Absorption spectroMeter for Atmospheric CHartographY (SCIAMACHY)

17. SCIAMACHY is a limb (horizon) and nadir viewing instrument which provides global measurements of trace gas concentrations in the troposphere and stratosphere. The instrument, an imaging spectrometer, scans the atmosphere between the Earth's surface and an altitude of about 90 km (56 miles) and can detect a range of trace gases, aerosols, cloud height and coverage. The data captured are important for a number of important environmental issues such as the emissions of greenhouse gases, the amount of industrial pollution and the role of natural atmospheric processes such as volcanic eruptions and forest fires in the changing composition of the atmosphere and cloud coverage.

*EARTHSHINE*¹⁰⁴

18. EARTHSHINE will be the UK's first deep-space mission and will use small satellite technology at large distances from the Earth. It is a novel concept for a low-cost, fast, responsive project that builds on the UK's past involvement in small satellite development. EARTHSHINE will make a unique set of observations that are vital to a wide variety of scientific disciplines. By carrying just four instruments, each carefully designed to combine with the other three, it will answer key questions about how Earth's climate and space environment are influenced by the Sun—questions that have vital social, political and financial as well as scientific importance.

¹⁰⁰ <http://www.ssd.rl.ac.uk/msf/access.htm>

¹⁰¹ <http://www.ssd.rl.ac.uk/hirdls/>

¹⁰² <http://earth.esa.int/ers/gome/>

¹⁰³ <http://www.eumetsat.de/en/index.html?area=left2.html&body=/en/area2/brochures/eps/EPS—info-sheets/EPS14.html&a=210&b=1&c=200&d=200&e=0>

¹⁰⁴ <http://www.ssd.rl.ac.uk/EARTHSHINE/earthshine.html>

*Her Majesty's Nautical Almanac Office (HMNAO)*¹⁰⁵

19. HMNAO is based within SSTD at the CCLRC. HMNAO is responsible for producing the annual volumes of The Astronomical Almanac, The Nautical Almanac, Astronomical Phenomena, The Star Almanac and The UK Air Almanac in the United Kingdom. Several of these publications are produced in collaboration with our colleagues at the US Naval Observatory.

20. HMNAO also produces astronomical data suitable for a wide range of users, including professional and amateur astronomers, mariners, aviators, surveyors, the armed forces, lawyers, religious groups, architects, schools, diary and calendar publishers, photographers and film crews.

Annex 3

Memorandum from the Engineering and Physical Sciences Research Council (EPSRC)

BACKGROUND

1. The Engineering and Physical Sciences Research Council (EPSRC) is the main UK government agency for funding research and training in engineering and the physical sciences, investing around £500 million a year in a broad range of subjects—from mathematics to materials science, and from information technology to structural engineering.

2. The Council operates to meet the needs of industry and society by working in partnership with universities to invest in people, scientific discovery and innovation. The knowledge and expertise gained maintains a technological leading edge, builds a strong economy and improves people's quality of life.

3. The work of EPSRC is complementary to other research investors including other Research Councils, government agencies, industry and the European Union. The Council actively engages in and encourages partnerships and collaborations across disciplines, boundaries and the world.

4. EPSRC also actively promotes public engagement in science, engineering and technology.

COMMENTS

5. EPSRC, in conjunction with other Research Councils and other partners has developed a portfolio of research which includes activities driven by climate change challenges. For example:

- EPSRC, in collaboration with the UK Climate Impact Programme (UKCIP) funded by Defra, has assembled a £3.2 million portfolio of research into the potential long-term impacts of climate change on the built environment, transport and utilities in the UK.
- Sponsorship, with the Carbon Trust, of the Carbon Vision programme. This £14 million programme will support research into low-carbon technologies. The first £5.4 million consortia, Building for Low Carbon Communities, will start in autumn 2004; it aims to demonstrate how carbon emissions from the UK building stock can be reduced by 50% by 2030, and to act as a catalyst for action to achieve these savings.
- The EPSRC SUPERGEN programme, described in the introductory text.
- The Research Councils' Towards a Sustainable Energy Economy Programme, with NERC and ESRC, and UK Energy Research Centre.
- In collaboration with NERC and ESRC, EPSRC also contributes £3.75M to the overall budget of £10 million over five years for the Tyndall Centre.

7. For further information on EPSRC support for energy research please see the newly-published EPSRC Briefing on Energy Research available at: <http://www.epsrc.ac.uk/Content/Publications/Other/BriefingNote8Energy.htm>

Annex 4

Memorandum from the Natural Environment Research Council (NERC)

BACKGROUND

1. The Natural Environment Research Council (NERC) funds and carries out impartial scientific research in the sciences of the environment. NERC trains the next generation of independent environmental scientists. Its priority research areas are: Earth's life-support systems, climate change and sustainable economies.

2. NERC's research centres are: the British Antarctic Survey (BAS), the British Geological Survey (BGS), the Centre for Ecology and Hydrology (CEH) and the Proudman Oceanographic Laboratory (POL). NERC also works with 15 collaborative centres¹⁰⁶.

¹⁰⁵ <http://www.nao.rl.ac.uk>

¹⁰⁶ www.nerc.ac.uk

COMMENTS

3. The Committee will recall NERC's submission earlier this year to its inquiry into "Climate change and water security". On that occasion, NERC's evidence included input from BGS, CEH and the Tyndall Centre for Climate Change Research. On this occasion, the Tyndall Centre is submitting evidence separately, and the purpose of this Annex is mainly to highlight other relevant programmes supported by NERC.

4. NERC's strategy document "Science for a Sustainable Future 2002–07"¹⁰⁷ sets out three priority areas, one of which is "Climate change—predicting and mitigating the impacts". Earlier this year, NERC's Science and Innovation Strategy Board identified six priority themes for potential future investment¹⁰⁸, one of them again being "Climate Change" (focusing on solar variability and the role of aerosols), and others also being relevant, for example "Environment and Health" and "Sustainable Water Management". NERC continues to support the programmes referred to in our evidence to the earlier inquiry, including COAPEC (Coupled Ocean-Atmosphere Processes and European Climate) and RAPID (Rapid Climate Change).

5. Other NERC programmes¹⁰⁹ which are contributing to our knowledge about the earth system and climate change include Core-Strategic Measurements for Atmospheric Science (COSMAS), Clouds, Water Vapour and Climate (CWVC), Quantifying and Understanding the Earth System (QUEST), the UK Surface-Ocean/Lower Atmosphere Study (SOLAS), and the Upper Troposphere—Lower Stratosphere Ozone Programme (UTLS OZONE). Many of them involve the NERC Centres for Atmospheric Science (NCAS), including the British Atmospheric Data Centre (BADC) mentioned in Annex 2 at paragraph 8. The work of NCAS is complemented by that of other Collaborative Centres such as the Centre of Observation of Air-Sea Interactions and Fluxes (CASIX) and the Centre for Terrestrial Carbon Dynamics (CTCD).

6. NERC also supports research into renewable energy through its coordinating involvement in the cross-Council Towards a Sustainable Energy Economy (TSEC) Programme¹¹⁰, as part of which it has been instrumental in setting up the UK Energy Research Centre (UKERC)¹¹¹. It is also involved in EPSRC's SUPERGEN initiative. These programmes and initiatives are described in the introductory text.

7. All the NERC Research Centres have research programmes looking at issues relevant to climate change. The BGS programmes include: Coastal Geoscience and Global Change, and Sustainable Energy and Geophysical Surveys; the latter includes study of the potential of carbon sequestration. One of the BAS programmes examines past climatic changes to provide data which can be used to test the validity of climate-prediction models¹¹². CEH's programmes include "Climate Change", "Water" and "Sustainable Economies"¹¹³, and POL has particular expertise in the relationship between climate and sea levels¹¹⁴.

8 October 2004

Memorandum submitted by Greenpeace (U40)

INTRODUCTION

1. Greenpeace thanks the Environment Food and Rural Affairs Select Committee for the opportunity to contribute to their review of the policies of the United Kingdom Government to address the challenge of climate change, and also the Government's activities in the international arena to drive forward the international response to the issue.

2. Greenpeace is an independent non-profit global campaigning organisation that uses non-violent, creative confrontation to expose global environmental problems and their causes. We research the solutions and alternatives to help provide a path for a green and peaceful future.

