ECOTAXES IN GERMANY AND THE UNITED KINGDOM - A BUSINESS VIEW

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GREEN BUDGET GERMANY CONFERENCE REPORT

IN COOPERATION WITH THE HEINRICH BÖLL FOUNDATION AND THE ANGLO-GERMAN FOUNDATION

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**Introduction**

The conference “Ecotaxes in Germany and the UK – A Business View” was organised by Green Budget Germany in cooperation with the Heinrich-Böll-Foundation and the Anglo-German-Foundation. Its main focus was to compare and contrast the ecological taxation systems in the UK and Germany and its underlying logic in this context was to investigate why ecological taxation is communicated, perceived and received so differently in the two countries and to lay foundations for future research.

This introduction aims to provide the reader with a basic knowledge of the ecotax systems in the two countries and common arguments for and against their implementation, thus placing the later presentations in context. It examines the main topics discussed at the conference, such as the issue of social insurance payments in Germany and the UK, possible improvements to both ecotax systems and the issue of European harmonisation. Later contributions examine many of the issues touched upon here in more detail, as do the conference discussions, which have also been included. Green Budget Germany would like to take this opportunity to thank everyone involved in the conference – participants, speakers and funding bodies. We are looking forward to future cooperation and further developments as a result of the conference’s conclusions.

As noted above, the very different responses on the part of business to ecotax in Germany and the UK provided Green Budget Germany with one source of inspiration for the conference. The Climate Change Levy – although by no means welcomed with open arms – was comparatively well-received by industry, which is particularly remarkable in the light of the fact that the levy targets industry and does not directly affect domestic energy users. In Germany on the other hand, the ecological tax reform received relatively bad press and was negatively received by industry, which claimed that the ecotax threatened international competitiveness and would lead to job losses and relocations. Particularly notable in the case of Germany is that the discourse of damnation has continued even though energy-intensive industries effectively pay only 3 percent of the tax, by means of the so-called *Spitzenausgleich* 1 and many other businesses pay only 60 percent, and in spite of evidence that most industrial sectors actually profit from the tax2.

The sections below first investigate typical explanations for these very different receptions: the differing economic structures of the two countries and the importance of exports for the German economy. It is shown that neither of these explanations can truly clarify this difference.

The paper goes on to compare the income from tax receipts in the two countries. This serves the dual purpose of contrasting the revenues raised by ecological taxation and highlighting the high cost of labour in Germany largely resulting from high social insurance payments – an issue that was much discussed throughout the conference, particularly with reference to the notion of the double dividend.

The next two sections examine the real differences in the rates of taxation. The analysis is separated into tax on electricity and heating fuels, then on transport fuels. Particularly because the two systems in question are extremely complex, this is by no means an easy task. The object of this section is to provide a relatively brief and simple overview of the relevant similarities and differences between the German and British ecological taxation systems, to put the presentations that follow in context.

The final section directly compares taxation rates on electricity and transport fuels and considers whether these differences are ecologically and environmentally justifiable. This last section also highlights possible potential for improvement to both ecotax structures in the future.

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1 This compensation for energy-intensive industry effectively provides for a 97 percent reduction on the rate of ecological taxation.
2 Many sectors of the German economy have made significant savings as a result of the ecotax. The public services sector has made savings of approx. € 1.4 billion; manufacturing has saved € 972 million and the service industries € 727 million. For more details see Dr. Anselm Görres’ welcoming speech below.
Two Common Explanations for Two Different Ecotax Structures: the German and British Economies

As noted above, one of the most startling contrasts between the two ecological taxation systems is the sectors most deliberately targeted by the respective policies. In the UK, the Climate Change Levy is a downstream tax on energy, deliberately designed to avoid impacting domestic energy users for socio-economic reasons.\(^3\) In contrast, the German ecotax was designed to avoid hitting business too hard, due to concerns that a tax that deliberately targeted industry would jeopardise international competitiveness.

