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THE UNITED KINGDOM CLIMATE CHANGE LEVY

A study in political economy

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FOREWORD

This report has been prepared as part of the work programme of the Joint Meetings of Tax and Environment Experts under OECD's Fiscal Affairs Committee and Environment Policy Committee. It was written by Professor David Pearce, University College London. Similar case studies on how the political obstacles to the introduction of economic instruments for environmental policy with potentially negative impacts on sectoral competitiveness have been overcome have been prepared concerning the Heavy Goods Vehicle fee in Switzerland and the 'minerals accounting system' MINAS, that address nitrogen and phosphorous run-off from agriculture in the Netherlands. A similar study on the taxation of fuels used in domestic commercial aviation in Norway will be prepared in 2005.

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THE UNITED KINGDOM CLIMATE CHANGE LEVY: A STUDY IN POLITICAL ECONOMY

EXECUTIVE SUMMARY

The United Kingdom has an elaborate array of policy measures to tackle its emissions of greenhouse gases.

Apart from more conventional measures relating to energy efficiency standards, policies include a number of market-based instruments. Economic theory suggests that the adoption of such instruments should (a) minimise compliance costs relative to conventional regulation, and (b) provide a stimulus to the development of new technology to reduce emissions, a stimulus that is absent with normal means of regulation. Notable among the market-based approaches is a combined energy tax – the ‘climate change levy’ – and a set of negotiated agreements with industry whereby the levy is reduced in return for an agreed package of measures to reduce emissions. The current report addresses a ‘political economy’ issue, namely why this combination of measures does not approximate the kind of market based approach that would be recommended if we lived in a textbook world in which policy was designed efficiently. Political economy looks at the factors that influence the design of policy measures, factors which will include the relative influence of different pressure groups, political sensitivities of governments to concerns such as the effect of policy on the poor, and the existence of a past history of policy measures which cannot easily be swept aside to make way for the new policy measure. Moreover, the presence of regulatory agencies which may not have a strong incentive to adopt market-based approaches can further inhibit the optimal design of policy measures.

The United Kingdom has had a strong tradition of action on climate change, dating mainly from the early acceptance of the problem by Prime Minister Thatcher in 1988. While there is some evidence to suggest that early support for action was based on a view that UK science would be a beneficiary from understanding climate change better, it soon became apparent that policy measures would be needed. Early discussion of carbon taxes was inhibited by concerns for the effect of such taxes on industry in general, and the sensitive issue of electricity privatisation. Carbon taxes might appear to reduce the attractiveness of investment in the sector. Nonetheless, clear indications were given that energy prices would have to rise to help combat the increase in greenhouse gas emissions.

The advent of a Labour government in 1997 reaffirmed the commitment to act on climate change and to use market-based instruments where possible.

However, the new government had added concerns that made the design of such measures more complex. First, the previous government had faced difficulties in extending value added tax to the household sector, and the new government also did not wish to introduce measures that might have a disproportionate effect on the poor. Second, Labour owed an allegiance to the coalmining communities, in stark contrast to the previous government which had successfully made overt attempts to curtail the power of the mineworkers. Third, Labour had to escape a past image of ‘high tax and high public spending’, so that whatever measures were introduced had to be as friendly to industry as possible and had to avoid the impression that any new tax was simply for revenue-raising. The ‘Marshall Report’ of 1998 attempted to resolve the problems by proposing (a) an energy tax and (b) a permit trading scheme. The end result was the climate change levy and the UK (carbon) emissions trading scheme.

The UK has several greenhouse gas targets.

The first, under the EU-wide burden sharing agreement linked to the Kyoto Protocol sets a 12.5 per cent reduction in all gases relative to 1990 by 2008-12. The second is a domestic 20 per cent reduction in carbon emissions by 2010, subsequently effectively abandoned in 2004. The third is a longer run 'aspirational' and conditional target of 60 per cent reduction on 1990 emissions by 2050. The two domestic targets, which are not linked to international agreements, indicate the strength of government commitment to climate change control.

The levy itself has features that are readily explained by the need, as government saw it, to avoid taxing households, keep industrial cost burdens to a minimum, and bring industry on board with the UK climate change programme. The levy is 'downstream', i.e. is paid by energy users not extractors or generators, is levied on industry only, with households and transport being exempt, and is structured so as to encourage renewable energy but not nuclear power (users of nuclear electricity pay the tax). An 80 per cent discount could be secured if the industry in question negotiated a 'climate change agreement' –i.e. an industry package of measures to reduce emissions relative to some baseline. Anyone over-complying with their agreement could, in principle, trade the resulting credits into the UK emissions trading scheme, along with permits allocated under that scheme and renewable energy certificates under a separate renewable energy constraint on generators. In this way the levy is linked to the other measures in the climate change programme.

How far is the climate change levy effective?

The issue really reduces to asking how effective it is relative to what the alternative measure might have been. Different commentators use different counterfactuals, with most believing that a 'pure' carbon tax would have been better. In contrast, the levy is perversely related to the carbon content of fuels – gas being taxed more heavily in terms of carbon content, than coal. The electricity generators have no incentive to switch between fuels by carbon content because the tax is levied downstream rather than upstream. Coverage is limited because of the exemption of households, who must nonetheless bear some incidence of the tax, and transport which is subject to other tax measures. The climate change agreements appear to have been very successful with over-compliance with targets even in the first year or so of operation. Others believe this reflects the 'soft' nature of the targets from the outset, with the system being largely 'captured' by industry. What is clear is that the levy's design very much reflects the political economy considerations of government. A pure tax would have come into conflict with government goals concerning household vulnerability, competitiveness concerns and the sensitivity of some sectoral interests.

Is it a good tax?

It has made a contribution to the UK climate change targets, but this measure of effectiveness assumes that the alternative was doing nothing. It may well have fared better than some outright regulation measures, but whether it has done better than a pure carbon tax is very much open to debate. The problem, then, is one of the counterfactual against which the levy is compared. The political economy literature argues that there is little point in comparing actual measures against ideal measures if the ideal measures could never be implemented. Equally, there is a risk in the political economy approach that explaining why policy measures look as they do will amount to justifying those measures. This paper attempts to chart a course between the ideal and the realised measures.

For more information about **THE UNITED KINGDOM CLIMATE CHANGE LEVY: A STUDY IN POLITICAL ECONOMY**, contact: Nils Axel Braathen, National Policies Division, Environment Directorate, OECD.
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THE UNITED KINGDOM CLIMATE CHANGE LEVY: A STUDY IN POLITICAL ECONOMY

1. Introduction¹

1. While economists have long set out the theoretically desirable features of market-based instruments for environmental policy, those theoretical prescriptions are rarely met in practice. The main reason for this disparity between theory and practice is fairly obvious: governments cannot simply design and implement policy measures without taking account of political realities. First, what economists may regard as an ‘optimal’ instrument design tends to serve one overriding goal – economic efficiency. Political reality demands that other goals, which in practice are not necessarily consistent with each other, also play a part in practical design and implementation. Second, governments are not all-knowing, all powerful guardians of social wellbeing. Rather, they have to contend with pressure groups and lobbies which, in turn, represent sets of conflicting interests. As a result, actual policy and ‘optimal’ policy rarely coincide. This ‘gap’ is very much the subject of a political economy approach to policy analysis. One goal of political economy is to analyse how large the policy gap is, why it occurs, what the social cost of the gap is, and what might be done to reduce that cost through better policy design.

2. This report focuses on one environmental instrument which is part of the UK’s wider programme of policies to deal with its various obligations to control climate change. The instrument is the Climate Change Levy (CCL) which takes the form of a tax on energy. However, the CCL cannot be viewed in isolation – it is part of a fairly elaborate package of measures, and its interaction with the other instruments in that package need to be understood. Accordingly, we first set out a brief history of the UK’s approach to climate change control, and describe the various components of the policy package. A detailed history of the CCL is then provided, and this is followed by an analysis of the features of the CCL, focusing particularly on the political factors that influenced its design, and the various reactions to it. Finally, we look at the likely future of the CCL in light of developments in climate change policy in the wider Europe.

¹ Comments would be very much appreciated, especially corrections to statements of facts and to numbers. Please send to David Pearce, d.pearce@ucl.ac.uk as an e-mail or Word attachment to an e-mail. I am very much indebted to the following for comments on earlier drafts: Dieter Helm of New College, Oxford University; Robin Smale of OXERA Consultants, Oxford; Michael Common of the University of Strathclyde, Glasgow; Chris Heady and colleagues at the OECD, Paris. Staff at the European Commission, Brussels kindly provided some corrections to the description of the EU emissions trading scheme. Paolo Agnolucci of the Policy Studies Institute, London, kindly supplied me with an advance copy of his paper on an event analysis of the climate change levy. Staff in the UK DEFRA and HM Treasury also kindly offered comments on earlier drafts. None of them bears any responsibility for the remaining errors or for the interpretation placed on events. These are my responsibility alone. An early version of the paper was presented to the EFTEC ‘EnvEcon’ conference at the Royal Society, London in March 2004.

2. Why political economy?

2.1 What is political economy?

3. Why should a study of an environmental tax be prefixed by the term ‘political economy’? The contrast between economics and political economy is now quite a sharp one, even though the two terms were used interchangeably from the end of the 19th Century to, say, the 1960s. An economic analysis of a policy measure would, by and large, be confined to an analysis of the aggregate gains and losses in wellbeing (welfare, utility) arising from a policy intervention such as an environmental tax. Such analyses are termed ‘efficiency’ analyses, or ‘welfare’ analyses, since they compute the changes in wellbeing for each individual or agent affected by the tax. These gains and losses are then aggregated, usually on the basis of the money value of the changes in wellbeing. Such an approach typifies cost-benefit analysis, for example. Some writers (e.g. Boyce, 2002) argue that political economy differs from economics in that the former would additionally analyse the distributional impacts of the policy: i.e. who gains and who loses. There are two aspects to this distributional concern. The first is *positive* and argues that the distributional incidence of the policy will do much to *explain* why the policy is designed in the way it is. This is because those who lose (or who do not gain as much as others) may well lobby against the measure, leading to its redesign. The second aspect is *normative*: what is or is not socially desirable depends in part on whether gains and losses are distributed fairly. In this case, some distributional judgement relating to the deserts of the gainers and losers would be added to the efficiency criterion. For example, if losers were the poor and gainers the rich, an equity criterion would pronounce the policy to be unfair, even though it may be efficient in the economic sense. (Pearce, 2003a, provides an extensive survey of equity approaches).

4. While political economy would certainly concern itself with the distributional implications of a policy, distributional assessments of this kind have been integral to most policy analysis, and it does not seem reasonable to confine ‘political economy’ to an analysis of distribution, important as it is². It is true that efficiency and equity can and do trade-off against each other: for a policy to be fair there may well have to be sacrifices in efficiency. Then, some ‘meta’ principle is required to decide what that trade-off is, and the political process may well be the means of deciding it. Moreover, if ‘distribution’ is construed widely enough to encompass different impacts on different interest groups, then distributional concerns certainly account for a significant part of the wider political concerns about policy. But it is the general interaction between the political process and the theoretical optimal design of policy instruments that defines political economy. As Drazen (2000) puts it:

‘If economics is the study of the optimal use of scarce resources, political economy begins with the political nature of decision-making and is concerned with how politics will affect economic choices in a society’ (p.5).

5. Optimality in economics is based on the notion of maximising net benefits. In turn, a benefit is defined as any gain in human wellbeing, and a cost as any loss in human wellbeing. A benefit is anything that is preferred by an individual, and a cost is anything that the individual ‘disprefers’. Hence, preferences are the basic data of welfare economics. To convert this analysis into something measurable, preferences are measured by willingness to pay to secure a benefit, and willingness to accept compensation to tolerate a

² For overviews of political economy see the special issue of *Journal of Economic Surveys*, December 2000 and especially the introductory article by Sayer (2000). For an overview of political economy and the environment, focusing on the political difficulties of introducing market-based instruments, see Kirchgässner and Schneider (2003) and Pearce (2002a).

cost³. In the case of an environmental tax, such as the CCL, economics would pronounce on its desirability or otherwise according to whether or not its benefits exceed its costs. Formally, the assumed social welfare function appears as:

$$\Delta SW = \sum_{i,t} \Delta W_{i,t} \dots [1]$$

where Δ signifies 'change in', W is wellbeing, SW is social wellbeing or welfare, and ΔW can be positive for some individuals and negative for others, i is the ith individual and t is time (discounting is ignored, for convenience). For a policy to pass a CBA test $\Delta W > 0$.

6. In practice, few political decisions are made on the basis of maximising net benefits in the sense defined above. 'Politics' intervenes in the process, even where the notion of optimality is accepted as a working goal of policy design, as it is in those countries, including the United Kingdom, where some comparison of costs and benefits is required by regulatory agencies⁴. In other contexts, the economist's notion of optimality may be rejected anyway, and some other goal or set of goals may be substituted for economic efficiency. Thus, the actual policy outcome may vary, often substantially, from the economic optimal design because of (a) rejection of the underlying goal of economic efficiency, or (b) the need to meet other interests which conflict with economic optimality (Oates and Portney, 2001). In the case of UK environmental policy the latter factor is probably the more important. Essentially, any policy imposes costs and benefits, setting up an array of conflicting interests. In turn, gainers and losers vary substantially in the political power and influence they wield, for good or bad reasons. Accordingly, a dynamic political process gets under way which can influence both the initial and subsequent design of policy and its implementation. The classic formulation of these interactions expressed as a simultaneous game is Becker (1983). For any issue there will be competing interest groups, each with a political 'influence function' which translates the interests of the group into political influence. The outcome is a game equilibrium.

7. However, Becker viewed political decisions as the equilibrium outcome of competing interest groups, leaving little room for the traditionally perceived role of government as a provider of the 'public interest'. Modern political economy accepts that actual decisions are not made on the basis of a textbook social welfare function. A function such as the following captures the essence of what might happen in practice (e.g. Kalt and Zupan, 1984; Grossman and Helpman, 1994; Aidt, 1998; Goldberg and Maggi, 1999):

$$\Delta PW = \alpha \sum_{i,t} \Delta W_{i,t} + (1 - \alpha) \sum_{n,t} \Delta W_{n,t} \dots [2]$$

In this case there are two broad groups in society: individuals i, as in the traditional social welfare function shown by [1], and 'interested parties' or 'pressure groups', n. To emphasise the difference, political welfare, 'PW' is substituted for 'SW'. The weights α and $(1-\alpha)$ reflect the strength of political regard for social wellbeing and the wellbeing of interest groups. In the limit, if $\alpha = 1$ the PW function is equivalent to

³ And, more comprehensively, willingness to pay to prevent a cost and willingness to accept compensation to forego a benefit. The resulting four main measures of welfare change are the four 'consumer's surpluses'.

⁴ In the UK, all policy measures of any significance must be accompanied by a Regulatory Impact Analysis (RIA). The relevant guidance can be found in UK Cabinet Office (2003) and in UK HM Treasury (2002a).

the SW function. If, on the other hand, $\alpha = 0$ then government is totally ‘captured’ by interest groups, as in early models of political economy (Becker, 1983). In the context of environmental policy, interest groups can be pro- or anti-environmental so that political decisions may over- or under-regulate for environmental quality. The conditions for successful organisation of lobbies are not of direct relevance here – Olson (1965) remains the *locus classicus* in this respect.

8. Equation [2] can be subjected to a broad interpretation. For example, as we shall see, the UK government, along with most other governments, has long had a concern with the effects of regulation on ‘competitiveness’⁵. Since any damage to UK competitiveness with other countries would harm most of the population, this can be thought of as a component of ΔW_i in [2]. But political lobbying will also reflect this concern since industrial lobbyists in particular will be concerned with competitiveness effects because of the implications for profit margins and hence shareholders’ interests and managerial rewards. Governments therefore react to issues of competitiveness with two interests at heart: (a) its role as provider of the public interest (ΔW_i) and (b) sensitivity to the effects of impairing competitiveness on lobbyists (ΔW_n).

9. The contrast between the two welfare functions [1] and [2] immediately explains why an optimally efficient tax is likely to be rejected at the political level: it simply fails to capture the various pressures on governments in making decisions. In turn, governments are sensitive to those pressures for their own reasons, which may be as simple as staying in power, or a concern to ‘buy’ support in order to realise some social or economic programme. The essential point is that the textbook recommendation is formulated in a context that is very different from the political context. However, great care is needed in pursuing the political economy perspective. *Explaining* differences between optimal and actual design of policy measures does not *justify* them. The role of normative economic analysis remains one of explaining how a decision should look if the economist’s social welfare function approach is adopted. Normative political economy then has the role of asking whether the various institutional and political constraints really are as limiting as the political economy model might suggest. Alternatively, if the constraints are accepted as being, in some sense, unalterable, the analysis shifts to asking whether the final design of policy really is the only possible one. In other words, given the constraints, could the actual outcome be improved? The risk in political economy analysis is that these later stages are not pursued: *what is* becomes *what should be*, simply because what is can be explained by the various ‘immutable’ factors faced by real-world decision-makers. This ‘Panglossian’ analysis needs to be avoided⁶.

2.2 Optimal environmental taxes in the UK

10. Interestingly, the UK introduced two environmental taxes that, initially anyway, mirrored exactly what an optimal externality tax should look like. The Landfill Tax, introduced in 1996, was based on a detailed study of the monetised externalities from waste disposed of to landfill sites (CSERGE et al. 1993)⁷. Since then the tax has been raised beyond the initial externality levels because of the need to comply with the EU Landfill Directive. In turn, if the original externality levels were correctly computed, and if the landfill Directive requires more externality reduction than is dictated by the tax, then the Directive itself must fail a cost-benefit test, i.e. the Directive is economically inefficient. How far this is true depends on the way externalities are estimated, and especially on the issue of whether or not a ‘user

⁵ Just what ‘competitiveness’ means is considered later in the report.

⁶ In Voltaire’s *Candide* Dr Pangloss was noted for arguing that, regardless of the misery he found himself in, ‘in this best of all possible worlds... all is for the best.’

⁷ Norway’s landfill tax was also based on an assessment of externalities, producing a significantly higher figure equivalent to £23 per tonne of waste, way above the UK’s initial tax rate of a £3-4. (OECD, personal communication).

cost' element for scarce landfill space is incorporated in the analysis (Pearce, 2004a). The second example of an economically efficient tax in the UK is the Aggregates Levy, a tax on the extraction of minerals such as sand, stone and gravel. This levy was introduced in 2002 and was based on an extensive stated preference study of the externalities associated with aggregates extraction (London Economics, 1999; Pearce, 2004b). The tax has remained at the initial level since 2002.

11. If the UK could set some environmental taxes at their optimal efficient level why has it failed to do so with other environmental taxes, and notably, as we shall see, the Climate Change Levy (CCL)? In the case of the Landfill Tax the answer is almost certainly that there was only a limited political opposition to the tax. Non-organic waste was taxed at a low level (£UK 2 per tonne) because of the lower externalities associated with inert materials (no carbon dioxide or methane emissions). Had the tax been higher, there may well have been an orchestrated campaign against it by the construction industry, since significant amounts of demolition and construction waste go to landfill. Taxing organic waste, which is associated with the higher externalities, essentially means taxing commercial and municipal waste, with the former being able to pass costs on fairly simply, and with the latter being dealt with by local government. In turn, municipal authorities would have the capacity to build the costs of the tax into their negotiations with central government over grants for expenditure. Turning to the Aggregates Levy, there was a spirited opposition to the tax from the aggregates industry but it seems fair to say that the opposition was not very strong. To some extent the industry misread government determination to impose some measure of externality control on the industry. The issue is discussed in detail in Pearce (2004b).

12. The contrast between these environmental taxes and the CCL is stark. Fossil fuel energy, and hence carbon, is pervasive to any industrialised economy. Raising the price of energy or carbon thus affects a large array of interests. Moreover, the effects in some cases could represent significant cost increases and hence pressures on profit margins. The whole history of energy taxation in industrialised countries is a history of very powerful political pressures against such taxes. The examples of the failed BTU tax in the USA and the failed 1992 EU energy/carbon tax are sufficient to illustrate the point. Whereas the Landfill and Aggregates taxes attracted some opposition, it paled into insignificance compared to what could be expected for an energy tax.

2.3 *A diagrammatic illustration*

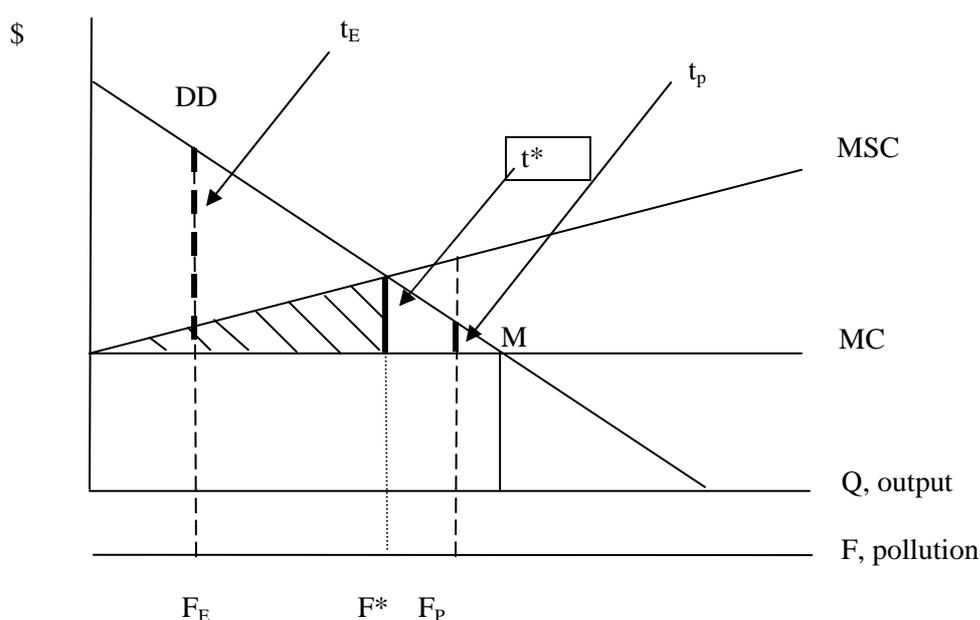
13. Politics is very much the study of the mechanisms for making collective choices in contexts where there are conflicting interests. To see why economics and politics produce very different answers, consider the standard economic analysis of an environmental tax in Figure 1. DD is the demand curve, and MC is the (assumed constant) marginal cost curve. MSC is the marginal social cost curve and the difference, $MSC - MC$, is the (marginal) environmental externality that is to be the subject of policy. The economist's prescription in this context would be for a (Pigouvian) tax of ' t^* ' such that price $P = MSC$, or a tradable permit system that brought about the optimal quantity of pollution F^* , or some control system that forced polluters to produce F^* pollution. The policy measure produces the economically optimal level of environmental damage, equal to the shaded area shown. Less damage than this involves a sacrifice of consumer surplus (the vertical difference between DD and MC) greater than the reduction in the environmental externality. More damage than F^* involves more environmental damage than any gain in consumer surplus.

14. Now introduce political power. Two stylised political equilibria can be illustrated. Suppose environmentalists have the balance of political power. Then they may force policy towards a situation such as F_E which is clearly non-optimal in the economic sense. They may do this by successfully arguing for a tax rate t_E rather than t . Similarly, if polluters have the balance of political power, they could force an outcome such as F_P , again a non-optimal outcome, and again brought about by lobbying for a tax rate different to the optimal tax, i.e. t_p rather than t . It is thus easy to see that 'politics' produces outcomes that

are not consistent with economic optimality. But this is hardly surprising. Unless policies are determined precisely using cost-benefit analysis, political outcomes will always be non-optimal in the economic sense.

15. There is, however, a far more subtle argument linking the notions of optima and politically determined outcomes. This emanates from the 'Public Choice' school's critique of welfare economics – see, for example, Buchanan and Vanberg (1988)⁸ – and tends to suggest that far more scrutiny needs to take place in terms of the need for policy interventions at all. Whereas the preceding discussion compared the efficiency optimum with politically determined equilibria, the Public Choice critique asks whether the policy is worthwhile in the first place. The two states that are compared are the politically determined equilibrium (F_E or F_P in Figure 1) and the no-intervention market equilibrium (M in Figure 1, i.e. the point where $P = MC$ and the polluter's profits are maximised). The argument is that intervention is not going to achieve the economic optimum because, in the real world, governments have to generate some sort of consensus out of conflicting interests. Hence there is little political point in analysing positions such as F^* in Figure 1: they may be an efficiency ideal, but they are not going to materialise. What matters, then, is how the likely political equilibrium compares with doing nothing at all, i.e. not intervening with, in this case, environmental taxes.

