



# **What the Government should do to tackle climate change**

Friends of the Earth's response to the  
Climate Change Programme review



**Friends of  
the Earth**

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**March 2005**

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# What the Government should do to tackle climate change

## **‘The best way to predict the future is to invent it’**

Dr Alan Kay, inventor of personal computing

## **EXECUTIVE SUMMARY**

In this submission to the Government’s review of the Climate Change Programme Friends of the Earth is responding to the Secretary of State Margaret Beckett’s comments in the media:

**“What we want to hear from Friends of the Earth and other people is how realistically and acceptably we can do better.”**

Margaret Beckett, *Channel 4 News*, 8 December 2004

This is our reply. We have split our submission into three parts – in Part A we set the context within which the Review is taking place. We argue that it is essential for the UK to continue to show leadership on climate change and to lead by example by meeting our national emissions reduction targets. We consider how the UK has so successfully achieved its Kyoto target and why we are currently not on track to meet our much more ambitious domestic targets.

In Part B we present recommendations for a new policy framework within which climate policies should operate. We argue that the UK must put in place a framework that enables Government to exert control over our emissions so that we can deliver annual reductions in emissions of around 3 per cent per annum. This is a **big ask**. It will require a fundamental shift in attitudes towards targets within Government. It is, however, a shift that must take place if we are to demonstrate leadership on the issue of climate change.

In order to achieve year-on-year reductions in emissions we recommend that the Treasury be tasked with preparing national carbon accounts, reporting performance towards targets and describing our position in financial terms using the market value for carbon emission allowances.

We go on to suggest that sectoral targets need to be determined using transparent political, environmental and social principles.

In Part C we consider some of the essential elements for carbon abatement policies that are needed to give Government control over emissions. We also describe a number of transformative policies that should be introduced to ensure all sectors contribute towards the meeting of annual reduction targets.

The eight **big asks** which form the core of this submission are:

1. The conversion of the UK's 2010 20 per cent reduction target into a carbon budget for years 2008-12 and the introduction of national carbon accounts reporting on progress towards targets and providing an economic framework for decision making.
2. The establishment of emissions budgets for different sectors of the economy based on a set of transparent principles, including the need to:
  - a. respect environmental limits
  - b. include all sectors of the economy
  - c. address genuine concerns about competitiveness
  - d. take account of social policies.
3. A set of recommendations for the second phase of the EU Emissions Trading scheme including actions needed at an EU level.
4. The use of regulatory mechanisms to reverse the "roll to coal" that has been occurring this decade (with support for coal gasification demonstration projects) and the introduction of a Renewable Heat Obligation.
5. The reinvention of the UK Emissions Trading Scheme using carbon credit taxes to require the purchasing of approved project credits to offset emissions from "difficult" sectors, such as the commercial sector.
6. Lowering transport emissions through new regulations on car efficiency, (increased VED rates and minimum standards), the introduction of Renewable Fuels Obligation, the recycling of tax receipts into sustainable alternatives to the car and measures to constrain the growth in aviation emissions.
7. Reducing emissions from households through the introduction of a tradable demand-reduction scheme for energy suppliers.
8. Institutionalising carbon dioxide reductions within government in Whitehall, Wales, Northern Ireland and the English regions through the sharing of the Public Service Agreement to reduce emissions of carbon dioxide by 20 per cent by 2010 from 1990 levels.

## **PART A:**

# **CONTEXT FOR THE REVIEW**

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.<sup>1</sup> The need for an effective, equitable and truly global, legally binding framework to bring down emissions rapidly is more pressing than ever.

The UK has declared itself a world leader on climate change and together with Europe has led the world in the political battle to bring the Kyoto Protocol into force. This has created the first legally binding international framework to tackle climate change, which will take effect in 2008.

The next challenge is to gain agreement on international action post 2012 when the first phase of Kyoto ends.

If we are to avoid committing the world to temperature increases in excess of 2 degrees, global emissions, which have been rising by about 1.5 per cent per annum, would need to peak and decline within the next 10-15 years, according to the IPCC's Third Assessment Report.

The Kyoto protocol is the first step towards achieving this goal. It introduces the concept of carbon budgets for all developed nations and was negotiated to reduce emissions from developed countries by 5 per cent relative to 1990 levels. It provides the architecture within which the much deeper future cuts that will be necessary can be made. Given the uncertainty inherent in climate modelling and global economic projections the first and foremost objective for Governments today is to develop a system for controlling national emissions so that they can confidently contribute to the global effort to reduce emissions.

### **The UK's leadership role**

Despite accounting for only 2 per cent of global emissions of greenhouse gases the UK has a key role to play in securing a global solution to climate change. As a rich developed country and member of the G8, OECD and UN Security Council the UK can and must work to secure increased participation, including all OECD countries, in international emissions reduction treaties. As the second biggest emitter and a leading country in the EU we can and must play a part in ensuring the EU meets its Kyoto target. As a highly industrialised country with a stable economy we can and must demonstrate how economic growth can be permanently decoupled from carbon emissions to achieve long-term deep cuts in atmospheric emissions of greenhouse gases.

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<sup>1</sup> *Nature* Vol 433 , 27 January 2005

Under Kyoto the EU has a target to reduce greenhouse gas emissions by 8 per cent (relative to 1990) by 2012. The EU is not currently on track to meet its target – in 2002 a reduction of 2.9 per cent had been achieved. However, in order to meet our 2012 target we should have achieved a 4.8 per cent reduction at this time.

In December 2004 the European Environment Agency predicted that a 7.7 per cent reduction was possible with additional policies and measures provided that six Member States<sup>2</sup>, including the UK, over achieved their target. If no overachievement was taken into account, the reduction fell to just 5.4 per cent.

The UK's contribution to the EU Kyoto target is to reduce by 12.5 per cent but it is clear that 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 1999 shortly after agreeing to it in 1997.

### **BOX 1: The path to Kyoto**

In 1997 when Kyoto was negotiated the UK's greenhouse gas emissions stood at 8.5 per cent below 1990 levels. But by 1999 they had already fallen by 14.5 per cent taking us comfortably under our Kyoto target.

The reason why the UK was able to demonstrate a decoupling of economic growth from emissions in the 1990s and comfortably meet its Kyoto target were twofold:

1. The “dash for gas” — throughout the 1990s gas was replacing coal as the primary fuel in the power sector and in industry. Switching to the less carbon-intensive fuel was combined with the increased efficiency of new combustion plant being built, thereby increasing the UK's resource productivity and reducing emissions very quickly. During this period 21GW of new electricity generating capacity was connected to the grid in just 10 years, displacing 86TWh of conventional generation.
2. The one off technical fix for non-CO<sub>2</sub> gases — The other reason the UK was able comfortably to meet its Kyoto target was a massive reduction in the very powerful greenhouse gases HFCs. Between 1998 and 1999 emissions of HFCs fell by 69 per cent in just one year. One company, Ineos Fluor, was able to reduce emissions of this gas by 90 per cent at one of its installations.

## **Progress towards our national carbon target**

In 1999 the UK set an ambitious national target of a 20 per cent cut in carbon dioxide emissions by 2010 from 1990 levels, and in 2003 in the Energy White Paper it set a long-term target of a 60 per cent cut in CO<sub>2</sub> by 2050 from 1990 levels.

The Climate Change Programme was published in 2000 and set out a range of policies and measures with which the Government hoped to meet our 20 per cent carbon dioxide reduction target by 2010.

In 2000 when the programme was published CO<sub>2</sub> emissions stood at minus 7.5 per cent below 1990 levels. At that point it appeared reasonable to expect continued annual reductions in emissions would be achieved. However, four years into the programme CO<sub>2</sub> emissions stand at virtually the same level as in 2000, and by the end of 2005 they are projected to be at just minus 8 per cent; had the programme succeeded in putting us on a linear reduction pathway to our target, emissions in 2005 should be 13.5 per cent below the baseline.

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<sup>2</sup> The six are Finland, France, Greece, Ireland, Sweden and the UK

In November 2004 the Government was forced to admit that on the basis of latest emissions projections, taking into account existing policies and measures, it was only likely to meet a 14 per cent reduction by 2010. Even this is optimistic considering the lack of progress since 2000.

### **BOX 2: Is 14 per cent realistic?**

Within the DTI's energy projections there are a number of debateable assumptions that will need to be realised if even the 14 per cent target is to be met:

- energy intensity improvement in the transport sector of 2.4 per cent per annum between 2004-2008 compared to trend of 1 per cent improvement from 1995-2000.
- improvement of energy intensity of domestic energy use to triple compared to recent trends (3.2 per cent average per annum improvement from 2000-2005 compared to actual trend of 0.98 per cent improvement between 1995 and 2000).
- a significant reduction in coal burn as a result of the large combustion plant directive and EU emissions trading scheme.
- the Government's target of 10 per cent of electricity to be supplied by renewables by 2010 is expected to be met in full – this is heavily dependant on off-shore wind becoming price competitive and coming on stream in large volumes in the second half of the decade.

### **Why are we off course?**

The original Climate Change programme was at least honest about the fact that despite emissions falling in the 1990s, economic growth in the UK had not successfully been decoupled from emissions. There was also an admission that the gains made in the 1990s could not be repeated. It was, however, assumed that the savings achieved in that decade were at least irreversible: the potential for fuel switching back to coal in the power sector, for example, was not considered; and there was no indication what intervention might be necessary if the economic conditions that favoured gas use in the power sector, for example, were reversed. Indeed there was an explicit assumption that even with an effective moratorium on new gas plant, the trend towards gas and away from coal would continue through the next decade. There was also an assumption that policies introduced between 1997 and 2000 – for example the Climate Change Levy were already successfully delivering savings.

With hindsight we can see that these assumptions were wrong and the programme consequently flawed from the start.

The Government uses complicated mathematical models to predict likely future demand for energy and associated emissions. In 2000 the future forecast that underpinned the CCP was the DTI document *Energy Paper 68*. Projections are notoriously difficult and this paper was widely criticised by industry when it was published. In 2003 when the DTI began revising its projections in order to work out how many emissions allowances to create to implement the EU Emissions Trading Scheme the extent to which the previous model had got it wrong became apparent.

In order to take account of uncertainty over global energy prices *EP 68* outlined two scenarios — a high and a low energy price. However, it assumed that prices for primary fossil fuels (oil, gas and coal) were linked. The model did not project emissions in a scenario where gas and oil prices were high but coal prices significantly lower.

In addition it has emerged that the conversion values being used by the DTI to quantify levels of emissions from fossil fuels were out of date — emissions from coal had been underestimated and emissions from gas overestimated. The net effect of these and other errors was that in 2000, policies and measures to meet climate targets were being introduced against a completely over-optimistic picture of what our business-as-usual emissions would be. As a result by 2004 progress towards our 20 per cent target was painfully slow.

The conditions that created the dash for gas — which delivered the bulk of the carbon savings — were new cheap and abundant supplies of North Sea gas and a power market with very low investment risk. During this period 21GW of new electricity generating capacity was connected to the grid in just 10 years displacing 86TWh of conventional generation.

Those conditions are extremely unlikely ever to recur. With a newly competitive power market, North Sea gas reserves dwindling and plentiful supplies of cheap imported coal<sup>3</sup>, in the first part of this decade the opposite conditions have prevailed. This has led to a return to coal and increased reliance on the ageing stations that are used to burn it. Imports of coal have been steadily increasing such that roughly half now comes from overseas.

On coming to power the new Labour Government, concerned about job losses in the coal industry, introduced a moratorium on gas-fired power stations. The Climate Change Programme remained complacently confident that fuel switching and the corresponding improvement in efficiency of combustion plants would continue, and focused instead on new policies to encourage investment in renewable electricity sources and to increase energy efficiency.