3. Our submission examines the opportunities for alternatives to carbon fuels and concludes that the fiscal regime for energy production needs to support the development and use of renewable energy, while carbon sequestration and nuclear power do not have the potential to combat serious climate change. Sequestration and nuclear are needless distractions in the climate change debate. The UK Presidencies of the G8 and EU in 2005 offer immense opportunities for advancing climate change policy internationally.

4. While the review of the UK Government Climate Change Programme has been scheduled for some time, recent developments in both the areas of climate politics and climate science makes this review especially significant. The decision of the Russian Government to forward the Kyoto Protocol to the Duma for ratification, as well the Prime Minister's renewed commitment to take action on climate change add to the urgency of the review both in the global and the national context. Russian ratification will mean that the protocol will come into force and the 11th meeting of the parties will also be the first Conference of the Parties of a legally binding protocol to reduce emissions of greenhouse gases.

¹⁰⁷ <http://www.nerc.ac.uk/publications/strategicplan/stratplan02.pdf>

¹⁰⁸ <http://www.nerc.ac.uk/funding/currentscipriorities.shtml>

¹⁰⁹ <http://www.nerc.ac.uk/funding/programmes/>

¹¹⁰ <http://www.nerc.ac.uk/funding/programmes/sustenergy/tsecao2.shtml>

¹¹¹ <http://www.ukerc.ac.uk/>

¹¹² <http://www.antarctica.ac.uk/BAS—Science/index.html>

¹¹³ <http://www.ceh.ac.uk/science—topics/>

¹¹⁴ <http://www.pol.ac.uk/home/research/>

5. In the meantime, the renewed and intensifying interest of the Prime Minister in climate change is reflected in the activities of the Government's Chief Scientific Adviser, who has publicly indicated that climate change is a "greater threat than global terrorism"¹¹⁵. In his recent speech on climate change the Prime Minister robustly expressed his strengthening views on the threat of climate change: he described it as "a challenge so far-reaching in its impact and irreversible in its destructive power, that it alters radically human existence"¹¹⁶.

6. What is the extent of this threat? The history of the political processes to mitigate human impact on the climate has been dogged by two significant failures: the first is the failure to engage effectively the United States in the multilateral process to reduce carbon emissions (we will return to this challenge later in this document). The second challenge has been to define adequately "dangerous climate change". This is the objective of the United Nations Framework Convention on Climate Change, as expressed (but not defined) in article 2.¹¹⁷

7. The ongoing work of the Intergovernmental Panel on Climate Change (IPCC) has however increased the global understanding of the causes and impacts of climate change. While a global political consensus on what constitutes dangerous interference with the climate system may still be some way off, both the European Union as a whole and Margaret Beckett, the UK Secretary of State for Environment Food and Rural Affairs¹¹⁸ have accepted a definition of dangerous climate change. Accepting such a definition effectively sets a cap on global emissions¹¹⁹.

8. Global average mean surface temperature increases must be kept below the threshold of 2°C above pre-industrial levels and reduced as fast as possible thereafter. To exceed this threshold would have dramatic implications for people, ecosystems and species across the world.

9. An increase of just 2°C could, by the 2050s, result in an additional¹²⁰:

- 228 million people at risk from malaria;
- 12 million at risk from hunger as crop yields fall;
- 2,240 million at risk from water shortages, particularly in the sub-tropics; and
- 20 million at risk from coastal flooding.

10. To stay within this 2° limit, dramatic reductions in emissions of carbon dioxide and other greenhouse gases from the developed world are necessary: reductions in the order of 30% need to be achieved by 2018. While this target is ambitious, it does fit within the context of another ambitious target identified by the Royal Commission on Environmental Pollution (RCEP) already endorsed by the Government in the Energy White Paper of 2003.¹²¹ The RCEP has identified a doubling of atmospheric carbon as the limits of acceptable human impact on the climate. While this represents a target that may exceed the 2° limit (depending on climate sensitivity), the emission cuts required to achieve such an objective are similar: such a target will "imply a reduction of 60% from current annual carbon dioxide emissions by 2050 and perhaps of 80% by 2100".¹²² Such reductions indicate the inadequacy of the current Kyoto protocol commitment to reduce emissions from the developed world by just 5.2% by 2012.

11. The UK Government has been proud of its position as a "market leader" in the global political process to protect the climate. The role of the UK government in the negotiation of the Kyoto protocol in 1997 and the current UK Climate Change Programme¹²³—designed to produce emissions reductions of 20% by 2010 (a commitment beyond the call of Kyoto) have been used by Government to justify this claim. While this positioning around the issue of climate change is welcome, an examination of current performance raises serious questions about the capacity of the UK to meet its obligations on climate change. In this context the review of the UK Climate Change Programme is not just a timely opportunity but necessary for a fundamental re-assessment of UK action on climate change.

¹¹⁵ King, David A. 9 January 2004. In: Science: Policy Forum: Climate Change Science: Adapt, Mitigate or Ignore. Vol 303, p 176–177.

¹¹⁶ Speech by Prime Minister The Rt Hon Tony Blair, MP 14 September 2005 to Prince of Wales' Business and Environment Programme. <http://www.number10.gov.uk/output/page6333.asp>

¹¹⁷ <http://unfccc.int/resource/docs/convkp/conveng.pdf>

¹¹⁸ iv—Speech from Margaret Beckett to the Earth Institute, Columbia University—May 2004. <http://www.defra.gov.uk/corporate/ministers/speeches/mb040503.htm>

¹¹⁹ The relationship of global average temperature rise and total global emissions is complex, in part because of climate sensitivity—the sensitivity of the temperature to rising levels of carbon in the atmosphere. However the IPCC TAR (is this true?) is robust enough in its understanding of this relationship to identify the 2° threshold as the basis for future action. http://www.grida.no/climate/ipcc_tar/

¹²⁰ "Millions at risk: Defining critical climate change threats and targets"—Jackson Environment Institute—Parry and Livermore, 2001.

¹²¹ DEFRA 2003. The scientific case for setting a long-term emission reduction target (paper published 24 February 2003 to accompany the Energy White Paper). <http://www.defra.gov.uk/environment/>

¹²² Royal Commission on Environmental Pollution 2000. The 22nd Report. Energy: the Changing Climate. London.

¹²³ Department for Environment, Food & Rural Affairs 2000. *Climate Change The UK Programme*. November, 2000.

12. Emission trends within the UK are not promising for meeting the challenging future emissions reductions necessary to avoid dangerous climate change. Even meeting the self-imposed target of 20% carbon reduction by 2010 is not assured. Reductions since 1990 have been achieved largely because of the switch of electricity generating capacity to gas from coal fired stations. Other sectors have not been as successful in exploiting potential reductions in emissions, and UK performance on climate change and related issues must be considered in this context.

13. The list of areas where UK aspiration must be higher is significant. The failure to exploit the huge potential resource of energy efficiency, a moratorium on new gas stations, the slow progress in developing wind power (and other renewable energy resources) in the UK, combined with the failure to control the growth in the road and air transport sectors has meant that UK carbon emissions actually rose from 2002–03.¹²⁴ At the same time, the UK must be robust when considering some of the huge potential opportunity costs in the climate change policy area. In this context it is important to examine the real potential of the nuclear industry to play a role in responding to climate change as well as the relatively new issue of carbon sequestration.

14. The Prime Minister has set out an ambitious agenda for UK leadership in all areas of climate change. The UK Climate Change Programme can potentially deliver enormous social and economic benefits in the medium term for the UK—based on exploiting both the UK's abundant renewable energy resources and the capacity within the UK for industrial and business innovation and delivery. The aggressive pursuit of this sector could deliver significantly to job creation and industrial development, but little has been done so far to develop that potential.¹²⁵

15. The Prime Minister has also laid out an ambition to take a lead in the international community, both at the EU and G8 level. Realising these ambitions will not be easy, and will require significant investment of both financial and political capital. But in addition to committing appropriate resources to meet this challenge, the Prime Minister and the Government will need to assess the political and social challenges presented by climate change.