One of the most common explanations for the almost total exemption of energy intensive industry in Germany from the ecotax is the contrasting economic structures of the two countries. It is often argued that the decline of heavy industry and manufacturing in the UK and the resulting shift towards the ‘post-industrial’ society has rendered the UK less dependent on manufacturing and energy-intensive heavy industries than Germany. The statistics do indeed support this argument to a limited extent: In the UK, almost 74 percent of gross domestic product (GDP) is generated by service industries, while in Germany services account for only 68 percent. However, as shown on the bar chart below, the economies of the two countries are not as dissimilar as is often claimed.

![Value Added at Current Prices in Germany and the UK in Percent](image)

The dependency argument does not only draw on evidence from the sectoral structure of the German economy, however. Industry also argues that the unprecedented international focus of the German economy disqualifies any measures (e.g. ecological tax reform) that increase costs and result in increased prices, thus jeopardising international competitiveness.

At first glance, this argument seems to have the facts on its side. Almost one-third of company profits are generated through export; one in four jobs in Germany is dependent on foreign trade; and exports from Germany are worth more than twice as much as exports from the UK and are on a par with the total output of Spain.\(^4\) However, what it fails to take into account is that the impact of higher costs on international competitiveness depends on the extent to which higher costs actually result in higher prices. Presuming that price increases are inevitable fails to take into account the flexibility of businesses to target prices to international

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3 Fuel poverty for domestic energy users in the UK is a significant problem. The UK government estimates that 4 million people have difficulties heating their homes in winter.

4 Statistics from the German Federal Foreign Office and Spiegel Online: http://www.spiegel.de/jahrbuch/0,1518,G,00.html.
markets in response to increasing electricity costs. For example, businesses are able to neutralise cost changes by accepting lower profit margins, which might in turn lead to increased production.\(^5\)

While the significance of international trade for the German economy should not be underestimated, the contributions of British speakers provided considerable evidence of the savings which even energy-intensive industries can make by implementing energy-saving and carbon abatement measures. For example, Sir Charles Nicholson, Senior Policy Advisor at BP plc, announced in his presentation that BP made savings of US $650 billion as a result of a BP-internal emissions trading scheme and other energy-saving measures. It is extremely likely that the introduction of similar measures in a German company would result in comparable savings, thus rendering German business more – rather than less – competitive.

Significantly, German speakers at the conference corroborated this view. Green Budget Germany Advisory Board member and conference speaker Dr. Georg Riegel, founder and managing director of dezem GmbH, pointed out that businesses can save far more by implementing energy saving measures than an ecological tax would foreseeably levy, corroborating evidence from British speakers during the morning session. Dr. Anselm Görres noted that many sectors in Germany have gained considerably as a result of the ecological tax reform and have considerably lower tax bills as a result – manufacturing saves €972 million annually, construction €246 million and energy and water supply €150 million.

Moreover, the concerns of industry with regard to international competitiveness issues have indeed been taken into account in the ecological taxation structures of both countries. Energy-intensive industries in Germany and in the UK are entitled to effective exemptions of 97 and 80 percent respectively, in the UK in return for emissions reduction commitments agreed in Climate Change Agreements negotiated with government\(^6\).

To summarise, the conference was unable to find evidence to support the suggestion that ecological taxation levied on industry necessarily jeopardises international competitiveness and unduly heightens the risk of business relocation. A recent study carried out by the German Institute for Economic Research, the University of Osnabrück and GWS, and the University of Oldenburg corroborates this conclusion. Using two macroeconomic models, the PANTA RHEI multi-sector econometric simulation and forecast model and the LEAN simulation model, the study concluded that environmental fiscal reform in Germany can be expected to have a minimal impact on economic growth while reducing CO\(_2\) emissions and increasing employment.\(^7\)

Perhaps a more pressing issue in relation to distortive competitive effects is the different rates of taxation in EU member states. In this regard, both the conference itself and the findings of the simulation study above highlighted the importance of the introduction of suitable instruments for emissions abatement and minimum levels of ecological taxation throughout the EU. This issue is examined in depth below.