However, such is the scale of impact of shifts between coal and gas that savings from other areas in the economy have been obliterated. For comparison, if we succeed in achieving a target of 10 per cent of electricity being generated from renewable sources by the end of the decade the CCP predicts this will deliver savings of 2.5MtC per year. Between 2003 and 2004 annual emissions increased by 2MtC in just 12 months – primarily as a result of a shift back to coal in the power sector.

Meeting the 20 per cent carbon dioxide target in the remaining five years is now an enormous challenge. CO<sub>2</sub> emissions currently stand at minus 7.5 per cent (compared to 1990) and have not fallen since Labour came into power in 1997.

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<sup>3</sup> Global coal reserves are sufficient to enable 200 years of consumption at current rates, by comparison gas is likely to run out in just 60 years. IEA Coal Industry Advisory Board, 2003, Background Paper for Meeting with IEA Governing Board, December 2003

The conditions that led to the carbon reductions in the 1990s are unlikely ever to be repeated and our existing policies and measures — including the targets set for renewable electricity, energy efficiency and CHP — are not enough to deliver the target on their own.

If we are to have a chance of meeting our 2010 target we need to learn from the mistakes made in the initial programme. That programme now needs a rapid and radical overhaul to get us back on track.

## **PART B:**

# **A NEW FRAMEWORK FOR UK CLIMATE POLICY**

In considering our response to this consultation Friends of the Earth's primary concern has been the extent to which the proposed policies and measures put forward in the original Climate Change Programme (CCP) have so far failed to keep the UK on a steady emissions-reduction trajectory. Individual policies and measures may be performing well against Government targets yet the total package has not delivered any substantial savings and fails adequately to control emissions.

We have described in the previous section some of the underlying reasons why we believe this is the case. In this section we propose that a radically different approach to the development of climate policy is now necessary. Key to this new approach is the need for Government to assert control over emissions through more proactive accounting and management of emissions for the UK as a whole and for key sectors in the economy.

### **A top-down approach**

One of the most fundamental changes that must be made to the programme is to adopt a more top-down approach to designing policies to achieve our emissions targets – that is to start with the questions: What level of emissions do we need to reach to meet our targets? Which sectors' emissions are not currently reducing and why? What needs to be done to gain control over emissions across the economy?

The existing programme began with a business-as-usual projection and then built towards a given reduction target below this projection, using estimated amounts of carbon saved from various policies and measures that existed already, or were planned for introduction. We believe a new approach should be adopted that places more emphasis on actual emissions and trends relative to targets. It would enable more effective targeting of policy and should result in more comprehensive and equal application of policies and measures across all sectors of the economy.

Had the question over whether Government had adequate control over emissions from key sectors of the economy been asked in 2000 it would for example have been clear that there were insufficient policies in place to influence the choice of fuels in the power sector and that transport emissions remained unconstrained.

## **The importance of a steady reductions pathway**

The amount of change we see in the climate will be determined by concentration levels of greenhouse gases in the atmosphere. Concentration levels are determined by the total volume of emissions over time and absorption in sinks.

Because concentrations are determined by total volume over time, *how* we reduce emissions — ie the rate which we reduce over time — is as important as the emissions reductions target we aim for. And because carbon emissions remain in the atmosphere for approximately 100 years, every tonne emitted is a significant commitment to more warming; therefore all avoided emissions have a value.

A successful climate abatement strategy must therefore seek to deliver steady incremental reductions over time.

Considering how Governments might achieve steady annual reductions in emissions shifts the debate from disagreements about the exact figure for long-term reductions in emissions to considering how to gain control over emissions so that we can meet whatever long-term reduction target the science indicates is necessary.

It also shifts the focus to more immediate questions about how to begin reducing emissions now rather than putting off difficult decisions to future terms of office. Tony Blair identified this political problem associated with tackling climate change in his speech in September 2004:

The problem ... is that the challenge is complicated politically.... 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. In other words, there is a mismatch in timing between the environmental and electoral impact.

The reality of this fact, and the propensity for Governments to put off politically difficult decisions, has been starkly illustrated in the recent discussions in the UK about how to implement the EU Emissions Trading Scheme. Exaggerated concerns over competitiveness have over-ridden desires to show leadership and to meet our own targets. As a result allocations have not promoted a linear path to our national climate target.

Mr Blair in the same speech went on to say:

But there is no doubt that the time to act is now. It is now that timely action can avert disaster. It is now that with foresight and will such action can be taken without disturbing the essence of our way of life, by adjusting behaviour not altering it entirely.

Despite the difficult nature of the politics timely action must be taken. Fortunately achieving steady incremental reductions rather than having to make much larger cuts later on is at least economically sensible. The European Commission's assessment of the costs of action post-2012 says reductions in emissions of 1.5 per cent per annum from 2012 will lead to loss of GDP of only 0.5 per cent in 2025. In the Energy White Paper it was stated that costs of meeting the 60 per cent target by 2050 would be an average annual reduction of between 0.01 and 0.02 per cent off business-as-usual GDP growth rate of 2.25 per cent per annum.

Also the DTI's Economics Paper No 4, *Options for a low carbon future* (June 2003), concludes that the most appropriate approach to achieving long-term reductions is to take progressive action from now on:

The more important conclusion ... is that the most cost effective approach for attaining an appreciable cumulative reduction in carbon dioxide emissions, combined with achieving a defined abatement target in 2050, is to take progressive action from now. This is also consistent with encouraging the necessary technological developments and economic and social changes needed to facilitate a low carbon future.

**Box 3: What levels of annual reductions should the UK seek?**

The Intergovernmental Panel on Climate Change's Third Assessment Report indicated that in order to avoid breaching a 2 degree increase in global average temperatures global emissions need to peak and decline within one to two decades. Responsibilities for achieving global reductions are differentiated and some countries will need to reduce while others increase.

Working back from a 2 degrees limit we can calculate what that means in terms of a per annum reduction rate for industrialised countries. This rate of reduction is ultimately dependent on assumptions about growth in emissions in non-OECD countries. The important question is can Governments gain control over emissions? The level of reductions, once control is established, can then be modified over time.

During the 1990s UK CO<sub>2</sub> emissions were reducing by approximately 1 per cent per annum. Recently they have been rising, with a 1.3 per cent rise between 2002 and 2003. Because of this, to hit the Government target of a 60 per cent reduction in emissions by 2050 we would now need to reduce by 2 per cent from 2007. If we assume, however, that we need to go further than the 60 per cent target in order to contribute to global emissions stabilising below 450ppm, then reductions of around 3 per cent per annum are needed. Delays in reducing emissions obviously mean higher annual reduction targets. For example if action is postponed until 2015 annual reductions of 4% per annum will be needed to achieve the same abatement levels.

In the revised programme the UK needs to make a statement that reductions pathways are as important as the reduction target and that it will introduce policies and measures to place us on a steady reduction pathway. We also need to negotiate within the EU to ensure that the post-2012 framework embeds the concept of linear reduction pathways. Already there are some calling for the next period of Kyoto reductions to be delayed for some years – the UK must press hard to agree targets for a consecutive reduction period of 2013-17.

## **Introducing a national carbon budget**

Once a reduction pathway to our targets has been identified the concept of carbon budgeting can be developed. The Kyoto protocol is based on this concept. In 2008 all Annex 1 countries (OECD) who have signed the treaty will be given a fixed amount of allowances for the following five years. The currency used to identify these allowances is the Assigned Amount Unit or AAU. The number of AAUs a country receives corresponds to the baseline year emissions (1990) plus or minus the target that country has agreed to achieve as detailed in Annex B of the Kyoto Protocol, times five. For example Japan has agreed to meet a 6 per cent reduction so its initial allocation will equal 5 x 94 per cent (of 1990 emissions).

So the challenge for Governments is not to reach a fixed reduction target at a fixed point in time but to manage its budget of allowances over a five-year period so that by the end of the period all emissions in that period are matched with certified allowances.

Allowances can be traded between countries with those beating their targets selling spare allowances to countries who fail to meet their target.

This concept of carbon budgeting should be introduced for the UK's national carbon dioxide emissions reduction target. The environmental effect of averaging the 20 per cent reduction target out over a five-year period would be the same. This would give an allocation for the period 2008-12 as follows:

**Baseline carbon dioxide emissions for 1990: 165.1 MtC**

**Carbon budget for years 2008-12 (165.1 x 80 per cent x 5): 660 MtC**

In order to stay within this budget we then need to create a system for managing emissions amenable to effective government control. One approach is to create a national carbon account that separates the property of carbon from the activities that produce emissions, such as energy production and industrial processes, and budgets it as a national asset and liability.

A value for carbon is currently being set by markets that trade in carbon emissions allowances. The price is determined by analysis of the supply and demand for allowances (i.e. over generous allowances lead to a low price of carbon and reduce the effectiveness of the financial incentive, tighter allowances based on the need to achieve sustained reductions lead to higher prices and a greater financial incentive). The EU Emissions Trading Scheme currently values 1 tonne of carbon dioxide at 8.5 Euros.<sup>4</sup> In companies whose emissions are constrained by a cap and trade scheme carbon allowances are treated like currencies in recognition of the fact that values change over time.

Within a national carbon account the commodity of carbon can be given a market value and our position relative to our targets calculated in monetary terms.

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<sup>4</sup> Market price December 2004

Table 1 (on page 15) illustrates a set of carbon accounts for the UK in 2004. The key fact demonstrated by the account is the order of magnitude figures for the national carbon asset and liability against national targets. The numbers are small. Even if the costs were an order of magnitude different, they would still be a small proportion of the current UK gross national product. Yet the tenor of the debate is one of impending economic catastrophe. There is a mismatch between the economic costs of solving the problem at a national level and the potential environmental problems in the future.

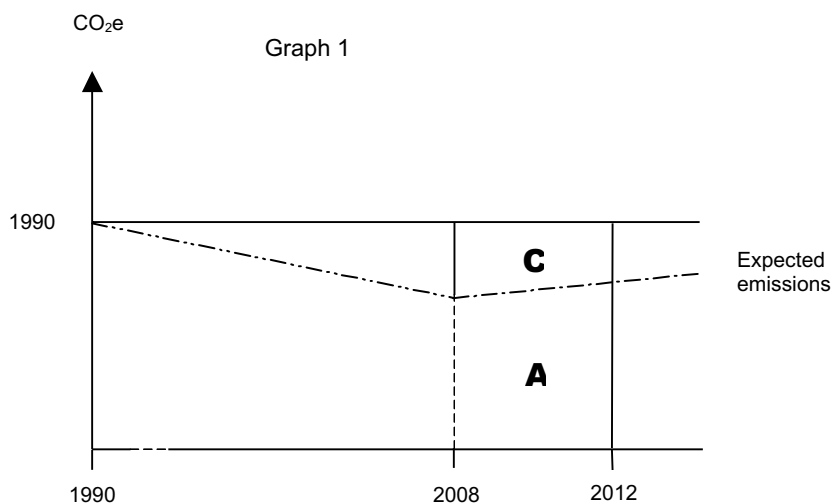
Once a carbon budget is defined in this way, the Government can manage carbon as with any other precious resource: with effective accounting and clearly specified activities to reduce liabilities or increase assets.

Under the Kyoto Protocol the UK is in a good position. It already has a net carbon asset against the first period target (2008-2012) of £0.445 billion (on current EU market prices). The Treasury could securitise the future financial value of this asset, and invest this income in reducing emissions, in effect purchasing more UK-derived carbon savings. Figure 1 illustrates how the UK could use our position relative to our Kyoto target to achieve this.