Figure 1. Economically optimal environmental damage and politically determined damage



16. Figure 2 repeats Figure 1 but this time focusing on a comparison of M with F_E and with the diagram constructed to illustrate the point in question. The question is whether society is better off, in

⁸ The Public Choice school of thought emphasises the interaction between economics and politics, or the 'application of economics to political science' (Mueller, 1989). Its later writings tend to criticise welfare economics for offering policy prescriptions that are independent of the set of political institutions and interest groups that define the political context of decision making, or, more crudely, for being politically unrealistic. Classics in the Public Choice literature include Downs (1957); Buchanan and Tullock (1962); Riker (1962); Olson (1965) and Niskanen (1971). Modern guides are Mueller (1989, 2003) and Stevens (1993).

efficiency terms, with the ‘forced’ equilibrium of F_E than a situation in which no policy intervention is undertaken at all, i.e. the externality is left uncorrected. To find this out, it is necessary to compute the relevant net surpluses, i.e. consumers’ surplus minus any environmental damage. For M, the net surplus is given by

$$\text{Area (A+B)} - \text{Area G} = A + B - G$$

For F_E , the net surplus is given by

$$\text{Area (A)} = A$$

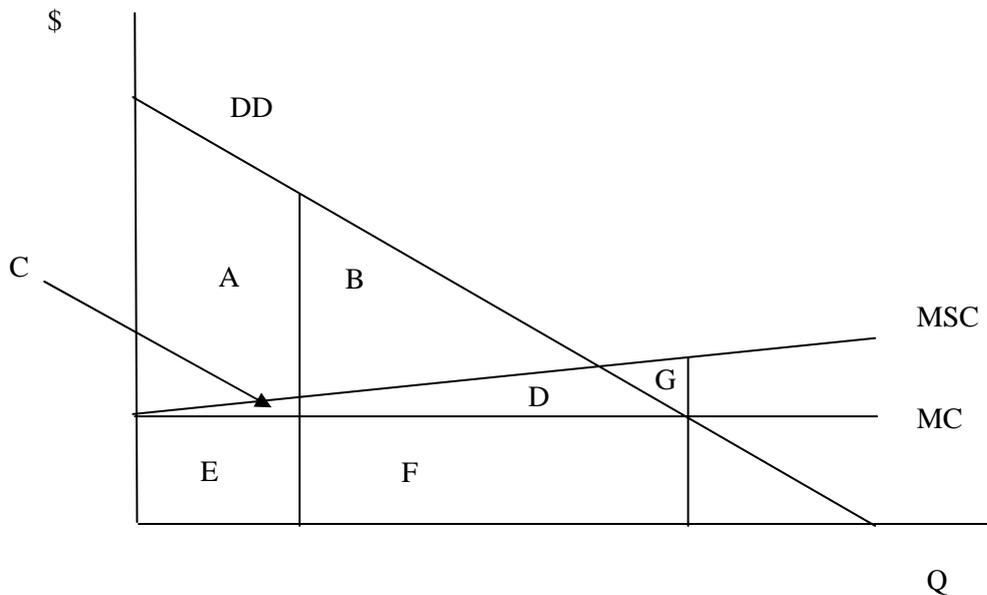
The no intervention solution, M, is to be preferred to the forced equilibrium F_E , if

$$(A+B-G) > A$$

or $B > G$

17. By inspection, this is the case in Figure 2 which means that the politically determined equilibrium is inefficient *relative to* doing nothing at all about the externality.

Figure 2. Comparing no intervention with forced equilibrium



18. The practical implications are potentially significant. What the Public Choice critique is arguing is that techniques like cost-benefit analysis are based on a false comparison of the ‘with policy’ and the ‘without policy’ situation. The ‘with policy’ situation is assumed to be that approximating the economic optimum, or a state of moving towards that optimum. But, if real-world policy forces governments to settle for compromise solutions, there is no guarantee that the compromise solution is better in efficiency terms than the ‘without policy’ situation. Real world ‘solutions’ may be worse than no policy at all.

19. The purpose of this illustration of a political economy argument is a methodological one, namely that the design of economic instruments in practice needs to come as close as possible to the theoretical optimum to avoid the risk that what happens in practice may be no better than taking no action at all⁹. Some of the criticisms of the UK CCL effectively argue this, i.e. that the CCL is an environmental measure that should not have been adopted at all (e.g. Helm, 2003). In principle, of course, this doubt about a measure such as the CCL should be overcome by conducting a more rigorous cost-benefit analysis of the change. This issue is revisited when looking at the Regulatory Impact Analysis of the CCL.

2.4 *The questions to be asked*

20. Political economy suggests that there are several questions to be asked in respect of the UK Climate Change Levy.

- Why do anything at all about climate change?
- Why choose a tax rather than more traditional command and control regulations?
- Why is the chosen tax not like a textbook tax?
- Could policy design be better?

21. Suggested answers to these questions are provided as the history of the CCL and its effects are analysed in the following sections. The concluding section revisits the questions and summarises the suggested answers.

3. A brief history of UK climate change policy

3.1 *A Prime Minister's conversion*

22. The UK Climate Change Levy (CCL) is an integral part of the UK's policy to tackle climate change by reducing emissions of greenhouse gases. UK climate change policy is usually regarded as dating from 1988 and, in particular, from September 27th of that year when Prime Minister Margaret Thatcher made a speech to the Royal Society. A small part of the speech referred to mankind having 'unwittingly begun a massive experiment with the system of this planet itself' (Thatcher, 1988). The Prime Minister went on to identify climate change, ozone layer depletion and acid rain as three examples of these 'experiments'. The speech did not entertain any explicit commitment to action on climate change, being primarily concerned to advertise the UK's leading role in climate change scientific research. Indeed, the references to climatic threats occupy only a small part of the speech. But, in terms of political significance, the fact that a Prime Minister should choose this topic at all is what mattered, rather than the detailed content of what she said. The speech cannot be seen in isolation of other events in 1988. The Montreal Protocol on ozone depleting substances had already been negotiated the year before and it needs to be remembered that, at that time, chlorofluorocarbons were seen as both an ozone depleting gas *and* greenhouse gases. Issues of global pollution were therefore already on the political agenda. Moreover, earlier in 1988 the UK Department of the Environment had published its own assessment of the effects of climate change on the UK, a report that was seized upon very widely in the newspapers because of its suggestion of Mediterranean climates for the southern areas of England (UK DoE, 1988). Also in mid-

⁹ There are also critiques and extensions of the Public Choice arguments. For example, the choice of a single policy instrument may alter political allegiances which in turn may alter other policies – see Besley and Coate (2003). The Public Choice argument also tends to insist on the need to consider the politically determined equilibrium, rather than arguing that what is needed is some improvement in decision-making that would get closer to the economic optimum. In part, this reflects the political preference of the Public Choice school for free markets over managed ones.

1988, an international conference of scientists had met in Toronto and called for a global programme of reducing carbon dioxide emissions by (an arbitrary) 20 per cent on the base year of 1988. While never an official conference, the 'Toronto targets' were widely discussed at the time (Maddison and Pearce, 1995). Finally, successive UK politicians have always sought to 'sell' UK scientific expertise, and it is no accident that Prime Minister Thatcher's Royal Society speech stressed the leading role that UK science played in climate research. This role was reinforced by the appointment in 1988 of UK meteorologist Dr (now Sir) John Houghton as the first Chairman of Working Group I of the United Nations Intergovernmental Panel on Climate Change (IPCC).

23. The Prime Minister's cautious embrace of climate change as a big issue has therefore to be seen in context. The agenda was seen initially as one of research from which the UK scientific community could gain, rather than one of immediate radical action. Nonetheless, no politician ventures into new and potentially controversial areas without some expectation that action would be called for, and Prime Minister Thatcher was no exception. Within government at that time there was substantial internal discussion about potential climate policies. However, it seems likely that no-one in government at that stage envisaged the scale of actions that would be necessary to have any significant effect on rate and levels of warming. In one sense, acknowledging climate change as a policy issue was not therefore a radical act, even if the subsequent scientific research revealed the implications to be far more serious than most people thought at the time. In another sense, the government of the time need not have volunteered to place climate change high on the political agenda. That they did so reflects a genuine persuasion of its importance, and the power of a scientifically-trained Prime Minister whose Cabinet was very probably not entirely convinced that climate change was a leading issue of the times¹⁰.

24. One answer to the question, why do anything about climate change?, is therefore that the leading politician of the time had decided that it was a serious issue. While seemingly simplistic, the answer has a lot to commend it. All Prime Ministers have more than proportionate power but Mrs Thatcher had more power than most. The influence of intellectual persuasion should also not be underestimated. But politicians are always suspected of other motives, and a political economy perspective would have to give potential credit for those motives. Helm (2003a) advances two other possibilities, and there is a third. The first is that Prime Minister Thatcher was bidding for the 'green vote' in the UK. Certainly, conversion to a stance of doing *something* on climate change would have been attractive to environmentalists. From the government's standpoint, provided the gesture was not going to prove costly, 'going pale green' would have hardly any political cost for at least a modest political gain. As the next sections discuss, modern environmental policy in the UK dates from the late 1980s. Contrary to most expectations, it was a Conservative Government that produced the first structured attempt at a cohesive environmental policy in the UK. Climate policy was just part of a more general 'greening' of government at this time.

25. Helm's second candidate explanation is that Prime Minister Thatcher was persuaded of the importance of environmental policy by various individuals, i.e. the intellectual stance of other key personalities was at work. One set of candidates was the scientific advisors and certainly at least one of them has claimed credit for the conversion. But others have made similar claims and it seems more likely that the Prime Minister listened generally to those around her and made up her own mind. No one individual was crucial. Helm cites the appointment of an environment-friendly Secretary of State for the Environment (Chris Patten) as a potentially important factor. But this probably inverts the sequence of events: Patten was appointed *because* he was environment-friendly. He was part of the plan, not the creator of it.

¹⁰ For example, Prime Minister Thatcher called a conference of leading climate experts in No. 10 Downing Street in which senior Cabinet Ministers were encouraged to listen to the experts.

26. The other significant feature of Patten's appointment suggests the third factor, however. Patten was (and is) a confirmed Europhile, and there had been a dawning realisation in the UK that environmental policy (and other policy) was increasingly going to be made in Brussels rather than London. It made political sense to 'Europeanise' the relevant Ministry dealing with environmental policy (Jordan, 2002). Moreover, continental Europe appeared to be 'greener' than the UK and the UK had in the very recent past suffered considerably from an image of the 'dirty man of Europe' because of its early stance on acid rain control¹¹. The late 1980s have also been described as the 'heyday' of EU environmental policy (Collier, 1996). A more positive stance towards Europe would do several things. It would help to modify the early image on an environmental laggard in Europe, it would even raise the possibility of the UK taking a European lead in environmental policy as part of a wider bid to secure political leadership in Europe (as others tried to do, notably with the EU carbon tax proposal – see Grant et al. 2000), and it would certainly enable the UK to secure more control over Brussels-initiated environmental policy. This last factor was important since a common theme of Conservative politics was the need to prevent Brussels from initiating expensive over-regulation.

27. Overall, explaining the UK's commitment to climate change policy rests in part on the intellectual persuasion of individual personalities, perhaps on the desire to command some of the green vote in the UK, but of more likely importance was the bid to correct a past European image and secure some leadership potential.

3.2 *Blueprint for a Green Economy*

28. In the late 1980s, no political party in the UK was wedded to the use of market-based instruments, such as taxes, for environmental policy. In 1988, the then Department of the Environment commissioned a report on 'sustainable development' (Pearce et al. 1988, 1989), with the aim of informing a structured response by the UK government to the Brundtland Commission's report of 1987 (Brundtland, 1987). The 'Pearce report' attracted extensive press attention, primarily because of its advocacy of a switch in environmental policy away from 'command and control' solutions to market-based approaches. (The immediate history of these events can be found in Pearce, 2002b). Media coverage focused very much on 'the polluter pays' principle and the idea that the polluters include all citizens, not just industry. These notions were not new, having been advanced nearly twenty years before by the OECD itself¹² and in the environmental economics literature. But the reference to the 'market' in market-based solutions appealed to the then Conservative government with its belief in a regulated but predominantly free market. (Subsequently, market-based approaches proved to be appealing to all of the main UK political parties, so that the measures were generally not divided along party lines. Indeed, both Labour and Liberal parties quickly produced their own manifestos supporting market-based approaches just after 'Blueprint' was published). The report, and the subsequent book (Pearce et al. 1989) marked the watershed in UK environmental policy between the 'old' regulatory style and the market-based approach, although there is

¹¹ The UK had refused to sign the First Sulphur Protocol – the Helsinki Protocol – under the Convention on Long Range Transport of Air Pollution in 1985. There was a rational economic reason for not signing, namely the fact that the Protocol was economically inefficient since it required equal percentage reductions in acidifying emissions from each signatory – the so-called '30 per cent Club'. Nonetheless, the UK earned a politically very bad reputation in Europe as a result. For discussion see Park (1987) and Boehmer-Christiansen and Skea (1991). The UK has since been a major player in the extension of the Convention through various successive Protocols.

¹² Indeed, the polluter pays principle was one of the first matters addressed by the new Environment Directorate of OECD in 1971. The author of this report was a member of the Directorate in that year.

some evidence that civil servants had tried in previous years to advance the cause of environmental taxes and tradable permits, in keeping with the environmental economics literature of the time¹³.

29. Explaining the conversion of government, and political parties generally, to market-based environmental policy is not easy. As with the conversion to some sort of pro-active climate change policy, the intellectual arguments were seen as persuasive by key individuals, notably by Prime Minister Thatcher and her Secretary of State for the Environment, Chris Patten. The message that market-based approaches could, ultimately, be cheaper for industry also played a part, although it is fair to say that there was continuing opposition, especially to taxes on the part of industrial lobbies¹⁴. Language also mattered: traditional policies were dubbed ‘command-and-control’ with all the emotive impact of soviet-style regulation that would be inimical to a market-oriented government. In contrast, market-based approaches appeared less coercive, as indeed they are so described in the economics textbooks.

30. What does political economy say about the political rationale for a move to market-based approaches? First, political economists do not see regulation *per se* as something that is imposed on industry, but as something that is demanded by them. The idea is that those who are regulated are effectively ‘harnessing the coercive power of the state to restrict entry, support prices, or provide direct cash subsidies’ (Keohane et al. 1998). Rent-seeking behaviour is also relevant: many regulations create rents which can be captured by industry and pressure groups. Second, this ‘demand’ side analysis ignores the public interest motives for regulation (the ‘supply side’) which need to re-enter the equation. But while this supply and demand analysis of regulation may generate insights, it tells us little about why politicians may convert to market-based approaches. One answer is that the conversion is very limited: the *extent* of market-based policy is easily exaggerated. Environmental policies in industrialised countries still tend to be based on standard-setting and especially technological standard setting (under various names, but in Europe as ‘Integrated Pollution Control’). Political economy argues that regulators and the regulated have a preference for these ‘command-and-control’ approaches because they have the potential to be captured by the regulated and fit into preconceived notions of regulation by the regulators. So, one political economy hypothesis would be that there has not been any ‘real’ conversion at all. What market-based instruments exist do so because they are marginal to the more general command-and-control profile of environmental policy. They are perhaps better seen as fringe experiments than an ideological shift.

31. But this argument is not valid for the UK where the range of market-based instruments is extensive, and especially so for the one market-based instrument, a tax or levy, where one would expect the greatest opposition. Interestingly, the political economy literature is strong on explaining why market-based instruments are *not* adopted, and generally silent on why they may *be* adopted!¹⁵ Moreover, the few efforts that have been made – e.g. Keohane et al. (1998) – focus on the USA where opposition to taxes is widespread, as political economy would predict, and where industry preference for tradable permits is easy to understand: grandfathered permits act just like environmental standards, providing a barrier to

¹³ The author of this report served as a Special Advisor to the Department of the Environment, 1989-1992 and was party to the preparation of the 1990 UK White Paper on the Environment.

¹⁴ The arguments were not always understood. Taxes may be cheaper in compliance terms than command and control regulation in one respect, but since they are paid on optimal as well as non-optimal emissions they could be more expensive in some respects. It is the net effect that matters. Some lobbyists certainly understood this. Others did not.

¹⁵ A helpful attempt to do this is provided by Wallart (1999) but his arguments are difficult to relate to the UK and concern low unemployment (true, but not peculiar to the late 1980s); divided industrial opposition (not really true of the UK); a civil service lobby in favour (true but this had failed once in the mid 1980s); and genuine public interest ideology (true).

competitive entry and hence rents for those already in place. It remains difficult to explain why the UK's approach has found 'acceptance' in the sense that environmental taxes have been introduced on a fairly wide scale.

32. The probable explanation for the UK's success in introducing environmental taxes is as follows.

33. First, and very sensibly from a political stance, political statements favouring the market-based approach were always conditional on the nature of the problem at hand and the general costs and benefits of introducing different instruments. In other words, no government ever argued that taxes or permits were 'the' solution in all cases. Indeed, the UK Treasury set out a list of conditions that had to be met before an environmental tax would be considered (UK Treasury, 1997; 2002b). Taxes had to be well designed, have no undesirable side effects, minimise deadweight compliance costs, have acceptable distributional impacts and be consistent with maintaining international competitiveness of the sectors most affected. Notably, no similar list of conditions was provided for other types of market-based instrument (e.g. tradable permits), nor for the traditional methods of control such as technology-based standards. Effectively, the Treasury was providing an insurance policy to polluters that taxes would only be introduced on a case-by-case basis and in a manner protective of industrial interests.

34. Second, each and every UK environmental tax has had some kind of 'sweetener' attached to it, making the tax acceptable over some alternative. The incentives included recycling of most of the revenues to other tax reductions (aggregates levy, landfill tax, CCL), recycling some revenues to special funds designed to improve the environment, or major reductions in the tax in return for a negotiated agreement to self-regulate the relevant externalities (the CCL and the Climate Change Agreements – see later). These measures have some appeal for polluters and environmentalists alike, provided the alternative is made clear, i.e. if there was no tax, some other form of regulation would be applied. Polluters see the return of their taxes, albeit in some other form, and environmentalists secure dedicated environmental funds. Thus, potential opposition to the taxes has been bought-off.

35. Third, from the government standpoint, taxes have a lower regulatory impact than command-and-control. 'Better regulation' has been a theme of all UK governments, the aim being to reduce rather than expand the regulatory burden. Market-based approaches help to achieve this whilst at the same time minimising the chances of regulatory capture.

36. Fourth, market-based instruments were an idea whose time had come. Their virtues had been expounded for thirty years by bodies such as the OECD. There was also some international experience to borrow from. In short, there had been a 'paradigm shift' in policy thinking and it finally gained acceptance, albeit cautious acceptance, at the political level.

37. Fifth, the UK's approach to market-based environmental policy has to some extent been experimental. Taxes might then be seen as part of a wider portfolio of measures designed to tackle seemingly tougher and tougher environmental targets across an array of problems. This view is consistent with the UK's subsequent embrace of quantity-based market approaches, i.e. tradable permits and quotas for landfill waste, packaging waste, and industrial carbon emissions.

38. Christiansen and Wettestad (2003) argue that a 'path dependency' does much to explain the evolution of market-based approaches to environmental policy in the European Union generally. They note, correctly, that making wholesale changes in the philosophy of regulation tends to be rare, because existing regulatory mechanisms are 'locked in' and are difficult to change. While not cited by them, the dominance of technology-based standards based on Integrated Pollution Control is a case in point. These standards require that the same, or similar, technology be employed plant-by-plant, the so-called 'best available technology'. But once standards are set on this basis there is little or no room for emissions

trading or even tax measures, the efficiency of which is conditional on marginal abatement costs varying across plant. If each plant has adopted the ‘best’ technology and no plant is allowed to employ less than best technology, it is hard to see what leeway there is for market-based approaches. Moreover, new instruments require set-up and switch-over costs which regulators may be reluctant to incur. So far, the path dependency approach is consistent with the view that command-and-control measures will prevail, because they are already there. How is the theory to explain what Christiansen and Wettestad (2003) call ‘break out’? They suggest several reasons why new and radical measures might be adopted:

- Disaffection with existing command and control measures in the face of stricter and stricter regulatory demands;
- Changes in the perception of switching costs –i.e. a realisation that new instruments are not as expensive as might be thought.

39. Their remaining arguments have more to do with the adoption of emissions trading in the European Union than adopting taxes in the UK. For example, they argue that trading had to be pursued to keep other countries ‘on board’ with climate change negotiations (notably Japan and Canada, and with the hope that the USA might re-enter the agreement). While path dependency has some virtues in the context of international policy instruments, its role in explaining why any one country might choose to pursue a specific policy change such as the CC is harder to accept.

3.3 *The 1990 Environment White Paper*

40. The first major outcome of this change in environmental policy philosophy was the 1990 White Paper on the Environment (UK Government, 1990), the first significant attempt at a comprehensive statement of environmental policy in the UK. An Annex was devoted to the principles of economic instruments and their advantages over conventional regulation. While the White Paper (which ran to nearly 300 pages) covered most of the then current environmental issues, it was the fact that an entire chapter and a separate annex were devoted to the greenhouse effect and policy measures that attracted most attention. This was in keeping with Prime Minister Thatcher’s personal elevation of the issue to the forefront of policy. Within government there had been extensive discussion of carbon taxes, especially in an Inter-departmental Group on Environmental Economics (IGEE), although the Prime Minister, in particular, was careful to avoid the use of the term ‘tax’ in public, preferring the notion of a ‘charge’¹⁶. Nor was there unanimous approval of such taxes. The White Paper entertained the idea of some sort of price change, although the language used was carefully chosen, once again avoiding the term ‘tax’. In large part this was because the then government was implementing the privatisation of the electricity industry via the Electricity Act of 1989, and it was feared that privatisation followed by an unanticipated carbon or energy tax might result in a legally compromising position for the government. (Legally, the possibility existed that investors could sue the government). Hence, potential investors had to be warned in the privatisation prospectus that future energy prices could be manipulated upwards through some policy-induced change. The White Paper made explicit mention of privatisation, arguing that it would (as it did) lead to a significant switch away from coal contracts to natural gas, with a resulting reduction in carbon dioxide emissions. But the White Paper went on to say that ‘more needs to be done’, not least because it had been decided that the UK would set a target of reducing CO₂ emissions to their 1990 levels by 2005 conditional

¹⁶ Language matters in politics. It is no accident that most subsequent taxes were not given that name: e.g. the Climate Change *Levy* and the Aggregates *Levy*, but there is a *Landfill Tax* and both ‘charge’ and ‘tax’ have been used in the context of a possible pesticides tax.

on other nations doing the same, a target that, at the time, was seen as being quite stringent¹⁷. The White Paper then stated:

'In the long term these [further measures] will inevitably have to include increases in the relative prices of energy and fuel. This could be achieved by taxation or other means, such as tradable permits.' (UK Government, 1990, para 5.25).

41. The same part of the White Paper further entertained the idea that any energy price increase need not be inflationary since other taxes could be offset by the revenues obtained, an explicit reference to revenue-neutrality. The White Paper softened the warning:

'Longer term measures affecting the relative price of energy can only sensibly be taken when competitor countries are prepared to take similar action...In the immediate future the reduction of inflation is of overriding importance. Given this, and our best assessment of how long it will take to achieve an international consensus, tax or other measures directly raising the relative price of energy *outside the transport sector* will not be introduced in the next few years'. (UK Government, 1990, para 5.26). (Our italics).

42. The White Paper notably excluded transport from near-term price rises because of the rapid escalation of emissions in that sector, so the scope for some form of carbon tax in transport was held open. Later in 1990 the European Community as a whole set its target as being one of stabilising 2000 emissions of CO₂ at 1990 levels, a stricter goal than the UK government had initially advanced, but one that now seemed achievable because of the judgement that the earlier forecasts of emissions had been exaggerated (Maddison and Pearce, 1995). In 1992, these targets were confirmed at the United Nations 'Earth Summit' in Rio, although the targets were voluntary: there were to be no sanctions under international law for not meeting them.

43. The White Paper was the subject of annual reviews. Significantly, in the 1992 review the term 'carbon tax' appeared for the first time:

'A price based mechanism (i.e. a carbon tax) allows individuals and companies to respond to the need to save energy in the way best suited to them and helps to ensure that reductions in emissions come from those who can achieve them at least cost' (UK Government, 1992, para.45).

3.4 *The transport carbon tax*

44. The 1990 White Paper implied that transport might well be the subject of an early energy/carbon tax. In 1993, the then Chancellor of the Exchequer announced a 10 per cent rise in transport fuel duty, along with a commitment to raise the duty by 3 per cent per annum in real terms in each future year. This was the 'fuel duty escalator' (FDE). The escalator was *additional* to the prevailing excise tax on gasoline and diesel, but it was explicitly introduced as an environmental tax designed especially to reduce carbon dioxide emissions from the transport sector. Since carbon is in fixed ratio to the quantity of fuel, the FDE very roughly approximates a carbon tax.¹⁸ It is important to understand that the FDE was *not* introduced as

¹⁷ This was because, at the time, CO₂ emissions were projected to rise by around 30 per cent by 2005 compared to 1988. The UK's 2005 deadline was subsequently replaced with a 2000 deadline since other European countries adopted this date and the UK could not be seen to be out of step.