16. To be successful in leading both the G8 and EU processes over the next year:

- The UK must aggressively pursue domestic reduction targets, as well as laying the groundwork for future ambitious cuts into the second decade of the century.
- At the G8, the UK must ensure agreement on a definition of dangerous human interference with the climate (as required by the UNFCCC)—and go far beyond the demands of the Kyoto Protocol. This must be a commitment to limit global warming to 2 degrees above pre-industrial levels, linked to emission reductions that will meet that objective. The G8 can't (and in any case should not) determine the future emissions of the developing world, but can provide resources to make sure that everything possible to promote development there without making the climate situation worse.
- The UK must commit to ensuring EU leadership—both at the G8 meeting and throughout the EU presidency following the G8 meeting—on climate issues. Successful action on climate change is dependent upon engaging the United States—the largest emitter of greenhouse gases, with a relatively small percentage of global population—in the political and technical processes that will address the challenges of climate change. This will only be possible if the EU is robust in response to ongoing US refusal to reduce its emissions of greenhouse gases and to engage the global political processes responding to climate change.

17. Additionally, Greenpeace would like to submit analysis of and recommendations for several specific areas of UK climate and energy policy:

- Renewable Energy—an overview of potential pathways (paragraphs 20–40).
- An examination of the role nuclear energy in responding to climate change (paragraphs 41–58).
- The implications and drawbacks of dependence on carbon sequestration technology (paragraphs 59–62).

18. It is now almost a truism that climate change is the most challenging and potentially catastrophic environmental problem facing the world. It is also an opportunity for genuine leadership from the UK in political and commercial/industrial terms. The most pressing question now faced by the UK is how we address that challenge and whether or not we make the most of the opportunities that are part of that challenge.

19. Energy generation within the UK is at a crossroads. In order to make our contribution to keeping the global temperature increase below two degrees, we have a limited period in which to undertake the radical overhaul of UK energy generation required to reduce carbon emissions at the rate and extent necessary without jeopardising security of energy supply.

¹²⁴ DEFRA 2004. Statistical release: 2002 UK air emission estimates and climate change sustainable development indicator. <http://www.defra.gov.uk/news/2004/040325a.htm>

¹²⁵ Find attached as an annex to this submission, two Greenpeace reports: Seawind East and Seawind Europe on the potential for job creation and economic development and the renewable energy industry.

20. The following comments must be viewed in light of the lack of development in other sectors where significant carbon reduction potential remains untapped. Government efforts to implement an effective programme of demand reduction in both domestic and commercial sectors, as well as future action to curb increases in emissions from both aviation and road transport will have an impact on the scale of intervention necessary in the electricity generation sector. If there is a massive uptake of energy efficiency measures combined with significant reductions in transport emissions, the burden of action on electricity generation will be reduced. To date action on both demand reduction and transport has been extremely limited, so the bulk of cuts in greenhouse gas emissions will continue to fall on the electricity supply sector.

RENEWABLE ENERGY: AN OVERVIEW OF POTENTIAL PATHWAYS

21. The UK boasts possibly the best renewable resources of any country in Europe. By exploiting just 15% of the total offshore wind strategic resource identified by the DTI¹²⁶, energy equivalent to the UK's entire electricity needs could be generated. Factors influencing whether or not we will meet the Government's renewable energy targets of 10% by 2010 and the aspirational target of 20% by 2020 (which hardly reflect the scale of the task ahead) do not concern the scope of potential. The potential is vast. The barriers that stand in the way are a series of inter-related social, regulatory, technical and economic problems. The key to unlocking these barriers remains concerted political action that takes a long-term view of how a sustainable energy system can be achieved.

22. After the failure of the Non Fossil Fuel Obligation to foster greater renewable development, the Government has made some efforts to improve the deployment of renewables. The introduction of the Renewables Obligation (RO), as well as increased funding for Research & Development and capital grants schemes have gone some way to increasing the ability of generators to build new renewable energy capacity.

23. However, looking further ahead there are significant barriers to the renewables industry meeting the challenge of climate change. The measures taken have served to sustain the status quo that favours large generating utilities over smaller more independent generators that do not have a diverse portfolio or an integrated supply chain to protect them against a volatile electricity market. Also, the emphasis on costs within the RO has only really served to increase the divide between the commercial viability of onshore wind (and landfill gas, supply of which is not likely to significantly increase) and other technologies struggling to become established.

24. As a result, action taken to date is failing to support the development of a diverse range of renewable technologies argued for in the Energy White Paper and which will be needed to achieve the target of 60% carbon reductions by 2050.

RECOMMENDATIONS

25. In order to achieve a sustainable generation mix that offers a diverse, flexible and secure energy supply, the Government must move as quickly as possible to a genuinely radical approach to develop an energy system based on smaller more dispersed generating units. Such action might include:

26. Redeveloping the UK transmission/distribution grids both to support micro generation and major renewables centres. Grid investment needs to take place now to upgrade the transmission grid and distribution network for use in the long term by a variety of sustainable renewable energy sources that offer safe and secure energy. Areas rich in renewable potential, such as the West Coast of Scotland, require grid development where access is currently inadequate. Development of new grid connections that link the source of primary renewable energy such as offshore wind to demand is expensive for individual developers but may represent good public value and an exceptional economic opportunity in the longer term.

27. The current grid is not suitable for the kind of diverse energy mix necessary to meet the demands of climate change. The centralised model is outdated and does not represent the optimum model of supply and distribution. In particular a sustainable energy system should foster more decentralised centres of production, which enables heat capture and which is supportive of the characteristics of renewable technologies. Households (and businesses) should be enabled to become small scale generators themselves, which will require Distribution Network Operators radically to transform their business model to one of active, rather than passive, managers of local distribution networks. Greenpeace particularly regrets the lack of emphasis given to facilitating decentralised energy and microgeneration, given the high political priority currently placed on the Sustainable Communities agenda. There are now also strong security drivers for a more decentralised energy model, both in terms of delivering inherent network security and reducing overall dependence on fossil-fuel supplies.

¹²⁶ Robert Gross "Technologies and innovation for system change in the UK: status, prospects and system requirements of some leading renewable energy options" Energy Policy—November 2004.

RESEARCH AND DEVELOPMENT

28. A significant increase in research and development must take place if renewables are to become the mainstay of UK energy generation in the future. Although there has been a significant increase in renewable funding from Government over the last few years, expected R & D funding from the DTI from 2003–06 is still less than £60 million¹²⁷. Compare this to the £5 billion that will be provided to the UK's failed private nuclear generator over the next 10 years to pay for its waste and decommissioning legacy. In this context, renewable energy is severely under-supported.

29. In order to assist developing renewables, we would also advocate amendments to the RO and possible additional mechanisms, such as:

30. Developing mechanisms outside the RO to assist the technologies other than onshore wind that are not currently well supported. Particular help is needed to support sustainable heat production, given heat is the primary energy use in the UK, and could possibly take the form of a heat obligation similar to the existing RO. Greenpeace believes a feed-in tariff or net metering may be required to expedite the growth in micro-renewables. Given the tiny proportion of micro renewables currently connected to local grids, Greenpeace believes that these costs could be readily absorbed by network operators in the short term.

31. Changing the currently uniform value of ROCs to a grading system that differentiates between the developed renewable technology of onshore wind and developing technologies like wind, wave and biomass. By re-valuing the price of ROCs to reflect the stage of development of the technology that generated the power, the Government will be fostering an environment of "learning by doing" in that a developing technology can take part in the market and reduce its overall cost/KWh through accelerated research and development.

32. We also see particular barriers hampering renewables in the regulatory structures outlined below:

33. The local/regional planning system : Although public acceptance of wind power continues to show high levels of public support (a recent ICM poll shows support for wind power at around 80%¹²⁸) the opposition of a vocal few continues to attract disproportionate press coverage which in turn influences local decision-makers.

34. PPS22 is a positive step towards making clear to local authorities the need to take account of the wider threat from climate change, but applications still take too long to come to a decision. In part this is because of the resource shortages planning has faced and the increasingly complex demands that sustainable development places on planners. It is important that the additional resources now being delivered by Government to improve planning performance and recruitment prove adequate. Regional spatial development strategies could be obliged to identify areas where there would be a presumption in favour of wind. This proactive planning approach would ensure community ownership is secured early on and environmentally contentious geographic areas are identified and excluded from development opportunities from the outset.