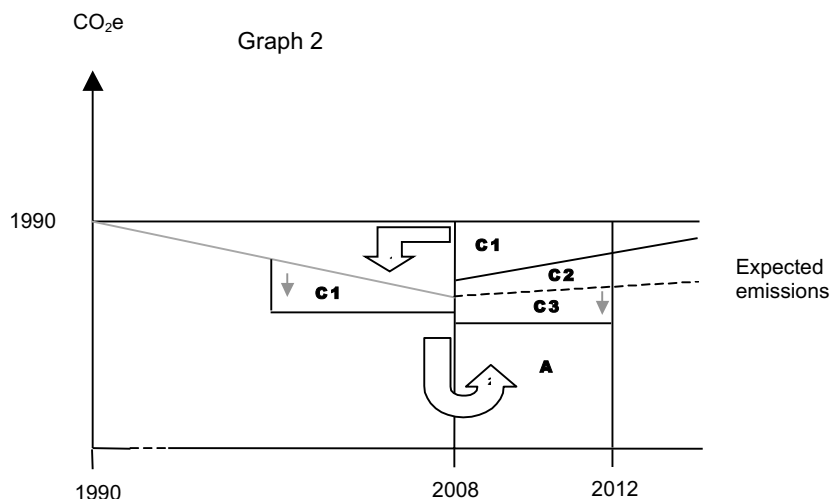
It is a different story for the Government's own CO<sub>2</sub> target and that of the Energy White Paper for 2050. In both cases the UK has a substantial liability.

To manage this liability the Government use economic instruments to enable actors within the economy, including the Government itself, to buy and sell carbon to make progress towards targets in a cost-effective manner. In order to reflect the fact that highly industrialised countries like the UK are well placed to deliver abatement and have a historic carbon debt relative to other countries accrued over decades Friends of the Earth does not consider purchasing carbon allowances or credits on the global carbon markets an adequate response to the challenge of tackling climate change. Our interest is buying or achieving UK-derived carbon abatement by means of application of regulations, taxation or market-based mechanisms. In this way we can lead by example and demonstrate how to control domestic emissions cost-effectively, providing a template for other countries.

**Figure 1: Illustrations of how AAUs can be used to invest in further emissions reductions**



**Graph 1:** This graph illustrates what happens if a country commits to keep CO<sub>2</sub> emissions at 1990 levels during 2008-2012. AAUs are allocated based on this goal (**A+C**). Since emissions decreased since 1990 and are not expected to reach 1990 levels by 2012 (**A**), a country has surplus AAUs (**C**) that it can sell.



**Graph 2.** In this case the same country borrows forward on the strength of the expected revenue from spare AAUs and invests that money to generate additional surplus allowances:

- 1) A country sells part of its AAUs (**C1**) and uses the funds to implement emission reduction projects during the pre-compliance period (**C1a**). Some expected spare allowances are held back as an insurance against projections being higher than anticipated taking the country out of compliance (**C2**)
- 2) The effect of the investment is to reduce actual emissions (**A**) still further during the compliance period (**C3**)
- 3) At the end of the compliance period the country can either sell, bank or retire the total number of spare allowances (**C2 + C3**)

Importantly, liabilities and assets within a national carbon account can be rapidly decreased and increased with short-term action as investment in abatement projects in any given year has a positive effect on all subsequent years. For example a reduction in emissions of 1MtC between 2004 and 2005 at current abatement costs would cost £22 million but would reduce the liability against the 20 per cent target by £200 million. In the UK's situation this would also increase the asset under our Kyoto target by £111 million.

This carbon budget and asset/liability approach achieves three important things:

- 1 It forces the controlling organisation (eg the UK Treasury) to report greenhouse gas emissions as a net asset/liability against appropriate targets, and take appropriate action to manage the asset/liability on an annual or rolling basis
- 2 It forces the controlling organisation to specify and set aside the financial cost of meeting those liabilities on an annual or rolling basis (for example the three-year spending review cycle or five-year emissions trading cycle)
- 3 It facilitates a top down approach to managing emissions and provides a clear economic framework within which decisions can be taken.

**Table 1: Net carbon position in the UK against Government targets (in MtCeq)<sup>5</sup>**

UK emissions			Kyoto target	Domestic target 2010 (CO <sub>2</sub> only)	2050 target (CO <sub>2</sub> only)
Reduction targets (MtCeq)			183	132	66
	Carbon dioxide	Basket of gases			
1990	165	208	-	-	-
2000	152	181	+2	-20	-86
2001	156	183	0	-24	-90
2002	150	177	+6	-18	-84
2003	153	179	+4	-21	-87

<sup>5</sup> Information adapted from [www.defra.gov.uk/environment/statistics/globalatmos/kf/gakf05.htm](http://www.defra.gov.uk/environment/statistics/globalatmos/kf/gakf05.htm)

**Table 2: 2004 UK carbon accounts<sup>6</sup>**  
**(Figures are for 2003 emissions levels relative to UK targets)**

		Kyoto GHG target MtCeq	Domestic CO <sub>2</sub> target MtCeq	Energy White Paper (2050) MtCeq
	<b>Current position</b>	+4	-21	-87
	2004-2007		-84	-87
	2008	+4	-21	-87
	2009	+4	-21	-87
	2010	+4	-21	-87
	2011	+4	-21	-87
	2012	+4	-21	-87
	2013-2050	-	-	-3567
	TOTAL	+20	-189	-4089
<b>Current market Price ~€8.5/tCO<sub>2</sub>e*</b>	Asset	£0.445 billion	-	-
	Liability	-	£4.21 billion	£91.03 billion
<b>Social cost of carbon - Mid-range of £70/tC</b>	Asset	£1.4 billion		
	Liability	-	£13.23 billion	£286.23 billion
<b>UK GDP: 2003/04</b>	£1.116 trillion	0.125 per cent of one year's GDP (for social cost)	1.185 per cent of one year's GDP (for social cost)	-
<b>UK GDP cumulative to 2050 (without assuming any growth)</b>	£51.336 trillion	-	-	0.18 per cent of cumulative GDP

\* Assuming €1.4 = £1

It should be noted that we are not endorsing the Government's current social cost of carbon as an accurate reflection of the costs to society of climate change. We recognise that pricing environmental and social externalities is fraught with methodological difficulties. Generally estimates of social cost are extremely conservative and in the case of climate change may be gross underestimates. We are simply using the social cost as a proxy for higher future abatement costs. Nor do we consider that the liability identified in the illustrated accounts in any way equates to the social cost of carbon – it is used merely to illustrate our position relative to our emissions reduction targets in financial terms.

<sup>6</sup> In calculating the accounts we assume no net benefits to the UK economy from actions to reduce greenhouse gas emissions (which are likely, especially for early movers), no growth in the UK economy, and market prices of €8.5/tCO<sub>2</sub> and a social cost of carbon of £70/tC. Emission figures are in MtCeq.

## **Establishing sectoral targets**

With a national carbon budget in place the Government can take a top-down approach to managing the delivery of savings across the economy. To assist in this process, sectoral targets can be set. Certain principles will need to be applied in undertaking this exercise.

### **Principle 1: There is an environmental limit within which all economic activity must now take place**

Every tonne of carbon emitted remains in the atmosphere for approximately 100 years – every tonne of carbon abated therefore has a lasting environmental effect. There is also a time factor associated with the need to reduce emissions well before the point at which irreversible climate impacts are triggered. These constitute environmental limits that must be respected. All sectors of the economy therefore can and should be required to internalise the cost of their emissions and sectoral targets must reflect this.

### **Principle 2: All sectors must be included**

The overall objective of an economy-wide reduction can be achieved only if there are adequate controls in place for all sources of emissions. Intervention will remain unpopular if some sectors of the economy are being relied on to deliver savings while these same savings are undermined by rising emissions in other sectors. Targets will be meaningless if some sectors of the economy remain outside the climate policy framework, for example, aviation.

The table in Annex I illustrates the breakdown in present emissions by sector, the trend in emissions since 1990 and 2000 and the range of measures included for each sector in the existing CCP. It is clear from this that the coverage of the current programme is incomplete and the style of intervention inconsistent.

### **Principle 3: Political concerns over competitiveness must be addressed in an open and transparent manner**

In determining how savings are to be delivered across the economy it would be unwise to ignore genuine concerns over competitiveness issues. These should not, however, be exaggerated and the potential benefits of intervention in stimulating innovation and investment should be fully taken into account. Within this context Government should develop a clear methodology for identifying industries genuinely affected by international competition and shape policies accordingly, either to introduce protective trade regimes, or to shift emphasis for achieving savings onto other sectors insulated from global competition.

### **Principle 4: Social impacts of policies must be considered**

It is clear that if the Government is to genuinely succeed in putting the UK on a linear path to meeting its challenging climate targets it will involve the internalisation of costs which are currently not being paid. This will lead to price rises and other ancillary effects. Many of the ancillary effects will be socially beneficial – reducing carbon emissions can also reduce associated air pollution to which poorer communities are most commonly exposed. Some effects may however be regressive; for example, higher prices for domestic fuel can hit the poor hardest. Certain sectors of the economy also provide a higher degree of social service than others — for example bus transportation relative to air travel. Government will need to take these issues into consideration when setting sectoral targets and introduce policies that mitigate regressive impacts.

Solving many social problems will also lead to carbon savings — for example improving access to public transport, regenerating urban centres, limiting night flights — and this should also be taken into account in setting sectoral targets.

**Principle 5: Abatement costs and technological potential need not affect the budget setting**

It is important to try to achieve reductions in as economically efficient a way as possible. There are two ways of achieving this. One would be to take into account a range of factors affecting the cost of uncovering reductions from different sectors of the economy when determining what level of effort should be required from those sectors. For example three factors could be taken in to account:

1. technological potential i.e. the degree to which it is possible to make savings over the timescale of the programme
2. abatement costs, the relative costs of achieving savings from different sectors of the economy
3. administrative complexity, cost associated with administering any intervention to achieve savings from that sector.

However, much of this information is not yet known and some information may be considered commercially sensitive. Also Governments are not best placed to predict abatement costs. During the design stages of the US sulphur emissions trading scheme early studies estimated cost of compliance at about US\$300/tonne, although it was possible to find even higher estimates. At the first annual auction in 1993 the clearing price was US\$131; prices then sank slightly below US\$70 by 1996 and only in 1998 reached 1993 levels again.

An alternative approach would therefore be to decouple the internalisation of the cost of carbon within an economic activity from the practical consideration of how those savings could be achieved within that economic activity.

Rather than consider cost differentials the Government could decide on political and social grounds alone how much responsibility different sectors of the economy should bear for the impact of their emissions.

The internalisation of these weighted responsibilities could then be fulfilled by requiring participants to purchase savings from an open market in emissions reductions credits, or carbon credits. This is described in more detail in Box 5. This principle is already in place in the UK and EU Emissions Trading schemes.

## **What might the sectoral targets look like?**

In the previous section we identified a national budget for years 2008-12 to enable the UK to meet its 20 per cent reduction target.

The advent of EU Emissions Trading and the requirement to allocate a fixed number of allowances to participating sectors created a sectoral budget for approx 46 per cent of the UK's carbon dioxide emissions. This was outlined in our National Allocation Plan (NAP). Allocations were underpinned by projections but political judgement also played a part in determining levels of effort required by different sectors.

Projections of emissions for the sources outside the EU cap were also undertaken to determine progress towards targets for the economy as whole. This process led to the conclusion that we were currently on course for only a 14 per cent reduction by 2010 but also created de facto targets for all major emitting sectors of the economy, illustrated in table 3 below.

For the sake of argument we can assume the economic factors and political concerns that informed the projected share of emissions in the NAP will remain constant. We can therefore use the same proportions used in the NAP to determine what the overall budget for the different sectors would be if we are to meet a 20 per cent reduction budget for years 2008-12.

The advantage of setting sectoral budgets over a five-year period are that from the beginning of the period as actual emissions are subtracted from the total budget the extent to which efforts in that sector needs to be increased becomes apparent each year and policies and measures can be adapted accordingly.