¹⁸ But not exactly. Most externalities arise in urban contexts, and fuel taxes cannot be varied between urban and non-urban areas since arbitrage would take place. Given the fact that most environmental damage arises in urban peak travel contexts where existing transport prices are well below the full social costs of travel, this suggests that transport policy measures should focus more on: (a) urban traffic at peak times through congestion tolls and parking charges, (b) differentiated fuel taxes such that high externality fuels

part of a revenue-neutral reform, unlike the CCL. Had it been so, it could be argued that it would not have met with such political resistance. Only in its last days was the notion of recycling some of the revenues introduced, but too late to placate the anti-FDE lobby which by 1999 was becoming very vociferous.

45. The FDE was expected to continue until 'at least' 2002. The mechanisms whereby the FDE were to operate included (a) changes in driving behaviour to conserve fuel, and (b) incentives for manufacturers to produce more fuel-efficient vehicles. The fuel efficiency target was subsequently set in the EU context by a 1998 agreement to reduce CO₂ emissions levels in new vehicles from 186 gC per km to 140 gC/km by 2008. Had it been retained, it was estimated that the annual 6 per cent tax increase from 1996 to 2002 would have produced savings in carbon emissions of 2-5 mtC by 2010 (a significant reduction of 5-12 per cent of projected transport carbon emissions in 2010)¹⁹.

46. The historical development of the FDE is set out in Table 1. While the tax was introduced by a Conservative Administration, it was continued by the new Labour Government of 1997. The transport lobby had long been vociferous in its criticisms of the FDE, and of the reductions in roads investment, for quite some time. The lobby was successful, and late in 1999 the FDE was cancelled as an *automatic* levy increase, but it remained on the statute book as a discretionary tax. In that year, however, it was announced that revenues would be earmarked for investment in transport. By March 2000 the FDE was modified to be a tax increase that rose only in line with the rate of inflation. At the same time, extra money was announced for investment in the roads network, reversing previous policy which had downgraded road construction as a solution to congestion. In September 2000 direct action was launched by heavy vehicle drivers and by farmers who blockaded oil depots and undertook 'go slows' on the motorways, even though, by then, the policy reversal on road investment and fuel taxation was well under way. Ironically, it was not the FDE that triggered the protests, although it is what protesters said was the cause. The jump in oil crude oil prices had led to an escalation in fuel prices (and subsequent changes in fuel tax in 2004 were similarly postponed because of high crude oil prices). The protests helped to kill off the FDE in November 2000 when *reductions* in *real* rates of fuel tax were announced for the coming 2001 Budget. Significantly, then, the UK's only 'real' carbon tax, the FDE, failed in the face of the political storm it provoked. In money terms, the past increments in the FDE remain in force. In real terms, the increments have been reduced by the rate of inflation since the last increments in 2000.

3.5 *Conceding to anti-tax lobbies*

47. The design of the CCL cannot be fully understood without an appreciation of the lobbies against fuel duties in the transport sector. The FDE was a 'pure' environmental policy measure in that it had no revenue-recycling associated with it. If there was to be opposition, therefore, it would inevitably have been targeted at a tax of this kind. By the time of the late 1999 pre-Budget report, the Labour government was showing clear signs of nervousness about energy taxes. As will be seen, the CCL itself was revised in that year. In the transport sector, concessions were made to the commercial transport lobby. Controls were announced on 'cowboy' road hauliers – road hauliers who tended to escape tax liabilities by using unregistered vehicles – one of the demands of the road freight lobby. The way was opened for the

are taxed more than low externality fuels to encourage substitution, (c) direct emission taxes, (d) vehicle taxes which vary by vehicle age and (e) vehicle mileage taxes.

¹⁹ The basis of the government's projections was, however, unclear. Salmons and Smith (1999) argue that, against a baseline where the average rate of fuel duty is held constant in real terms, the FDE would have secured far higher reductions in CO₂ emissions. Against a baseline where real fuel duties increased at the 1990-1995 rate, the net gains in CO₂ emissions would be zero. Against a baseline of 1990 transport emissions, the FDE would have secured 4-8 per cent reductions by 2010 provided the 6per cent real increase per annum continued.

introduction of 44 tonne 'super' heavy goods vehicles, also a demand of the lobby. Complex changes were announced in the duties on ultra-low sulphur petrol (ULSP) and ultra-low sulphur diesel (ULSD), the latter being a disguised price cut benefiting road hauliers. Previously fairly strong advocacy of road congestion charging faded, with only a handful of schemes being envisaged by 2010. Other concessions included: reductions in vehicle excise duty on lorries; announcing that, in future, foreign hauliers would be charged to use UK roads in the same way that UK hauliers are charged to use continental European roads (the 'vignette' system, or 'Brit Disc' system as it has become known); and an additional £100 million was allocated for early retirement of old (and hence more polluting) lorries. Pearce (2001) estimates that the concessions totalled around £1.5 billion. The UK was not alone in seeking to pacify the haulage industry: Belgium, Italy, France and the Netherlands had all granted concessions of one form or the other. Whatever the rights and wrongs of the fuel duty protests, the anti-tax lobby had demonstrated just how easily market-based approaches to environmental policy could be blocked or modified²⁰.

48. How can the blame for failure be apportioned between the tax being poorly designed and political mismanagement? Pearce (2001) points to a number of political misjudgements. The speed with which concessions were made to the anti-FDE lobbies showed political weakness. Efforts to explain why the tax existed at all became very confused. It was described as a climate tax, a general air pollution tax, and a revenue raiser without which other taxes would have to be increased. In economic terms it could have been all three since the goals are not inconsistent. But the problem was that government pronouncements never settled on which it was. Added to this, as most politicians know, explaining a technical case to a non-technical press and public can be counter-productive. In a display of economics ignorance, one major daily newspaper, for example, regarded the argument that the FDE was needed to raise revenue as false, arguing that the government was 'awash with money' (Pearce, 2001).

49. A more subtle argument is that the FDE had gone beyond the optimal level that would be demanded by a Pigouvian style optimal tax. On the basis of fairly rough calculations, Newbery (1998), Newbery and Santos (1999) and Pearce (2001) noted that, as a carbon tax, the cumulative tax went beyond most central estimates of the marginal damage from carbon emissions. A more sophisticated analysis by Parry and Small (2002) suggests that as an externality tax, covering all emissions and congestion, the *overall* gasoline tax in the UK (i.e. including the FDE element) is twice the second-best optimal level²¹. Could it be argued that this non-optimality argument fed through to pressure groups? If it did, it was almost certainly of marginal political importance. As noted above, while the UK has introduced two almost pure Pigouvian style environmental taxes, all other measures have simply been designed to meet pre-ordained targets. Economic optimality has had little to do with the design of these measures.

50. The central point remains that the experience of the FDE showed how hard it can be to secure the introduction of a carbon tax. This experience also had an impact on the final design of the Labour Government's other main energy tax, the Climate Change Levy.

²⁰ Even economists were not united on the issue of the FDE. Some argued that it was the correct notion, but had escalated beyond a level that could be justified on climate change grounds. Others spoke of the protests as demonstrating that there exists a 'taxable capacity' for taxpayers, a level beyond which some form of direct action would be taken. Yet others regarded the FDE as sound in principle and practice.

²¹ Second-best because other distortions exist so that the gasoline tax cannot be a first-best tax.

Table 1 Evolution of the fuel duty escalator (RPI = Retail Price Index)

Date	Rate of duty increase ¹	
	Gasoline	Diesel
Apr 1993	3per cent over RPI ('RPI+X')	3per cent over RPI
Nov 1993	5per cent over RPI	5per cent over RPI
1997	6per cent over RPI	RPI+6per cent+1p/litre
Mar 1999	6per cent over RPI	RPI+6per cent+1p/litre
Nov 1999	Cancelled as an automatic levy increase, with decisions being made on a budget-by-budget basis but with X<6per cent. Real increases in fuel duties to be earmarked for a fund to improve public transport and the road network.	Cancelled as an automatic levy – see gasoline
Mar 2000	No increase in fuel duty in real terms, i.e. increase = 0 per cent over RPI	
Nov 2000	Budget 2001 to have a cash (nominal price) freeze, i.e. a decrease in tax equal to the RPI, i.e. increase = minus RPI.per cent	

Notes: thus, '3 per cent over RPI' means that the tax was equal to the rate of inflation plus 3per cent; '6per cent over RPI' means the tax was equal to the rate of inflation plus 6 per cent, and so on.

3.6 The UK's climate targets

51. Despite the problems the Labour Government was having with the road lobby over fuel and vehicle taxation, it committed itself to the international negotiations on climate change, culminating in the Kyoto Protocol of 1997 and its subsequent revisions at the Bonn and Marrakech Conference of Parties, knowing that any agreement would require further policy measures, including measures directed at the transport sector. Governments of all political persuasions were already committed to the Rio Framework Convention on Climate Change voluntary target of 2000 CO₂ emissions being no more than 1990 emissions. By the late 1990s it was clear that the UK would meet this voluntary target very largely by virtue of the switch by the privatised electricity supply industry out of coal and into natural gas. (Annex 1 traces the history of UK emissions). Additionally, in its Manifesto, and when not yet in office, the Labour Party committed itself to a *unilateral* target for carbon dioxide (only) emissions. It set a target of a 20 per cent reduction by 2010 on 1990 emissions. How far this was ever a very 'hard' target is debatable, the language describing it changing from time to time between the extremes of a 'commitment' and an 'aspiration'. A 2003 review of progress towards the target concluded that the UK 'is unlikely to achieve even two-thirds [of the target] and maybe even less than half' (SDC 2003)²² – see also Annex 1.

52. An additional complication arises from the European Union Emissions Trading Scheme for carbon, due to start in 2005. Each EU Member State must agree a National Allocation Plan (NAP) under this scheme. Technically, the UK could have offered the lower target under its commitment to the EU Burden Sharing agreements which are linked to the Kyoto Protocol (- 12.5 per cent by 2010) or it could have offered the domestic target of -20 per cent. If it had chosen the former, the political status of the

²² The SDC is the Sustainable Development Commission, an independent body but appointed by the government and charged with advocating sustainable development as a goal, advising on progress towards sustainable development, and acting as a 'critical friend'.

20 per cent target would have seemed fragile. On the other hand, the UK is not legally obligated by the 20 per cent target, whereas it is by the 12.5 per cent target.²³ In its November 2004 revision of its earlier NAP (in April 2004) the UK Government chose to allocate emission allowances more in keeping with the stricter, domestic target. Annex 3 details the allocations.

53. Finally, in 2003, the Labour Government announced that it accepted the Royal Commission on Environmental Pollution's recommendation (RCEP, 2000) that a long term goal should be a 60 per cent reduction in carbon dioxide by 'about' 2050 (UK DTI, 2003a)²⁴. The language describing this target varies. Most of it makes it clear that it is a *conditional* target, i.e. unlike the 1997 20 per cent target, it is conditional on other countries agreeing to similar targets. Thus:

'The government believes longer term targets [for GHGs beyond the Kyoto end period] must be agreed internationally, reflecting the global challenge of climate change, and that the UK could place itself at a disadvantage in future negotiations by setting a target unilaterally'. (UK DETR, 2000, para.17).

54. This conditionality was repeated in the *Energy White Paper* issued early in 2003 (UK DTI, 2003a) in which it was argued that a 60 per cent target might cost the UK 0.5 – 2.0 per cent of GDP in 2050, and that the cost to developed countries as a whole might be 1 per cent 'assuming that the world's leading industrial nations act together' (UK DTI, 2003a, para.1.12). In other statements, the language suggests that the UK will seek to show leadership by adopting the long-run target or, at least, its 'path' by 2020.

55. However hedged the printed language was, the 60 per cent target quickly came to be regarded as a firm target. Moreover, there was little sign of politicians seeking to emphasise the conditional nature of the goal. Given the deep political concerns over earlier climate change goals and their cost, how could such a seemingly dramatic goal of reduced carbon intensity have come about? Helm (2003a revised in 2004) argues that the relevant government departments, and especially the Department for Trade and Industry, convinced themselves that, after all, strict carbon reduction targets were virtually costless, reducing *annual* GDP by no more than 0.01 per cent. In turn, this reversal of faith rested on the MARKAL energy model (DTI 2003c). Helm's criticism of this model is that it assumes the result it produces – by assuming energy efficiency measures and renewable energy are low cost, a future based on them must also be low cost²⁵. If Helm is right, the UK's long run climate change goal is based on a huge self-delusion. Politically, however, it is easy to see that any discovery of this self-delusion in the future could easily be corrected. First, the goal is a very long-term one, nearly 50 years, and hence way beyond normal political memory. Second, the conditional nature of the goal can easily be resuscitated.

56. Table 2 summarises the various UK climate change policy targets.

²³ The obligation exists regardless of whether the Kyoto Protocol is ratified by the requisite number of countries.

²⁴ In the UK, Royal Commissions have a varied membership but usually contain representatives of industry and academia. They take written and oral opinions from anyone who wishes to make a representation and they are independent of government. However, whatever a Royal Commission says officially must be responded to by the government of the day.

²⁵ Helm argues that the DTI ignored various cost elements associated with energy efficiency and renewables: costs of network needed to support energy technologies with low and variable load factors; transaction costs; costs of capital associated with higher political and regulatory risk, and even the health costs of energy efficiency (Helm, 2003a, revised 2004, pp.403-4).

3.7 *The late 1990s context*

57. The 1990 White Paper on the Environment was conceived at a time when energy prices were falling, a trend that continued for most of the following decade. But in 1999/2000 the price of crude oil suddenly rose to between \$US 20 and \$ US 30 per barrel, and the price of natural gas also rose. As noted earlier, the oil price rise played no small part on the fuel duty protests, with the protesters blaming the tax rather than the oil price for high fuel prices²⁶. The price rises generally reinforced the environmental focus on getting out of fossil fuels and into more renewable ones. The problem, of course, was that renewable sources were either significantly more expensive than fossil fuels, even with the increased oil and gas prices, or, if potentially competitive (almost entirely wind power), could not be relied upon to secure major shares of the market. Nonetheless, as Helm (2003b) notes, the new need to reflect again on the management of energy markets came at an opportune time in that significant parts of the supply system were becoming due for renewal anyway, notably the nuclear power stations, but a number of the fossil fuel stations as well. Whatever the technology mix, new investment in the electricity sector would be needed, creating a potential window of opportunity to introduce low carbon technology²⁷.

²⁶ An unexplored issue is why price of \$30 barrel contributed to fuel duty protests in 2000, but prices of around \$50 per barrel in 2004 produced no protests.

²⁷ Helm (2003b) notes that the same set of circumstances, plus the depletion of North Sea gas and the UK's switch to becoming a gas importer, plus the privatised electricity sector's unwillingness to keep the same reserve margins as the nationalised electricity sector had, produced a security of supply problem. This issue lies outside the remit of this report but needs to be kept in mind, not least because the major outages in California attracted a lot of media attention in the UK, primarily focusing on the question 'can it happen here'?

Table 2 The UK climate targets

Year agreed	Gases covered	The target	Comment
1992 Framework Convention on Climate Change, Rio	CO ₂ only	2000 emissions no greater than 1990 emissions: voluntary agreement	Achieved very largely via electricity privatisation introduced by Conservative Government
1997 Labour Manifesto	CO ₂ only	2010 emissions 20per cent less than 1990 emissions	Language of commitment varies, e.g. Energy White Paper 2003 (UK DTI, 2003a) para. 2.14 states it as 'to move towards a 20 per cent reduction', repeated in UK DEFRA (2004d)
1997 Kyoto Protocol, agreed in EU 1998	GHGs	2008-12 emissions 12.5per cent below 1990 emissions	UK's share under the EU burden sharing agreement for the Kyoto Protocol
2003 Energy White Paper	CO ₂ only	c2050 emissions 60per cent less than in 1990 'with real progress by 2020' (UK DTI 2003a, para.1.18) = goal of 110-120 MtC by 2020 ² .	Commitment is to be 'on a path towards' the target. In absolute terms it equals 'around 65 mtC' in 2050. Also stated as a global goal for the 'world's developed economies' ¹

Notes: ¹⁾ See UK DTI (2003a). The Royal Commission's 60per cent cut was against a baseline of 1997. ²⁾ The existing climate change policies are predicted to produce emissions of 135 MtC by 2020, so the 60 per cent target adds a further reduction target of 15-25 MtC by that year.

3.8 *The climate change policy mix*

58. In November 2000, the UK Government published its climate change programme (DETR et al. 2000). The programme set out the emission reduction targets that the UK intended to achieve, and the policies to achieve these targets. The main parts of the policy package (excluding the FDE) are summarised as follows:

- A set of measures designed to reduce business GHG emissions, focusing on (a) the Climate Change Levy (see Section 4); an emissions trading scheme (ETS) in which firms would be induced by payments to reduce emissions and trade permits; a Carbon Trust which would receive some revenue from the CCL and would encourage the take up of cost-effective low carbon technologies; and energy labels and standards at the product level, designed to improve the energy efficiency of products.
- The placing of an obligation on electricity suppliers (i.e. sellers of electricity to final consumers) to obtain 10 per cent of their electricity supplies from generators from renewable sources by 2010. This is the 'Renewables Obligation' (RO). The RO is to be facilitated by allowing the trade of Renewable Obligation Certificates (ROCs) so that electricity sellers over-complying with the target can sell ROCs to those who under-comply. Additionally, combined heat and power (CHP) capacity is to be doubled by 2010.
- Participation in EU-wide agreements to improve the average fuel efficiency of cars by a minimum of 25 per cent by 2008/9. In the UK, this goal is to be assisted by changes in company car taxation, vehicle excise duty (the tax on vehicles before they can be used on the road).

- The 10 year Transport Plan, involving substantial capital expenditures, is also aimed at reducing congestion and hence emissions of various kinds, including carbon. Various changes in vehicle taxation which vary the Vehicle Excise Duty by carbon emissions have been introduced.
- A wide range of measures and initiatives targeted at the household sector. These include obligations on electricity retailers to assist customers to save energy; targeting of older houses and vulnerable groups to secure adequate heating; and energy efficiency improvements in new building regulations.
- Other measures targeted at agricultural emissions from fertiliser (N₂O) and enhancing forests sinks for CO₂, and various policies on public buildings.

3.9 *The Energy Review and the Energy White Paper*

59. Under the previous Conservative government regimes, there was a process of significant disengagement from intervention in energy markets in the name of ‘energy policy’²⁸. As far as possible, nationalised energy concerns were to be privatised and mechanisms for inducing competition within privatised markets were to be encouraged. Indeed, the separate Department (Ministry) for Energy was closed down in 1992, a signal that energy was ‘off’ the political agenda and that policy would broadly coincide with whatever the market dictated.

60. By the end of the 1990s it was clear that there would have to be a partial reversal of this minimum management regime. No-one was suggesting re-establishing public ownership, but several driving forces came together to suggest that government could not leave long-run energy prospects to the market alone. Undoubtedly, the environment was one of the driving forces, and within that, climate change continued (and still continues) to dominate. The Royal Commission on Environmental Pollution’s call for a long term goal for GHG reduction reinforced the demand for a rethink on energy policy (RCEP, 2000) But there were the other factors noted above and which had emerged sharply at the end of the 1990s – the short-run prospect of the UK becoming an oil importer, the drama surrounding the electricity outages in California and the associated fear that it could happen in the UK because of low reserve margins, and the rapidly ageing structure of the nuclear power industry and its seeming inability to compete in a world of liberalised energy prices. All this suggested a long term look at energy security and the links between energy and environmental goals.

61. In an effort to map out the implications of these various future challenges, including climate change, in 2001 the Labour Government commissioned a review of long run energy prospects and policy. In Helm’s view (Helm, 2003a, p.392) this was a ‘classic response’ to a situation in which the Government had ‘little idea what to say’ about the RCEP’s long term goal for GHG emissions. The Review was published in 2002 (UK Cabinet Office, 2002). The Review suggested that the long run goal of a 60 per cent reduction in emissions by around 2050 could be achieved but would require ‘step changes’ in measures such as energy efficiency, and significant expansions of renewable energy electricity. Theoretically, nuclear power expansion was not ruled out, but there were serious political problems of placing it centrally on the agenda, not least the problems it was having with low electricity prices as markets were liberalised. Policy instruments do not figure significantly in the Review, but there are

²⁸

The defining moment was probably the speech of the then Secretary of State for Energy, Nigel Lawson, in 1982. The speech, ‘The Market for Energy’, made it clear that there was to be an end to energy ‘planning’ and that markets would be given the dominant role in determining how energy demand was to be met. Environmental issues were not, at the time, at the front of the political agenda. As Helm (2003a) notes, this market philosophy did not sit easily with the then government’s goal of expanding energy sources such as nuclear power in order to remove power from the coal mining unions.

quantified estimates of the contributions that various technologies could make to achieving long run targets. Thus, for 2020, nearly all measures would have to focus on energy efficiency and wind power. By 2050 the focus on energy efficiency is even more pronounced, but wind, energy crops, solar power, nuclear power and carbon sequestration come into play. The Review counselled against any *unilateral* attempt to meet a long run 60 per cent carbon emission reduction goal, but this was really restating the obvious since the Royal Commission on Environmental Pollution itself had never argued for a unilateral target, and all government statements were fairly clear in making the target conditional on international action. Arguably, however, the Energy Review was concerned to make the position clear since there had been calls from some environmentalists for a unilateral policy²⁹. Overall, the Review carefully avoided direct challenges to the major industrial pressure groups, whilst pleasing the environmentalists at least to the extent of taking long run climate goals seriously³⁰. In the opinion of Helm (2003a), the *Review* was weak analytically and reflected the confusion of objectives that government now seemed to have for an energy policy: ‘cheap energy’, climate change goals, other environmental goals, security of supply (especially gas) and reliability of supply (electricity). Helm argues that, whereas the previous government’s reliance on the market produced an implicit energy policy in which efficiency alone mattered most, the Labour government had added a set of complex and inconsistent goals which were hard, if not impossible, to secure in the absence of clear guidelines on the trade-offs involved.

62. Indeed, it could be argued that this process of multiplying goals without giving very serious consideration to trade-offs characterises UK policy on sustainable development generally. Pursuing ‘sustainability’ is risky if the term is allowed to describe almost any goal that one or other pressure group believes is important. In order to appease the pressure group, its own-serving goals are added to the menu of the objectives of sustainable development, gradually debasing the value of sustainability as a goal.

63. Backed by the *Energy Review*, early in 2003 the Labour Government issued another White Paper on energy (UK DTI, 2003a), the previous one being the 1998 White Paper which made short-run efforts to appease the coal industry in the face of electricity privatisation and the ‘dash for gas’. The 2003 White Paper reaffirmed the climate change goals listed earlier. Like the *Energy Review*, the White Paper added little that was new as far as policy instruments are concerned. Overt reference to increasing energy prices to meet environmental goals would have foundered on the government’s belief that low energy prices were good for consumers, and especially good for those in fuel poverty. But the White Paper acknowledged that the EU-wide emissions trading scheme would be adopted in the UK with the expectation that it would further reduce UK carbon emissions. A role for the CCL was thought to remain because the trading scheme will not cover all carbon emissions. (In the event, the coverage is similar, so this argument for retaining the CCL has diminished). Nonetheless, the White Paper openly acknowledges that the future of the CCL will be partly dependent on the EU trading scheme and the form it takes³¹. The White Paper adopts the *Energy Review* target of a 20 per cent renewables electricity target for 2020. In both cases wind power is seen as the main contributor.

²⁹ And not just environmentalists, see Parker (2002).

³⁰ While not the subject of this report, the political economy of the Energy Review is addressed in Helm (2002), Hartley (2002) and Parker (2002). Helm (2002) writes: ‘...the [Energy Review] process was one which lent itself more to a political objective of keeping as many interests happy as possible’ (p.11). Similarly, see Helm (2003a, b) for a critique of the Energy White Paper. Helm’s view is that the government’s reliance on large scale energy efficiency benefits is misplaced and that its renewables target cannot be met without a significant change in policy instruments towards a carbon tax.

³¹ ‘We will now consider the impact of the proposed EU trading scheme on the climate change levy, while bearing mind that this will ultimately depend on the precise nature of the future emissions trading scheme which has yet to be agreed’. (UK DTI 2003a, Para 2.30).