OFFICE OF GAS AND ELECTRICITY MARKETS (OFGEM)

35. Another barrier has been the narrow way in which OFGEM has interpreted its remit. Greenpeace is concerned that OFGEM's consultations are characterised by short-term cost-benefit assessments that fail to recognise both existing environmental/social costs which are currently externalised, and the immense costs to consumers posed by climate change in the longer term if emission reductions are not made now. Many of OFGEM's consultations are highly technical and engage only the "usual suspects". There is a concerning lack of vision and forward thinking at OFGEM which raises questions about OFGEM's ability to instigate the radical reconfiguration of networks and regulation required to achieve ambitious emissions reductions. Given the long term nature of investments in energy infrastructure, it is critical that OFGEM works to a longer term horizon than at present.

36. The requirements under Section 83 of the recent Energy Act 2004 (for OFGEM to pursue sustainable development for the benefit of consumers as a key part of its statutory purposes) offers the opportunity for a reinvigorated response from OFGEM to the environmental imperative.

NEW ELECTRICITY TRADING ARRANGEMENTS (NETA)

37. A further barrier to renewables has been the introduction of NETA which at one point brought wholesale prices below the cost of production, increasing the need for renewables support. NETA is designed to encourage the cheapest form of generation and does not offer any incentive to increase the efficiency of electricity production. Of particular concern to Greenpeace is the massive waste of primary energy associated with the regulatory regime's failure to value heat energy, whether wasted or captured. The plight of CHP under NETA illustrates this point. NETA has served to reinforce the dominance of the

¹²⁷ Catherine Mitchell "Renewable Energy Policy in the UK" 1990–2000 Energy Policy—November 2004.

¹²⁸ A copy of the poll can be found at <http://www.icmresearch.co.uk/reviews/2004/Greenpeace-windfarms/greenpeace-windfarms-aug.asp>

existing grid by large, wasteful centralised units of conventional generation sources in the primary energy market. This has served to undermine the effectiveness of secondary mechanisms such as the RO or carbon emissions trading scheme.

38. In addition, NETA penalises generators for generating either above or below their agreed output, which is a particular problem for variable sources of power such as wind. This adds to the risk taken when investing in intermittent renewable sources such as wind power and therefore detracts from the attractiveness of wind as an investment.

39. NETA also discourages renewable development because of the huge transaction costs involved simply to participate in the market. This means disproportionate costs are incurred by small-scale renewable generators.

CONCLUSIONS

40. The Government has made efforts to increase the capacity of renewable energy on the grid. It is imperative however that the Government remains focused on its primary motivation for bringing about this uptake in renewables. Namely, the need to combat climate change by reducing carbon emissions by 60% by 2050. The role of the energy generation sector in meeting this target has become increasingly important as effective transport and demand reduction measures have failed to materialise. As was made clear at the beginning of this submission, it is the view of Greenpeace that the barriers identified (particularly the regulatory obstacles that have come about through NETA and OFGEM) can and should be fully addressed through decisive political action from Government.

41. The Government's task therefore is not simply to encourage an increase in the capacity of renewable energy from which ever type of technology comes forward under the existing regulatory and economic parameters. Rather, it is to foster a renewables industry where a number of different technologies are capable of commercial deployment on the scale that we are currently seeing with wind power. This diverse portfolio of renewable technologies that are small scale, flexible and safely responsive to demand represents the future of sustainable energy generation in the UK. It is the responsibility of the UK Government to take the necessary steps now in order to bring about this long-term future.

NUCLEAR POWER AND CLIMATE CHANGE

42. The present discussion of new build for nuclear plants in the UK is not about utilising nuclear power to significantly offset CO₂ emissions, but to replace the current fleet of reactors in order for nuclear power to maintain its current market share in terms of electricity produced (and therefore possibly maintain the same level of CO₂ offset at present).

43. Greenpeace believes that Government should not make any intervention in the energy framework that acts as an explicit or implicit support to new nuclear power. One of the objectives of the Government White Paper is that functioning markets should be an objective of energy policy and these are completely undermined if nuclear power is given the sort of support that has been given to British Energy. Obviously Government has to have a role in regulation, safety, ensuring proper waste disposal etc but nuclear power has had 50 years of substantial government support in many countries worldwide support to develop. It is a nonsense to have functioning energy markets which are still biased by support to nuclear power. Greenpeace will oppose all new nuclear power stations for reasons of radioactive discharges, waste, and danger of catastrophic accident. But even within the Government's own terms of reference, new nuclear power should receive no support whatsoever.

44. Nuclear power provides roughly 22% of the UK's electricity and currently offsets approximately 7% of the UK's CO₂ emissions (6% of total greenhouse gas emissions). Most of the offset is achieved through operation of British Energy's reactors (which have a capacity of 9,600 MW). All but one of BE's reactors are due to close by 2020. All of BNFL's reactors will close by 2010.

45. The figure of 7% CO₂ offset from nuclear power is lower than the 9% CO₂ offset based on information in British Energy's 2001 submission to the Energy Review (which covered BE and BNFL plants). That is because the actual output from BE's reactors over the past three years has not met the company's projections.

46. By 2010, due to changes in fuel mix and nuclear plant closures, it is estimated that the CO₂ offset from nuclear power in the UK will be around 4–5%.

47. For the UK's nuclear industry to maintain a) its market share as an electricity producer and b) to act as a source of energy to offset CO₂ emissions it will have to replace its current fleet of reactors and then build many more.

48. In order to replace the existing electricity output from existing reactors BNFL/Westinghouse has proposed building a fleet of 10 AP1,000MWe (or AP1,1000MWe) reactors. The AP1000 design has yet been tested (ie constructed and operated) and is not yet licensed anywhere in the world.

49. Industry figures are based on a modular production line design specifically in order to reduce costs.¹²⁹ This carries two major risks:

- Modular design increases the risk of generic faults which—as with reactors systems in Japan and France—can lead to a lot of reactors being closed at once if a major fault is found.
- A program of reactor construction on a modular design basis—to reduce costs—would mean a significant financial commitment to an as yet untested design.

50. As can be seen below, there can be massive differences given for capital costs for reactors. Similarly, massive uncertainty exists over waste costs. This is particularly true for the UK as there is no final waste disposal route with the result there is no final cost for intermediate level waste, high level waste or spent nuclear fuel disposition.

51. Costs: The lowest cost estimates, provided by the nuclear industry, put the cost between US\$1.1 billion–\$1.5 billion per AP1,1000MWe plant.¹³⁰ The Congressional Budget Office (CBO) in the US has challenged these figures, saying that construction costs would be 60% higher than industry estimates.¹³¹

52. It should be noted that BNFL/Westinghouse claim that by the time of construction of the fourth reactor, construction costs would be significantly less than for the first and second reactors. The costs given below assume all the reactors will cost the same. Estimates should be undertaken to assess reactor costs—using both industry estimates and independent costings on unit prices for a ten reactor construction program (this should also take into account externalities of setting up production centres, staff training etc).

53. Using the currently available range of figures, based on today's prices and current exchange rates, we can however provide rough estimate the costs for a new build program:

- 10 AP1,100 reactors, to replace most of existing reactors, would entail capital expenditure of £6.14 billion–£8.37 billion (industry figures) or £9.82 billion–£13.39 billion (CBO's figures, using 60% increase over industry costs as the basis).
- 20 plants—to offset 10% of CO₂ (depending on fuel mix at the time) would cost £12.28 billion–£16.74 billion (industry figures) or £19.64 billion–£26.79 billion (CBO figures).
- To build 40 plants would cost £24.56 billion–£33.48 billion (industry figures) or £39.28 billion–£53.58 billion (CBO figures). To put this in perspective, the whole Trident missile and submarine program is estimated to have cost £30 billion.

54. A program of “only” 10 reactors would involve huge capital outlay. Private investors would not want to expose themselves to such a massive risk. Indeed, at the recent Annual Utilities Market Convention, organised by the Energy Information Centre (Birmingham, 5 October 2004), senior city analysts and market advisers said that the city would not be prepared to invest in new build and this would have to be undertaken by the Government.