The setting of sectoral budgets also helps guide the development of policies in the revised CCP by illustrating the scale of the challenge. For example, for the power sector to stay within the 20 per cent target budget, policies to deliver an additional 2.5MtC per year will be required. This could be achieved through, for example, tough allocations in the second phase of trading, the doubling of the existing renewable electricity obligation or regulatory control to deliver fuel switching of approximately an additional 18 TWh of coal capacity to CCGT.

**Table 3: Implied sectoral budgets within UK National Allocation Plan<sup>7</sup> (MtC)**

	2000 CO <sub>2</sub> emissions (MtC)	% of annual total	2005 CO <sub>2</sub> NAP Projection (MtC)	% of annual total	2010 CO <sub>2</sub> NAP projection 14% below 1990 (MtC)	% of annual total	Pro rata budget for years 2008-12 to meet -20% target (MtC) <sup>8</sup>
Power Stations	43.1	28	44.8	30	37.4	26.5	<b>174.9</b>
Refineries	4.4	2.9	5.4	3.6	5.5	3.9	<b>25.7</b>
Residential	23.0	15	21.2	14	20.5	14.5	<b>95.7</b>
Services	8.1	5.3	7.3	4.8	7.5	5.3	<b>35</b>
Industry	33.8	22.1	33.7	22.3	31.6	22.4	<b>147.84</b>
Road Transport	31.7	20.8	32.4	21.4	34.5	24.4	<b>161</b>
Other Transport	4.3	2.8	3.9	2.6	4.0	2.8	<b>18.5</b>
Land Use Change	4.2	2.8	3.3	2.2	2.5	1.8	<b>11.9</b>
Afforestation	-0.4	-0.3	-0.5	-0.3	-0.7	-0.5	<b>-3.3</b>
<b>TOTAL</b>	<b>152.7</b>		<b>151.4</b>		<b>141.3</b>		<b>660</b>

The sectoral targets used in this table are intended merely to illustrate how budgets might be derived and the approximate scale. We do not agree with the energy projections or political judgments that were used by Government to derive the NAP allocations.

<sup>7</sup> Information taken from projections of sector carbon emissions in Updated Emissions Projections (DTI, November 2004)

<sup>8</sup> Calculated from per cent emissions projected for 2010 in National Allocation Plan (DTI, November 2004)

## Part C: Policies and measures

We welcome the fact that the Government is currently undertaking a review of the effectiveness of climate policies to date and look forward to the results. We hope that the lessons learnt during this exercise will contribute to more effective policy making. In composing this submission we have not undertaken a thorough assessment of each of the measures in the existing CCP. We have, however, developed a set of core principles we believe need to be considered in the modification of existing policies and design of new ones. Using these principles we go on to make recommendations for transformative policies in some of the key sectors identified in the consultation paper.

### Core principles for climate policies

#### 1. Forcing innovation

The internalisation of cost alone does not guarantee delivery of emissions savings. In highly capitalised and concentrated markets such as the oil and gas and power sectors there is little incentive to diversify to introduce new disruptive technologies or practices. Successful policies therefore must combine the internalisation of the cost of carbon with measures to force innovation, ideally in a way that facilitates new entrants into the market.

#### 2. Control and adaptiveness

Government must seek to design policies that are able to deliver absolute reductions relative to historic emissions. There are limited ways in which carbon emissions can be reduced. An economic downturn is one. The only other is to decouple economic growth from emissions — this can be achieved only by reducing the carbon intensity of energy fuels, increasing resource productivity and reducing end-user demand for energy. To gain control over our emissions a revised strategy must include measures to achieve all of these objectives for all sources of emissions. If we focus solely on one element — ie decreasing intensity — this alone does not guarantee reductions in emissions if resource productivity is declining or end-user demand increasing.

There is a variety of means by which Governments can intervene to deliver these policy objectives ranging from voluntary agreements to regulation. Obviously the degree of control each option provides differs — Government should adopt a consistent approach across sectors to avoid the perception among some sectors that they are being unfairly treated relative to others. For example the degree of regulation in industrial sectors relative to the reliance of voluntary measures in the transport sector is currently inequitable. Annex 1 illustrates recent trends in emissions and/or energy demand in different sectors and the major abatement policies currently in place. The lack of consistency of approach across sectors is clearly visible.

Policies must also therefore be adaptive to external circumstances that remain beyond Government control. For example, the Renewables Obligation creates targets for the power sector to purchase renewable electricity that are expressed as percentages of total electricity supplied and so keep pace with rising demand for electricity.

By contrast, the energy efficiency commitment has targets expressed in fixed amounts of energy saved with no reference to overall energy demand. This means that effort is not linked to overall demand and the effectiveness of the scheme in meeting our targets is easily undermined by, for example, increasing levels of comfort or increased numbers of households.

### **3. Recycling cash flows into the low carbon economy**

While taxation can influence behaviour, it does not itself lead to the development of the necessary low carbon infrastructure. Unless the Government is planning to (re)nationalise large parts of the energy infrastructure, it will need to feed taxation receipts back to the private sector. Where the Government still has control (eg over public services) it too must recycle funds into the low carbon economy. Innovative approaches have been tried: examples include the mechanism for recycling revenue from the Climate Change Levy back to reduce business NIC contributions or recycling revenue back to business competitors in the Renewables Obligations. The latter approach appears to have more validity for developing low carbon infrastructure; recycling funding back to reduce the cost of employment may benefit employment levels but does not result in less energy use.

### **4. Delivering longer-term objectives**

Although meeting the immediate goal of a 20 per cent reduction target must be the main focus of the revised CCP, longer term goals must also play a role in the formation of policy.

For example policies and measures will be needed in this decade to prepare less close to market technologies for commercialisation in the next decade. This is especially true of renewables and, in particular, off-shore renewables. Likewise, investing now in long-term sustainable transport infrastructure projects such as high-speed long distance rail will result in emissions reductions post 2010.

In considering how to incentivise the upgrading of our fleet of coal-fired power stations, the Government should consider the long-term future for coal in a carbon-constrained economy. Investment now in incremental improvements in efficiency or in sulphur cleaning equipment may preclude investment over the medium term in far more efficient combustion technologies such as gasification, leading to hydrogen production and capture and storage options.

### **5. Avoiding regressive impacts**

Government should seek to ensure that the social impacts of climate policy packages are not regressive. Where regressive impacts are unavoidable supporting policies must be introduced to ensure the effect of the package is at least neutral or better still positive.

## Specific policies and measures

### EU Emissions Trading Scheme

The EU Emissions Trading Scheme covers the 46 per cent of UK emissions of carbon dioxide that come from industry and the power sector. The scheme places a cap on emissions but enables trading of emissions permits to be used to assist with compliance. The first round of trading runs from 2005-2008 and the UK has issued 7 per cent fewer allowances to the power sector than were emitted in the baseline years for the scheme (average of 1998-2003).

This under-allocation to the power sector is the only assumed reduction in the first phase and allocations to non-power sector participants have been generous. The allocation plan has not assumed a steady linear pathway towards our 20 per cent target and as there can be no adjustment to allocations once trading begins we have missed an important opportunity to deliver savings from approximately half of our sources of emissions.

It is true that UK industries could still decide to beat their caps and sell credits overseas taking us closer to our national target. This would not deliver additional savings across Europe however as it will enable participants in other countries to emit more. The opposite is also true – credits can be imported taking us further away from our domestic target but requiring companies elsewhere to reduce more. The allocation therefore dictates the level of environmental ambition.

The initial allocation was also one of the best opportunities the Government had to constrain actual emissions in the UK as the scarcity of allowances will set the price of carbon. It is true that scarcity will be determined by how all 25 members of the EU allocate, but the UK was seen by many to be setting the pace, and, as the second largest emitter in Europe, controlled a sizeable portion of the market. Allocation also affects behaviour, as most participants in the scheme are likely to trade only around the margins – i.e. plus or minus 5 per cent of their initial allowances. The ratio of allowances to future emissions cannot be known at this stage because it will depend on the emergence of the UK's carbon abatement cost curve relative to other countries. However over time this ratio between allocation and resulting emissions will become better understood and should help to inform allocation processes. In the meantime, allocations in the UK remain significant, affecting total EU emission levels and influencing behaviour in the UK.

### What the Government should do

#### Phase two allocation levels

The Review of the Climate Change Programme should, by determining overall carbon budgets for the economy, and sectors within the economy (see sections above), create the framework within which allocations in the second phase of trading will be determined.

The same set of emissions projections must be used for the second phase allocation as are used to help determine budgets and policies and measures within the revised Climate Change Programme.

## **Auctioning**

The full provision for auctioning of 10 per cent of total allowances in phase II should be taken up by the UK and applied in the power sector. Revenues raised in the auction should be recycled into the low-carbon economy.

## **Closures and New Entrants**

The UK should modify its rules for closures and new entrants for the second phase. Member States have introduced a variety of rules for handling allowances once installations close or when new installations are built. In the UK the rules militate against closure and therefore put a break on investment in new capacity. To incentivise closure of old plant and investment in cleaner plant, no special provisions for closures should be introduced. This would keep allowances in the possession of the company throughout the trading period – creating an incentive to ensure replacement capacity is as clean as possible to generate spare allowances.

## **Use of Flexible Mechanisms**

The Linking Directive agreed in 2004 means that companies will be able to use carbon credits (CERs) generated by the Kyoto flexible mechanisms (Clean Development Mechanism for projects in developing countries) in order to comply with their caps under the Trading Directive. In order to ensure there remains a requirement for action to reduce emissions within the EU, Member States can create limits on the amount of credits that could be used in compliance by any one installation. Friends of the Earth recommends that limits on the amount of credits that could be used in compliance by any one installation be set at zero in the UK in order to maximise abatement within the UK and Europe, demonstrating that the developed world is serious about developing a low carbon economy through action at home.

## **Extension to other gases and sectors**

Another key question for the second phase is whether the UK wishes to voluntarily opt in other sectors and gases not currently covered by the scheme. Friends of the Earth recommends that the UK should not seek to extend the EU scheme ahead of a third phase of trading and should instead bring sectors within the UK's own national emissions trading scheme to speed the discovery of low-cost abatement options in the UK which will contribute towards our 20 per cent reduction target.

## **Action in Europe**

In addition to determining the framework for UK allocations in subsequent phases of trading the CCP should set out Government objectives for modifying the rules of the game at a European level. This should ideally be achieved through agreement at the European Council in advance of the official review of the Emissions Trading Directive which will take effect only after second-phase allocations have been made.

The UK should work to achieve the following:

- **Set a challenging European level cap on total allocation of allowances in the second phase.** The ETS is a key policy for the EU to meet its Kyoto target and the second phase corresponds with the Kyoto compliance period. At present Member States decide on their total allocations; once all States have allocated, the net position dictates how many allowances are available in the market. In 2008 the EU should provide a clearer framework within which Member States must calculate their national allocations, by determining an overall budget for allowances in the scheme at a European level. This budget must be in line with the EU's Kyoto budget and be consistent with trends in emissions in non-EU ETS sectors.

- **Agree a consecutive post-2012 trading period** – for investor confidence it is essential that the market is seen to have a life beyond 2012 and that the next phase of trading begins in 2013. Even without agreed post-Kyoto targets it will be possible for the EU to make clear statements about a third phase of trading and that it wishes to continue to use the scheme to make sustained reductions in EU emissions.

- **Agree that baselines for future allocation periods will remain the same to avoid perverse effects** – if baselines are moved forward for subsequent periods it will create a disincentive for companies to act to reduce their emissions in the current phase in expectation of higher allowances in the next period.

- **Shift to the use of clearer standardised allowance methodologies** –business-as-usual emissions projections are used by Member States to inform both the setting of the total cap on emissions and the distribution of allowances between industrial sectors. Individual installations are then given allowances from within their sectoral totals on the basis of historic emissions – so called grandfathering. Projections are open to abuse and notoriously inaccurate – and grandfathering fails to implement the polluter-pays principle. A far more transparent means of calculating allowances would be to determine sectoral allocations on the basis of an agreed reduction level relative to baseline emissions.