64. In keeping with the *Energy Review*, the White Paper concluded that there would have to be a judicious mix of renewable energy investment plus energy efficiency. Tension over the role of nuclear power remained in the White Paper. The issue was whether renewables and energy efficiency could achieve the RCEP 60per cent reduction target alone, or whether nuclear power would be needed as well. Bearing in mind the end-of-life profile for existing nuclear stations, reliance on renewables and energy efficiency alone to achieve such a long run target appears groundless. The renewables component of an energy future would be needed just to offset the decline in the contribution of nuclear power, leaving energy efficiency with the dominant burden of achieving emission reductions. But nuclear power was already in trouble in the UK, with the nuclear power company, British Energy, collapsing financially at the end of 2002. There are also divided political views on nuclear power within government, so that reducing the role for nuclear power in the future energy mix avoids addressing the opponents of it. Helm (2003a) notes further problems in linking the EU emissions trading scheme with these goals. Given the difficulties of meeting targets with energy efficiency and renewables, coal re-enters the energy mix as a vital balancing fuel. Yet the EU ETS is likely to put most pressure on coal as the technology with the lowest emission abatement costs. Pressures to reduce coal further sit uneasily with its role as a balancing fuel. The White Paper fosters a view that many would regard as unrealistic, namely that the UK's long run climate goals can be achieved at only moderate cost in a context where nuclear power will be declining in terms of its contribution to energy supply; where renewables will, at best, offset that decline; where energy efficiency bears the major brunt of the policy goals, without hard evidence that it can do this³²; and where gas imports will have to expand considerably. As noted above, the UK DTI underwent a conversion of belief about the extent to which renewables and energy efficiency are low cost options. The new *credo* assumes they are low cost (or will be, with technological change and 'learning') so that (a) the 60 per cent target can be achieved with serious economic disruption, and (b) nuclear power is not needed. It is hard to attach much scientific credibility to this view.

4. The Climate Change Levy

4.1 *The Marshall report*

65. Table 2 showed that, even on its accession to government in 1997, the Labour Party had set itself some potentially difficult climate change goals. It was committed to the Kyoto process and it had argued in Opposition that it could and should achieve a 20 per cent unilateral target with regard to carbon emission reductions by 2010 relative to 1990. In contrast, the Conservative Government's privatisation of the electricity industry and the consequent new build using gas rather than coal ensured that the 1992 UN FCCC target of 2000 CO₂ emissions equal to 1990 emissions would be achieved. The array of policy weapons was clearly not enough to achieve probable targets, and the debacle of the FDE had illustrated just how hard it would be to tackle the transport sector where carbon emissions were rising at the fastest rate. Moreover, energy prices had been falling because of world economic conditions and because of market liberalisation measures, making it all the more difficult to encourage energy conservation and reduced use. Indeed, commentators such as Helm (2003a) see the simultaneous pursuit of energy market liberalisation and environmental goals as an instance of inconsistent policy goals, illustrating the political economy argument that governments are rarely 'rational' in the sense of having fully co-ordinated goals (or 'joined up' government, as it became to be known in the UK). Others would argue that market liberalisation simply ensured that one market distortion – monopoly – was removed, leaving the way open to control the other distortion – environmental externality – through taxation or tradable permits.

³²

A more recent statement on energy efficiency (DEFRA, 2004c) indicates a recognition that there are serious barriers to energy efficiency of an organisational and behavioural character, with payback periods in excess of those dictated by capital constraints. Nonetheless, it appears to be assumed that these barriers can be overcome.

Technically, this second argument is correct, but relative to the pre-liberalisation baseline, the fact remains that competition expands emissions.

66. In March 1998, the government appointed a distinguished businessman, Lord Marshall (then President of the Confederation of British Industry) to head a Task Force investigating the ways in which economic instruments could be used to make effective reductions in GHG emissions. Marshall reported in November 1998 (Marshall, 1998). Marshall's remit was effectively constrained to discuss taxes or permits, or some combination of both. But, as Helm (2003a) notes, Marshall could not embrace a 'pure' carbon tax. The reason lay in the historically close links between Labour and the coal industry. In 1998 the last contracts between the electricity supply industry (ESI) and the coal mines were due to expire. Without them, yet more contraction of the industry – already accelerated by the privatisation of the ESI earlier by the Conservatives – was inevitable. But Labour was politically sensitive to the mining industry and the remaining workforce which had already been dramatically reduced under the Conservative government³³. The government's response was a new 1998 White Paper which offered some further protection of the coal industry. The government expressed concern about the speed with which the newly privatised ESI was switching to gas and out of coal, and hence slowed the switchover down by limiting consents for new gas-fired stations³⁴. The central point is that Lord Marshall, despite his own view favouring a tax differentiated by carbon content, could not have produced a report fully supporting a carbon tax. If there was a tax, it had to be an energy tax in order not to damage the coal industry any further. The Climate Change Levy was born.

67. Marshall was also mandated to consider tradable permits. He was cautious, arguing that the UK should move slowly and set up an experimental scheme to learn about the practicalities of trading. In the event, this recommendation formed the basis of the subsequent UK Emissions Trading Scheme (UK ETS). Why, then, did the recommendation about an energy tax take priority over permit trading? The apparent reason was that UK governments were familiar with taxes and not familiar with permit trading. Hence the former could be launched quickly and the latter only gradually. But, as a businessman, Marshall could also see that taxes raised revenues, while, unless auctioned, permits did not. Strong arguments could be presented for 'recycling' energy tax revenues back to industry to secure a 'double dividend' – i.e. a reduction in emissions and an encouragement to employment by reducing labour taxes. This recycling provision would also make an energy tax easier to sell to industry. Marshall also sought to ease the burden of energy intensive industries by advocating some system of rebates. On this argument, taxes won over permits because taxes generated revenues which could be used in this way, whereas permits could not.

68. On the other hand, it could be argued that a truly bold initiative would have been to introduce an auctioned system of permits. That auctions have so far played only a minimal role in tradable permit systems – some permits under the US acid rain programme are surrendered and auctioned to ensure new entrants are not disadvantaged – suggests that industry opposition would be enormous³⁵. They would have

³³ That outcome reflected Prime Minister Thatcher's personal drive to reduce the power of the national Union of Mineworkers.

³⁴ These restrictions were intended to be temporary while the government sought a reorganisation of the electricity trading system which it regarded as having undesirable distortions. The government argued that slowing the dash for gas would protect 'diversity and security of supply'. Helm (2003a) provides a spirited critique of the decisions about the coal industry at that time – see his Chapter 16. He remarks: 'In the history of energy policy, the White Paper is one of the best examples of the triumph of spin over substance' (p.303).

³⁵ Under the UK's provisional (2004) National Allocation Plan for entry to the EU there is also a 'new entrant reserve' of permits to be allocated to those entering various sectors – see Annex 3.

to transfer wealth to the government rather than having wealth conferred on them by grandfathered permits. Nonetheless, the EU permit scheme envisioned for 2005 includes provision for *some* auctioning of permits. Moreover, the UK has auctioned other assets, with huge financial transfers taking place as a result, e.g. the spectrum auction resulted in over £20 billion being paid to the government by the successful mobile phone companies. Finally, economic theory suggests that permits (a quantity restriction) will be preferred by politicians and decision-makers if what matters is meeting a quantity target, as is the case with the way climate change policy has evolved. Overall, then, there are powerful arguments for a tradable permits approach. This has proved to be the case with the European Union where an emissions trading scheme is due for introduction in 2005. The EU has a very unsuccessful record of trying to introduce carbon/energy taxes.

69. Finally, Labour government policy was explicit in trying to isolate the household sector from energy price rises. This policy was partly motivated by the traditional concerns of a Labour Party for the impacts of any price changes on the poor. But the government was also mindful of the recent history of value added tax (VAT) on household energy. Household energy was zero rated to 1993 when the then Conservative Government announced its intention to impose VAT, initially at 8 per cent and eventually at 17.5 per cent, the standard rate in the UK. These measures were very much for purposes of revenue raising, but environmental considerations played some part. In response to concerns about the impact on vulnerable households a compensation package (based on the Home Energy Efficiency Scheme) was announced. The 8 per cent rate was introduced but met with a political backlash from Members of Parliament, forcing the 17.5 per cent rate to be abandoned. In June 1997 the new Labour Government immediately reduced the rate to 5 per cent. Smith (2004) remarks:

‘This unhappy experience seems to have been etched into the consciousness of politicians of all the major UK parties, and higher taxes on consumer energy for environmental or any other reasons seem to be regarded as politically impossible’.

70. The fear of losing votes from price-sensitive householders thus motivated the desire to ring-fence the household sector. In fact, of course, it is not possible to isolate final consumers from tax-induced cost increases, as simple supply and demand analysis shows. But it is easy to obscure the effects of taxes when so many other factors were determining energy price changes at the time.

71. In the event, both of Marshall’s recommendations were adopted. There would be an energy tax and there would be an experimental tradable permits system. The ‘textbook’ solution would have been a carbon tax and/or a reasonably widespread permit trading system. But auctioned permits were never going to stand a chance because of the effective ‘tax’ they would constitute on industry. The energy tax, on the other hand, could be recycled to ‘buy in’ industry’s cooperation, could be imposed on industry and commerce without appearing to affect transport or the household sector, and could incorporate significant concessions to energy-intensive industries. A pure carbon tax was also never viable in political terms because of the impact on the coal sector. Helm (2003a) argues that the resulting energy tax – the CCL – was a tax that operated virtually entirely on the demand side, doing little or nothing to address the supply-side issues that should have been necessary to move towards a long-term low-carbon economy.

4.2 *The nature of the CCL*

72. The Chancellor of the Exchequer announced the CCL in his Budget of March 1999. The CCL was to come into effect in April 2001. The basic elements of the CCL are:

- The CCL is levied on industry only and applies to all non-household use of coal, gas, electricity, and non-transport LPG. Industry is taken to include agriculture and the public sector. Household and transport sector uses of fuels are exempted, as are fuels used for electricity generation and

non-energy uses, and waste-derived fuels. Renewable energy, including ‘good quality’ CHP, is similarly exempt since 2002, the argument being that good quality CHP comes close to performing like renewable energy. The definition of ‘renewable’ has evolved. For example, electricity generation from coal-mine methane capture was not exempt from the Levy originally but was slated for exemption in 2002 and was confirmed as being exempt late in 2003³⁶. Further amendments were made in 2003 with respect to some categories of CHP.

- The CCL is applied at the ‘time of supply’ to industrial and commercial users of energy. For example, the tax is payable on electricity supplied by an electricity utility to an industry and, for that matter, for its own use. In effect, the CCL is a single stage sales tax.
- Most revenues from the CCL are ‘recycled’ back to CCL-paying industry in the form of reductions in employer contributions to social security taxation. These taxes are effectively taxes on labour employed. The aim of recycling is to encourage employment. The aggregate net tax burden from the CCL is theoretically zero since revenues are, in the main, recycled. From the standpoint of any individual industry, however, the tax may be positive or negative according to whether payments exceed NIC reductions. Moreover, while designed to be revenue-neutral in the aggregate, the CCL could generate net receipts or deficits since the labour tax reductions are a fixed percentage (0.3per cent) of whatever the overall labour tax is for that year, and CCL revenues depend on energy consumption by the affected parties and the various exemptions.
- Some revenues are used to stimulate energy efficiency schemes and to develop renewable energy resources through the ‘Carbon Trust’ – see later.
- Energy-intensive industries face lower rates of CCL (20per cent, i.e. an 80per cent discount) than other industries provided the industries concerned adopt energy efficiency measures to achieve targets agreed on the basis of government criteria. This they can do via Climate Change Agreements (CCAs). However, not all energy-intensive industries are embraced by the CCAs because the government’s definition of ‘energy-intensive’ follows that of the European Integrated Pollution Prevention and Control (IPPC) Directive and this is not all-encompassing. In 2003 the government promised to review the arguments for extending the CCAs to other industries. In the Budget of April 2004 two additions were made to the IPPC test. First, any sector with a 12per cent ‘energy intensity threshold’ (ratio of energy expenditure to value of output) would also qualify to enter a CCA. Second, any sector with an energy intensity threshold in the range 3-12per cent will qualify for a CCA if, in addition it has an import penetration ratio of 50per cent or more, or an export-to-output ratio of 30per cent or more. These latter tests are referred to as ‘international competitiveness’ tests.

73. Initial illustrative rates of charge were published in 1999 (UK HM Customs and Excise, 1999a). These were modified in the pre-budget statement of November 1999 where they appear as intended rates (UK HM Customs and Excise, 1999b). The Budget 2000 confirmed the rates as shown in Table 3 and they have not changed since.

74. It is possible to translate these rates of charge into an implicit carbon tax by taking account of the carbon content of fuels. The results are (ECOTEC, 1999):

³⁶ The delay is explained by the need to secure European Commission clearance under state-aid regulations.

	Original rates	Nov 99 rates
Coal	£23 per tonne C	£16 per tonne C
Gas	£42	£30
Petroleum	£31	£22
Electricity³⁷	£43	£31

75. The figures make clear the disparity between the CCL and a pure carbon tax. Indeed, natural gas, which has the lowest carbon content, attracts nearly the highest rate of CCL. Since the tax per kWh of gas and coal is the same, and given the lower carbon content of gas, the effect is to produce a differential tax rather than a uniform one. Hence the tax is potentially inefficient as long as there are opportunities to switch between fuels. The carbon content of gas is only 54 per cent of that of coal³⁸. While one would therefore expect encouragement of a switch between fossil fuel uses and non-fossil fuels, the CCL does not encourage gas to be supplied at the expense of coal.

76. As originally formulated, the flat rate for electricity, however it was generated, provided no incentive at all for electricity users to switch to cleaner fuels, and no incentives to use energy more efficiently (since the tax is charged per unit of electricity). This problem was ameliorated slightly in the November 99 revisions since renewable energy and CHP were then exempted.

77. One argument for not reflecting carbon intensities in the CCL is that of administrative simplicity. Since the tax is levied 'downstream' it is not possible, the argument goes, to identify the fuel sources 'belonging' to any given unit of electricity. This is largely true, but only arises because of the way the tax was designed. There was, in principle, no difficulty in designing a pure carbon tax. At the time, the CCL was also argued to provide 'fair competition between fuels' (UK HM Customs and Excise, 1999a, para.5.3), but this appears to involve a very narrow definition of fairness, since if one fuel pollutes more than the other, economic efficiency would demand that it be taxed at a higher rate. Again, the justification really reflects the concerns at the time about the impact on the coal industry.

78. Another important point relates to the exclusion of the transport and household sectors. The exclusion of transport can be explained by the fact that, at that time, separate market-based instruments were being directed at the transport sector. The FDE was in place, although its foundations by this time were shaky. Other differential fuel taxes were coming into being, along with company car tax reform, changes to vehicle excise duty, and so on. But the FDE experience was beginning to show that imposing a further tax on transport would risk political protest on a significant scale. Excluding transport was therefore as much a political necessity as anything else. Arguably, environmental taxation of road transport was also adequate in terms of the marginal damage costs of carbon were concerned. As noted earlier, the exclusion of the household sector also had a political motivation, but additionally reflected the goals of government as set out in a 1997 Treasury statement that environmental taxation must be 'well designed, meet objectives without undesirable side-effects, keep compliance costs to a minimum, have acceptable distributional impacts, and take account of implications for international competitiveness' (UK HM Treasury, 1997b). The exclusion of the household sector from the CCL would therefore have a justification because of the probable regressive impacts of an energy tax³⁹.

³⁷ Based on the prevailing fuel mix for electricity generation.

³⁸ Natural gas has 14,000 grams of CO₂ as C per GJ, whilst coal has 26,000.

³⁹ Households in 'fuel poverty' were estimated at 1.75 million in 2002, compared to 4 million in 1996 (UK DTI 2004).

4.3 Revenues from the CCL and the role of nuclear power

79. Table 3 shows projected and actual revenues from the CCL

Table 3 Projected and actual revenues from the CCL £ million

Year	Projected	Revised projection	Actual
2001-2 (part year)	800	-	585
2002-3	1030	900	837
2003-4	N/A	NA	786

Source: House of Commons Written Answers, April 23 2002, Cols 127-8; May 2002, Cols 884-5. ENDS Report, 238, May 2002 and 350, March 2004. Office of National Statistics – www.statistics.gov.uk.

Table 4 Climate change levy tax rates and provisions

Fuel	Customs and Excise (1999)	Revisions in pre-budget statement November 1999	Budget 2000
Coal	0.21 pence/kWh	0.15 pence/kWh	0.15 pence/kWh
Gas	0.21 pence/ kWh	0.15 pence/ kWh	0.15 pence/kWh
Electricity	0.60 pence/ kWh	0.43 pence/ kWh	0.43 pence/kWh
LPG*		0.14 pence/kWh	0.07 pence/kWh**
Exemptions***	household sector transport fuel/feedstock	add: 'new' renewable energy; 'good quality' CHP ⁺ ; rail freight traction electricity	Same
Discount for energy intensive industries subject to CCA	50 per cent	80 per cent	Same + 50 per cent discount and special help for horticulture
NIC reduction	0.5 percentage point	0.3 percentage point	Same
Fund for energy saving investments	£50 m	£50 m + £100 m for first year depreciation allowances on energy saving investments	Same
Expected revenues	£1.75 billion (2001/2)	£1.00 billion (2001/2)	Same
Expected CO ₂ reductions	1.5 mtC (2010)	2 mtC from levy (2010) 2 mtC from CCAs	2.5 mtC ⁺ 2.5 mtC
Inflation	Levy to rise with inflation	Levy to rise with inflation	
Other		Tradable permits schemes within a CCL industry can be part of a CCA.	

Note: a CCA is a Climate Change Agreement – see text and Annex 2. NIC is the National Insurance Contribution in this case payable by employers on labour employed (employees also pay NIC but this is unaffected). 100 pence = £1.
*) Other than LPG used in road vehicles, i.e. LPG used for heating does attract the CCL. **) = 0.96 pence per kg.

***) Technically, the law distinguishes exclusions from exemptions but they are regarded as one category here. ^{+) In 2002, some changes were announced to take effect in 2003 and relating to the provisions for the exemption of 'good quality' CHP electricity from the CCL. 'Good quality' CHP had been defined as electricity that was certified under a quality assurance programme run by DEFRA and with the stations in question holding a certificate of exemption from the CCL (a Levy Exemption Certificate, or LEC). The 2003 revisions set out in more detail the provisions for allowing CCL relief on the onward supply of good quality CHP electricity via third-party electric utilities ('indirect' supplies). See UK HM Customs and Excise (2003).}

80. One way of 'decomposing' the CCL is to ask what the revenues would have been without any exemptions and without the reduced rates for CCAs. Table 5 illustrates the analysis.

Table 5 Decomposition of the CCL – simulation for 2001

Sector	Energy TWh	CCL revenues £m
Total industrial electricity use	210	901
(of which, nuclear)	(94)	(403)
(of which, hydro)	(6)	(24)
Less renewables exemption	5	21
Less good quality CHP	22	96
Less CCA reduced rates		232
Equals Revenue from actual CCA		553

Source: based with some modifications on *The Utilities Journal*, October 2002: 20-1. Note that the figures 'simulate' calendar year 2001, not the tax year April 2001-April 2002, so the correlation of final revenues with the revenue figure in Table 3 is not precise. Note: nuclear includes the inter-connector between France and the UK.

81. The main point revealed by Table 5 is that CCL revenues would be some 20 per cent higher but for the exemptions of renewables and CHP, and would be 40 per cent higher but for the CCA rate reductions.

82. The other important point is the role of nuclear power. Nuclear power is not exempt under the CCL despite being a zero carbon energy source⁴⁰. This is because, despite its name, the CCL is an energy tax, not a carbon tax. Had it been a carbon tax, the competitive position of nuclear power, already seriously compromised in the UK because of price falls in the liberalised energy markets, would have been enhanced. But had nuclear been exempt, the CCL would have been seriously compromised in the sense that revenues would have been drastically affected, and coal would have been exposed to further contraction. Given that revenues from the CCL are recycled and hypothecated (see below), the revenue raising effect of including nuclear power would appear to be irrelevant. But including nuclear power nonetheless increased revenues, enlarging the fund available to 'buy in' cooperation from industry. One other argument for including nuclear power in the CCL has been advanced in some quarters. Had nuclear power been exempt, it would have secured a competitive advantage that would have favoured imports of electricity from France via the interconnector. In short, while including the sector in the CCL was clearly going to damage UK nuclear power, excluding it would only be to the advantage of France. At the time of

⁴⁰ This is true as long as emissions are measured from generation only. On a life cycle basis, i.e. including fuel extraction, station construction etc., nuclear power is not carbon free. However, even with life cycle effects allowed for, emissions from nuclear power are still small relative to other fuel cycles – see Bates (1995).

writing (2004), British Energy continues to exert pressure on government, arguing that it could save UK£ 80 – 100 million p.a. if it was exempt from the CCL⁴¹.

4.4 *The recycling and hypothecation debate*

83. The CCL was introduced in a revenue-neutral reform. This means that the government secures no net revenues since these are recycled to reduce other taxes, and a small fraction is hypothecated to specific expenditures⁴². In the case of the CCL, recycling involves a reduction in employers' social security contributions, while hypothecation involves using some of the revenues to finance carbon technology improvements.

84. The interesting feature of the recycling is that it purports to capture what has widely been regarded as a 'double dividend' arising from environmental taxation (Pearce, 1991). Since the tax remains in place, albeit on energy rather than carbon, there is some inducement to reduce energy consumption and hence carbon emissions. Thus, an environmental goal is achieved. By using the revenues to lower labour taxes, the goal of inducing employment is also allegedly achieved since labour now becomes cheaper. This is the sense in which there are two 'dividends', sometimes called a 'green' dividend and a 'blue dividend' (de Mooij, 1999). At the time the tax was announced, it seems fair to say that the literature on the double dividend probably did support the view that a single recycled tax could achieve both goals. Since then, the evidence has proved to be far more ambiguous. While the literature confirms that an environmental tax will generate a 'green dividend', i.e. an environmental improvement, the real problems arise because the environmental tax interacts with pre-existing tax distortions. Essentially, any environmental tax is a tax on labour because the tax ends up affecting goods that people buy. This underlines the earlier reference to the illusion that the household sector can be isolated from the effects of a business tax such as the CCL. In this respect the environmental tax produces changes in the mix of consumption goods which produce losses in wellbeing that could be larger than the gains from reducing labour taxes. The central point is that environmental taxes cannot be analysed solely in terms of their environmental benefit – they interact with other taxes – the 'tax interaction effect' – and the net effects may not be beneficial. Needless to say, like needs to be compared with like. If the environmental externality is not addressed by the tax, it has to be addressed by some other form of regulation and there are no guarantees that these other forms of regulation will not have similar counterintuitive effects (Sterner, 2003). After all, all regulations raise prices initially. The overall conclusion, however, is that the double dividend is not such a forgone conclusion as the early literature implied. Nonetheless, recycling revenues to reduce labour taxes (which is what social security contributions are) does reduce labour market distortions. Hypothecation, on the other hand, may not generate the double dividend.

85. The links between the double dividend debate and political economy are fairly obvious. If the double dividend argument is correct, it provides a kind of 'icing on the cake' justification for environmental taxes such as the CCL. That is, while the main reason for revenue-neutrality and recycling is likely to be a political one – polluters will not come 'on board' otherwise – the double dividend argument helps to persuade other tax-doubters that the tax is a good idea. There are also 'public choice' arguments for recycling and hypothecation. The standard economic argument against recycling and hypothecation is that they target public revenues to a use that may not be the highest social rate of return use of those funds. The public choice response is that, politically, taxpayers like to know where their taxes have gone and that

⁴¹ As quoted in *Accountancy Age*, November 25, 2003.

⁴² 'Recycling' is used here to mean a reduction in other taxes and 'hypothecation' is reserved for tax revenues that are used to finance other public expenditures. The economic effects of recycling and hypothecation are different.

they have not been ‘swallowed up’ in general funds. Hence taxpayers may prefer recycled and hypothecated taxes to general taxes. It seems fair to say that the UK Treasury was historically opposed to recycling and hypothecation, but, significantly, it subsequently relaxed its opposition⁴³. While the public choice argument may have been persuasive to some extent, it seems more likely that the use of recycling and hypothecation to get new taxes on to the agenda largely explains the support that such taxes now attract from industry (even though individual sectors may lose), from the public (who see that the ‘tax pound’ is being used to a good purpose), and from policy makers who see the flexible uses to which revenues may be put.⁴⁴

4.5 *Gainers and losers*

86. While the CCL was designed as part of a revenue-neutral reform, this does not mean that each and every industry would find itself in a tax-neutral position. An early effort to estimate which sectors would gain and lose was that of ECOTEC (1999). This analysis was based on the early 1999 CCL proposed levy, not on the eventual levy. However, the study did suggest that the net effects of the CCL and the employment tax rebate would be very modest – either beneficial or a very small cost – for most industries. The exceptions were food products (net cost of UK£ 87 million p.a.), iron and steel (£80 million); oil extraction (£54 million), pulp and paper (£48 million), and a few other industries. Even then, the net tax is very small relatively to sectoral turnover. Moreover, for those industries facing a net tax, most are energy-intensive and they could take advantage of the provision for a CCA. It is difficult to argue, then, that the CCL was unjust in creating sectoral opposition, although, of course, lobbies against it from affected industries still continue.