55. Financial Risks: The CBO report (see Annex 3) states that there is a high risk of a company involved in construction of a new reactor defaulting on government loans, such as the amount of finance involved in capital expenditure. The CBO's concern is somewhat analogous to concerns raised by environment groups over the recently passed Energy Act, which would allow for the Government to bailout private operators if they failed to provide fully for their liabilities. Despite concerns raised by the Trade and Industry Committee on this issue, the final version of the Energy Act contained no obligation on the future private operators to fully fund their waste costs. Knowing this could lead plant builders/operators to run a plant and profit strip, leaving liabilities to be paid for by the taxpayer. New legislation would be needed (or current legislation amended) to place a legal obligation on future private operators to fully fund their liabilities before paying dividends etc.

56. CO₂ offset from the whole fuel cycle: In order to fully assess the CO₂ offset from a program of 10 new reactors calculations would have to be done on the energy needed—and CO₂ produced—from uranium mining, processing and enriching, fuel fabrication (using both fresh uranium and reprocessed uranium), reactor construction, spent fuel storage and disposal options.

57. Timing: To achieve replacement one plant would have to be built every one and half years between 2010 (when licensing may have finished) and 2025. It is expected that the first new reactor will not come on line until 2018–20. It is not known how long it would take for a replacement program of 10 reactors.

58. Radioactive waste: The industry proposal for a new nuclear fleet proposes that spent nuclear fuel arisings could remain on site with the closed reactor for up to 100 years. On sites housing a number of facilities (eg a decommissioned plant and/or an existing waste store) a new reactor could significantly add to the overall site hazard. In the case of Sizewell B, for example, where spent fuel will be stored from the

¹²⁹ *Nuclear Power and the Characteristics of “Ordinariness”—the Case of UK Energy Policy*, McKerron, NERA, September 2004.

¹³⁰ *WESTINGHOUSE EXPECTS TO RECEIVE NRC CERTIFICATION FOR ITS AP1000 ADVANCED* Platts Nuclear News Flashes 3 September 2004. This gave Westinghouse costs of US\$2.2–2.7 billion for two reactors. The International Herald Tribune, (2/9/04) “China looks abroad for nuclear help” quoted Westinghouse as giving a figure of US\$1.5 billion per reactor.

¹³¹ Congressional Budget Office Cost Estimate 7 May 2003 S 14 Energy Policy Act of 2003 As introduced on 30 April 2003 The CBO puts the cost of the first reactor at US\$2.5 billion. <http://www.cbo.gov/showdoc.cfm?index=4206&sequence=0>

current reactor, new build plus a store could significantly add to the long term risk for that site. As noted earlier, there is currently no final disposal option and, according to NIREX, it is not expected that a radioactive waste dump would be available for at least the next 25–40 years.

59. Terrorism: Apart from the risk of a major accident leading to either plant shutdown and/or serious off-site contamination, another major risk from nuclear facilities is the potential for them to be used as terrorist targets. (For more detail, please see: *Assessing the Risk of Terrorist Attacks on Nuclear Facilities* (July 2004) which contains detailed information on this issue. Greenpeace information on terrorism and the nuclear industry is referenced in the report <http://www.parliament.uk/documents/upload/POSTpn222.pdf>).

CARBON SEQUESTRATION

60. The Prime Minister has suggested that carbon sequestration—the act of capturing and storing CO₂ either below ground, on or below sea beds—is “a low carbon technology” and should be considered an environmentally acceptable method of controlling CO₂ emissions. Others have suggested that absorption by vegetation above ground or the use of techniques such as iron fertilisation of Southern Oceans or placing liquid CO₂ on the sea bed should be considered as viable options. In the first instance, the use of the environment as a dump for carbon dioxide in this way presents an unacceptable risk to already threatened environments; and does so with no guarantee of success. Indeed in the case of “tree planting” to “absorb” carbon dioxide emissions this is a dangerous option because there is no way to guarantee long-term removal of CO₂ from the biosphere.

61. More importantly however, even technically feasible options for carbon capture cannot be described as low carbon technology. It does not reduce carbon dioxide production or replace capacity that does, unlike energy efficiency technologies or the capacity to generate renewable energy. It is in fact an imperfect “end of pipe” disposal solution to a problem that needs to be solved at a “systems” level. There is—possibly—still a real opportunity to reduce global greenhouse gas emissions. This must be done at the rate required keep global temperature increase within the 2° widely accepted as the upper limit of the climate’s tolerance before catastrophic occurs. The danger is that the pursuit of carbon sequestration at this point could prove a distraction from these fundamental challenges.

62. Significantly, applications for carbon capture and storage are limited. In the first instance, of course, it would only be applicable for fixed emissions sources, conveniently located near a suitably depleted saline water aquifer or depleted oil or gas field. (This rules out for the foreseeable future road transport or aviation, the two fastest growing areas of carbon emissions world-wide.) Further, the projected growth in demand for energy, especially in the developing world, means that dependence on carbon sequestration will lock future energy development into a conventional, fossil fuel trajectory. Every fossil-fuel power station constructed now in India means CO₂ emissions for a further 40 years. Finally there is a distinct possibility, subject to further evaluation, that capacity for carbon storage will be overwhelmed by the projected increase demand for energy services in the developed and developing world. Given the substantial uncertainties over guarantees of effective storage, an energy strategy that relied upon fossil-fuel generation coupled with carbon sequestration could be a gamble that could go badly wrong.

63. With a significant range of technical and political options to develop genuinely sustainable energy still available, governments have a duty to concentrate all resources in the design and implementation of a truly sustainable energy system. This must be based upon the speedy development of renewable energy combined with effective measures to curb energy use in all sectors. Resources spent on chasing disposal technologies such as carbon sequestration represent wasted resources, and would undermine the success of efforts to combat climate change.

12 October 2004

Memorandum submitted by the Confederation of British Industry (U42)

INTRODUCTION

1. The CBI—with a direct company membership employing over 4 million and a trade association membership representing over 6 million of the workforce—is the premier organisation speaking for business in the UK.

2. The CBI welcomes the opportunity to assist the inquiry by the Environment, Food and Rural Affairs Committee into UK climate change policy.

3. The CBI represents a broad spectrum of business in the UK, including energy producers, suppliers and users, manufacturing and financial services—all of whom are affected by policy decisions on climate change.

BUSINESS APPROACH TO CLIMATE CHANGE

4. British business takes the threat of climate change seriously and recognises its responsibility, with other sectors, to help tackle the problem. Business has already made a significant contribution to the UK’s achievement of its Kyoto target—both through technical energy and carbon efficiency improvements and through specific measures and policies introduced under the climate change programme.

5. The CBI believes that more can be done to improve the carbon efficiency of business, but Government must work to develop the most cost-effective programme of climate change policies and measures, involving all sectors.

6. Business wants to participate fully in developing the programme of policies and measures that reduce risks associated with climate change. Equally, our members are deeply concerned that this should be done in a way that not only maximises environmental benefit, but does not harm their competitiveness.

7. As such, we are keen to work with Government in its review of UK climate change policies and measures to help deliver a programme that:

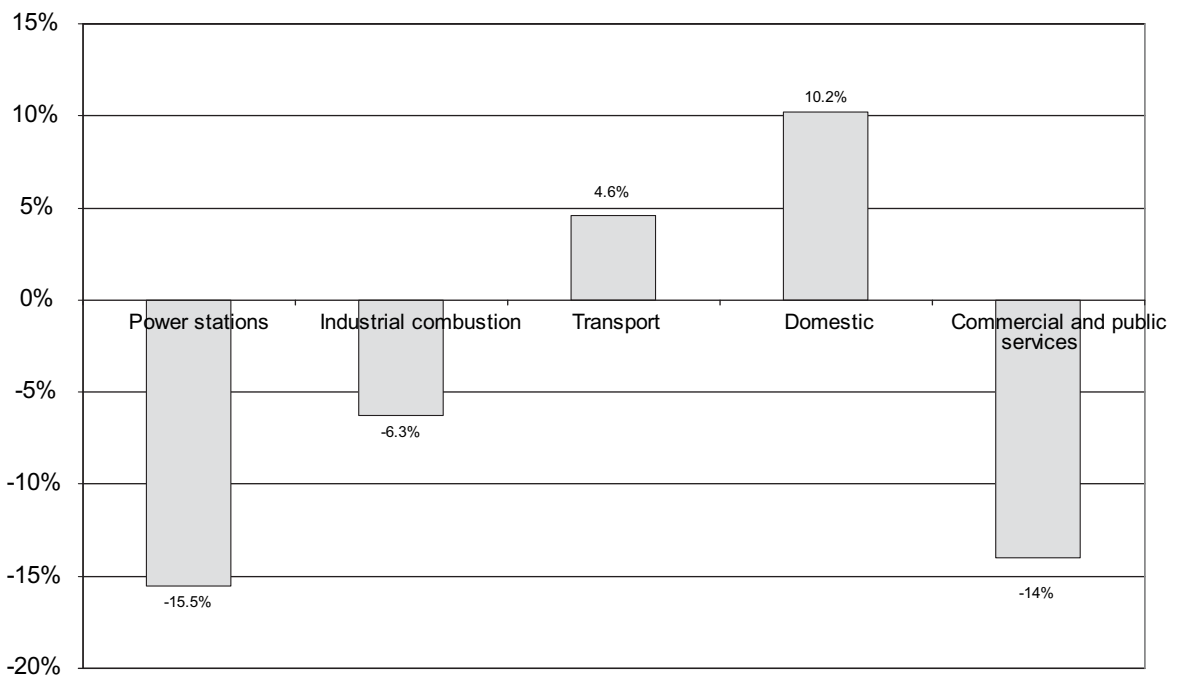
- is cost effective in both the short and long term;
- reflects the global nature of the impacts of and responses to climate change;
- ensures that all actors, nationally and internationally, play their part in full;
- ensures that the potential burden of meeting the UK target does not fall disproportionately on business; and
- gives appropriate recognition to action already taken by business to address climate change.

BUSINESS HAS BEEN A KEY PLAYER TO DATE

8. Business, including power generators and industry, has made a significant contribution to emissions reductions in recent years. Between 1990 and 2003:

- CO₂ emissions from power stations fell by 15.5% against a background of increased demand for electricity (approximately half of which was due to improvements in efficiency and technology, the remainder from switching from coal to gas and nuclear);
- industry cut its CO₂ emissions by more than 6% while increasing output by 8%, while emissions from the commercial and public services sector also fell; and
- CO₂ emissions in the domestic and transport sectors, by comparison, have risen by 10.2% and 4.6% respectively.

Percentage change in CO₂ emissions by sector between 1990 and 2003 (Source: DTI, Energy – Its impact on environment and society – 2004 update)



(Source: DTI, Energy—Its impact on environment and society—2004 update)

BUSINESS IS ALREADY SET TO DELIVER FURTHER EMISSION REDUCTIONS

9. Under the existing climate change programme published in 2000, the UK is due to exceed its Kyoto commitment, largely due to the action of businesses as energy users and providers (eg through core policies such as the CCL and delivering the Government's renewable energy target).

10. Business in general, energy suppliers and agriculture are projected to deliver cuts of over 39MtC in the period 1990–2010 as a result of core policies identified in the programme. Domestic emissions are due to remain static as a result of such policies, while transport emissions would increase significantly, resulting in an overall net reduction in UK greenhouse gas emissions of some 15% (compared with the Kyoto target of 12.5%).

11. The programme also identifies further measures aimed at taking the UK towards the Government's more stringent aspiration of a 20% cut in CO₂ emissions alone. Over three-quarters of these additional cuts are accounted for by five policy measures, with business responsible for delivering a significant element of these either directly (eg through Climate Change Agreements and emissions trading) or indirectly (eg energy companies' role in promoting domestic energy efficiency).

BUSINESS RECOGNISES THAT MORE WILL NEED TO BE DONE

12. The CBI recognises that British business has a role to play alongside others, nationally and internationally, both to consolidate the progress being made during the Kyoto period and to deliver reductions in the years after that:

- transport consumes more energy than any other individual sector (including industry and services). Business as a major transport user is already doing much in this area (eg through improved operational efficiencies in freight and changes in the composition of the company car fleet apparently stimulated by tax changes) but—as with other transport users—will be expected to continue delivering emission reductions;
- the forecast growth in emissions from air transport poses particular challenges. UK aviation companies are in the forefront of efforts to integrate this sector into the EU emissions trading scheme from 2008; and
- while industrial energy consumption has fallen since 1990, energy use in the private commercial sector has risen by 14% and is set to continue rising. Although the service sector as a whole accounts for less than a half of current industrial energy use and less than a third of that used by transport, there is likely to be considerable scope to promote energy efficiency in this area.

BUT IMPORTANT BUSINESS CONCERNS REMAIN

13. Policies to combat climate change may have some positive effects on business, not only in mitigating the costs that would otherwise arise, but also in creating new commercial opportunities in the provision of environmental goods and services. But many CBI members are also very concerned that emissions reduction measures aimed at UK business may affect their competitiveness by imposing costs which are either greater than they should be or not shared to the same extent by rival firms based overseas.

14. The overall competitive position of British firms will depend on a range of factors, but with general business profitability and investment currently at lower levels compared with the relevant point in the last economic cycle, there is particular sensitivity to any initiatives which risk generating additional costs. Concerns focus on the following dimensions:

- the extent to which other countries are committed to cutting greenhouse gas emissions. The CBI recognises the UK government's goal of showing global leadership in tackling climate change. Equally, there is a need to be realistic about what the UK alone can achieve given that we generate some 2% of global emissions. An ambitious UK programme of reductions could generate significant costs to the economy with little overall environmental benefit if not matched by similar efforts elsewhere in the world. It is worth emphasising that while the Government's Energy White Paper suggested that there would be a small cost to the economy from pursuing a 60% in CO₂ emissions by 2050, this was explicitly based on the assumption that the world's leading industrial nations act together;
- how far businesses based overseas are expected to contribute to other national climate change programmes. With some exceptions, eg the UK, the Ecofys study demonstrates that in most member states the caps imposed on industry participants in the EU emissions trading scheme are less strict than would be required if these sectors were to make an equal contribution to meeting Kyoto as other sectors or if no use of the Kyoto mechanisms was envisaged; and
- the economic rigour underpinning the mix of policies and measures in the UK climate change programme. The existing programme identified potential for additional emissions savings from business, but provided little quantification of the impacts or cost-effectiveness of pursuing these options compared with pursuing further options in other sectors. With the domestic sector

currently accounting for 30% of energy use, yet a significant emphasis on measures through which business will deliver additional savings, there is a question about how far the programme has adequately identified the most cost-efficient set of measures.

The review of the UK programme needs to result in a well-conceived strategy

The Government's intention shortly to review its climate change strategy is a welcome opportunity to establish how best British business can play its part alongside others in tackling climate change while continuing to deliver economic growth. The CBI will be developing its views in this field during the forthcoming consultation process, but we are particularly keen that the review should address the following key issues:

Strengthening the global response to climate change. The CBI has been encouraged by the recent steps towards Russian ratification of the Kyoto Protocol, which we believe is good news for both companies and the environment. However, we remain concerned that significant trading partners in the USA, China and India do not yet have international commitments to reduce their emissions. This both potentially results in a competitive advantage for businesses operating in these countries and fails to cover some of the most significant sources of global greenhouse gas emissions. We therefore very much welcome the Prime Minister's recent stated intent to use the UK G8 Presidency in 2005 to make progress on this issue;

Improving the EU response to climate change. An immediate priority is to ensure that there is equivalence of effort between business sectors in different member states for those firms covered by the EU emissions trading scheme. There is also a key opportunity for the UK's Presidency of the EU in 2005 to ensure that the review of EU climate change strategy results in a cost-effective programme of policies shared between business, individuals and other sectors, and to consider an effective migration of policies beyond the Kyoto period;

Improving the assessment of costs and benefits arising from the revised UK programme. The supporting analysis for the existing programme is patchy and raises questions about how far the most cost-effective strategy for the UK as a whole has been identified. The forthcoming review should seek to evaluate the cost-effectiveness to date of existing policies and measures, with a view to developing a programme which delivers meaningful carbon reductions at the lowest cost per tonne of carbon;