- **Shift towards 100 per cent auctioning for power sector (and aviation) post-2012.** Auctioning offers a far more straightforward means of allocating to installations and fully implements the polluter-pays principle as companies are required to pay upfront for the pollution they cause. The power sector is not open to significant international competition and should be the first sector to fully internalise the cost of its emissions by shifting to 100 per cent auctioning post-2012. Revenues raised can be used to invest in the low-carbon economy. If aviation is included in the scheme this too should be subject to 100 per cent auctioning according to the polluter-pays principle.

- **Agreed limits on use of credits from Kyoto flexible mechanisms.** To ensure action occurs within the EU a limit should be set on the number of overseas credits that can be used in compliance with the EU scheme.

- **Extension to other sectors and gases.** It is possible to foresee the extension of the scheme to cover the remaining five greenhouse gases, process emissions from industry and emissions from transport and aviation. However, this should only be done once more stringent rules for caps and allocation methodologies have been agreed. If, for example, aviation emissions were included but on the basis of projected need and grandfathering this would fail to internalise the costs of emissions in this sector and simply add to the over-allocation in the existing scheme.

- **Establish UN procedure to oversee the development of trading internationally.**

The EU scheme is becoming the de facto international scheme to which trading initiatives in other non-European countries may wish to link. While there are advantages to extending and linking trading schemes internationally in order to preserve the environmental integrity of the system as a whole a UN system needs to be established to oversee the development of the global carbon trading market.

## Energy supply

The energy supply sector remains the largest source of emissions in the UK and consequently the effectiveness of policies in this sector has a big impact on total emissions. It was assumed in the original CCP that there would be a continuing trend away from coal to gas during this decade. So far this has been proven to be inaccurate. Worryingly, in the consultation document for the CCP Review there are signs that the Government is about to sleep-walk into the same dilemma.

Despite being published in December 2004 when emissions for 2003 were already known, the consultation paper considers trends in this sector only up to 2002. If these trends had included 2003 data it would have shown the massive impact a shift back to coal can have over just 12 months. Between 2002 and 2003 increasing coal burn led to an increase in emissions of 2.7 MtC in the power sector – contributing to a 1.3% rise in total CO<sub>2</sub> emissions for that year.

With the price of gas linked to global oil prices and relatively abundant global supplies of coal there is a continued risk that UK coal stations will remain higher up the merit order than their efficiencies and emissions would otherwise suggest. Yet the consultation confidently asserts:

Emissions from power stations are expected to further decline, reducing by around 30 per cent on 1990 levels by 2010, as these trends continue and accelerate: mainly because of the impact of the EU Emissions Trading Scheme (EU ETS) and the Large Combustion Plants Directive (LCPD) on the energy mix; and also as the proportion of electricity supplied by renewable sources of energy grows.

As described above we consider the allocations within the first phase of the EU ETS to be inconsistent with a linear pathway to the 20 per cent reduction target in 2010. This problem is compounded by generous allocations within other EU countries and companies' ability to use low-cost Kyoto credits from overseas projects. We do not therefore share the Government's confidence in the ability of this mechanism to deliver savings in this sector. A recent study by Global Insight echoed this concern concluding that overall the first phase would do little to correct commodity price imbalances encouraging a shift towards cleaner fuels.<sup>9</sup>

Similarly the Large Combustion Plant Directive (LCPD) does not in itself guarantee any reduction in coal burn – particularly as the UK has yet to finalise plans for implementing the Directive and is pursuing plant definitions and a hybrid approach that will maximise flexibility for industry and undermine the environmental integrity of the Directive.

Even if a more stringent approach were taken the fact is that the LCPD does not come into force until 2008 and has a provision for stations to opt out which enables them to continue operating at full capacity for at least a further three years from that date. This means the LCPD does not provide an adequate proxy for carbon-abatement policies in this sector.

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<sup>9</sup> Reported in *The Times*, 16 February 2005

The extent to which renewables will reduce total emissions in the sector under current policies is also limited. More intervention is likely to be necessary to deliver the volume of off-shore wind anticipated in this decade.

Therefore, to avoid repeating the mistakes of the original CCP, and to gain control over emissions under a scenario where carbon and coal prices are low and gas prices high, other forms of intervention in the market will be necessary. We believe intervention is also required to stimulate investment in new generating capacity this decade to avoid capacity constraints in the next decade when large nuclear power stations will begin to be decommissioned.

### **What the Government should do**

There is a considerable amount of inefficient old coal capacity on the UK grid which has in recent years been running at relatively high levels. Whilst there is currently no direct regulatory route to enforce carbon emission limits on such plant, two regulations that are coming into force will have an impact on how long these stations remain in operation. These regulations are the Large Combustion Plant Directive and the Integrated Pollution Prevention and Control (IPPC) Directive.

By 2008 the Government must have set sulphur, NO<sub>x</sub> and particulate limits for all large combustion plant. These limits provide a regulatory route for ensuring the timely closure of plants that do not warrant substantial investment in clean-up technologies.

Government should take a holistic view when implementing these limits to ensure that there is a steady reduction in coal burn in existing stations.

The Government has identified energy efficiency as a key low-cost way of uncovering carbon savings. Policies to date, however, have concentrated on downstream consumer energy demand. Considerable savings could be uncovered upstream. The IPPC Directive created energy efficiency standards for large combustion plant but beyond the uncertain effect of the EU ETS there is no means by which the Government can enforce efficiency improvements in the energy supply industry. The Government should rectify this and stipulate minimum efficiency standards in new IPPC licences which will replace IPC licences in 2006.

The Government can also intervene to incentivise the timely construction (or complete refurbishment) of new generating capacity. A step change in coal combustion technology is required that will provide intrinsically cleaner combustion and potential future options for capture and storage of carbon dioxide emissions. Integrated Combined Cycle Gasification technologies provide such a step change; a number of schemes have been proposed already in the UK and we should join Germany and the United States in encouraging investment in demonstration projects.

### **Renewable heat**

The power generating sector is currently subject to an obligation that requires a rising amount of investment in renewable electricity technologies. There is no comparable requirement for suppliers of energy for heat to diversify their business.

Friends of the Earth recommends the creation of a Renewable Heat Obligation. This would be a cross-cutting measure that, like the Renewable Obligation, would incentivise investment in renewable energy across industrial, commercial and domestic sectors.

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.

The obligation would be placed on all suppliers of fossil fuels for heat such that a rising proportion of their business is provided by renewable sources of heat — e.g. biomass (including biogas), ground source heat pumps and solar thermal.

#### **BOX 4: How would a Renewable Heat Obligation (RHO) work?**

##### **Why we need an RHO**

An obligation on energy suppliers has proved to be an effective way of stimulating change, without imposing a financial burden on taxpayers. The existing Renewable Obligation (RO) is potentially the most cost-effective way of delivering a step-change in take-up of renewable electricity generation of all the measures adopted around the world.

An obligation of this type provides a market-based incentive, to which companies can respond, without the expense, lag-time and inertia in trying to stimulate change in the population at large. It directly rewards success – unlike capital grant schemes — and therefore provides an ongoing incentive to remain efficient. Businesses are more likely to respond to a long-term market-based policy than to grants because grant programmes are notoriously bureaucratic and short-lived.

##### **Principle**

The RO provides a flexible market-based mechanism to incentivise investment in renewable electricity. It places an obligation on licensed electricity suppliers to source a rising percentage of their supply from renewable sources. In the heat market the same principle would be applied. The idea of a renewable heat obligation (RHO) is to ensure that heating fuel suppliers are required to supply an increasing proportion of their customers' demand for heat from non-fossil fuel sources. The obligation would therefore be placed on suppliers of fossil fuel heating fuels — e.g. gas suppliers, coal, coke and oil suppliers — and would be met by the surrendering of Heat Obligation Certificates (HOCs) purchased from accredited renewable heating schemes.

##### **On whom should the obligation be placed?**

The RHO should be placed on suppliers of fossil fuels for heat. The administrative systems for a heat obligation for industrial and commercial customers are relatively straightforward. The volume of fuels sold for heat (as opposed to electricity or transport) is easily determined as suppliers are required to complete detailed records in order to comply with the requirements of the Climate Change Levy. Oil supplies sold for heating purposes would need a separate administrative system but this should be achievable and is already practiced in France for example. Retailers of small volumes of heating fuels — e.g. garage forecourts — would not be included in the obligation.

### **How would the suppliers of heating fuels be identified?**

Although there is no one license that identifies these bodies, they are limited in number and easily identified as all have a relationship with Customs and Excise that would allow for their easy identification.

### **Who would administer an RHO?**

An authority (such as Ofgem) would register qualifying schemes, and issue HOCs on basis of their monthly metered heat output. Ofgem is involved in the RO, so is already familiar with the administration and operation of the applicable systems. Any site could be accredited provided adequate metering systems are in place.

### **What level should the Obligation be set at?**

The percentage the obligation should be set at initially, and future quotas it should seek to attain, need further consideration; these should also be underpinned by capacity assessments and subject to public consultation. As with the Renewables Obligation, the quotas and profile of the RHO needs to be clearly set out in advance in order to send a clear signal to the industry and encourage investment. It is likely that the quota would be set at a relatively low level initially, building up over time as the industry grows.

### **Who would generate Heat Obligation Certificates (HOCs)?**

Schemes producing heat from renewable sources would be eligible to be awarded HOCs related to their qualifying heat output. The main sources of renewable heat will be biomass including biogas, solar thermal and ground source heat pumps.

### **Where's the flexibility?**

As with the existing RO a buy-out price would be set to limit the cost of the scheme to consumers. Because of the lower emissions per unit of output associated with generating heat, the Climate Change Levy on heating fuels is roughly a third of that on electricity (0.15p/unit compared with 0.43p/unit). Following the same logic the buy-out price of a HOC could be around £10/MWh (ie one third or the current level for the RO.)

### **Additional benefits**

- Development of the renewable heat sector would encourage the biomass industry, with the potential for positive effects in agriculture and the rural economy.
- Provide value for the waste heat generated by biomass electricity generators – stimulating investment in CHP.
- Provide incentive for biomass to be used as heating fuel in biofuel refineries greatly increasing carbon reduction potential of biofuels.
- Contribute to UK's energy security
- A renewable heat obligation would assist the Government in tackling Fuel Poverty in the future  
by reducing the energy costs of low-income households, particularly in off-gas-network areas.

### **Rates reform**

New rules governing how business rates are calculated will be introduced in April 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 is an example of perverse effects undermining Government's climate objectives. It highlights the need for 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 based at least in part on carbon emissions per unit of production.

## **Business**

This sector covers non-energy supply industrial emissions and the commercial sector. It is a broad category and a number of policies have been introduced to date. Despite this, the energy intensity of industry between 2000 and 2005 has been projected to decrease substantially and demand for energy within the commercial sector is growing. The package of policies in this sector is not delivering absolute reductions and changes therefore need to be introduced.

### **Climate Change Levy**

The Climate Change Levy has the potential to deliver significant emissions reductions by internalising the cost of carbon-intensive fuels and profligate use of energy. So far, however, its impact has been limited primarily because of the low level at which it was introduced and the indirect way in which revenues are recycled. Energy costs for most businesses remain a relatively small expenditure item and a more sophisticated fiscal instrument is needed to curb rising emissions in this sector (see Box 5 - the Future of the UK Emissions Trading Scheme).

The Climate Change Levy is also supposed to create a weak incentive for investment in renewable forms of electricity. However, two serious flaws prevent this from working effectively.

First, the classification of levy-exempt forms of electricity is different from the one used in the Renewable Obligation in that it makes imported sources of renewable energy eligible and includes energy from mixed-waste incineration.