4.6 *The RIA of the CCL*

87. Section 2 noted that politically determined regulations need not improve overall social welfare relative to a position of taking no action at all. This tends to underline the need for an effective cost-benefit appraisal of the regulation, something that, in the UK, is meant to be covered by a Regulatory Impact Assessment (RIA). An early RIA issued in 2000 (UK HM Customs and Excise, 2000) was disappointing in this respect, although it was clearly faced with the problem of not knowing at that time what the extent of exemptions would be under the CCAs. The RIA suggested that the levy package as a whole (levy plus CCAs) might reduce carbon emissions by 5 MtC p.a. by 2010. If savings are linear with time, this would suggest a saving of some 25 MtC cumulatively over the period 2000-2010. The RIA could have multiplied this figure (technically, suitably discounted) by prevailing estimates of the marginal damage from a tonne of carbon. These estimates are controversial (e.g. see Pearce, 2003c) but suggest perhaps £15 tC. The UK government currently (2004) uses a figure of £35-150 tC but has this estimate under review. At £15 tC, the levy package would generate benefits of £375 million, while at, say, £70 the benefits would be £1750 million, over the ten year period 2000-10. The RIA does not engage in this kind of analysis.

88. The RIA also argued that compliance costs at the national aggregate level are broadly zero since the levy simply transfers tax revenues from industry back to industry via the employment tax cuts. Any other costs are outweighed by the energy efficiency gains which cut energy bills. The obvious weakness of

⁴³ Several other environmental taxes in the UK are revenue neutral and recycled/hypothecated: the aggregates levy and the landfill tax are two such taxes. Later stages of the FDE were also intended to be hypothecated for transport investment but the fuel protests precluded this happening.

⁴⁴ Helm (2004) notes that within a year of the start of the CCL, labour taxes were raised by 1 per cent across the board starting in the tax year 2003-4. This is three times the reduction finally agreed under the CCL. The labour tax rise was very much due to revenue needs because of the Labour Government’s increased public expenditure policies.

this analysis is that the recycled revenues to industry must still have a cost. The CCL and CCA make industry do what they otherwise would not have done, which in turn means that there must be a cost to complying with the CCL. While it is hard to see how these costs could be estimated, it is difficult to argue that they are zero. The House of Commons Environmental Audit Committee similarly noted that ‘the Government has no figures on total compliance costs for government or industry for these energy-related policy instruments’ (House of Commons EAC 2001). Strictly interpreted, then, it is not possible to say if the CCL/CCA package passes a cost-benefit test.⁴⁵

4.7 *Price and revenue effects of a tax*

89. One argument against environmental taxes is that, unless the externality can be taxed directly, they work least well when the good being taxed is in inelastic demand. Suppose the externality cannot be taxed directly, but that the good associated with the externality is taxed. Inelastic demand will mean that the tax has little effect on the quantity of the good produced and hence little on the level of the externality. This contrasts starkly with the standard public finance rationale for taxing goods with inelastic demand, namely that this is a good way to generate tax revenues. One reason for demand inelasticity is lack of substitutes for the good in question, i.e. the ‘substitution effect’ of the tax is low. Energy tends to fall into the category of a good with a relatively low short-run demand elasticity. Hence an energy tax, such as the CCL, will, initially, have little effect on the level of carbon emissions. On the face of it, this means that the CCL seems like a non-starter in terms of an efficient environmental tax. Two arguments tend to soften this criticism.

90. First, so long as the tax is regarded by polluters as *permanent*, polluters will have a strong incentive to institute longer run measures to reduce the carbon content of their processes and products. This means that it is the long-run elasticity of demand for energy that matters, not the short-run demand, and long run elasticities tend to larger than short-run ones. The second way in which the tax can induce longer run substitution is via the revenue effect of the tax. In a world where tax revenues are not hypothecated, for whatever reason, tax revenues go to general government revenues. Once the notion of hypothecation is accepted, then some of the tax revenues can be used to fund, say, research into low carbon solutions to process technology and so on. As noted above, the UK government has acknowledged the rationale for hypothecation with several of its environmental taxes. Part of the CCL revenues have been allocated to a Carbon Trust for this purpose.

4.8 *The use of CCL revenues: the Carbon Trust*

91. Since the CCL is a revenue-neutral tax and since the Marshall Report was clear in its recommendation that the tax must not harm ‘competitiveness’, the major part of the CCL revenues is recycled directly back to the corporate sector in the form of employment tax refunds. Along with substitution effects arising from the resulting price increases, the substitution argument also requires that some of the revenues be invested in measures designed to encourage longer-run switches to low carbon technologies. As of April 2001, the Carbon Trust was established as a private company with grants given via DEFRA and using CCL revenues. The main purpose of the Trust is to stimulate the adoption of low carbon technologies. It has a Low Carbon Investment Programme (LCIP) which aims to invest in low-carbon technologies, taking a higher risk perspective than conventional investors since part of the ‘return’

⁴⁵ Indeed, RIAs associated with the climate change programme as a whole have been very disappointing in terms of their failure to quantify benefits and costs. An example is the RIA of the whole programme – see Annex 1 of UK DETR et al. (2000) which fails to cite any monetised costs or benefits. The RIA of the emissions trading scheme is similarly very limited in terms of cost and benefit information – see UK DEFRA (2001e).

is taken in the form of carbon reductions as opposed to financial benefit. In 2002 the Trust also took over the government's Enhance Capital Allowances scheme for stimulating low carbon investment through up-front capital allowances. Part of the Trust's programme has secured carbon emission reductions with a cost range of £8-39 tC (Carbon Trust, 2003). Total expenditure by the Trust was some £24 million in 2001/2 and £36 million in 2002/3, or around 4 per cent of CCL revenues per annum. The obvious question with respect to these expenditures is how far they take on board the 'revenue effect' argument previously. Since the sums are very modest, it can be argued that the use of such revenues to secure long-run substitution effects is unlikely to be effective. However, the Trust cannot be seen in isolation since the CCAs themselves also have the effect of shifting energy conservation and hence, to some extent, lower carbon technologies to the fore.

4.9 *The Climate Change Agreements (CCAs)*

92. Like all governments, the UK government has always been sensitive to the effects of any regulation on international competitiveness of given economic sectors. By and large, this concern relates to actions which may raise UK industrial costs without similar cost increases being experienced in competitive countries. How far this is a valid economic concern is debated, but it is certainly a pervasive concern in political circles – see below. These concerns surfaced quickly in the discussions about the CCL and the approach to dealing with them was to offer conditional exemptions to energy-intensive industries. To overcome definitional problems it was decided that energy-intensive industry sites would be regarded as those who were already registered under the EU Integrated Pollution and Prevention Control (IPPC) Directive. IPPC regulations require that the sites in question operate in an energy efficient manner. Any sector within this legal ambit can then enter into a Climate Change Agreement (CCA) which requires them to adopt and implement an energy saving or carbon emission reduction programme. The CCA is legally binding. In return, the sector will be exempt from 80 per cent of the CCL. Failure to comply with the targets at the interim target dates (2002, 2004, 2006, 2008) means that the firm in question loses its tax reduction for the following two years. Failure to comply with the final 2010 target means that the firm would have to repay all tax reductions over the whole period. The compliance incentives within the CCAs are thus very powerful, and may explain what appears to be the high level of over-compliance in the first interim target year, 2002. An alternative explanation for this high degree of compliance may, however, be that the targets themselves were not very different from 'business as usual' emission levels (see below).

93. Annex 2 lists the CCAs at the time of writing (2004). In their review of CCA performance up to the first target period of 2001, ETSU (2003) find that over half of the CCAs have achieved their targets. Inspection of the data suggests that around a quarter of the agreements are adrift of their targets by 5 per cent or more. Arguably, the first target period is too short a period for some of the sectors concerned to implement effective energy saving programmes, and the true effectiveness of the agreements remains to be seen. Nor are there any data to indicate what costs businesses adopting CCAs have borne. ETSU (2003) notes that one effect of the CCAs has been to motivate corporations to raise energy saving up the corporate agenda. There is an argument to suggest that energy savings are low-cost precisely because energy is not usually the subject of special boardroom interest or expertise, at least in the lower energy intensive industries. What the CCL and the associated CCAs do in this context is to make energy a managerial concern. Nonetheless, it remains the case that the costs and benefits of the CCAs appear not to be known with any precision⁴⁶.

⁴⁶ The issue is made even more complex if household energy efficiency is targeted. This is because of the so-called 'rebound effect' whereby improvements in energy efficiency are seen by households as the equivalent of real energy price reductions. Such reductions induce more energy consumption. For households in energy poverty this is, of course, a desirable outcome, even though it generates

94. In the pre-Budget statement of November 2003 the Chancellor of the Exchequer announced that he was persuaded of the case to extend the CCAs to other energy-intensive sectors not currently embraced by the IPPC Directive. Other currently excluded sectors include some that are within the remit of IPPC but with activities too small to qualify for a CCA.

4.10 *The CCAs and ‘competitiveness’*

95. The CCAs came into being because of the very strong political lobby, led by the Confederation of British Industry, against the effects of the CCL on the competitiveness of energy-intensive industries. That there is a ‘competitiveness’ problem is deeply ingrained in political culture, but it is not always clear what the problem is meant to be. Krugman (1996) notes that most of the concerns about ‘competitiveness’ are inconsistent with basic international trade theory and remarks:

‘While influential people have used the word ‘competitiveness’ to mean that countries compete just like companies, professional economists know very well that this is a poor metaphor. In fact, it is a view of the world so much in conflict with what even the most basic international trade theory tells us that economists have by and large simply failed to comprehend that this is what the seemingly sophisticated people who talk about competitiveness have in mind’.

96. While Krugman’s remarks hold for nations, competitiveness has more meaning at the level of the firm. Moreover, while many studies have concluded that environmental regulations generally have little or no impact on international trade flows, Baron (1997) notes that the conclusions of these studies may not be transferable to contexts where the regulatory instrument is a tax. This is because the tax is on all emissions, optimal and non-optimal, whereas command-and-control style regulations regulate only emissions beyond the standard set. Offsetting Baron’s argument, however, is the widely held view that taxes have lower compliance costs than command-and-control regulations. But Baron is correct in concluding that past experience might not be a very good guide to assessing the competitiveness impacts of taxes. After assessing the available evidence, Baron (1997) concludes that competitiveness effects on energy-intensive industries could be significant in a few cases, but that much would depend on the other factors affecting costs – e.g. exchange rate movements – and on any compensatory measures. The CCAs are a significant compensatory measure.

97. Whatever the analytical nature of competitiveness effects, the fact remains that the issue is a highly charged one at the political level. Lobbies against the CCL stressed the issue repeatedly and politicians have systematically embodied the concern in all policy formation and guidance.

4.11 *The effectiveness of the CCL and CCAs*

98. While the CCL clearly diverges substantially from a textbook carbon-tax and while the CCAs appear to be a politically convenient way of getting energy-intensive industry to sign up to the CCL, one obvious test of the CCL package is whether or not it has secured significant carbon emission reductions. Such a test is obviously incomplete because one would want to know what emission reductions would have been secured by the textbook solution – a carbon tax and/or a comprehensive tradable permit system. Nonetheless, any criticism of the CCL must be supported or tempered by an assessment of the environmental impacts.

environmental costs. For other households it clearly has benefits but the environmental costs can be considerable. If rebound effects are important, it may help to explain why it is so politically difficult to secure an effective household conservation policy and why targets in the industrial sector, such as the CCA targets, are easier to secure.

99. Agnolucci et al. (2004) provide an assessment of the emissions effect. They define the *general effect* of the tax as comprising an *announcement effect* and an *implementation effect* (see also Agnolucci and Ekins, 2004). The announcement effect tries to account for industrial responses to the fact that the tax has been announced and will be implemented. The implementation effect accounts for the residual, i.e. any effect not accounted for by the announcement effect⁴⁷. Using regression analysis, Agnolucci et al. (2004) test for the presence of an announcement effect in three broad sectors: the industrial sector, the commerce and other final users sector (basically commerce and public administration), and the economy as a whole. They find an announcement effect (i.e. energy reductions in 1999-2001, the period between the announcement of the tax and its introduction) only for commerce and other final users. Agnolucci et al. (2004) conclude that:

‘..this is a positive result as it shows that a credible Government policy of pre-announcing new taxes can lead to early action by firms. The study has shown that this change is ... permanent and not transitory’.

100. However, the effect is found only for the commercial and other users’ sectors which, together, account for only 10 per cent of final energy demand or 15 per cent of non-household final energy demand. The announcement effect appears to be absent for industrial and economy-wide demand. This does not mean that the CCL package has not had a general price effect but, unfortunately, Agnolucci et al. do not estimate what this might have been.

101. An assessment of the CCA component of the CCL package by UK DEFRA regards the achievements of the CCAs up to the end of the first target period ending 2002 as ‘massive’⁴⁸. The long run goal of the CCAs was to achieve a 2.2 MtC reduction in emissions by 2010. Yet the 2002 figures suggest a reduction of 3.7 MtC from the baseline, implying substantial over-achievement well before the final target date⁴⁹. There are considerable complexities in interpreting performance under the CCAs since, after the CCL was introduced, the CCAs were linked to the new emissions trading scheme in the UK (ETS) – see later. Another debate surrounds the ‘additionality’ of the CCA achievements, i.e. whether they represent energy/emission reductions that would not otherwise have occurred. The original attempt in the CCAs to prevent non-additionality involved estimating ‘business as usual’ energy consumption figures, then setting a limit target that would have involved all conceivable cost-effective measures being undertaken, and finally setting the actual targets to be 60 per cent of the gap between business as usual and these limit targets. The 2002 targets were then calculated as a step on the way to this ‘60 per cent gap closure’.

102. Whatever the truth about additionality, the achievements by 2002 certainly look impressive, although some have argued that the energy efficiency improvements would have occurred anyway⁵⁰.

⁴⁷ ‘Event studies’ encompass this kind of analysis but are usually more concerned with effects on company worth, e.g. via changes in stock market valuations. Hayler (2003) was unable to detect such an event effect for the CC, but this is probably due to being unable to capture the complexity of the entire CCL/CCA package in defining the ‘event’.

⁴⁸ The CCAs have interim target dates of 2002, 2004, 2006 and 2008 before the final target date of 2010.

⁴⁹ A significant part of this reduction is accounted for by the UK steel industry, primarily one company - Corus - which experienced economic downturn conditions in the relevant years. There has been some debate about the extent to which steel’s emission/energy reduction is due to the CCA. The CCA for steel does have conditions built into it about renegotiating targets if output falls by more than 10per cent. See ENDS Report 339, April 2003, 23-26.

⁵⁰ Notably, the Association for the Conservation of Energy. One argument here is that the extent of over-compliance indicates the ‘soft’ nature of the targets originally agreed. See also Dressner et al. (forthcoming). It is hard to evaluate this argument.

Taking the figures for the ‘units’ undertaking commitments (i.e. the individual companies rather than the sectors as a whole), some 5000 of the 5700 units met their target for 2002. 1500 units have withdrawn from the CCAs, and just over 200 units failed to meet their targets. As noted, the emission reductions appear to have been significantly greater than the targets set for 2002.

103. Finally, a purely theoretical analysis by de Muizon and Glachant (2004) suggests that *environmental effectiveness* of the CCAs is improved by the link to the CCL rebate scheme, and *cost-efficiency* of the CCAs is improved by the link to emissions trading (see below). But if the tax rebates secure environmental effectiveness and trading secures cost-efficiency, the CCAs become technically irrelevant since their effectiveness is secured by the two market-based instruments which could have been introduced together and separately from the CCAs.

4.12 *The CCAs and emissions trading*

104. The CCAs entitle participants to an 80 per cent discount on the CCL provided the targets agreed in the CCA are met. A natural extension of the CCA is emissions trading and this arises if some participants over-achieve their targets and others under-achieve. In such circumstances, over-achievers could be given credits for the excess achievement and they could then sell them to the under-achievers. While not envisaged as part of the original CCL/CCA package, this trading option became available when the UK developed its emissions trading scheme (ETS). The Marshall Report had recommended cautious progress on emissions trading. Encouraged by government, a business consortium studied the ways in which an ETS could be implemented in the UK. It published its outline proposals late in 1999 (ETG, 1999) and the government published a consultation paper late in 2000 (UK DETR, 2000) followed by draft and final Framework Documents in 2001 (DEFRA 2001a, 2001b). The UK ETS is worthy of a separate study in itself,⁵¹ but the immediate concern is the link between the ETS and the CCAs.⁵²

105. The ETS was launched through an auction in March of 2002 and trading began a month later. Initially, some 34 organisations bid successfully and others joined later. The auction process involved bidders bidding absolute levels of emission reduction that they would pursue in return for progressively

⁵¹ A notable and possibly unique feature of the ETS was the fact that participants are paid some £215 million to take part, in return, of course, for binding commitments to emission reductions. The argument for financial incentives were (a) that the scheme was voluntary and part of a learning experience, and (b) there were worries that, without incentives, the resulting market would be too thin to derive meaningful results. The familiar debates about ‘additionality’ also arose, with some critics arguing that much of what was eventually traded was ‘hot air’, i.e. emissions reductions that would have occurred anyway, usually because of other regulatory requirements (see ENDS Report 326, March 2002 and 338, March 2003; Roeser and Jackson (2002); UK National Audit Office (2004), and Varma 2004). The UK government has strongly resisted these criticisms.

⁵² The UK ETS also incorporates two other types of trading: (a) trade in renewable (energy) obligation certificates and (b) trade in energy efficiency certificates. The former derive from obligations on electricity utilities to supply 10 per cent of their electricity from renewables sources by 2010. Interim targets are set for intervening years. Political recognition that the 10 per cent target will not be met can be found in UK DTI (2004) where the target is repeated but ‘as long as the cost to the customer is acceptable’. Over-compliance with targets generates certificates that can then be traded with under-suppliers. There is also a ‘buy out’ clause which sets a maximum price of 3 pence per kWh, i.e. no compliance can be ‘bought at this price. Revenue from this effective tax is then redistributed to utilities in proportion to their use of renewable energy. The Energy Efficiency Certificate Scheme similarly arises from obligations on utilities to secure energy efficiency targets in the household sector.

lower incentive payments per tonne carbon.⁵³ Participants agreed to targeted reductions in emissions with two main paths to entry to the scheme: (a) as *direct participants*, i.e. those who bid emission reductions in the auction in return for incentive payments; and (b) as *agreement participants*, i.e. those who could trade credits under a CCA, some 6000 firms.⁵⁴ Those entering via a CCA are not eligible for the incentive payments. As with most permit trading, various kinds of transaction are allowed. Thus trades may take place with immediate effect of transferring an allowance (a 'spot' trade), or trades may take place 'forwards' in which the seller agrees to deliver an allowance at a future date, or trades may involve options in which participant acquires the right to buy or sell at a future date. Banking is also permitted (up to 2007 at least).

106. One complexity involves a 'gateway' between the 'relative' and 'absolute' sectors. Recall that the CCAs – see Annex 2 – have varying ways of expressing targets, but the main distinction is between *relative targets* (energy or carbon per unit output) and *absolute targets* (absolute reductions). Someone in the relative sector could secure their target (in terms of carbon per unit output, say) but actually increase emissions because their output has grown. As de Muizon and Glachant (2004) note, relative targets have an associated inefficiency since expanding output secures more emission credits. In light of this, it becomes important to regulate sales of credits between the relative and absolute markets.

107. To avoid such trades between the two sectors threatening the overall emission reduction target, no *net* transfers of allowances may take place from the relative to the absolute sector. Thus, anyone seeking to transfer allowances out of the relative sector must go through the 'gateway' such that the trade will only be allowed if there has been a net flow of transfers into the relative sector. Inspection of Annex 2 shows that most of the CCAs involve relative targets, so CCA participants are restricted in the ways in which they can trade under the ETS.

108. In its first year the UK ETS had some 200 trades involving about one million allowances. As noted earlier, the parties to the CCAs substantially exceeded their aggregate targets for 2006 in a single year. Significant surplus credits were therefore available for purchase by under-compliers. The actual reduction achieved was 4.5 mtCO₂ compared to the target of 0.8 mtCO₂ (Smith 2004). As with other commentators, the UK National Audit Office (2004) suggested that the over-achievement reflected soft baselines in a number of individual cases, i.e. actual baseline emissions were already close to targets. The National Audit Office suggested this was due to the undue haste in setting the scheme up and the difficulty of finding enough agents to take part in the auction. As Smith (2004) notes, the auction was postponed twice in order to attract more participants. If there was a failure to set demanding targets it may have been due to 'asymmetric information', i.e. the fact that the emitters possessed more information about actual emissions and the ease of reducing them compared to the government. Finally, the UK ETS trades have taken place at a very low carbon price, further suggesting that participants have found it relatively easy to make emission reductions.

⁵³ Known as a 'descending clock' auction. The auctioneer first states a price per tonne carbon. Potential participants bid quantities of emission reduction they are willing to undertake at that price. The auctioneer sums the bids and if the price multiplied by the aggregate quantity is less than £215 million the auction ends. If it is more, the auctioneer lowers the price, and so on until the £215 'budget' is exhausted. See UK DEFRA (2001d).

⁵⁴ There is one other category of participant involving emission reduction projects, but for current purposes these are the ones that matter.

4.13 *The EU trading scheme*

109. The difficult interactions between the various components of UK climate change policy are further complicated by the impending European Union Trading Scheme (EU ETS) for carbon. Draft proposals were issued in 2001 and the Directive came into force in October 2003. The EU ETS covers industrial sources of emissions only - basically, installations in any sector with combustion facilities above 20MW rated thermal input, but installations below 20 MW may also be listed. The sources covered are power generation, oil refineries, offshore installations, and heavy industry⁵⁵. According to Boemare and Quirion (2002), the EU's bad experience with the proposed carbon/energy tax early in the 1990s mainly explains the absence of an 'upstream scheme', since an upstream scheme would look very similar to a carbon tax, but others dispute this judgement. The EU ETS is a 'cap-and-trade' system whereby each plant will have an absolute cap on emissions and must hold allowances equal to that cap. The period planned for the introduction of the scheme is 2005, the initial planning period if 2005-7, and the second is 2008-12 to coincide with the Kyoto target period. Initial coverage is 45 per cent of all EU carbon emissions. Other GHGs may be included in the second period. Permits will mainly be allocated for free, but 5 per cent of permits will be available for auctioning in the first period. Land-based sequestration is not eligible under the EU ETS. Penalties (for each missing allowance) exist for non-compliance. Use of Clean Development Mechanism (CDM) credits (under the Kyoto Protocol) will be permitted within the EU ETS, with each Member State being allowed to decide the limits to the use of CDM credits under the 'Linking Directive'.

110. The real problem for the UK is that the EU ETS appears to be incompatible with the UK ETS and with the CCL/CA systems. The main reasons for supposing this to be the case are:

- The EUETS is a mandatory scheme whereas the UK ETS is voluntary, so that the two together may result in leakage issues (*Utilities Journal*, November 2001).
- The CCL, CCAs, and EUETS all have different coverage, despite the fact that the EUETS and the CCAs are based on industry definitions under the IPPC, which is itself a regulatory instrument. Sorrell (2002) observes that some sites may face up to 10 instruments! This coverage problem is further exacerbated by the differing treatments of within-plant technologies, carbon versus other GHG emissions, and combustion and non-combustion sources. However, multiple regulation is not necessarily bad in itself and trading schemes may well be able to handle variable coverage. One issue of concern is the potential for double counting problems where direct and indirect emissions are covered.
- The EU ETS has links to the Kyoto Flexibility Mechanisms (e.g. the Clean Development Mechanism), which in turn raises the prospect of 'cheap' carbon allowances in Europe (due, for example, to East European 'hot air'). If so, it may be cheaper to buy these credits than to reduce emissions domestically. However, with the expansion of the EU membership, the hot air issue effectively becomes 'internalised' to the National Allocation Plans (NAPs) and it remains to be seen how far hot air trades take place. Moreover, Joint Implementation projects will be disallowed as part of the EU ETS after 2012, and this is likely to limit the number of such trades going ahead now.
- Sorrell (2002) argues that, if the CCAs survive and if CCA trading is still allowed, it is difficult to see how CCA credit trading can co-exist with wider permit trading in Europe (p5). The co-existence of two trading schemes would be potentially burdensome, but it seems more likely that the UK CCL package would have to give way to the EU trading scheme.

⁵⁵ Heavy industry includes coke ovens, metal ore roasting and sintering installations, iron and steel, cement/lime, ceramics including bricks, glass, pulp and paper.