**Tax Structures in the UK and Germany**

The two pie charts on the following page show the share of tax revenues in the UK and in Germany by source. At their most basic level, these reveal that Germany raises a higher proportion of revenue from ecological taxation than the UK – indeed, as the pie chart shows, only the Fuel Duty Escalator in the UK raises a significant amount of revenue at all\(^8\), while almost 10 percent of Germany’s tax receipts come from eco tax in one form or another.

One of the most significant differences between the two tax structures is the huge proportion of social insurance contributions payable in Germany, which accounts for almost 50 percent of all tax receipts, while national insurance accounts for just 20 percent in the UK. While this figure should be understood in context – the National Health Service is funded by income tax as well as from national insurance – this structural fault

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\(^6\) Energy intensive industries negotiated agreements with the UK government to reduce their emissions systematically in five steps every two years from 2000 to 2010 and received an 80 percent reduction on the Climate Change Levy in return. It is of note in this context that some sectors committed themselves to reducing their emissions by a considerable amount: for example, chemicals committed themselves to an 18 percent improvement to energy efficiency, cement to a 26 percent improvement, semi-conductors to a 59 percent improvement and aluminium to a 32 percent improvement.


\(^8\) Revenues raised by ecological taxes in the UK are as follows: Fuel Duty £ 22.1 billion/ € 36.69 billion, Landfill Tax £0.5 billion / €0.83 billion, Climate Change Levy £0.8 billion / €1.33 billion, Aggregates Levy £0.2 billion / €0.33 billion, Air Passenger Levy £0.8 billion / €1.33 billion.
**SHARE OF TAX REVENUES IN GERMANY BY SOURCE**

- Insurance Premium: 1%
- Fuel Duty: 7%
- Aggregates Levy: 0%
- Climate Change Levy: 0%
- Air Passenger Duty: 0%
- Landfill Tax: 0%
- Employment: 33%
- Customs & Excise, Betting, Tobacco, Wine & Spirits, etc.: 6%
- VAT: 20%
- Windfall and Petroleum Tax: 0%
- Capital Gains, Stamp Duty and Inheritance Tax: 4%
- Corporation Tax: 9%
- National Insurance Contributions: 20%

Source: German Ministry of Finance, FÖS calculations

Labels in green have an environmental impact

**SHARE OF TAX REVENUES IN THE UK BY SOURCE**

- Insurance Premium: 1%
- Fuel Duty: 5%
- Tobacco, Wine & Spirits: 2%
- Land Tax: 1%
- Vehicle Tax: 1%
- Energy Tax: 1%
- Customs & Excise, Lottery, Coffee Tax: 1%
- VAT: 16%
- Capital Gains, Inheritance Tax: 2%
- Corporation Tax: 5%
- Income Tax: 16%
- Social Insurance Contributions: 49%

Source: [http://www.hm-treasury.gov.uk/media//29C59/PublicFinancesDatabank220604.XLS](http://www.hm-treasury.gov.uk/media//29C59/PublicFinancesDatabank220604.XLS)
is arguably one of the underlying reasons for the emphasis, particularly in Germany, on the so-called ‘double dividend’ – the implementation of ecological taxation to reduce labour costs while taxing environmentally damaging behaviour. Whether using ecological tax revenues to reduce social insurance payments is still the best way to use the revenues raised, or whether it acts to support an underlying structural fault which ought to be more directly addressed, was discussed in some detail during the conference, particularly during the panel discussion at the end of the day.

**The UK Climate Change Levy and the German Ecotax on Electricity and Heating Fuels**

As noted above, ecological tax in the UK in the guise of the Climate Change Levy was a downstream energy tax on business rather than domestic users, whereas the German ecotax targeted electricity and gas at point of consumption by domestic and industrial energy users, although much of industry was partially exempt. This renders a direct comparison of the two instruments relatively difficult, as taxes paid on the energy used are paid on energy at different stages in the process of energy use and by different sectors.