Second, 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 (ROC). This means there is significant potential for double selling and the incentive the levy creates for renewable energy is further weakened. The Government should introduce proper accreditation for all renewable electricity offerings in the domestic and commercial sector and use the new certificates – Renewable Energy Guarantee of Origin (REGOs) — to eliminate double counting.

### **Climate Change Agreements and UK Emissions Trading Scheme**

In the industrial sector, where energy costs are high, most sectors have secured exemptions from the Climate Change Levy and have instead signed Climate Change Agreements (CCA) with Government. These negotiated agreements have so far been very generous and have failed to deliver significant carbon savings in all but the iron and steel sector where there was a large falling-off of capacity.

CCA companies can also participate in the voluntary UK Emissions Trading Scheme, which is set to run until 2007.

The UK invested £215 million of tax payers money in the creation of the UK ETS by incentivising companies to participate – this was justified on the basis that it would help the UK learn by doing in relation to carbon trading and that it would help to establish the City of London as a global centre for the carbon trading market.

There have been a number of assessments of the UK's emissions trading scheme that have highlighted serious concerns about the process used to set baselines and determine targets and Government has been forced to renegotiate with participants to try to reduce the 'hot air' or excess credits in the scheme.

The UK scheme differs in many ways from the EU ETS and Government is now forced to consider what to do with it when it comes to an end in 2007. There remain many sectors of the economy and five of the basket of six greenhouse gases that are not currently included in the EU scheme and likely to remain outside until at least 2013. Friends of the Earth therefore recommends that the UK should continue to use its own national trading scheme to continue "learning by doing" and to maintain our lead in the development of the global carbon market by bringing new sectors within the scheme.

In order to improve the environmental integrity of the scheme, however, many changes will be needed.

### **BOX 5: Future of the UK Emissions Trading Scheme and carbon credits**

A new emissions-reduction policy in the non-EU ETS sectors would be to introduce the concept of a **carbon credit tax**. This would impose the cost of carbon on emitting activities, such as companies in the commercial or transport sectors, but allow polluters to meet that cost by investing in carbon credits generated in the UK.

The UK Emissions Trading Scheme (ETS) could be adapted to supply **carbon credits** to meet the offset requirement created by the carbon credit tax. Carbon credits would be generated using a baseline and credit method where credits can be generated through investment in approved low carbon projects (such as energy efficiency, fuel switching, renewables or transport projects).

The development of a market for carbon credits should allow the progressive capture of emission reductions following the UK's marginal carbon emissions abatement cost curve.

Under this scheme the Government could adapt the Climate Change Levy to impose an obligation on energy suppliers to match some percentage of the carbon intensity of their energy supply with carbon credits. Eg company X would be required to purchase emissions credits to cover 20 per cent of its annual emissions. The CCL values carbon at £5-10 tonne/CO<sub>2</sub> which is paid to the Exchequer and recycled via National Insurance reductions and the Carbon Trust. Under a credit tax situation revenues are recycled directly to any company delivering savings through the generation of carbon-reduction project credits approved within the UK ETS (including company X itself if it undertakes certified reduction projects).

The Government owns the implementation of the policy by deciding what rate of offset to require, but the delivery is by the energy companies and businesses investing in generating certified carbon credits. The CCL paying companies would be required to purchase credits from public or privately funded UK emission reduction projects through the UK ETS registry. They pass on these costs to the consumers, who are then internalising their environmental costs.

The principles for generating carbon credits in the UK already exist. Under current rules ROCs could be sold into the UK Emissions Trading Scheme to help meet targets, but not vice versa. Similarly, efficiency improvements from Climate Change Agreements could be sold into the UK ETS through the gateway mechanism. In other words, fungibility of carbon derived from different UK policy instruments has already been considered and implemented.

The rules for developing a project route (ie where emissions credits are generated relative to a certified baseline by investing in eligible abatement activities) for entry to the UK ETS were also far-advanced before the massive over-supply of carbon in the initial voluntary scheme and the development of the EU scheme stopped activities in early 2003.

Controlling carbon through credit taxes achieves three crucial things. It enables the government to exert absolute control over traditionally awkward areas such as commercial or transport emissions, since the Government can adjust the rate of the carbon credit tax on an annual or rolling basis. Second, the income from the tax must, by definition, be recycled back into the low-carbon infrastructure in the UK. The Government is left to define the total carbon liability from the relevant sectors (such as the commercial sector), through setting the tax rate, while the private sector is incentivised to seek out emissions reductions across the UK since there is a transparent financial value attached to them. Third, the creation of the credit tax provides the incentive to participate in the UK scheme without requiring incentives or the imposition of a mandatory cap on either the participating company or the sector.

This is the basis of all existing voluntary carbon offset schemes in the UK, although many players choose to purchase carbon credits from outside the UK because of the regulatory difficulties in generating and valuing carbon in the UK. The adaptation of the UK ETS to facilitate the development of UK-generated credits would help capture this voluntary market, further helping the UK meet its targets.

A further advantage of such a system is that the upfront cost to the consumer is very small, but will grow as emissions reductions become scarcer, while the Government retains control over the carbon liability.

### **Calculating cost of a credit tax on commercial electricity**

According to Government figures, using the UK grid will lead to 0.43kgCO<sub>2</sub> being released for each kWh of electricity consumed.

So: 0.43kgCO<sub>2</sub>/kWh = 0.00043tCO<sub>2</sub>/kWh

For a 20 per cent offset we need to purchase carbon credits worth 20 per cent of 0.00043tCO<sub>2</sub>, which is: = 0.000086tCO<sub>2</sub>

At a market price of €8.5/allowance and an exchange rate of €1.4 = £1, this offset will cost: 0.000086 x 8.5 / 1.4 = £0.000522, or 0.0522 pence per kWh.

If the social cost of carbon were used as an indicator of the future market cost @£19/tCO<sub>2</sub>, the cost would be: 0.000086 x 19 = £0.001634, or 0.163 pence per kWh for a 20 per cent offset.

### **Relationship with EU ETS**

UK carbon credits should not be exchangeable with EU carbon allowances or Kyoto mechanisms since the intention is to uncover UK reductions at least cost to enable sectors to stay within the UK's 20 per cent reduction budget. This would also reduce the potential for double counting.

### **Relationship with other traded schemes**

In this submission we recommend a range of new market-based instruments used to internalise the cost of carbon and incentivise innovation. These are in addition to existing mechanism such as the Renewable Electricity Obligation. Each of these mechanisms delivers an outcome relevant to the achievement of our climate targets but not all will value carbon at the same rate.

It is possible that the UK Emissions Trading Scheme could operate as an exchange through which the various UK-generated certificates that value carbon could be exchanged. This would be similar to the way in which currency exchanges operate.

## Surface transport

Transport emissions have grown substantially since 1990 and are forecast to continue growing throughout the remainder of the decade and beyond.

Despite this and in distinct contrast to the number of new regulations that have been introduced in the industrial sector, efforts to curb transport emissions have been largely reliant on weak fiscal incentives or voluntary action. The consultation paper says little about the need to shift towards a more regulatory approach although this is certainly now necessary to stay within our carbon budgets.

The three areas where the Government could make significant reductions in carbon dioxide emissions but has failed to do so to date are:

- Greener cars
- Renewable fuels
- Modal shift

### Greener cars

The UK looks set to miss the voluntary EU/ACEA target for reducing the average emissions of new cars sold in the UK to 140gCO<sub>2</sub>/km by 2008. When the target came into force in 1997, average emissions from new cars sold in the UK were 189.8gCO<sub>2</sub>/km. By 2003 this had only dropped to 172.1gCO<sub>2</sub>/km. The UK's performance is lagging behind the EU average. The Government estimated that meeting the EU/ACEA target would reduce emissions in the UK by 4MtC in 2010 but has recently said that it now expects reductions of nearer 2.6MtC.

The Chancellor has reformed Vehicle Excise Duty (VED), bringing in lower rates for more fuel-efficient cars, but has not significantly increased VED levels for less fuel efficient vehicles. This failure to tackle VED adequately has contributed to the UK's relatively poor performance in reducing average emissions: current VED levels provide only a weak incentive for car buyers to choose a more fuel-efficient model and is having little impact on buyer choice, as research for the Department for Transport has found.

### Renewable fuels

The Government has yet to introduce a comprehensive policy to deliver renewable transport fuels. Fuel duty rebates have been introduced for biodiesel and bio-ethanol but are still taxed at a higher rate than LPG. These incentives are weak compared to incentives being introduced in other European countries and unlikely to deliver substantial investments in the UK.

### Modal shift

According to the most recent Government figures, traffic levels have risen by 10.7% since 1997. Policies to encourage modal shift are significantly handicapped by relative changes in the cost of motoring and public transport use. The cost of motoring has fallen in real terms since 1997, but the cost of public transport use has risen. There is also an imbalance in funding of transport infrastructure with large sums of money being allocated by central Government to road building but much less on alternative transport options.

## What the Government should do

### Greener cars

The CCP consultation paper places a good deal of influence on the question of how to further encourage consumers to choose greener vehicles. Whilst introducing labelling schemes for cars on carbon dioxide emissions is welcome it is far from what is needed to deliver significant reductions in carbon dioxide emissions, especially given the investment the car industry is making in advertising SUVs as opposed to more efficient hybrid cars.

The current voluntary agreement between the EU and ACEA should therefore be succeeded by a mandatory agreement to meet a target for the average emissions of new cars of 120 gCO<sub>2</sub>/km by 2012. This will increase the continued market penetration of low-carbon vehicles such as hybrids. There is already support for a mandatory target from the European Parliament and some member states. In addition to this measure it will also be necessary to introduce maximum emissions levels for new cars which should decline over time. This will provide an incentive to introduce low carbon technology to the top end of the market and ensure reductions in emissions in new cars is matched by overall reductions by mileage traveled. A starting point for a maximum emission level could start for instance at a level of 300 gCO<sub>2</sub>/km in 2010

The Government should also reform VED to offer real incentives for the purchase of fuel-efficient cars, introducing higher tax bands for less efficient vehicles. The number of bands should be increased across a wider range with a top rate of £500, and a bottom rate of £0.

The Chancellor could signal that the new top rate would be put in place gradually over 5 years, with proportionate increases in the intervening years. The Government could bring in the increases over 5 years, but introduce the reductions immediately. Such a measure would increase the impact of the recently announced voluntary car labeling scheme. As an example, VED rates for cars registered after March 2001 could be:

**Table 4: Suggested new VED structure**

Band	CO <sub>2</sub> emissions g/km	Current rate (diesel car)	New rate – year 1	New rate – year 5
AAA	up to 100	75	0	0
AA	101 – 120	85	0	0
A	121 – 150	115	50	50
B	151 – 165	135	100	100
C	166 – 185	155	150	150
D	186 – 205	165	170	200
E	206 – 225	165	180	250
F	226 – 245	165	190	300
G	245 – 265	165	200	350
H	265 and above	165	230	500

Calculations by Friends of the Earth show that such a scheme could result in savings of around 4 million tonnes of carbon dioxide by 2010.

## **Renewable fuel**

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.

In July of 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 should indicate their willingness to introduce such a scheme and begin consultations on how it could best bring about increased fuel diversity and reduced emissions. 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.

The extent to which biofuels help to deliver emissions reductions is dependent on many factors including the application of best practice in farming, transportation distances and the use of renewable fuels in processing plants. If implemented correctly the combination of both a renewable transport obligation and a renewable heat obligation should stimulate investment in integrated bio-refineries. An accreditation scheme for fuels will also be necessary to set minimum environmental standards.

## **Modal shift**

Even with greener cars and a greater proportion of renewable fuels the Government will need a sizeable shift in the mode of travel for people and freight, and to reduce the need to travel through better spatial planning, to achieve the necessary reductions in carbon dioxide (as well as tackling congestion and other issues). The Government needs to commit to introducing a distance-based road-user charging scheme, covering either the whole country or at least the main conurbations. The scheme should be designed to reduce carbon dioxide emissions as well as to tackle congestion. The scheme must be revenue raising rather than revenue neutral if it is to achieve desired goals, and monies raised should be recycled into alternative transport options.