- The co-existence of the CCL/CCA regime and EU ETS, unlikely as it is, would threaten double regulation of some sectors. For example, electricity generators might shift forward some of the EU ETS allowance costs to customers who are already paying the CCL.
- The various instruments treat electricity differently. Under the EU ETS, electricity generators will be responsible for electricity emissions. The UK CCL places that responsibility on consumers of the generated electricity (including those who retail it to households). The two types of responsibility are incompatible.
- The EU ETS is a 'permanent' scheme beginning in 2005 but timed to meet Kyoto targets whereas the CCAs are legal agreements expiring in 2012 but with legally binding targets to 2010. The UK ETS has a target date of 2006, but could, presumably, be extended if there was any merit in the UK and European scheme coexisting.
- The EU ETS should act like a textbook trading scheme in that trading will be determined by the various marginal (carbon or GHG) abatement costs of the participants. The UK ETS, on the other hand, has a less direct link to abatement costs. The bidding system ensures some link since firms bid for shares of the available incentive fund and presumably do so on the grounds that they will secure their emission reductions at less cost than the cash they get from the fund (Cornillie, 2003).

111. Some leeway exists for keeping the CCL/CCA system for a few years since there is an 'opt-out' provision from the first trading period 2005-8. Thus, technically, participants in the UK ETS and CCA schemes could opt out, provided they can satisfy the European Commission that they will achieve emission reductions equal to what they would have been required to achieve had they joined the EUETS. However, the separate treatment of electricity under the EU and UK schemes is not resolved since it appears that electricity generators may have to join the EUETS at the outset, i.e. will not have the capacity for an opt out. It should be noted that the pre-Budget statement November 2003 informed CCAs that they would keep their 80 per cent discounts if they joined the EUETS, suggesting that the UK government does not view the incompatibility problems as being as serious as Sorrell's critique suggests.

112. The linkages between the UK CCL/CCA package, the UK ETS and the EUETS are immensely complex.⁵⁶ One influential commentator has stated:

'If the [EUETS] Directive goes ahead as planned, the UK Government will be faced with a choice between either accepting the coexistence of the EU ETS with UK climate policy, or replacing or modifying a number of policy instruments only a couple of years after they were introduced. The first option leads to double regulation, complexity and additional cost burdens for affected groups, while the second implies changing a complex and finely balanced policy mix that took several years to negotiate and was anticipated to remain stable until 2013. Neither option is attractive and both will attract opposition. The extent of disruption will depend on the nature of the changes that are proposed, but at the time of writing the UK government does not appear to have given a great deal of thought to the specific options available' (Sorrell, 2002, p2).

113. One of the problems that would be generated by the changes that would probably have to occur to UK policy, and especially the CCL/CCA package, is that industry's suspicions about environmental taxes will have been fulfilled, albeit without anyone intending the result. These suspicions centre on two things: (a) whatever the environmental rationale for taxes, industry suspects that, if they survive, they will

⁵⁶ These interactions extend way beyond those listed here. For an excellent analysis see Sorrell (2002).

eventually become revenue-raisers⁵⁷; and (b) the tax will be changed after a short while to escape some other political problem. In the case of the CCL, the revenue-neutrality of the reform suffered a serious blow when labour taxes were raised significantly across the board in the 2002 Budget, and the advent of the EU ETS also looks as if it will spell the end of the CCL/CCA regime, at least in its present form.

5. The political economy of the UK Climate Change Levy

114. The preceding sections have shown that the CCL is itself a complex tax since it is part of a 'package' of measures which, in turn, is linked to other climate change policy measures in the UK. The CCL is the subject of various exemptions, whilst non-exempt energy-intensive industries are subject to negotiated agreements which reduce the CCL to just 20 per cent of the formal rates of tax. Moreover, the tax is a downstream sales tax with an explicit goal of excluding the household and transport sectors. The CCAs are further linked to the UK ETS. Finally, the entire structure – CCL, CCAs and UK ETS – has an as yet unknown relationship with the impending EU ETS.

115. Section 2 of this report noted that one purpose of political economy analysis is to look for the political factors that *explain* why the CCL takes the form it does. In so doing, there need be no particular normative implication that the final version of the CCL is 'wrong'. Much depends on the benchmark used to judge the effectiveness of the tax. For example, if that benchmark is economic efficiency, and if the purpose of the tax is to help achieve a climate target for the UK, then the CCL appears to be inefficient. In terms of the analysis in Section 2, the gap between the economically efficient solution and the political economy outcome is likely to be very large. In terms of the government's perception of political constraints, however, the CCL could be argued to be the 'best' that could be done in the circumstances. Any appraisal then has to consider whether the political constraints were as binding as the policy outcome implies. As noted in Section 2, the risk is that an uncritical acceptance of the political constraints could result in a Panglossian judgement that whatever is the outcome of the political process must be for the best. Whatever happens, happens for good reasons. The issue becomes one of judging whether an alternative, such as a textbook style carbon tax, would have been better, and whether it could have been introduced. Finally, if the CCL package actually achieves 'significant' emission reductions, there is a *prima facie* case for supposing that, however divergent it is from the 'ideal', it has been effective. The unknown here is the counterfactual – namely, how effective a carbon tax or full trading scheme would have been.

116. In what follows, we first focus on explanations for why the CCL and its associated measures took the form that they did. A number of these explanations have already been indicated in the previous sections. This section brings the observations together. Later we look at some of the critiques of the CCL, again from a political economy standpoint.

5.1 *Understanding the CCL*

117. The CCL is central to the history of the UK's changed commitment to market based environmental policy instruments. That change in policy came about fairly suddenly in 1989/90 and the landmark was the 1990 White Paper *Our Common Future*. From the time of the White Paper there has been a fairly open discussion about a carbon tax or an energy tax, the aim of which is to help meet the UK's initial Rio climate emissions target for 2000, and, subsequently, the Kyoto GHG target and the Labour Party's self-imposed target for carbon emissions for 2010. The interesting feature is that this

⁵⁷ In the UK this suspicion was certainly fostered by political announcements or comments on the Fuel Duty Escalator which unquestionably had its original rationale in the form of a carbon tax. Later it appeared to be a general environmental tax and then a tax to finance much needed social expenditures.

discussion did not vary much by political party. The 1990 White Paper was a Conservative Government document, but the CCL was a Labour Government instrument.

118. All this suggests that the CCL was the political compromise emerging from discussions about a carbon tax, i.e. that the energy tax cautiously referred to in the 1990 White Paper and the CCL were, effectively, one and the same. Put another way, even if there had been no change of government in 1997, some form of energy/carbon tax would have been introduced. If this interpretation is correct, the first question that needs to be asked is why the CCL was not in fact a carbon tax. The previous sections have suggested some of the answers.

119. First, a carbon tax would have further accelerated the demise of the UK coal industry. Reducing the political power of the National Union of Mineworkers was a quite explicit goal of the Thatcher government administrations, so it is possible that, had Labour not secured power in 1997, the final form of the CCL would have been closer to a carbon tax. But the Labour government has historically very close links to the mining industry and the associated communities. A carbon tax would have affected coal adversely and the Labour government were not willing to allow that. Indeed, the 1998 White Paper that tried to slow the build of gas-fired power stations is evidence of this concern. Hence the tax was not differentiated by carbon content of the fuel, was applied downstream as a sales tax, and was applied to nuclear power. Without nuclear power, revenues from the tax would have been seriously depleted.

120. Second, the tax had to be confined to industry. Transport had to be excluded because (a) transport fuels were already the subject of excise taxes, but also (b) the experience of the Fuel Duty Escalator had shown the political risks of further transport fuel taxation. While the first justification for excluding the transport sector was the one cited by government, political reality suggests that the second was probably more important, especially as other new measures were being taken on e.g. company car taxation and vehicle excise duty. The other sector that needed to be excluded was the household sector. The stated rationale for this exemption was the Labour Government's concern with fuel poverty, i.e. the social incidence of taxes mattered. The other major factor at play was Labour's concern not to appear to be taxing household energy consumption. Politically, this would have confirmed its old image of being a 'high tax, high spend' party, with all the electoral consequences. Again, had the Conservatives continued in government, this feature of the CCL (or whatever name it might have been given) might not have survived. As noted earlier, the Conservatives had already applied VAT to household fuels and Labour lowered it in keeping with its concern about household taxation.

121. Third, the reform had to be revenue-neutral, or nearly so. The Marshall Report had already made industry's view clear that a tax without any recycling of revenues would be unacceptable. While it was thus politically expedient to make the reform revenue-neutral, it seems fair to say that the intellectual rationale for revenue-neutrality was also a leading issue at the time – the double dividend. As noted in previous sections, the double dividend argument is less compelling now than it was several years ago. But it is how it was perceived then that matters. It is also important to note that other taxes were being introduced in a revenue-neutral manner as well – the landfill tax, the aggregates tax and, had it been implemented, the later stages of the FDE. Overall, then, the political and economic arguments for revenue-neutrality converged. As the previous sections explained, this revenue-neutrality remains in the sense that revenues are still theoretically linked to a 0.3 per cent reduction in employers' labour tax, but the subsequent 1.0 per cent rise in this tax makes it very difficult to sustain the argument. Essentially, one would have to be arguing that, but for the CCL, the 1.0 per cent rise would have been 1.3 per cent, a counterfactual it is not possible to prove or disprove.

122. Fourth, the energy intensive sectors had to be brought into the agreement on the CCL. Politically, these sectors could have caused problems for the government but, as previous sections noted, government was also genuinely concerned about the impact of the CCL on these sectors' competitiveness. Quite what

the intellectual foundation is for this concern is, as we saw, open to some debate, but the reality of this concern as seen from the government standpoint cannot be in dispute. Reference to government websites (especially HM Treasury and the Department of Trade and Industry) make this concern very clear. Once again, then, there was a convergence of political need and genuine concern, and this resulted in the Climate Change Agreements.

123. Fifth, one other factor explains the CCAs as well. Despite only bringing market-based instruments on to the environmental policy agenda in the early 1990s, the UK has experimented with most types of instrument, making it one of the more adventurous governments in the OECD in this respect. One of the experiments has been with ‘negotiated agreements’ whereby government makes a threat of, say, a tax, but withholds the threat if polluters come forward with some package of measures to regulate themselves. The attraction of these measures is that they appear to less intrusive and heavy-handed than outright regulation⁵⁸. Moreover, polluters get to be part of the regulatory design. The CCAs thus fitted this increased portfolio of market instruments. Not only did the CCAs fit the negotiated agreements model, but linking the CCAs to the UK ETS, which had also been recommended by the Marshall Report, was a logical extension of the agreements.

124. Overall, then, there are sound political economy reasons to explain the structure of the CCL and the resulting CCAs. Certainly, they explain why, despite its name, the CCL is an energy tax and not a carbon tax, why it is set downstream rather than upstream, and why it excludes transport and the household sector. But politics alone did not determine the CCL/CCA package. Some of the structure is also explained by the prevailing environmental economics philosophy of instruments: mixing taxes and trading reflected the emerging literature on hybrid instruments; the double dividend gave a rationale for revenue-neutrality; and the arguments for ‘smart’ regulation gave a justification for negotiated agreements⁵⁹.

125. Finally, it could be asked why the UK went on its own down the CCL/CCA route when the European Commission was developing its own proposal for an EU ETS. There appears to be no clear answer to this question. The UK may well have believed that taxes and trading could co-exist, as indeed they should in theory, and that the sole issue would be the compatibility of the UK ETS with the EU ETS. Perhaps they believed that these would also be compatible, or that the real purpose of the UK ETS was to invest in learning about trading in order that, when the EU scheme was launched, London would be well placed to act as the clearing centre. Certainly, the Marshall Report had used an argument of this kind to justify a UK trading scheme. In that case, the UK scheme could be quickly abandoned – its finish date being only one year later than the planned start date of the EU scheme. Part of the incompatibility problem is that the CCL/CCA system changed bit by bit as the CCAs were negotiated and as trading was added to the CCAs. In other words, no-one had a clear vision at the start of the process of what the package would

⁵⁸ Softer still are ‘voluntary agreements’ where, on paper anyway, there is no threat of some other form of regulation. The experience with voluntary agreements has been ambiguous – see ten Brink (2002) and OECD (2003). A negotiated agreement, on the other hand, contains the formal threat. As examples, in the UK, there is a voluntary agreement on pesticides backed only by statements to the effect that a pesticides tax is not ‘off’ the agenda. There could have been a negotiated agreement on aggregates extraction, but the industry failed to satisfy the government that it could do better than a tax, and hence the threatened aggregates tax was introduced.

⁵⁹ There have been suggestions that the CCL was actually not an environmental tax at all, but a revenue-raiser in a context where the Labour Government could be predicted, on historical and philosophical grounds, to be a larger public spending party than the Conservatives. Thus, Labour would need some revenues to fund the eventual increase in social spending. But the CCL was devised to be revenue-neutral, so this argument appears to be difficult to sustain unless the subsequent rise in labour taxes is seen as a way of effectively nullifying the neutrality feature of the tax.

like at the end. But it could also be that the UK was keen to honour its compliance record with internationally agreed goals. The belief may have been that UK climate policy needed to start before the EU ETS for the UK to ensure it would meet its Kyoto target.

5.2 *How good a tax is the CCL?*

126. Once the focus shifts from explaining the CCL to asking whether it a good policy instrument, views can easily diverge. Surprisingly, independent views about the efficacy of the CCL are few, while those from industry are understandably more numerous.

Academic/policy analysis commentary

127. The most vocal critic of the CCL has been Dieter Helm⁶⁰. His views have been recorded in a number of papers and in a major book on UK energy policy (e.g. Helm 2001; 2002; 2003a, b). Helm's views are essentially that the CCL is not an effective instrument because it is not a carbon tax, and the reasons for it not being a carbon tax are, in the main, those discussed above. In particular, Helm emphasises the Labour Government's commitment to the coal industry and the problems that had arisen with the introduction of VAT on the household sector. He also considers the CCL to have little environmental effectiveness relative to its elaborate structure of penalties and dispensations and conditional incentives. He stresses the income and substitution effects, arguing that the CCL fails to address the supply-side incentives to move to a low carbon economy. Helm is just as critical of the UK ETS which, as noted above, has been interlinked with the CCAs. He argues that emitters had to be paid to participate in trading because they had to be persuaded to go beyond the emission reductions already embodied in the IPPC Directive, that the restrictions on who can trade with whom are symptomatic of inefficiency, and that the exclusion of electricity generators as trading agents also reduces effectiveness. One may note, however, that paying ETS participants to go beyond IPPC standards might just as well apply to other instruments, including the carbon tax that Helm favours. Helm's view is that it is necessary to start again rather than continue amending the prevailing instruments. His own preference is for a carbon tax, starting at a low level and then rising through time. Revenues would be used more effectively than via the Carbon Trust at the moment, and would be directed at the long run substitution effect. How far this radical approach is politically feasible is open to question, but the previous sections noted the very likely incompatibility of the CCL/CCA regime with the EUETS, which may bring an opportunity for the kind of reappraisal Helm argues for.

128. More general criticisms of the CCL/CCA focus on the inconsistency of government objectives (Helm, 2003a; Pearce 2001, 2002a). For example, energy market liberalisation, and consequently lower energy prices, are not consistent with the role of the CCL in raising energy prices, whatever the textbook answer. Actions on fuel poverty which exclude the household sector from price impacts of the CCL impede energy efficiency. Underlying some of these criticisms is the presumption that, where policy goals conflict, governments should choose between policies. Political economy suggests that such options are rarely politically feasible since they would amount to an abandonment of some measures which have a political constituency: i.e. the measures are there to meet some self-imposed goal or to respond to some lobby group. In such circumstances the trade-offs between objectives need to be made clear, but it may not be in the interest of government to make those trade-offs transparent. Such transparency might reduce the flexibility to react to new situations. Specifying trade-offs, e.g. between equity and efficiency or consumer interests versus environmental interests, in advance might make subsequent decision-making more, not

⁶⁰ Helm is an Oxford University academic, a consultant, and serves on several panels and advisory boards for the UK government.

less, difficult. The end result, however, is a risk that policy is adapted and modified as events unfold, rather than reflecting a clear goal, or set of goals, at the outset.

129. The other major critic of the CCL/CCA system has been Steven Sorrell of Sussex University. Sorrell's critique does not, however, fit neatly into a political economy mode. His criticisms are based on the fact that the UK has an elaborate system of policy instruments in the climate arena and that the interactions between the various component parts of the policy have not been thought through carefully enough. The end result may well be an inefficiency of unknown proportions. The target of this argument has primarily been the EU ETS, but is applicable to the CCL as well (Sorrell and Sijm 2003). More specifically, Sorrell has also argued that the CCL/CCA package is not compatible with the EU ETS (Sorrell 2002). By implication, the criticism is that the UK should have investigated these issues of compatibility earlier than they apparently did, and that they should have developed some options for making the schemes compatible. As of November 2002 Sorrell was arguing that 'the UK government does not appear to have given a great deal of thought to the specific options available' (Sorrell, 2002, p.2). Reasons why the UK may have decided to 'go it alone' on the CCL were suggested at the end of the previous sub-section.

130. As far as policy interactions are concerned, Sorrell and Sijm (2003) note that evaluations of policy instruments tend to focus on the instruments in isolation, rather than on the efficiency of the package of instruments as a whole. Thus, given that the EU ETS is a *downstream* trading scheme⁶¹, taxation of fuel use by any sector participating in the ETS results in marginal emissions being priced twice, whereas non-participants in the ETS face taxation only once. The result will be a distortion of substitution incentives. This criticism applies to the co-existence (if it continues) of the CCL and the EU ETS, but is not peculiar to the UK since other EU countries have forms of energy or 'carbon' taxes⁶². At the political economy level, however, Sorrell and Sijm accept that the co-existence of taxes and an ETS may have several justifications.

131. First, the ETS is dominated by the grandfathering of permits and this is arguably not consistent with the Polluter Pays Principle (PPP). Carbon/energy taxes, on the other hand, are consistent with the PPP. The 'first best' solution would be to allow complete auctions in the ETS. Given that this will not happen – because of the guaranteed industrial opposition to the resulting transfer of rents – a combined grandfathered ETS and tax system could be thought of as a 'second best' outcome. The tax, for example, helps capture some of the rent for government. Second, the tax can be thought of as a 'back up' system to ensure that ETS participants undertake some level of abatement, rather than simply buying in permits. This would be a valid criticism if the EU ETS becomes more comprehensive over time. Given that Russia has announced (October 2004) its intention to ratify Kyoto, the prospects of securing 'paper' reductions in emissions through the purchase of 'hot air' is a real one. How far the problem develops depends in part on the interactions between the EU ETS and non-EU trading under the Kyoto mechanisms.

132. Effectively what Sorrell and Sijm are arguing is that because policy proceeds by 'incremental evolution' rather than via one 'grand design', the end result is very unlikely to be one of overall cost-efficiency. It is open to question just how far this loss of efficiency is offset by the benefits of the pragmatic arguments for retaining potentially inconsistent elements in the overall policy package. Sorrell and Sijm do not attempt to quantify the respective gains and losses. As far as the CCL is concerned, the

⁶¹ 'Downstream' refers to the fact that permit allocation is to fossil fuel *users*. An 'upstream' scheme would allocate permits to fossil fuel *producers*.

⁶² Arguably, no country has a 'pure' carbon tax in the sense that the tax is directly proportional to carbon content of fuels and no industrial exclusions are allowed.

issue is not so much whether it is a ‘good’ tax or not, but whether it is part of an internally consistent overall package of measures. Sorrel and Sijm are clear in arguing that the end result is ‘a series of examples of double regulation and double counting’ (2003, p.14). They conclude that:

‘Unless resolved, these interactions [between individual policy elements] could lead to substantial economic impacts for the affected groups, and/or threaten the overall environmental integrity of the policy mix’ (p.14)

Industry

133. Industry criticisms of the CCL were vocal from the point in time at which the CCL was first mooted. As noted above, anticipation of and reaction to these protests account for several of the main features of the CCL/CCA regime – notably the revenue-recycling feature and the discounts for energy-intensive sectors. Substantial lobbying has taken place both generally at industry level, and by specific industries seeking dispensations or some form of special treatment⁶³. A notable example has been the revival of the criticism that the CCL embraces nuclear power despite its non-carbon status as an energy source. The revival of this concern owes much to the financially difficult position of the UK nuclear industry in the face of falling electricity prices.

134. One interesting feature of the industrial lobbies has been that few of them argued for no action at all, perhaps judging that the high profile that climate change policy has in UK environmental policy generally would make that form of opposition counterproductive. Put another way, industry was obliged to acknowledge the conversions that had taken place in all political parties in the late 1980s. This may be contrasted with the opposition to the EU proposals for an energy/carbon tax in the early 1990s. That lobby was almost exclusively concerned with ensuring that the tax was never introduced at an EU level. Not much attention was paid to suggesting constructive alternatives. But in the context of the CCL many industries criticised the CCL for not being a carbon tax, i.e. if there was to be a tax, which most accepted, it needed to be a carbon tax and not an energy tax. Some have sought the gradual modification of the CCL into a carbon tax, and have argued that the CCL should rise over time. Thus, the then Director-General of the Confederation of British Industry 1995-9, Adair Turner, argued:

‘...the climate change levy should increase steadily over time, and the decision to exempt the domestic sector from energy taxation effects...was I believe mistaken given that the desirable policy objective of avoiding fuel poverty could have been pursued by other means.’ (Turner, 2003).

135. Turner’s remarks raise an interesting possibility. If this was the view of the leader of the Confederation of British Industry (CBI) just before the tax was first announced, and given that the CBI was the leader of industrial opposition to the tax, it suggests that government may have misread industrial opposition. There may, after all, have been a chance to get a carbon tax put in place. If so, it was government itself that created the complexity of the final package of measures by imposing its own political constraints on a carbon tax.

136. Industrial criticism of the CCL/CCA regime resurfaced once it was clear what the general nature of the EU ETS was likely to be. As noted earlier, this was inevitable given that industry places a high premium on being reasonably certain what near-term environmental policy is. In the absence of that uncertainty, investment decisions are made that may commit firms for years ahead. Additional criticism

⁶³ These activities are too numerous to document. The ENDS Report, issued monthly, documents virtually all of the claims by individual industries. Also useful are the memoranda submitted to the UK House of Commons Select Committee on Trade and Industry – see its *Ninth Report*. A number of these submissions call for a carbon tax rather than an energy tax.

arose as the sectors gathered their own information on the net gains and losses from the CCL and the labour tax refunds. A 2002 survey by the Confederation of British Industry suggested that the manufacturing sector was making net payments of some £140 million, and the service sector was gaining by about £60 million (reported in *ENDS Report* 334, November 2002).

137. While industry generally continues to voice criticism of the CCL, some surveys have found that a sizeable fraction of firms aware of the CCL found it a spur to energy efficiency. More alarming, however, is the finding that many firms were not aware they were paying the CCL and receiving reductions in labour taxes in return. Smaller firms, exempt from the CCL, seemed unaware that they were nonetheless benefiting from the labour tax reductions (Agnolucci, 2004). As noted earlier, one political economy argument in favour of hypothecation of revenues is that it reduces opposition to the tax. But if firms are not aware that they are paying the tax or benefiting from other tax reductions, this argument loses some of its force.

138. Large firms tend to be very aware they are paying the CCL. A survey by the Engineering Employers' Federation and the Confederation of British Industry (2002) found that those involved in CCAs were generally active in measures to reduce energy consumption. 50-65 per cent of CCA firms were considering emissions trading and energy efficiency schemes. Only 6 per cent of non-CCA firms were considering trading and only 20-25 per cent energy efficiency schemes.

Politicians

139. The UK Parliament has a number of standing committees that regularly investigate government policy issues. Within the House of Commons, the Environmental Audit Committee (EAC) has frequently commented on progress within the UK on environmental taxation. In its 2004 report (EAC, 2004) the Committee criticised the UK Climate Strategy for being 'seriously off course' with respect to its domestic target of minus 20 per cent CO₂ emissions by 2010 on the base of 1990. The EAC argued that the government's own predictions would mean emissions of some 140 MtC in 2010 compared to the 132 MtC required for the domestic target (see Annex 1). The basis for the predictions does, however, change. Annex 1 shows that the UK Department of Industry (DTI 2003) projected that the 'with climate change policy' scenario would result in 139 MtC emissions in 2010, and the later DEFRA (2004) projections suggest 136.5 MtC. In both cases, the projections still imply a shortfall on the domestic carbon emission reduction target, by 5 per cent in the DTI case and just over 3 per cent in the DEFRA case. Arguably, these are small degrees of 'failure', but the EAC also argues that some elements of the climate change policy are unlikely to be fulfilled, notably those relating to the transport sector, energy efficiency and renewable electricity generation. The EAC also notes that actual emissions increased 1999 to 2001, and again 2002 to 2003 (see Annex 1). The EAC concludes that:

'...the Treasury is failing to exploit opportunities for more imaginative policy initiatives which might deliver the step changes needed rather than steady incremental progress' (Para.21).