On the other hand, the two systems do have many similarities and reflect the recommendations contained in Lord Colin Marshall's ground-breaking report, “Economic Instruments and the Business Use of Energy” (HM Treasury, 1998). Both tax systems aim to protect the competitive position of the economy, recycle revenues to business by means of lowered employer national insurance contributions, take energy-intensive sectors into consideration while retaining some form of incentive for energy saving (although there is certainly room for improvement in both countries in this respect) and aim to increase incentives for the take-up of renewable sources of energy.

For the purposes of analysis, only the German ecotax on electricity and heating fuels is discussed here, while transport fuels are discussed later in a separate section, below. This enables a more direct comparison of the two systems.

The graph below is based on figures collated by the European Commission in preparation for the implementation of the EU energy tax Directive 2003/96/EC and provides an overview of the overall taxation rates on energy products in the two countries; however, these taxes are not by definition entirely ‘ecological’, i.e. solely introduced as part of a systematic ecological fiscal reform policy, and do not differentiate between commercial and domestic users.

**Tax Levied on Energy Products in the UK and Germany**

![Graph showing taxation rates on energy products in the UK and Germany](image)

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9 This section does not discuss ecological taxes on transport fuels, as these are dealt with in detail under the heading ‘Fuel Duty in the UK and the German Ecotax on Fuels’ below.
The actual ecological tax on electricity used for commercial purposes amounts to 0.71 Euro cent per kilowatt hour in the UK, whereby energy-intensive industries which negotiate Climate Change Agreements with the UK government receive reductions of 80 percent to this rate – 0.14 Euro cent per kilowatt hour – in return for emissions reduction commitments. Ecological taxation on electricity in Germany amounts to 2.05 Euro cent, although energy-intensive businesses receive an effective reduction of 97 percent – 0.06 Euro cent per kilowatt hour – and forestry, agriculture and manufacturing receive reductions of 40 percent – which amounts to an ecotax rate of 1.23 Euro cent. Not only is the amount of ecological taxation on natural gas for heating much lower in the UK – 0.23 Euro cent per kilowatt hour, in contrast to Germany’s rate of 0.6 Euro cent – but light fuel heating oil is exempt from the UK levy altogether as it already carries excise duty, while 2.05 Euro cent per litre ecotax is paid on light fuel heating oil in Germany.

**Ecological Taxation on Electricity for Industry in the UK and Germany**

The differing rates of taxation in the two countries as shown above could be used to defend, to some degree at least, tax reductions for industry from the German ecotax. As the Climate Change Levy on electricity constitutes approximately one third of the ecotax in Germany, it is possible to argue that the UK can afford to tax industry more heavily, as such low tax rates are almost immaterial for business in any case. Moreover, falling electricity prices in the UK due to continued liberalisation of the market have offset the impact of the 10-15 percent increases in electricity prices due to the Climate Change Levy to such a degree that businesses have hardly felt the pinch of the levy at all. On the other hand, effective reductions for energy-intensive businesses in Germany are such that their rate of tax is still lower than that in the UK and they are not required to negotiate emissions abatement agreements in return. To put this in context: the UK chemical industry pays 0.14 Euro cent per kilowatt hour ecotax on electricity and in return, agreed to reduce emissions by 18 percent, the UK aluminium industry pays the same low rate and committed themselves to reducing emissions by 32 percent in return. In Germany, both sectors are required to pay 0.06 Euro cent per kilowatt hour without accompanying agreements.

The targeting of all electricity users in Germany, the lower rates of the Climate Change Levy, and the different sizes of the two countries’ economies have inevitably resulted in considerable differences in the amount of revenue raised by the two energy tax systems. In 2003, revenues from the Climate Change Levy – paid by
industry alone – amounted to €1.3 billion, whereas the ecotax on electricity, gas and heating oil – paid by industrial and domestic users – raised €10.5 billion in total in Germany.\footnote{The total revenue raised by the ecotax in Germany amounted to €18.6 billion. This can be broken down as follows: €0.2 billion ecotax revenue from tax on heating oil, €3.4 billion from tax on natural gas, €6.5 billion from tax on electricity, €2.4 billion from tax on petrol and €5.7 billion from tax on diesel. The latter two figures are not included in the €10.5 billion quoted above, as ecotax on transport fuels are dealt with in a separate section, below.}