The Chancellor should also pledge that future Budgets will increase the cost of fossil transport fuels in order to progressively internalise the environmental costs of emissions in this sector and to create funds for alternative transport infrastructure. Raising fuel duty and recycling it through the public accounts is one obvious way of doing this. Another would be to use further increases to both raise the price of fuel and to recycle investment into the low carbon economy through, for example, a carbon credit tax levied on fuel retailers (see earlier section).

The use of these fiscal instruments could reduce the amount of travel and provide the funds necessary to develop effective and affordable travel alternatives as outlined in the Way to Go campaign's *Paying for Better Transport* report.

## **BOX 6: How could a renewable transport fuel obligation work?**

### **Why we need an RTFO**

A renewable transport fuel obligation would generate carbon savings by decreasing the carbon intensity of road transport fuels. An obligation is the most reliable, inexpensive, and simple way to cut carbon emissions from transport fuels whilst reaching broadly accepted EU objectives by 2010. These objectives will save over a million tonnes of carbon from the transport sector, where emissions are currently forecast to continue growing.

### **Principle**

A mechanism based on the electricity Renewable Obligation model, to achieve compliance with the EU biofuels directive, which is aimed at delivering environmental and fuel security benefits, between 2005 and 2010. The Obligation will also encourage a UK biofuels industry, delivering social, environmental and economic benefits to the UK whilst helping to reduce farm subsidies and other costs to the taxpayer.

### **How it would work**

The obligation should require that a proportion of all road transport fuels supplied into the UK market should be sourced from accredited renewable sources.

Unlike a mandate, which would require compliance, at whatever cost, the Obligation, permits those suppliers who do not deliver the required percentage of biofuels, to pay a penalty, on their underperformance.

The sum of these penalty payments is then proportionally redistributed to those who have supplied complying fuels in order to encourage growth in supply up to the Obligation target.

### **Who does it apply to?**

By supplying road transport fuels into the UK market, companies would become liable to include a percentage of biofuels, or pay the shortfall penalty.

The definition of the UK transport fuel market would be all of those fuels, which pass through the duty regime, or pass "out of bond". This definition has the benefit of occurring at a limited number of locations where the nature of the fuel is currently monitored, unlike retail points which are numerous, and only record product value for VAT purposes. This system would also allow averaging of compliance (say 5% biofuels in 20% of locations, creating 1% supply into the "pool") rather than a rigid national target, which would be difficult to achieve in the short term.

### **What level should Obligation be?**

Our view is that progress towards the EU's indicative 2010 target of 5.75% of transport fuels is the key element, and that clear commitment to a longer-term target, and challenging interim targets are the most appropriate structure.

Underachievement against annual targets generates increasing incentives under an Obligation scheme, and will demonstrate consistent progress towards a target line throughout its life, and is therefore a desirable interim situation.

On this basis we see no reason why the short-term target for the obligation scheme, should not be set at 1%, rising by this amount on an annual basis until 2010. Setting the penalty, or buy-out, at 10ppl, would generate sufficient incentive for biofuel producers, assuming supply initially runs at 50 per cent of target, or below. Given the capping effect of the buy-out price (see “How much will it cost?” below), we would envisage accelerating the percentage obligation rather than increasing the buy-out price, as a means of ensuring continued incentives to producers.

### **How much will it cost?**

The cost of the Obligation can be viewed from a number of perspectives, from overall financial value, to the cost for Government, oil companies, and the individual consumer.

Whether through purchasing compliant fuels or paying the buy-out, the turnover value of the Obligation scheme is capped by a multiple of the obligation percentage and the buyout price, say 1 per cent (or 440m litres) x 10ppl = £44m. This level of cost is unlikely to provoke wide-scale reaction from the major oil companies, but is sufficient to overcome the economic risk to the emerging producers, when combined with the duty alleviations already announced.

From the government’s perspective, the Obligation provides a top up mechanism, which alleviates pressure for further duty cuts for biofuels, and may even allow an exit route from these subsidies in the future. It also has the benefit of stimulating domestic activity with secondary income benefits.

From the consumer’s point of view, as the person ultimately bearing the cost, this is capped at five percent of ten pence per litre by 2010, or half a pence per litre. This additional pump price is dwarfed by current market changes, none of which deliver the wider benefits of the biofuels obligation.

### **What information will be required?**

An established system of reporting deliveries of UK road transport fuels is currently in place, covering production, imports and domestic distribution. The most relevant information with respect to the operation of an obligation scheme, is that gathered by Her Majesty’s Customs and Excise (HMCE) who monitor all transport fuels for the purposes of duty. This system already covers all domestically refined and imported material, and differentiates on quality between fuels, including biofuels, and traditional mineral oils.

Using this information as a base, will ensure consistency of information, avoid duplication of effort and cost, and will ensure that emerging small producers or importers are brought into the duty and obligation schemes on similar basis.

### **How will it be policed?**

While currently generating much of the information required for an obligation scheme, HMCE is unlikely to be the appropriate operator of such a scheme, with the potential for confusing duty and buyout issues, together with the redistribution issues raised by the buy-out pool.

The transport fuels industry does not have a regulatory body such as OFGEM, who operate the current ROCs scheme, we would suggest that the Environment agency is the probably the most appropriate body to conduct such a role as they already have experience of administering through, the packaging recycling note scheme and will be operating the emissions trading registry. If this was not possible we would suggest the obligation fell within the remit of the DTi as the major challenges surround trade issues.

We envisage this system being formalised by the licensing of producers using accredited inputs and methods, such that they are able to issue certificates with their production. This certification would form the basis for eligibility under the obligation scheme, and be one method of demonstrating eligibility for reduced duty rates applicable to biofuels.

### **What about environmentally unsustainable crops like palm oil?**

The Obligation should be designed to act as an incentive for investment in UK produced feedstocks and UK refineries. Finished products from overseas may be excluded on the same basis that imported renewable electricity is excluded from the existing Renewable Electricity Obligation. Raw commodities will not be able to be excluded but quality standards and accreditation schemes should be used to ensure that only crops produced according to high environmental standards are eligible.

### **Advantages**

- Maximum cost to motorist of 0.5ppl
- Forces innovation in a highly capitalised and concentrated fossil fuel market
- No cost to the Exchequer
- Forces innovation and allows market to uncover most efficient producers first
- Flexible and adaptable allowing increased incentives through higher targets
- Provides investor confidence that a market will be created and maintained over period of the obligation
- Captures current agricultural surpluses and provides new market for farmers
- Encourages UK farm profitability while assisting in subsidy reductions
- Timely, with CAP reform reducing incentives to agricultural output.

## Aviation

Uniquely, aviation is currently free from any policies or measures designed to curb emissions. Currently aviation accounts for only a small portion of the UK's carbon emissions, however these are projected to grow sharply. By 2030 domestic and international aviation emissions could account for up to a quarter of the UK's total emissions. This must be addressed or forecast increases will swamp savings made in other sectors.

The Government's unwillingness to introduce fair taxation for aviation is keeping the cost of flying artificially low, which in turn is fuelling rapid growth. Flying is cheap because the aviation industry has been subsidised by various forms of tax exemption – such as tax-free fuel – for the past 60 years. Aviation is getting an effective subsidy of around £9 billion a year.

Continuing low prices will cause further growth. The Aviation White Paper predicts that the price of flying will continue to fall – this assumption is at the heart of its predictions of rapid growth for the aviation sector up to 476 million passenger journeys by 2030. By contrast, if the price of flying stays constant, then the Department for Transport's own modeling shows that aviation would grow to only 315 million passenger journeys – which could be accommodated without building any new runway capacity in the UK. Keeping the price of flying constant would not mark the end of cheap air travel.

The Government's predict and promote attitude to airport expansion is deeply flawed and inconsistent with a need to reduce carbon dioxide emissions across all sectors. Indeed the Government's passenger growth forecasts have in some cases moved from being a prediction of what might happen to being a target to work towards. For example, one of the targets set as part of the Northern Way is that "we are therefore aiming to achieve a target of at least 17.2 million business and 6.4 million inbound leisure travellers each year through northern airports by 2030 as a key contributor to the overall target of 82 mppa identified in the Future of Air Transport White Paper.

### **What the Government should do**

We believe that aviation's growing contribution to climate change cannot continue to be ignored. Internalising the environmental cost in the price of flying, to reflect the environmental damage it causes, is essential to tackle rising emissions.

#### **Emissions trading**

The Government is currently pinning its hopes on bringing aviation into the EU Emissions Trading Scheme (EU ETS). This will be politically extremely difficult, given that the majority of EU states have yet to offer their official support for this idea.

As with other sectors the environmental outcome of including aviation in the scheme will be determined by decisions about how to allocate allowances. Friends of the Earth would only support the inclusion of aviation in the scheme if the following criteria are met:

- An EU wide cap on allocations must be in place that includes aviation emissions.
- Total allocation for the aviation sector should be determined by deciding on the reduction required from aviation subtracted from historic baseline emissions (e.g. an average of 1998-2003 emissions)

- Permits should be 100 per cent auctioned with funds being recycled to further mitigate the environmental impacts of aviation
- A mechanism to account for the full effects of radiative forcing must be included or separate fiscal measures introduced to address this.

Even with a fair wind, the inclusion of aviation in the EU ETS is still a few years off. Therefore we believe that interim and complimentary measures are needed.

### **Air Passenger Duty and carbon tax credits**

The Chancellor should increase Air Passenger Duty (APD) by adding an additional environmental element to the existing duty. APD is the simplest method available to tackle the effective subsidy aviation receives from its tax exemption. It is already in place, so would be administratively simple to do, and it would signal the Government's commitment to bringing aviation emissions under control, as it does for other sectors of the economy. It would start to meet the Government's commitment in the Aviation White Paper to internalise aviation's external costs.

The additional environmental element could either take the form of a flat fee (e.g. £10 per passenger) or be calculated as a proportion of the carbon intensity (i.e. distance times emissions) of the flight. A similar charge to APD should be introduced to cover transfer passengers and freight flights.

This additional fee would work most effectively if it were recycled back into the low-carbon economy through the purchasing of carbon credits (see Box 5).

We can calculate the likely cost to the consumer of requirement to offset say 20 per cent of the carbon emitted during a short haul flight in the UK as follows:

- According to DEFRA figures, a short haul flight in the UK produces 0.18kg CO<sub>2</sub> per passenger kilometre. So: 0.18kg CO<sub>2</sub>/pass-km = 0.00018kg CO<sub>2</sub>/pass-km
- For a 20 per cent offset, airlines would need to purchase carbon credits worth 20 per cent of 0.00018kg CO<sub>2</sub>, which is: = 0.000036tCO<sub>2</sub>
- At a market price of €8.5/allowance and an exchange rate of €1.4 = £1, this offset will cost: 0.000036 x 8.5 / 1.4 = £0.000219, or 0.022 pence per passenger km.

### **Airports expansion**

The projections of rapid growth within the aviation sector that underpin the Government's Aviation White Paper do not take into account the fact that aviation like all other sectors of the economy must internalise the environmental cost of their emissions of greenhouse gases and over time reductions of emissions within the sector will need to be achieved.

Until the policies and measures outlined above are introduced, which will take some time, it will be necessary to constrain the growth of emissions from aviation through preventing the expansion of airport capacity.

## Households

### Energy Efficiency Commitment

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 (e.g. 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 is continuing, to rise.

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.

By contrast, in the upstream energy sector the economic instrument being introduced to reduce carbon emissions – the EU Emissions Trading Scheme – creates a market to deliver absolute reductions compared to a set baseline. It also includes an incentive to innovate.