140. As with other commentators (e.g. Helm, see above), the EAC expressed serious doubts about the effectiveness of energy efficiency and renewable energy measures. Thus, the annual improvement in energy efficiency of around 2 per cent per annum would need to double to achieve even the 140 MtC forecast. Similarly, the target of just over 10 per cent of electricity from renewable sources by 2010 will also, in the EAC's view, not be met. The percentage share of all renewables in electricity generation in the UK remained at under 3 per cent in 2003 (EAC, 2004, p13).

6. The political economy questions revisited

141. Section 2 suggested that there were four political economy questions that could be asked about the UK's Climate Change Levy in its climate policy context:

- Why do anything at all about climate change?
- Why choose a tax rather than more traditional command and control regulations?
- Why is the chosen tax not like a textbook tax?
- Could policy design be better?

142. This concluding section briefly summarises the suggested answers and takes a brief look at the role of economic instruments for long term climate policy..

6.1 Why do anything about climate change?

143. Understanding the CCL and its related measures first of all involves understanding the UK's commitment to climate change policy. Section 3 looked at the evolution of this commitment from the 'conversion' of Prime Minister Thatcher in 1988 to the present day. While not always fashionable with political economy theorists, the role played by personalities and the intellectual case in question should not be underestimated. A scientist Prime Minister was genuine persuaded of the fact of human-induced climate change. How far she understood the policy consequences of placing climate change high on the political agenda, and certainly at the top of the environmental agenda, is open to debate. Section 3 suggested that Prime Minister Thatcher may not have foreseen the implications of the policy debate in its entirety. But she did see one of the implications – doing *something* about the price of energy – because her government quite explicitly allowed that policy instrument to figure prominently in the 1990 White Paper on environmental policy, and much of the discussion about environmental policy 1988-1990 was about carbon taxes and energy prices. Other factors were certainly at work. While a bid for the green vote in the UK may have had some role to play, of more likely importance was the bid to correct an only recent image of being the 'dirty man of Europe' in the context of acid rain, and to secure some European leadership potential. In turn, these concerns reflected the growing 'Europeanisation' of environmental policy – the recognition that the UK would not be in immediate control of major environmental decisions in coming years – and the need to be a central political influence in the European Union.

6.2 Why choose a tax?

144. The UK's espousal of the CCL was part and parcel of a wider commitment to market-based instruments as tools of environmental policy. The nature of this conversion needs to be placed in context. It was not a wholesale conversion at the time (the late 1980s) nor is it now. Most environmental policy remains in the traditional technology-based standards mode. Thus the market-based 'revolution' should not be exaggerated. Moreover, political statements favouring the market-based approach were always conditional on the nature of the problem at hand and the general costs and benefits of introducing different instruments. No government ever argued that taxes or permits were 'the' solution in all cases. The UK Treasury's list of conditions that had to be met before an environmental tax would be considered a suitable instrument were stringent, more so, it seems, than the conditions for adopting conventional solutions. This asymmetry undoubtedly reflects political nervousness about environmental taxes and their transparency, compared to the hidden costs of command and control. Nonetheless, there was a paradigm shift in so far as arguments in favour of market-based approaches were now accepted. The challenge became one of how to design taxes and permit systems in practice, not whether or not they were good ideas. As with climate change itself, the role of intellectual persuasion should not be underestimated. Advocacy of market-based instruments was close to thirty years old if we date the highest European profile for this from the founding of the OECD Environment Directorate in 1971. The arguments were not new. The Brundtland Report on 1987 and the UK's response to that – *Blueprint for a Green Economy* in 1988/9– set out the case for a change in the way environmental policy should be conducted. For reasons that may never be fully apparent, the late 1980s were 'just right' for these arguments to be accepted. Undoubtedly, however, the messages resonated with governments increasingly concerned with reducing public expenditure and with reducing regulatory burdens on industry. The language of market-based approaches was also politically

convenient – reliance on the market to solve problems contrasted with soviet-style command-and-control measures. It was also recognised that taxes could be made acceptable by including some kind of ‘sweetener’: recycling of most of the revenues to other tax reductions, recycling some revenues to special funds designed to improve the environment, reducing the tax in return for a negotiated agreement to self-regulate the relevant externalities. Potential opposition to the taxes could be bought-off. These side-payments are not available with technology-based standards which dictate what is to be done and how it is to be achieved. In short, the market-based approach promised not just the flexibility for adapting to policy, as is stressed in the textbooks, but political flexibility as well.

145. The array of market-based instruments is wide: taxes and levies, tradable quota and permit systems, voluntary and negotiated agreements, tax-subsidy schemes, hybrid tax/permit schemes, liability laws, etc. Why did the UK choose a tax? The first answer is that it chose a tax because it chose the entire package of market-based instruments. Indeed, this is what makes the UK environmental policy experience unique. It contains at least one example of every market-based instrument so far thought up. The climate change context alone has taxes, subsidies, tradable permits and negotiated agreements. The CCL was just part of the wider set of measures. To a considerable extent, then, the choice of a tax is explained by the fact that the UK chose market-based instruments and explaining why it did that is discussed above.

146. But taxes do, as Section 4 discussed, have certain advantages. As noted above, they raise revenues which, if not retained in general funds, can be used as levers to secure acceptance of the measure, and also as a means of reducing other distortionary taxes. The scale of revenue raising thus matters *even if* the tax revenues are hypothecated. The scope for ‘buying in’ polluters is therefore also greater. Not only can the revenues be used to secure polluters’ acquiescence in the policy, taxes are readily varied through discounts in return for which compliance agreements can be sought. This was the role played by the CCAs. Just announcing taxes can secure some compliance, although in the case of the CCL this may not have been very large. Taxes can also be changed. So far (2004), the CCL has been left unaltered. The experience with other taxes suggests that government is well aware of the benefits of altering the taxes – as with the landfill tax⁶⁴ – and the costs – as with the FDE. In short, taxes offer policy flexibility from the government side, just as the textbooks explain. This perspective is largely missing from the environmental political economy literature which tends to focus on the many reasons why direct controls tend to be favoured over market-based approaches, and especially taxes. One useful message for political economy is the suggestion that it is as important to explain why some countries, such as the UK and a number of other European countries, have adopted taxes, as it is to explain why yet others, notably the USA, have rejected them.

6.3 *Why is the CCL not a carbon tax?*

147. Perhaps the dominant political economy question is why the CCL does not look like a carbon tax which tends to be the textbook solution? Sections 4 and 5 suggested a number of reasons. A carbon/energy tax had been proposed and failed miserably at the EU level in the early 1990s in face of a massive industrial lobby. The major lesson from that failure was to be careful in introducing such measures and to ensure that there are many compensating features – the political flexibility point made above. A ‘tax alone’ was never going to succeed. A carbon tax was fairly openly considered by the Conservative Government at the end of the 1980s, but there were serious concerns about the impact on industry, a concern that pervades all governments, even if the detailed effects of such taxes on competitiveness is open to some argument.

148. In the end, a change of government to Labour in 1997 ensured that the tax could not be a carbon tax. Any measure could not be seen to harm the remains of the coal mining industry – the 1998 White

⁶⁴ This tax has been changed repeatedly and increases each year in order to assist with compliance with the EU Landfill Directive.

Paper had even made an attempt to halt the effects on that industry of electricity privatisation. Labour also had to avoid the ‘high spend, high tax’ party image. It had already lowered VAT on household fuel consumption. There was also a concern that household taxes would harm the vulnerable, although this aspect of policy is less credible given the tax and allowance systems in place. It had to ensure that any tax at least appeared to ring fence the household sector. It also had to exclude the transport sector, perhaps because that sector already had its ‘fair share’ of taxes, but more likely because the political problems with the Fuel Duty Escalator precluded increasing the taxation of that sector again with a surrogate carbon tax, at least in the short term⁶⁵. Once the constraints were acknowledged, the nature of the tax was circumscribed: it could apply to industry and commerce only and it had to be on energy, not carbon.

6.4 *Is the CCL a good tax?*

149. To explain is not to justify. The problem with ‘political economy’ is that it risks taking the political factors that generate the political-economic ‘equilibrium’ as exogenous. Whatever happens does so because those factors set the constraints, or are part of the political objective function. Such an approach leaves little room for criticism. What the civil servants in question end up doing is choosing between nth-best solutions. But the basic criticism of the CCL is precisely that it deviates too far from the ‘public interest’ design of an economic instrument, i.e. that it might have achieved more had it looked more like a carbon tax and less like a hybrid emerging from all the political pressures that had to be juggled to get any policy at all. Several arguments can be provided in favour of this view. First, by surrendering to the FDE lobby, government had already signalled its weakness in standing up to lobby groups. In terms of the political objective function in Section 2, special interests were triumphing over public interest. Second, sensitivities over the vulnerability of low-income households reflect an ideology which is not consistent with practice: there are ways of dealing with the fuel poverty issue that do not require the clumsy exclusion of the entire household sector from the province of the CCL. Third, fears about impacts on competitiveness are also very understandable, and they are just as much reflected in other countries where some form of carbon/energy tax has been introduced (especially the Scandinavian countries). But it can be argued that governments should be more critical of the competitiveness arguments than they have been, and hence less reluctant to introduce a tax closer in design to a carbon tax. Finally, going to considerable lengths to protect the coal industry involves a balancing of costs and benefits that seems very skewed. Whilst the exercise has not been attempted here, there must be more than a suspicion that the efficiency costs of having the CCL instead of a carbon tax greatly outweigh the social costs of further damage to the coal industry.

150. Others will see such criticism as being unduly harsh. Whilst accepting that the final package – CCL, CCAs and the UK ETS – was never planned as a coherent whole from the outset, there is some evidence to suggest that they have been effective in environmental terms, although some caution is needed on this conclusion. The counterfactual is impossible to demonstrate, namely that a carbon tax without all the exemptions and escape routes would have been more effective. If the CCL package ‘works’ much of the criticism that it is not a carbon tax is weakened. Moreover, the idea that a ‘pure’ carbon tax could be introduced without it facing all the special pleading that influenced the CCL is fanciful. As noted earlier, some critics argue that the UK’s ‘mix’ of policy instruments is inefficient because of the failure to analyse and design for interactive effects between the instruments. But in the real world it is hard to see how incremental approaches can be avoided. If there had been a clear vision and understanding of what was needed to tackle climate change, and far more certainty about how other countries would react to the climate threat, then perhaps a more consistent mix of policies would have been developed. But the policy

⁶⁵ Critics of fuel taxation in the UK also drew (and continue to draw) attention to the fact that UK automotive fuel taxation is the highest in OECD countries. While in itself not a valid criticism of tax levels, the argument carries considerable political force.

needs have changed in light of greater awareness of the environmental threat, and greater understanding of the implications for the economy of undertaking action. Incrementalism thus seems unavoidable to a considerable extent. Against this, advocates of 'purer' carbon taxes would argue that a carbon tax could embrace this need for flexibility as scientific and economic knowledge changes. An initial tax could be set and varied in response to informational change, but with the long-term signal being that the tax would rise over time.

6.5 *The CCL and the long run climate future*

151. Finally, what of the future? Section 3 noted that the UK has a conditional long run (c2050) target for reducing carbon emissions. In this it appears to be alone in the world and the target can be taken to reflect the UK's very real commitment to climate change policy. A political economy perspective might take a more cautious view. The target is long run and no government can commit its successors more than forty years hence. It is a conditional target, with the evasive language suggesting it is not going to be unilaterally pursued. It arose from a context in which government was obliged to respond to the Royal Commission on Environmental Pollution: saying there would be no long run target would have been politically more embarrassing than adopting a target couched in the way it was.

152. If this target is real, and the policy statements suggesting interim targets along the way to the 2050 target suggest some substance to it, then how is it to be achieved? The 2003 White Paper on Energy Policy is not convincing on a UK energy future with environmental goals being achieved by huge increases in energy efficiency and renewables, all in the face of an almost inevitable decline in the substantial contribution currently made by nuclear power. But if the long run climate goal is to be achieved, energy futures must look like the White Paper's vision – the only alternative is a politically infeasible reduction in economic growth.⁶⁶ Other than renewables and energy efficiency there is no other technical alternative unless nuclear power is revived on a major scale. It is not inconceivable that a renewables policy could come in by *diktat*: the UK already has a 10 per cent 'Renewables Obligation' imposed on electricity retailers. But the social cost of this kind of policy is very high. Assuming similar kinds of measures would meet with strong and perhaps fatal resistance, long term energy policy has to come full circle to the position reached by the Conservative Government in 1990 – energy prices must rise. Whether this is by a tax or tradable permits is an open question. There are signs that Europe is now following the US model of preferring permits to taxes. The UK, has more experience with taxes than permits, some of it politically very costly, some of it reassuring. The chances are that the UK will continue on a pragmatic basis, choosing taxes and permits and traditional regulatory forms where they are best suited. In other respect, the UK will not be the agent choosing the instrument. Climate policy has to be pursued mainly in Brussels, although the UK's unique long run climate goal is a reminder that not even climate policy will be wholly decided there. The basic fact is that future climate policy, wherever it is formulated, will have to involve radical shifts in energy prices, ideally through taxes approximating far better a carbon tax than the CCL. Whether the CCL survives in its current form is therefore academic in one sense – some form of energy/carbon tax will have to exist. Helm (2003b) argue strongly for such a carbon tax under the management of an independent agency, rather as interest rates in the UK are set by a Monetary policy Committee independent of government.

153. There is an alternative and that is that long run climate policy will fail. Already there are commentators suggesting exactly that – e.g. Böhringer (2003) and Pearce (2003). This is a prediction, not a prescription. The central conclusion remains. If these gloomy predictions are not to be fulfilled, there must be radical changes in energy prices.

⁶⁶ This is not a passing remark. There are lobbies in the UK, including the Sustainable Development Commission, who argue exactly this.

ANNEX 1. GHG EMISSIONS IN THE UK⁶⁷

Table A1.1 sets out data on emissions of greenhouse gases in the UK, including projections to 2050. These are then compared to the various targets discussed in the text.

Table A1.1 Emissions in MtCe

	1990	2000	2010	2020	2050
CO ₂	164.4	151.4	150.9	158.2	103.0-167.0
Non-CO ₂	44.0	28.9	26.7	25.8	
Total	208.4	180.3	177.6	184.0	
Rio CO ₂ target. (per cent relative to 1990)		164.4 (-0.0 per cent)			
Domestic CO ₂ target. (per cent relative to 1990)			132.0 (-20.0 per cent)		
Kyoto target GHGs. (per cent relative to 1990)			182.4 (-12.5 per cent)		
All Climate Change Programme				135 ¹	
RCEP ² target CO ₂				110-120 ¹	62.0 (-60 per cent)
Actual change relative to 1990: CO ₂		- 7.9 per cent	- 8.2 per cent	- 3.8 per cent	
Actual change relative to 1990: GHGs		-13.5 per cent	-14.8 per cent	-11.7 per cent	

Sources: 1990 to 2020 from DEFRA (2001; 2004). 2050 from DTI (2002). DTI has recently changed some of the figures – see DTI (2003b) – and below. Notes: ¹ DTI (2004); ² Royal Commission on Environmental Pollution

The emission levels can be compared with the various targets. Thus the 2000 CO₂ emissions met the voluntary Rio target; the 2010 GHG projection meets the UK's burden sharing target under the Kyoto Protocol; the 2010 CO₂ emissions do not meet the domestic target of -20 per cent.

Table A1.2 shows some of the 2003 revisions to the carbon emissions data, including an assessment of the contribution of the Climate Change Programme (CCP). It also shows yet later revisions to the estimates (DEFRA, 2004c). It is important to understand what is and what is not included in the CCP in Table A1.2. In the first set of figures, measures included are: the CCL/CCA, the Renewables Obligation, the UK emissions trading scheme, the Carbon Trust, building regulations, vehicle taxation and EU agreement on fuel efficiency, the fuel duty escalator (to 1999), the 10 year transport plan, various energy efficiency measures in the household sector, afforestation and some public sector schemes. Excluded is the EU emissions trading scheme. As noted in the text, the CCAs may produce even higher carbon savings

⁶⁷

Note: sources vary, and projections are revised in a fairly regular basis as information changes.

than anticipated. In the DEFRA (2004c) estimates, the EU ETS is included. Table A1.3 shows the breakdown of 2010 emission reductions by main policy measure.

The UK's Kyoto targets are agreed under the EU Burden Sharing agreement. From the standpoint of the Kyoto Protocol, therefore, it is EU compliance that is sought, not UK compliance. Currently (2004) greenhouse gas emissions in the EU lie above the linear trajectory required for the EU to comply by 2008-12. Germany and the UK dominate the GHG emission reductions achieved so far, due in the main, respectively, to reunification and energy market liberalisation – see EEA data in DEFRA (2004).

Table A1.2 Revised CO₂ emissions and effects of Climate Change Policy (CCP). MtC

	1990	2005	2010
No CCP	159.3 – 159.6	146.6-148.8	148.6 – 151.5
With CCP DTI(2003)	159.3 – 159.6	140	138.9
DEFRA (2004c)			136.5
Savings from CCP			- 12.1

Source: DTI (2003); DEFRA (2004c).

Table A1.3 Contribution to 2010 emission reductions by policy measure

Measure	Contribution to emission reduction in 2010 MtC
Household	
Energy efficiency and building regulations	4.2
Non-household:	
CCAs and revisions	3.8
UK ETS and EU ETS	2.0
Carbon trust and capital allowances	1.0
Other	1.1
Total	12.1

Source: DEFRA (2004c)

Table A1.4 Actual UK CO₂ emissions 1990 to 2003 MtC (data rounded)

Year	CO ₂ Emissions MtC	Shortfall on Domestic (- 20 per cent) target: linear basis ¹
1990	165	0
1991	166	3
1992	163	1
1993	157	-3
1994	156	-2
1995	154	-3
1996	160	5
1997	153	0
1998	154	2
1999	152	2
2000	153	4
2001	156	9
2002	150	4
2003 (prov) ²	153	9

Source: Data from UK DTI *Energy Trends*. *Notes:* ¹⁾ Deviation from a straight line projection of emission levels required to meet the 132 MtC domestic target by 2010. This procedure will overstate policy failure in the early years since measures take time to develop and have effect. ²⁾ The rise was due to increased coal burn in power stations.

ANNEX 2. THE CLIMATE CHANGE AGREEMENTS

The Climate Change Agreements (CCAs) relate to those industries that secure a discount from the climate change levy (CCL) in return for which they enter into energy efficiency agreements with the government. There are 44 such agreements. The targets for these agreements are set out in Table A2.1 below. Each agreement projects a 'business as usual' (BAU) level of energy use to the year 2010. For most agreements there is also an 'all cost effective' (ACE) level of projected emissions: emission levels that are judged by independent auditors (in all cases, the Energy Technology Support Unit, ETSU, with occasional assistance from specialist bodies) to be feasible and cost-effective. The agreements are then negotiated between government and industry and in virtually all cases the targets set within the agreement are better than BAU and lower than ACE. Targets can be expressed in various ways:

- 'absolute energy' (AE) is a target set in terms of reductions in delivered or primary energy consumed relative to BAU;
- 'absolute carbon' (AC) is a target set in terms of tonnes of carbon reduced relative to BAU;
- 'relative energy' (RE) sets the target in terms of energy per unit of economic activity;
- 'relative carbon' (RC) sets the target in terms of carbon emissions per unit of economic activity.

All targets are, however, capable of being expressed in tonnes of carbon reduction. Targets are expressed in terms of years to 2010, with the first target period being 2001-2. Each sector is made up of 'target units' and it is these units that have to secure the agreed efficiency targets. Those achieving them are re-certified up to the next target period.

Table A2.1 Climate Change Agreement targets: summary

Industry	Nature of target	Per cent reduction in energy use in 2010 relative to 2000 in terms of target units			Total carbon saved 2010 relative to BAU 2010, 000 tC
		CCA	ACE	BAU ¹	
Aerospace	AE	8.5	-	-	0.5
Agricultural supply	RE	6.9	10.5	1.7	7.9
Aluminium	RC	14.0	20.0	4.0	150.0
Baking:	RE				1.7
Bakeries		9.0	-	-	
Shops		4.5	-	-	
Brewing	RE	11.0	14.5	5.0	16.0
Cathode ray	RE	21.0	-	-	7.4
Cement	RE	8.0	15.0	5.0	170.0
Ceramics	RE	13.0	22.0	6.0	44.0
Chemicals	RE	18.0	27.0	6.0	790.0
Dairy	RE	7.6	16.9	1.9	17.2
Egg processing	RE	9.3	-	-	0.4
NFU - eggs	RE	11.5 ²	17.9	-	1.5
Food and drink	RE	13.4	14.0	1.0	420.0
Foundries	RE	11.0	16.0	8.0	20.0
Glass	RE	9.0	21.0	6.0	20.0
Gypsum	RE	7.2	-	-	7.2

Leather	RE	9.8	-	-	0.7
Lime	RE	7.9 ⁴	-	-	6.0
Malting	RE	7.8 ³	-	-	5.0
British Meat Fdtion	RE	9.5	11.9	0.8	3.8
Metal forming	RE	7.0	-	-	0.8
Metal packers	RE	9.0 ³	-	-	2.5
Mineral fibres	RE	14.9	-	-	6.7
Motor manufacture	RE	15.3	-	-	19.2
Non-ferrous	RE	19.0	28.0	8.0	50.0
Paper	RE	36.0	37.0	14.0	430.0
Pig industry	RE	16.0 ⁵	17.6	-	4.5
Poultry processing/feed	RE	12.7	11.1	0.9	13.2
Poultry meat	RE	13.7 ³	19.2	-	7.9
Poultry meat rearing	RE	13.0	19.2	-	4.5
Printing	RE	12.0	-	-	4.2
Rendering	RE	9.0	-	-	4.5
Rubber	RE	8.7	12.0	5.0	5.0
Semi conductors	RE	59.0	-	-	220.0
Slag grinders	RE	10.0	-	-	2.0
Spirits	RE	3.3	6.0	0.2	6.5
Steel	AE	8.0	13.0	5.0	200.0
Supermarkets	AE	4.5 to 9.0	-	-	5.0
Surface engineering	RE	10.3	-	-	2.5
Textiles	RE	9.0 ³	-	-	9.5
Vehicle building	RE	10.0	-	-	0.02
Wallcovering	AE	9.0	-	-	2.0
Wood panel	RE	7.3 ³	-	-	1.9
TOTAL					2691.8⁶

Source: ETSU (2001), Future Energy Solutions (2003). The targets shown are those originally agreed. In some cases these have been modified over time.

Notes: ¹⁾ BAU here refers to projected BAU energy consumption in 2010. In many cases this shows a decline due to expected efficiency changes that are independent of the CCA. ²⁾ Base year varies 1995-2000. ³⁾ Base year 1999. ⁴⁾ Base year 1998. ⁵⁾ Base year 1995. ⁶⁾ Total of savings shown ignoring different base years.

ETSU (2003) reports the performance of the CCAs up to the first target reporting date 2001-2. Out of the 44 sectors, 24 met their targets fully. Inspection of the data suggests that 10 sectors were 5 per cent or more adrift of their targets. ETSU (2003) estimates that some 2.8 MtC has been saved relative to the current year through energy efficiency improvements. By and large, this appears to be in keeping with the original projection of annual savings for 2010 –see the final column of table A2.1.

ANNEX 3. PROVISIONAL EMISSIONS ALLOCATION FOR CO₂ FOR THE UK UNDER THE EU ETS

Table A3.1 sets out the *provisional* allocation of industrial sector emission allowances for the UK under the EU ETS for the trading period 2005-7. The allocation shown here is that set out in April 2004 and submitted to the European Commission for approval. In November 2004 the UK Government announced its intention to seek revisions to the April 2004 allocation primarily because of revised energy projections. The effect of the new projections was an upwards revision of the 'business as usual' level of emissions by 56 mtCO₂. Figure A3.1 illustrates the nature of the change. The original 'cap' for UK participants was set at 0.7 per cent below business as usual (BAU₀). The effect of revising BAU₀ to BAU₁ means that a new target has to be set and this has been put at 5.2 per cent below BAU₁. Figure A3.1 shows that the net effect of the increased BAU emissions and the revised target is to *increase* the 'allowed' emissions in absolute terms, but also to *increase* the target reduction relative to BAU. It is easy to see therefore how the revised NAP generated both criticism from environmentalists that emissions targets had been relaxed, and criticism from industry that the targets had been made stricter.

Table A3.1 Provisional allocations of CO₂ emission allowances (MtCO₂) as at April 2004 (see text for revisions).