Adopting a sophisticated approach to the contribution which can be made by business. The record to date of business in reducing emissions varies in different ways, for example, by sector (eg manufacturing compared with services), within sectors (eg some parts of retail compared with other service sectors) and by size. Some parts of business have already delivered significant gains (such as energy-intensive industries which have long had a commercial interest in energy efficiency). The reviewed strategy needs to recognise the extent to which further progress is possible where reductions have already been made, and where there may be scope for new initiatives. It also needs to recognise that the drivers for action can vary by type of business and that policy needs to reflect that diversity; and

Tackling policy overlaps and gaps. Some sectors are (or will shortly be) affected by different initiatives (either within one policy field—such as emissions trading and CCL in energy policy—or between policy fields, such as in energy and transport). There needs to be an assessment of the cumulative impact of measures on the economic performance of different sectors, with a view to ensuring that no sectors are unduly burdened (particularly in the case of traded sectors competing at home and abroad with overseas firms). In other cases, the extent to which other non-climate change policies conflict with measures aimed at cutting greenhouse gases (for example, policies on vehicle manufacturing to tackle pollutants such as NO_x emissions and to improve safety add to vehicle weight and thus fuel consumption) needs to be identified and tackled. In further cases, current lack of Government clarity in relevant areas (such as the future role of nuclear power—potentially a major element of climate change policy as a non-carbon source of energy) also needs to be addressed.

15 October 2004

Memorandum submitted by Scottish and Southern Energy plc (U43)

Scottish and Southern Energy (SSE) welcomes the Committee's decision to examine the policies of the United Kingdom Government to address the challenge of climate change and also the Government's activities in the international arena to drive forward the international response to the issue. SSE values this opportunity to submit written evidence to the Committee, and apologises for the fact that this submission is late.

SSE is one of the UK's largest energy companies, with interests in the generation, transmission, distribution and supply of electricity and in the storage and supply of gas. It is the largest generator of electricity from renewable sources in the UK and has in place a £850 million programme of investment in renewable energy. Because its operations are entirely focused in the UK, this evidence will concentrate on the policy issues relevant to keep the "UK on track".

FOCUS ON THREE KEY AREAS

SSE believes that the Government policy needs to focus on three key areas in order to achieve its aim of putting the country on the path to cutting its carbon dioxide emissions—generally agreed to be the main contributor to global warming—by around 60% by 2050;

- (the maintenance and development of a positive framework for investment in existing and new renewable energy technologies;
- (the achievement of a "step change" in energy efficiency across the economy; and
- (a major reduction in the carbon dioxide emissions produced by the transport sector, including aviation, which is responsible for around one quarter of the UK's total.

As an energy company, SSE does not feel qualified to comment on transport matters, except to say that amongst its own environmental targets for 2004–05 is to reduce fuel consumption by company vehicles. More broadly, looking ahead to the period after a general election, there may be a case for consideration being given to combining transport, energy efficiency and energy policy in a single government department geared to tackling climate change.

FRAME WORK FOR INVESTMENT

With regard to the framework for investment in existing and new renewable technologies, it is clear that the Renewables Obligation has been singularly successful. It was introduced in April 2002 to incentivise generators to produce progressively higher levels of renewable energy over time. SSE's plans to invest £850 million in renewable energy stem directly from it, and it is clear that it has led to the invigoration of the market for wind power.

Against this background, it is encouraging that, in consulting on the terms of reference for its forthcoming review of the Renewables Obligation, the government has stated its wish to maintain confidence in the stability of the renewables support framework. This is vital, because financial analysts cite the legislative and regulatory framework as one of the key uncertainties associated with investment in renewable energy in the UK.

Assuming that framework is maintained or enhanced—then there is no doubt that the appetite for investment in renewable energy is there. The key question is whether there are, in fact, other growing barriers in the way of allowing that investment to take place. The most visible barrier is planning. Indeed, almost two years ago, the Energy White Paper, *Our energy future—creating a low carbon economy*, stated that many of those who responded to the white paper consultation saw planning as one of the big obstacles to new renewables.

There is a general acknowledgement that the UK has to meet its international and national statutory obligations to protect designated areas, species and habitats of natural heritage interest. Equally, there is concern that the natural heritage agencies are moving away from this point of consensus and seeking to impose greater and greater burdens on renewables developers. To ensure that the UK remains on the path to cutting its carbon dioxide emissions by around 60% by 2050, there will have to be further action to streamline and simplify the planning process for new renewable developments.

While the planning process needs to take account of natural heritage issues, and developers have a responsibility to address these issues sensitively, it is also clear that the links between renewable energy, action on climate change, and the potential impact of climate change on the UK's natural heritage need to be made much clearer.

DIFFERENT RENEWABLE ENERGY TECHNOLOGIES

An equally significant issue which has to be addressed is the fact that renewables technologies are at different stages of development. As such, some renewable technologies do require the support of a substantial programme of capital grants in order to speed up their technical and commercial deployment. At the same time, investors' current confidence in the durability of the Renewables Obligation has resulted in them investing resources in alternative renewable technologies for the medium- to long-term.

Nevertheless, the economics of offshore wind remain uncertain and the costs associated with installing capacity are significantly greater than for onshore wind. Offshore wind must, therefore, be supported with capital grants as well as through the Renewables Obligation.

Wave and tidal technologies are further away from technical and commercial deployment, but the UK has many of the qualities needed to develop a marine energy industry. Nevertheless, there is some way to go before wave and tidal technologies have completed the design, development and manufacturing processes that are necessary before they can be successfully deployed in a commercially viable way. They, too, must be supported by capital grants in addition to the Renewables Obligation. In summary, the future development of new renewable technologies will be dependent upon a sustained partnership involving companies, the Scottish Executive and the UK government.

EMISSIONS TRADING SCHEME

The first phase of the iEU Emissions Trading Scheme is scheduled to begin in January 2005, and it is intended to be a central plank of the UK's future emissions policies. It is founded on the principle that the traded carbon market can set a signal for the value of carbon reductions in the economy. The Government has made it clear that the inclusion of the electricity industry within the scope of the EU emissions trading scheme will put an incentive on electricity generators and suppliers to reduce emissions.

The Government's recent announcement about the total number of emissions to be allocated to UK industry included welcome revisions to emission factors for coal and gas. Nevertheless, the principal concern with the introduction of the EU ETS remains the process. It seems likely that the level of emissions allowances per installation will not be known until the end of February, which is a position which most people will find very difficult to accept. Put simply, the ELI Emissions Trading Scheme is all about trading, but some companies are unlikely to begin to trade before they know how many allowances they will have and hence how great a surplus or deficit they will have. This is greatly hampering the development of liquidity in the market and is limiting investment in projects aimed at reducing emissions.

As things now stand, the UK's National Allocation Plan is now 5.2% below final projections of business as usual in the UK, and the Government states that this sets a balance between the need to maintain a competitive economy and the UK's leadership on climate change. It believes that the emissions cap will take the UK beyond its Kyoto commitment and is "consistent" with the UK's domestic goal of moving towards a 20% reduction in CO₂ emissions on 1990 levels by 2010.

SSE believes that an EU-wide emissions trading scheme is an appropriate response to the climate change agenda. It believes that, over the long term, three key principles need to be observed:

- the process for implementing and monitoring the scheme must be much smoother than has been the process for determining the UK's National Allocation Plan—participants need to have the details as early as possible to allow emission reduction projects to be brought forward;
- (it is vital that the ability of the UK electricity generation sector to maintain security of electricity supply is not compromised during either the first or the second phases of the EU Emissions Trading Scheme; and
- while showing leadership in tackling climate change, the Government must safeguard the UK's position with regard to other participating states.

ENERGY EFFICIENCY IS KEY

SSE believes that the Energy White Paper was correct in its assessment that the "cheapest, cleanest and safest way of addressing our energy policy objectives is to use less energy". It also agrees with the White Paper that a "step change" in energy efficiency across the country is necessary and that it is reasonable to expect that energy efficiency can contribute around half of the emissions reductions the UK is likely to need by 2020. The White Paper also listed many of the opportunities that clearly exist for improving energy efficiency in homes, offices and businesses.