This cap and trade mechanism is economically efficient because delivery of the objective is guaranteed (i.e. a set reduction in emissions) but trading provides flexibility and ensures savings are delivered at least cost.

The Renewables Obligation is another economic instrument that harnesses trading to deliver an objective which is expressed as a fixed portion of a total market. The buy-out mechanism ensures that the costs of compliance are capped however the recycling of the revenue created by the 'buy out' facility helps to incentivise compliance.

### What the Government should do

Friends of the Earth proposes a move towards a far more flexible traded mechanism incorporating features from the Renewables Obligation. The consultation paper refers to the potential for a shift in this direction provided by the idea of 'white certificate' trading. The EEC can be modified along these lines by for example immediately setting targets for the scheme expressed as a per cent 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.

The benefit of such a scheme would be to force energy supply companies to shift their business model to an energy service provider with an incentive to meet customers needs in the most energy-efficient and cost-effective way. This market transformation would create the right conditions for increased investment in domestic micro-generation and force companies to identify and tackle fuel-profligate customers.

The shift to a more flexible traded system is unlikely to be able to be implemented fully until after 2008 when the design of EEC will be next revisited. 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:

- 1 Stamp duty rebates for efficient homes
- 2 Much tougher building regulations applying to existing as well as new developments;
- 3 A domestic business tax allowance allowing private landlords to claim investment in energy-saving materials against profits;
- 4 Council Tax reduction for householders installing energy saving measures;
- 5 Reduced rate of VAT to 5 per cent for the supply and installation of energy efficient products or materials (in non-grant schemes when householders employ contractors).

### **BOX 7: A new demand reduction instrument – trading in Negawatts or White Certificates**

#### **Why we need a demand reduction instrument**

The current EEC mechanism may aspire to improve energy efficiency but as it is not tied to any baseline there is no requirement to achieve a net reduction. This is causing an increase in total demand for energy. In order to meet the necessary carbon reduction targets energy efficiency will need to play a key role.

#### **Principle**

To deliver on the Government's demand reduction targets Friends of the Earth proposes a new economic instrument be introduced which combines the successful features of the EU cap and trade emissions scheme and the UK's Renewable Obligation.

In order to deliver the objective Government would set a cap on volumes of centrally supplied energy. (This might be set at a percentage net increase or zero growth initially). Certificates would be used to ensure the cap is met at the least cost through trading and also to denote compliance. A buy-out fund would ensure the cost is capped at an appropriate level and this fund would be recycled into the system with a portion earmarked for fuel poverty programmes.

#### **How it would work**

##### **How should the cap be determined?**

The most important feature of any cap and demand system is how the cap is set and allowances allocated to trading participants. The concept of sectoral carbon budgets described in this submission should be used to determine the overall level of cap in the obligation.

Various allocation methodologies can then be considered for determining the allocation of certificates among participating supply companies. These include:

- allocating according to a set value per household
- allocating according to historic aggregated customer profiles (using D19 data held for each customer which gives information about demand levels).

The first of these allocation methodologies would be the most effective way to internalise the cost of profligacy and would incentivise suppliers to either improve the energy efficiency of the most profligate users or to try to change their customer base.

The second would essentially be a form of grandfathering, where reasons that may contribute to a supplier having a relatively fuel profligate consumer base (e.g. because of geographic location) could be taken into account. If grandfathering is not used then another means to take account of the implications of geographic location would be necessary.

#### **Would this prove anti-competitive?**

No. In each case the acquisition or loss of customers would require targets to be adjusted so that growth in market share was not penalised. Energy Demand Certificates could be transferred between companies as part of a customer transfer process. However, where suppliers have facilitated investment in a customer's property that will result in long-term savings a method of protecting the value of that investment would need to be included. Energy service contracts could for example be separated from the supply of electricity and fuel so that the value of the investment remains with company A while company B can continue to uncover savings from the remaining energy demand. A formula would need to be derived to ensure different energy sources (e.g. electricity, gas, coal) can be treated equally.

#### **Where is the flexibility?**

A method of accounting for the impact of weather fluctuations would also be necessary but could be accommodated through the use of banking and borrowing rules. The presence of a buy-out mechanism which caps costs also helps to mitigate the impact of weather extremes.

Finally measures would need to be put in place to counter the possibility for perverse incentives including the acquisition of housing voids and the creation of "new customers" through use of sub-metering in currently single-metered properties.

#### **How would this relate to carbon budgets for other sectors?**

The objectives of a demand reduction market are multiple (ie increased security of supply, reduced costs, environmental gains) and do not solely relate to the achievement of emissions-reduction targets. However, clearly there is interplay between this proposed scheme and budgets for the energy supply sector and allocations within the EU Emissions Trading Scheme. As with the EEC, expected savings from this new measure would need to be taken into account in determining carbon budgets for upstream businesses with allowance allocations to participants needing to be reduced accordingly. However, the increased certainty of outcome delivered by the cap and trade scheme compared to the EEC should reassure upstream generators that they will not be penalised by needing to buy extra credits to compensate for the failure of downstream policies.

### **Could this be linked with the EU ETS?**

In the longer term there is the potential to link the two trading schemes allowing credits in the demand reduction market to be sold in the carbon market. It would be more difficult to allow carbon credits to be sold into the negawatt market as there is no read-across in terms of increasing security of supply. A gate mechanism would be needed between the two schemes which prevented the carbon market from being flooded with credits (the buy-out fund within the negawatt market providing a relatively low cost of compliance compared to the penalty system in the EU ETS) and to facilitate the conversion of the demand reduction currency into a carbon value

### **Advantages**

- Increased certainty of outcome — although the buy-out means there is no absolute cap on demand, the range of low-cost efficiency abatement options in this sector and the recycling of the fund to competitors would create a strong incentive to comply
- Incentive for suppliers to shift business model to provision of energy services rather than the sale of units of energy
- Change in tariff structures so that low energy users are rewarded and profligate users penalised
- Economic efficiency and accountability as the scheme concentrates on outcomes rather than activities where results have to be projected
- More holistic approach which incentivises actions to meet the dual objective of least cost and most reliable/predictable outcome
- Part of the buy-out fund could be used to fund a dedicated fuel poverty programme.

## **Institutionalising the achievement of targets across Government, nations and regions**

The Government has so far failed to ensure that governments in Wales and Northern Ireland, English Regions and local authorities have a duty to share the UK's responsibility for meeting legal Kyoto commitments and national Government manifesto commitments to reduce CO<sub>2</sub> by 20 per cent by 2010 from 1990 levels.

In England the Office of the Deputy Prime Minister (ODPM) does not share the Public Service Agreement (PSA) target on climate change with Defra, DfT and DTi. Regional bodies under the stewardship of the ODPM have no duty to help deliver the climate change target within their Regional Spatial Strategies (RSS), despite the likelihood of an unsatisfactory RSS increasing carbon dioxide emissions through poor spatial planning and poor regional transport strategies. The ODPM has failed to include responding to climate change in its guidance for producing Regional Transport Strategies (PPS11 Annex B); and the DfT failed to make climate change a shared priority for local transport plans. The DTi has failed to make reducing climate change an objective of the Regional Development Agencies (RDAs). This failure of top-down direction leaves the Government with less control in meeting legal Kyoto commitments and manifesto commitments.

### **What the Government should do**

#### **Whitehall**

The Treasury should at the next spending round include ODPM in sharing the climate change PSA target. Until then the Climate Change Programme should require commensurate action by the ODPM on climate change.

#### **Wales and Northern Ireland**

Wales and Northern Ireland governments should share the PSA target on climate change to achieve a 20 per cent reduction in carbon dioxide by 2010. A target for each country should also be agreed and be institutionalised within all their programmes including their planning guidance. The target should be arrived at through an open consultative process involving the public and institutions in these countries.

#### **England**

The OPDM must share with regional and local authorities the PSA target for delivery of 20 per cent cuts in carbon dioxide by 2010 and this should be cascaded to regional planning bodies which should be given a duty to contribute to this target within their Regional Spatial Strategy and should develop with other regional authorities, regional action plans to deliver the changes.<sup>10</sup>

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<sup>10</sup> Government adopted good practice by the Yorkshire and Humber RSS should be promoted and encouraged.

The ODPM must also require Regional Transport Strategies to address the issue of transport's climate change emissions so that these strategies contribute to the delivery of the climate change PSA. ODPM must also produce a Planning Policy Statement on climate change to integrate guidance across other Planning Policy Statements and cover missing guidance in PPG13 on transport and PPG3 on housing.

The Department for Transport must amend the guidance to local authorities on producing their five-year local transport plans to include a "shared objective" to require local authorities to reduce emissions of carbon dioxide from transport within their areas to contribute to the Government's 2010 20 per cent carbon dioxide reduction target, and the Department's shared climate change PSA target.

The Department of Trade and Industry must cascade its shared climate change PSA target to RDAs through adding a new tier two objective (regional outcome targets) for RDAs as happens with other DTI PSAs.

Action at this level should include the use of a centrally managed fund to provide incentives for action on climate change by regional bodies and such actions should also be eligible for creating carbon credits to offset carbon credit tax.

## Annexe 1

**Table 5: Effectiveness of measures to reduce carbon emissions 1990-2003**

Sector	Trend in emissions (1990-1999)	Trend in emissions (2000-2003)	Measures to reduce carbon intensity	Measures to improve resource efficiency/reduce demand
Power	↓28.3% From 54.1 to 38.8 millions tonnes carbon	↑9.07% From 41.9 to 45.7 million tonnes carbon	Regulation: Renewables Obligation	
			Regulation: EU ETS encourages fuel switching (at a price of 8 euros per tonne) and penalises inefficiency	
Industry	↑2.7% From 37.6 to 38.6 million tonnes carbon	↓5.63% From 37.3 to 35.2 million tonnes carbon	Regulation: EU ETS encourages fuel switching (at a price of 8 euros per tonne) and penalises inefficiency	
			Fiscal: Climate change levy (CCL) and CCAs – weak incentive to switch to cleaner fuels and increase efficiency	
Commercial	↑13.8% From 21.1 to 24 million tonnes oil equivalent	↑3% From 25.0 to 25.7 million tonnes oil equivalent	Fiscal: Climate change levy – weak incentive to switch to cleaner fuels and increase efficiency	
			Regulation: Reform of Building Regulations	
Domestic	↑7.4% From 21.6 to 23.2 million tonnes carbon	↑1.71% From 23.4 to 23.8 million tonnes carbon	Regulation: Energy Efficiency commitment	
			Energy Efficiency Commitment	
			Public spend: grants for small scale renewables	Public spend: Community Heating grants
			Regulation: Reform of Building Regulations Regulation: all boilers sold to be condensing boilers from 2005	
Public	↑15.1% From 11.9 to 13.7 million tonnes oil equivalent	↓15% From 13.1 to 11.4 million tonnes oil equivalent	Policy: Efficiency targets for buildings	
			Policy: requirement to consider CHP (excluding the NHS)	
Transport (road)	↑6.65% From 38.82 to 41.40 million tonnes oil equivalent	↑1.8% From 41.07 to 41.82 million tonnes oil equivalent	Public spend: Powershift grants	Fiscal: Company car taxation
			Fiscal: Graded Vehicle Excise Duty	
			Voluntary measure: EU voluntary agreement on vehicle efficiency	
			Public spend: Investment in public transport	Fiscal: Congestion charging
			Fiscal: Congestion charge exemptions	
Transport (rail)	↑10.6% From 1.12 to 1.24 million tonnes oil equivalent	↓19.46% From 1,228 to 1,028 thousands tonnes oil equiv 19.46%		
Transport (air, domestic)	↑50.26% Increase from 7.33 to 11.02 million tonnes oil equivalent	↓0.35% Decrease from 11.98 to 11.94 million tonnes oil equivalent		

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