In the UK, over 90 percent of all revenue raised through the Climate Change Levy is used to reduce employer's national insurance contributions (NIC) by 0.3 percent and to fund the Carbon Trust, which is responsible for developing programmes to assist business to improve its energy efficiency and for supporting the development of new low-carbon technologies. Although reviews from the Federation of Small Businesses and from the Confederation of British Industry and the Engineering Employers Federation indicate that the industrial sector as a whole pays more tax than it receives from the reduction in employer's national insurance contributions, these figures do not take account of the revenue recycled to provide support for energy efficiency.\footnote{See 'The climate change levy: another cost for small businesses', Federation of Small Businesses, Research Paper No. 2, July 2002 and 'The climate change levy: first year assessment', Confederation of British Industry and Engineering Employers Federation, October 2002.}

In Germany, approximately 60 percent of the €10.5 billion paid in ecotax on electricity, gas and heating oil is paid by domestic energy users\footnote{Estimates from "The effects of environmental fiscal reform in Germany: a simulation Study", Stephan Bach, Michael Kohlhaas, Bernd Meyer, Barbara Praetorious, Heinz Welsch, \textit{Energy Policy} 30 (2002) 803-811.}, meaning that approximately €4.2 billion was paid by industry. 88 percent of revenues from ecotax paid on electricity, gas and heating oil (and indeed 88 percent of all ecotax revenues) are recycled into the German pensions payment system and half of this, i.e. €4.6 billion, is used to reduce employer's pension contributions. Thus, German industry as a whole is a net winner from the ecotax on electricity, gas and heating oil and profits by €0.4 billion.

While the purpose of an ecological tax might ultimately be that of a steering mechanism, i.e. its primary function might not be to raise a great deal of revenue but to change behaviour, the amount of revenue raised in the UK – one eighth of that in Germany – seems to be too low to incentivise the introduction of energy-savings measures. This is particularly important because, as the conference presentations show, the potential for energy saving measures in business is tremendous in both countries and seldom used to its full advantage.

In terms of carbon emissions, it seems unlikely that the UK Levy itself incentivised emissions reduction sufficiently, particularly as tax increases were offset by falling electricity prices. This speaks in favour of a direct tax on carbon emissions, as called for by business according to a survey carried out by the Green Alliance in 2002.\footnote{`Next steps for energy taxation: a survey of business views', Green Alliance, November 2002.} In spite of this, the Climate Change Agreements introduced in April 2001 with the Levy were able to save 13.5 million tonnes of carbon in their first year. In Germany, estimates vary greatly in relation to emissions reductions. The German government estimated in its climate protection program 2000 that the ecological tax reform will save 10 million tonnes of CO$_2$ in 2005 in relation to 1998 emissions levels and that 6-8 million tonnes of these CO$_2$ savings will be achieved in the transport sector, while other studies indicate reductions of between 9 and 24 million tonnes relative to 1998 by 2003.\footnote{All these figures originate from the Federal Ministry for the Environment’s response to a parliamentary question submitted by a Member of the German Bundestag on 19th May 2004. For details (in German) see a copy of the letter at http://www.foes-ev.de/4fakten/index.html.} From the German government’s figures it would seem that Climate Change Agreements are the more effective instrument in terms of emissions abatement, while other, more optimistic estimates of the impact of the ecotax in Germany would seem to indicate the opposite. Thus, it is difficult to make a definite statement in this regard.
**Fuel Duty in the UK and the German Ecotax on Fuels**

It is possible to make a relatively uncomplicated and direct comparison of fuel taxation in Germany and the UK. The actual rates of duty in the UK and Germany in cent per litre of fuel are shown in the diagram below.