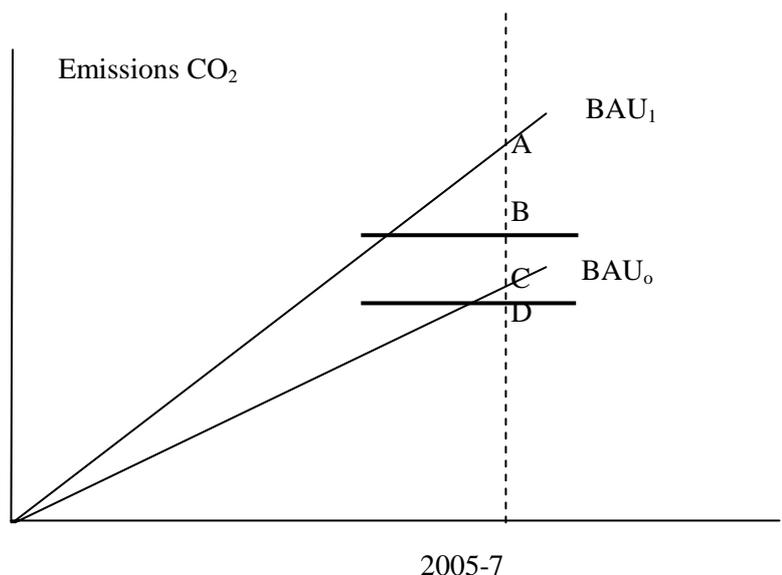
Sector	Annual allowance gross of new entry reserve	Annual allowance net of new entry reserve	Reduction relative to 1998-2002 actual emissions (rounded) per cent
Electricity generation	146.2	134.3	- 13
Iron and steel	21.9	21.5	+10
Refineries	18.1	18.1	- 10
Cement	9.3	9.2	- 1
Lime	2.5	2.4	- 17
Bricks/ceramics	3.1	3.0	- 10
Glass	1.8	1.7	+ 2
Pulp and Paper	4.6	4.6	+ 6
Oil and gas	13.8	13.4	- 38
Food and drink	3.7	3.6	0
Chemicals	7.6	7.5	+ 9
Non-ferrous metals	2.7	2.6	- 8
Other	2.8	2.8	+15
TOTAL	238.2	224.6	- 11

Source: DEFRA (2004b).

A 'new entry reserve' (NER) of around 6 per cent of allowances is designed to allow for potential competitors to enter the sectors. In the case of pulp and paper and refineries no new entrants are expected so that pre and post NER allocations are the same. Relative to 2000, the percentage changes vary significantly across sectors, with oil and gas being particularly hard hit. However, the percentage changes conceal other factors leading to changes in output and hence emission levels. The major share of the reductions borne by electricity generation is explained by the fact that UK electricity output is subject to very little international competition, i.e. impacts on competitiveness are thought to be minor, whereas they could be significant for international trading sectors.

While the November revisions – which have to be agreed by the European Commission – affect the aggregate level of emissions, the allocation to sectors will not be known until early January 2005 (UK DEFRA 2004e). Hence table A1 will be subject to further amendment. It is included here because it is not anticipated that there will be major changes to the overall allocation shares.

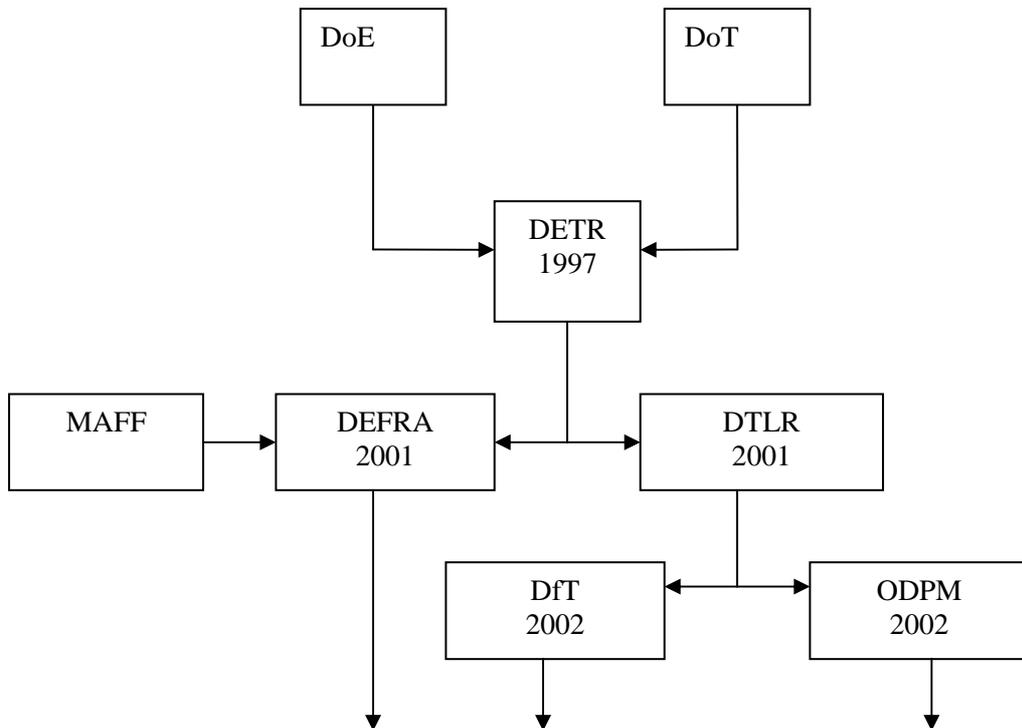
Figure A1: Revisions to the UK NAP 2004



$C - D = -0.7\%$. $AC = 7.6\%$. $A - B = -5.2\%$. Since $B > D$ the targets appear to be ‘softer’ than under the earlier NAP. But $(A-B) > (C-D)$ so the targets are in fact harder than previously. A is regarded as being ‘inconsistent with the UK’s leadership role on climate change’ but C (and hence D) ‘would risk damaging UK competitiveness’ (UK DEFRA 2004d)

REFERENCES

Institutional note: the government department in the UK responsible for environmental policy has changed its name several times. This may cause confusion. Until 1997 the environment ministry was the Department of the Environment (DoE). In 1997 DoE merged with the former Department of Transport (DoT) to become the Department of the Environment, Transport and Regions (DETR). In 2002, the two parts separated again to become Department for Environment, Food and Rural Affairs (DEFRA) and Department for Transport, Land-use and Regions (DTLR), the former merging with the old Ministry of Agriculture, Fisheries and Food (MAFF), and the latter taking over regional and planning functions of the old DETR. In 2002, DTLR was again split into transport (Department for Transport – DfT) and a ministry dealing exclusively with housing, land use and regions (the Office of the Deputy Prime Minister – ODPM). The chart below shows the evolution⁶⁸.



⁶⁸ My sincere thanks to Nick Hague of DEFRA for clarifying this information.

- AGNOLUCCI, P. 2004. *Ex-post Evaluations of CO₂-based Taxes: a Survey*. London: Policy Studies Institute, mimeo
- AGNOLUCCI, P and EKINS, P. 2004. *The Announcement Effect and Environmental Taxation*. Tyndall Centre for Climate Change Research, Working Paper 53, University of East Anglia, Norwich
- AGNOLUCCI, P., BARKER, T and EKINS, P. 2004. *Hysteresis and Energy Demand: The Announcement Effects and the Effects of the UK Climate Change Levy*. London: Policy Studies Institute, mimeo; and Tyndall Centre for Climate Change Research, Working Paper 51, University of East Anglia, Norwich
- AIDT, T. 1998. Political internalisation of economic externalities and environmental policy. *Journal of Public Economics*, **69**, 1-16
- BARON, R. 1997. *Economic/Fiscal Instruments: Competitiveness Issues Related to Carbon/Energy Taxation*. Paris: OECD
- BATES, J. 1995. *Full Fuel Cycle Atmospheric Emissions and Global Warming Impacts from UK Electricity Generation*. Harwell: Energy Technology Support Unit
- BECKER, G. 1983. A theory of competition among pressure groups for political influence. *Quarterly Journal of Economics*, **98**, 371-400
- BESLEY, T and COATE, S. 2003. On the public choice critique of welfare economics. *Public Choice*, **114**, 253-273
- BOEHMER-CHRISTIANSEN, S and SKEA, J. 1991. *Acid Politics: Environmental and Energy Policies in Britain and Germany*. London: Belhaven Press
- BOEMARE, C and QUIRION, P. 2002. Implementing Greenhouse Gas Trading in Europe: lessons from Economic Theory and International Experiences. *Nota di Lavoro 35.2002*. Milan: Fondazione Eni Enrico Mattei. www.feem.it/web/attiv?-attiv.html
- BÖHRINGER, C. 2003. The Kyoto Protocol: a review and perspectives. *Oxford Review of Economic Policy*, **19**, 3, 451-466
- BOYCE, J.K. 2002. *The Political Economy of the Environment*. Cheltenham: Edward Elgar
- BRUNDTLAND, G.H. 1987. *Our Common Future*. Oxford: Oxford University Press
- BUCHANAN, J and VANBERG, 1988. The politicisation of market failure. *Public Choice*, **57**, 101-113
- BUCHANAN, J and TULLOCK, G. 1962. *The Calculus of Consent*. Ann Arbor: University of Michigan Press
- Carbon Trust. 2003. *Annual Review 2002-3*. London: Carbon Trust
- CHRISTIANSEN, A and WETTESTAD, J. 2003. The EU as frontrunner on greenhouse gas emissions trading: how did it happen and will the EU succeed? *Climate Policy*, **3**, 3-18

- COLLIER, U. 1996. Implementing a Climate Change Strategy in the EU: Obstacles and Opportunities. Working Paper RSC 96/1. Florence: European University Institute
- CORNILLIE, J. 2003. *Development in EU CO₂ Emissions Allowance Trading*. Paper to OXERA Environmental Policy Group. Oxford: Oxera
- CSERGE, EFTEC and Warren Spring Laboratory, 1993. *Externalities from Landfill and Incineration*, London: Her Majesty's Stationery Office
- de MOOIJ, R. 1999. The double dividend of an environmental tax reform. In, J van den BURGH (ed). *Handbook of Environmental and Resource Economics*. Cheltenham: Edward Elgar. 293-306
- de MUIZON, G and GLACHANT, M. 2004. The UK Climate Change Levy Agreements: Combining negotiated agreements with tax and emission trading. In, A. BARANZINI and P. THALMANN (eds.). *Voluntary Approaches in Climate Policy: An Economic Assessment of Public-Private Partnership*. Cheltenham: Edward Elgar
- DOWNS, A. 1957. *An Economic Theory of Democracy*. New York: Harper
- DRAZEN, A. 2000. *Political Economy in Macroeconomics*. Princeton: Princeton University Press
- DRESSNER, S., JACKSON, T and GILBERT, N. (forthcoming). History and social responses to environmental tax reform in the United Kingdom. *Energy Policy*, forthcoming
- EAC (Environmental Audit Committee of the House of Commons). 2004. *Budget 2004 and Energy: Tenth Report of Session 2003-04*. London: The Stationery Office
- ECOTEC. 1999. *Who Gains from the Climate Change Levy?* Report to WWF UK. Birmingham: ECOTEC
- Engineering Employers' Federation and Confederation of British Industry. 2002. The Climate Change Levy – First Year Assessment. www.eef.org.uk
- ETG (Emissions Trading Group) 1999. *Outline Proposal for a UK Emissions Trading Scheme*. London: ETG
- ETSU (Energy Technology Support Unit). 2001. *Climate Change Agreements – Sectoral Energy Efficiency Targets*. www.defra.gov.uk/environment/ccl/pdf/etsu-analysis.pdf
- Future Energy Solutions. 2003. *Climate Change Agreements – Results of the First Target Period Assessment. Version 1.1. – Preliminary Results*. www.defra.gov.uk/environment/ccl/pdf/cca_tp1_prelim.pdf
- GOLDBERG, P and MAGGI, G. 1999. Protection for sale: an empirical investigation. *American Economic Review*, **89** (5), 1135-55
- GRANT, W., MATTHEWS, D and NEWELL, P. 2000. *The Effectiveness of European Environmental Policy*. London: Macmillan
- GROSSMAN, G and HELPMAN, E. 1994. Protection for sale. *American Economic Review*. **84**. 833-50
- HARTLEY, N. 2002. The Performance and Innovation Unit Energy Review. In D.Helm (ed), *Towards an Energy Policy*. Oxford: OXERA Press, 17-30

- HAYLER, J. 2003. *The UK Climate Change Levy: an Event Study*. University College London: Master's Thesis, Environmental Economics
- HELM, D. 2001. Climate changes, policies and the case for a carbon tax. In, British Energy, *Turning Point? An Independent Review of UK Energy Policy*. London: British Energy
- HELM, D. 2002. Energy policy and the PIU energy review. In D.HELM (ed), *Towards an Energy Policy*. Oxford: OXERA Press, 5-16
- HELM, D. 2003a. *Energy, the State, and the Market: British Energy Policy since 1979*. (Revised edition). Oxford: Oxford University Press. Revised edition 2004
- HELM, D. 2003b. *The Energy Policy Britain Needs*. London: The Maxwell Lecture
- House of Common: Environmental Audit Committee. 2001. *Second Report: Pre-Budget Report 2001 – a New Agenda?* London: House of Commons
- JORDAN, A. 2002. *The Europeanisation of UK Environmental Policy: a Departmental Perspective*. Basingstoke: Palgrave
- KALT, J and ZUPAN, M. 1984. Capture and ideology in the economic theory of politics. *American Economic Review*, **74**, 3, 279-300
- KEOHANE, N., REVESZ, R and STAVINS, R. 1998. The choice of regulatory instruments in environmental policy. *Harvard Environmental Law Review*, **22**, 313-367
- KIRCHGÄSSNER, G and SCHNEIDER, F. 2003. On the political economy of environmental policy. *Public Choice*, **115**. 369-396
- KRUGMAN, P. 1996. Making sense of the competitiveness debate. *Oxford Review of Economic Policy*, **12**, 3
- London Economics. 1999. *The Environmental Costs and Benefits of the Supply of Aggregates. Phase II Report*, London: DETR
- MADDISON, D and PEARCE, D.W. 1995. The UK and global warming policy. In. T.GRAY (ed), *UK Environmental Policy in the 1990s*. London: Macmillan, 123-143
- MARSHALL, Lord. 1998. *Economic Instruments and the Business Use of Energy*. London: Marshall Task Force
- MUELLER, D. 1989. *Public Choice II*. Cambridge: Cambridge University Press
- MUELLER, D. 2003. *Public Choice III*. Cambridge: Cambridge University Press (Revised edition of Mueller [1989])
- NEWBERY, D., 1998. *Fair Payment from Road-Users: a Review of the Evidence on Social and Environmental Costs*. London: Automobile Association
- NEWBERY, D. and SANTOS, G., 1999. Road taxes, road user charges and earmarking, *Fiscal Studies*, **20** (2): 103-132

- NISKANEN, W. 1971. *Bureaucracy and Representative Government*. Chicago: Aldine-Atherton
- OATES, W and PORTNEY, P. 2001. *The Political Economy of Environmental Policy*. Discussion Paper 01-55. Washington DC: Resources for the Future
- OECD. 2003. *Voluntary Approaches for Environmental Policy: Effectiveness, Efficiency and Usage in Policy Mixes*. Paris: OECD
- OLSON, M. 1965. *The Logic of Collective Action*. Cambridge, Mass: Harvard University Press
- PARK, C. 1987. *Acid Rain: Rhetoric and Reality*. London: Methuen
- PARKER, M. 2002. A low-carbon energy policy for the UK under conditions of uncertainty. In D.HELM (ed), *Towards an Energy Policy*. Oxford: OXERA Press, 31-42
- PARRY, I and SMALL, K. 2002. *Does Britain or the United States have the Right Gasoline Tax?* Discussion Paper 02-12. Washington DC: Resources for the Future
- PEARCE, D.W. 1991. The role of carbon taxes in adjusting to global warming. *Economic Journal*, **101**, 938-948
- PEARCE, D.W. 2001. *Trucks, Tractors, Trains and Trash: Problems with Britain's Economic Approach to Environmental Policy*. Department of Economics, University College London, *mimeo*
- PEARCE, D.W. 2002a. What have we learned from the UK's experience with market-based instruments? In S.SCOTT and D.McCOY, *Green and Bear It: Implementing Market-based Instruments for Ireland's Environment*, ESRI: Dublin,7-20
- PEARCE, D.W. 2002b. Economics and sustainability. In N.CROSS (ed), *Evidence for Hope: the Search for Sustainable Development*. London: Earthscan, 172-181
- PEARCE, D.W. 2003a. *The Distribution of the Benefits and Costs of Environmental Policies: Conceptual Framework and Literature Survey*. Paris: OECD
- PEARCE, D.W. 2003b. Will global warming be controlled? Reflections on the irresolution of humankind. In R.PETHIG and M.RAUSCHER (eds), *Challenges to the World Economy: Festschrift for Horst Siebert*, Springer Verlag, Berlin, 367-382
- PEARCE, D.W. 2003c. The social cost of carbon and its policy implications. *Oxford Review of Economic Policy*. **16**, 3, 362-384
- PEARCE, D.W. 2004a. Does European Union waste policy pass a cost-benefit test? In D.VIGSOE and C.RASMUSSEN (eds), *Rethinking the Waste Hierarchy*. Copenhagen: Environmental Assessment Institute
- PEARCE, D.W. 2004b. *Anatomy of a Resource Tax: the UK Aggregates Levy*. Department of Economics, University College London. *Mimeo*
- PEARCE, D.W., MARKANDYA, A and BARBIER E. 1988. *Sustainable Development, Resource Accounting and Project Appraisal: State of the Art Review*. Report for the UK Department of the Environment. London: DoE. (This became Pearce et al. 1989).

- PEARCE, D.W., MARKANDYA, A and BARBIER E. 1989. *Blueprint for a Green Economy*. London: Earthscan
- RIKER, W. 1962. *The Theory of Political Coalitions*. New Haven: Yale University Press
- ROSER, F and JACKSON, T. 2002. Early experiences with emissions trading in the UK. *Greener Management International*. **39**: 43-54
- Royal Commission on Environmental Pollution. 2000. *Energy – the Changing Climate*. Cm 4749. London: TSO
- SALMONS, R. and SMITH, S., 1999. *Memorandum of Evidence on the Fuel Duty Escalator to the House of Commons Environmental Audit Committee*, CSERGE, University College London, mimeo
- SAYER, S. 2000. Issues in new political economy: an overview. *Journal of Economic Surveys*. **14**, 5, 513-526
- SDC (Sustainable Development Commission). 2003. *UK Climate Change Programme: A Policy Audit*. London: Sustainable Development Commission
- SMITH, S. (2004). Taxes and emissions trading in European climate change Policies: reflections on UK experience. In J.COTTRELL (ed), *Ecotaxes in Germany and the United Kingdom – a Business View*. Report of a Conference hosted by Green Budget Germany, Heinrich Boll Stiftung and the Anglo-German Foundation. Munich
- SORRELL, S. 2002. *The Climate Confusion: Implications of the EU Emissions Trading Directive for the UK Climate Change Levy and Climate Change Agreements*. Brighton: Science Policy Research Unit – University of Sussex
- SORRELL, S and SIJM, J. 2003. Carbon trading in the policy mix. *Oxford Review of Economic Policy*. **19**. 3. 1-18
- STERNER, T. 2003. *Policy Instruments for Environmental and Natural Resource Management*. Washington DC: Resources for the Future, The World Bank and Swedish International Development Agency
- STEVENS, J. 1993. *The Economics of Collective Choice*. Boulder: Westview Press
- ten BRINK, P (ed). 2002. *Voluntary Environmental Agreements: Process, Practice and Future Use*. London: Greenleaf Publishers
- THATCHER, M. 1988. Speech to Royal Society. Obtainable in e-form from the Thatcher Foundation at www.margareththatcher.org/Speeches.
- TURNER, A. 2003. *The Inaugural Carbon Trust Lecture*. London: Carbon Trust. www.thecarbontrust.co.uk
- UK Cabinet Office, 2002. *The Energy Review: a Performance and Innovation Unit Report*. London: Cabinet Office
- UK Cabinet Office, 2003. *Better Policy-Making: a Guide to Regulatory Impact Assessment*. London: Cabinet Office

- UK Department of the Environment. 1988. *Possible Impacts of Climate Change on the natural Environment in the United Kingdom*. London: DoE
- UK Department of the Environment, Transport and Regions. 2000. *A Greenhouse Gas Emissions Trading Scheme for the United Kingdom*. London: DETR
- UK Department of the Environment, Transport and Regions; Scottish Executive; The National Assembly for Wales; Department of the Environment in Northern Ireland. 2000. *Climate Change: the UK Programme*. Cm 4913. London: DETR
- UK Department of the Environment, Food and Rural Affairs. 2001a. *The UK's Third national Communication under the United Nations Convention on Climate Change*. London: DEFRA
- UK Department of the Environment, Food and Rural Affairs. 2001b (May). *Draft Framework Document for the UK Emissions Trading Scheme*. London: DEFRA
- UK Department of the Environment, Food and Rural Affairs. 2001c (August). *Framework Document for the UK Emissions Trading Scheme*. London: DEFRA
- UK Department of the Environment, Food and Rural Affairs. 2001d. *Incentives Bidding Mechanism: Options for a Mechanism to Allocate Incentives Funding and Set Emission Targets in the UK Emissions Trading Scheme*. London: DEFRA
- UK Department of the Environment, Food and Rural Affairs. 2001e. *UK Emissions Trading Scheme – Regulatory and Environmental Impact Statement*. London: DEFRA
- UK Department of the Environment, Food and Rural Affairs. 2004a. *Environmental Protection Statistics*. www.defra.gov.uk/environment/statistics/supp/spkf10.htm
- UK Department of the Environment, Food and Rural Affairs. 2004b. *EU Emissions Trading Scheme: UK Draft National Allocation Plan for 2005-2007, and Explanatory Note 1 – Sector-by-Sector Breakdown*. London: DEFRA
- UK Department of the Environment, Food and Rural Affairs. 2004c. *Energy Efficiency: the Government's Plan for Action*. London: DEFRA
- UK Department of the Environment, Food and Rural Affairs. 2004d. *News Release: UK Announces Plan on EU Emissions Trading Scheme*. London: DEFRA
- UK Department of the Environment, Food and Rural Affairs. 2004e. *EU Emissions Trading Scheme. UK National Allocation Plan: Updated Timetable to Final Allocation Decision*. London: DEFRA
- UK Department of Trade and Industry. 2002. *Long-term Reductions in Greenhouse Gas Emissions in the UK*. London: DTI
- UK Department of Trade and Industry. 2003a. *Energy White Paper: Our Energy Future – Creating a Low Carbon Economy*. Cm 5761. London: TSO
- UK Department of Trade and Industry. 2003b. *Stage 1 Results – DTI Exercise to Update Energy and Emissions Projections*. London: DTI

COM/ENV/EPOC/CTPA/CFA(2004)66/FINAL

UK Department of Trade and Industry. 2003c. *Options for a Low Carbon Future*. DTI Economics Paper No.4. London: DTI

UK Department of Trade and Industry (and UK DEFRA) 2004. *Creating a Low Carbon Economy: First Annual Report on Implementation of the Energy White Paper*. London: DTI

UK Government. 1990. *This Common Inheritance: Britain's Environmental Strategy*. Cm 1200. London: HMSO

UK Government. 1992. *This Common Inheritance: The Second Year Report*. Cmnd 2068. London: HMSO

UK HM Customs and Excise. 1999a. *Budget 99: A Climate Change Levy*, HM Customs and Excise: London

UK HM Customs and Excise, 1999b. *Climate Change Levy: Draft Regulatory Impact Assessment*, HM Customs and Excise: London

UK HM Customs and Excise, 2000. *Climate Change Levy: Regulatory Impact Assessment*. London: HM Customs and Excise

UK HM Customs and Excise. 2003. *Climate Change Levy Technical Briefing No.18: Supplies from Combined Heat and Power Stations*. Salford: HM Customs and Excise

UK HM Treasury, 1997a. *Budget Press Notice*, 4, July 2. London: HM Treasury

UK HM Treasury. 1997b. *Tax Measures to Help the Environment*. New Release, July 2. London: HM Treasury

UK HM Treasury. 2002a. *The Green Book: Appraisal and Evaluation in Central Government (Draft)*. London: HM Treasury. www.hm-treasury.gov.uk

UK HM Treasury. 2002b. *Tax and the Environment: Using Economic Instruments*. London: HM Treasury

UK National Audit Office. 2004. *The UK Emissions Trading Scheme: A New Way to Tackle Climate Change*. London: NAO

VARMA, A. 2004. *UK's Climate Change levy and Emission Trading Scheme: Implications for Businesses' Productivity and Economic efficiency*. Department of Economics, University of Hull. Mimeo

WALLART, N. 1999. *The Political Economy of Environmental Taxes*. Cheltenham: Edward Elgar