It is clear, however, that the major barrier to substantive progress is behavioural, as one example illustrates. The majority of heat is lost through either the roof or the walls of houses but, although costs have fallen significantly, most properties in the UK do not have adequate insulation. The Energy Efficiency Commitment obviously helps to improve energy efficiency. But, without major changes to people's behaviour the contribution which greater energy efficiency will make to securing the necessary emissions reductions will be greatly (and unnecessarily) restricted.

SSE believes, therefore, that there are two changes which should be effected.

First, progressively greater incentives should be placed on property owners to ensure that their properties are well insulated. For example, this could be done by varying tax rates so that the owners of well-insulated properties pay lower stamp duty when ownership of the changes than poorly-insulated properties. Another example would be to levy lower council tax or business rates on properly-insulated properties.

Second, it is vital to reduce the availability of appliances with relatively low energy efficiency. A new ELI voluntary industry committee aims to remove all "C" rated appliances from the market and introduce new higher ratings of "A+" and "A++". This voluntary industry commitment should be supported with formal backing from the government.

It must be clear that this approach towards attaining energy efficiency objectives needs to be extended well beyond the household sector. In particular, the public sector can demonstrate leadership in showing how energy efficiency can work in practice in new commercial and public sector buildings. The adoption of higher building standards is case in point. While the government is committed to raising standards over the next decade, and in doing so learning lessons from the standards achieved in other comparable countries, there needs to be much greater clarity about how to deliver this commitment in practice. The same is true of highly efficient combined heat and power (CHP) solutions. These are highlighted by the Government as a key energy efficiency tool yet they are seldom adopted for use in the government estate.

In addition, the energy services model should be extended so that energy supply companies are able to establish longer-term contracts than 28 days with all customers and at the same time provide energy efficient products and services such as home insulation, energy efficient boilers, domestic appliances and low-energy lightbulbs. The two-year pilot programme announced by the Department of Trade and Industry earlier this year was a step in the right direction, but this is a complex area. Six months into the pilot period, only a limited number of energy services schemes have got under way. Nevertheless, SSE believes that in due course, the initiative—and customers—would benefit from confirmation that it will be extended to everyone.

In conclusion, the fight against fuel poverty also needs to become energy efficiency-based. SSE has developed a proposal for a “Social Obligation”, modelled on the Renewables Obligation. Its key principle is that there should be an incentive on energy suppliers to play their part in tackling fuel poverty by helping to make the housing stock more energy efficient so that homes are easier to power and heat. It believes that making homes more energy efficient is the only sustainable way to reduce fuel poverty and contribute to the government’s emissions reduction ambitions.

SUMMARY

The comments set out in this letter may once have been viewed as radical. SSE believes that the urgency of the need to reduce emissions is such that they represent a sensible package of measures that would be effective within a foreseeable timescale.

25 November 2004

Memorandum submitted by Iogen (U44)

This follows evidence submitted by Iogen in April 2004 in response to the enquiry into Biofuels.

Carbon emissions from the transport sector, which have grown by 62% in the last 20 years, now account for 27% of our greenhouse gas emissions (Transport Trends Summary: DfT 20 May). 85% of these emissions come from road transport (DTI Energy White Paper). Although the Government has announced an aspiration to move towards “zero emissions” from vehicles under the Department for Transport’s Powering Future Vehicles Strategy, the policies to deliver this have yet to be put in place. Whilst EU car manufacturers struggle to meet their voluntary target of 140 g/km emissions of carbon dioxide by 2008, carbon emissions from vehicle fuels continue to rise without constraint.

I am therefore writing to bring your attention to the advantages cellulose ethanol (ethanol from crop residues such as wheat straw) has to offer and the major contribution it is poised to make to future sustainable fuel production.

Iogen, based in Canada, is the world leader in producing cellulose ethanol which has been shown by independent studies to make a net carbon reduction of around 90% compared with conventional petrol. In conjunction with our partners and biggest investors, Royal Dutch Shell, Iogen has built a £17 million pre-commercial cellulose ethanol plant in Ottawa which is now in continuous production. The technology is “ready to go” and we are in the process of finding a location for the world’s commercial scale industry.

Cellulose ethanol is one of the most cost effective ways of making greenhouse gas emission reductions from the transport sector and could be blended up to 10% today in any vehicle with no modifications to engines or forecourts. Furthermore, a domestic industry would provide rural communities with a sustainable, new income stream based from non-food portion of crops, and improve energy security of supply.

Following a detailed feasibility study we have identified that the UK’s Yorkshire Humber region would also be an excellent location for the first cellulose ethanol plant. There is the potential for at least two 150 million litre plants based on existing straw supplies, and an estimated further eight similar size plants based on dedicated energy crops throughout the UK.

As well as the UK, Iogen is also focussing its efforts on Canada, the US and Germany in particular. In Canada Ontario Premier Dalton McGuinty’s Liberal government is set to unveil legislation that would require gasoline to contain 5% ethanol by 2007 and 10% by 2010. In the US, the draft Energy Bill includes targets for biofuel consumption with a 2.5 to 1 bias for cellulose ethanol for the same reason.

Since 2001 we have had an ongoing, positive dialogue with the UK Government. The enhanced environmental benefits of cellulose ethanol were recognised in the 2003 Budget and the Energy White Paper. We now sincerely hope that the Government will proceed with haste towards establishing a Renewables

Obligation for Transport Fuel with long term targets (like those that apply to the renewable power sector) and a framework that encourages the greenest technologies. This could be done in a number of ways, such as increased duty allowances, different levels of tradable credits for different technologies, loan guarantees or capital grants. Above all in the UK cellulose ethanol should be regarded as a major, untapped and cost effective opportunity to reduce carbon dioxide emissions and mitigate global warming, and one that cannot be overlooked if we are to contemplate the Royal Commission on Environmental Pollution's recommendation that the Government should reduce carbon emissions by 60% by 2050.

18 November 2004

Letter from the Prime Minister, Rt Hon Tony Blair MP (U45)

Thank you for your letter of 15 December on the Environment, Food and Rural Affairs Committee's inquiry "Climate change: looking forward". This letter sets out, as requested, the main elements of No 10's engagement with the US on this issue.

Climate change is a critical issue and, as you know, a major priority for this year's UK Presidency of the G8. I have made it plain that we will not be able to come up with an adequate global response to this challenge without engaging the US.

The differences between ourselves and the US Administration over Kyoto are well known. However, as I say in my article in *The Economist* of 1 January, the US is taking some steps to address the issue: their spending on climate science and technology is impressive; many individual States are taking ambitious action; and, at a national level, other approaches are being considered such as the McCain-Lieberman Bill. I firmly believe there is scope for working more closely with the US on the international climate change agenda, both through the measures we intend to press for in the G8 Presidency, and also through the international framework, the UNFCCC.

I covered some aspects of our relations with the US on climate change in my oral evidence to the Liaison Committee on 6 July 2004. I specifically addressed the issue in my latest speech on climate change, in September 2004, when I said:

"We know there is disagreement with the US over this issue. In 1997 the US Senate voted 95-0 in favour of a resolution that stated it would refuse to ratify such a treaty. I doubt time has shifted the numbers very radically."

But the US remains a signatory to the UN Framework Convention on Climate Change, and the US National Academy of Sciences agree that there is a link between human activity, carbon emissions and atmospheric warming. Recently the US Energy Secretary and Commercial Secretary jointly issued a report again accepting the potential damage to the planet through global warming.

I also spoke on this subject when I addressed Congress in July 2003:

"... we need to go beyond even Kyoto, and science and technology is the way. Climate change, deforestation, the voracious drain on natural resources cannot be ignored. Unchecked, these forces will hinder the economic development of the most vulnerable nations first and ultimately all nations. So we must show the world that we are willing to step up to these challenges around the world and in our own backyards... America must listen as well as lead"

Climate change is a regular topic of discussion between myself and President Bush and was one of the subjects we covered during my most recent visit in November 2004. It is an issue that is often raised in other meetings I have with US interlocutors, such as the meeting you mention with Senator John McCain.

Officials in my office work closely with Defra and other departments on climate change, and maintain regular contact with members of the US Administration, as well as with other US stakeholders.

I look forward to hearing of the conclusions of the Committee's inquiry.

Rt Hon Tony Blair MP

January 2005

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