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**FUEL DUTY IN THE UK AND GERMANY**

<table>
<thead>
<tr>
<th>Fuel Type</th>
<th>Duty in the UK (cent per litre)</th>
<th>Duty in Germany (cent per litre)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ultra-low sulphur petrol</td>
<td>75.5</td>
<td>67.1</td>
</tr>
<tr>
<td>Ultra-low sulphur diesel</td>
<td>75.5</td>
<td>48.7</td>
</tr>
<tr>
<td>Sulphur-free petrol</td>
<td>71</td>
<td>65.6</td>
</tr>
<tr>
<td>Sulphur-free diesel</td>
<td>71</td>
<td>47.2</td>
</tr>
<tr>
<td>Biodiesel</td>
<td>40.8</td>
<td>0</td>
</tr>
<tr>
<td>Liquefied petroleum gas used as road fuel</td>
<td>8.4</td>
<td>9</td>
</tr>
</tbody>
</table>

The most obvious point in this context is that the UK has the same rate of taxation on petrol and diesel, unlike other EU member states. Bringing the rate of diesel taxation into line with that of petrol in Germany is the first point in Green Budget Germany’s thirteen-point program for the further development of ecological-social tax reform in Germany, the FÖS/GBG Memorandum 2004, and the Fuel Duty Escalator is an example of a successful policy instrument introduced to achieve this end.¹⁵

Secondly, the UK has the highest taxation rates of any EU member state on petrol and diesel – and can afford these high rates largely because it is an island and enjoys a more trapped market than other EU countries.¹⁶ Germany inevitably faces rather more direct competition in this regard, as its immediate neighbours – all nine of them (the highest number in the world) – all have considerably lower rates of fuel taxation. For instance, prior to the implementation of the EU energy tax Directive 2003/96/EC in 2003, taxation in Germany per 1,000 litres of fuel amounted to €625 for unleaded petrol and €441 for diesel, whereas Luxembourg’s rates amounted to a mere €372 and €253 and Austria’s €407 and €282 respectively. Although these rates

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¹⁵ Kerosene is almost exempt from fuel taxation in the UK and totally exempt in Germany. This may change in the future, as the EU energy tax Directive 2003/96/EC has given EU member states the possibility to tax kerosene used for internal flights and on flights between member states.

have been or will have to be increased in line with the new EU energy tax directive\textsuperscript{16}, these increases will have little practical impact in terms of fuel tourism in Germany – as explained in the next paragraph.

The new energy tax Directive stipulates minimum taxation rates for diesel of €302 per 1,000 litres of diesel from 2003 and €330 per 1,000 litres of diesel by 2010, but diesel was already taxed at a rate of €710 per 1,000 litres in the UK and €470 per 1,000 litres in Germany in 2003. Thus, in spite of minimal increases elsewhere in the EU, it will still pay for German car drivers living near a border with e.g. Austria, Luxembourg, or the Czech Republic, to purchase their fuel abroad, or for hauliers travelling to the UK to fill up their fuel tanks before crossing the channel. German hauliers in particular have made “tank tourism” a matter of company policy. Thus, such low minimum taxation rates can do little to resolve the problem of fuel tourism in the EU in countries with particularly high ecological taxation on vehicle fuels, such as Germany or the UK. This highlights the importance of EU-wide legislation stipulating minimum taxation rates on transport fuels that are considerably higher than the lowest common denominator.

In terms of revenues raised from transport fuel duty, Germany is slightly ahead and raised €38.8 billion in 2003, while the UK raised €36.7 billion in the 2002-3 financial year. However, this statistic does not reflect the fact that the UK has 424 vehicles per 1,000 inhabitants and 60 million inhabitants in total, while Germany has 541 vehicles per 1,000 and 82.5 million inhabitants overall. Thus, while the annual average fuel duty paid per vehicle in Germany amounts to €869.96, this figure amounts to €1444.88 in the UK.\textsuperscript{19} Bearing in mind transport's significant and growing contribution to CO\textsubscript{2} emissions, both countries should incentivise public transport use and alternative fuels to a greater extent and continue to raise fuel duty, although the latter would be considerably easier to implement in the context of EU-wide harmonisation. On a more positive note, the impact of the ecological tax reform in Germany is already evident – since its introduction, transport fuel consumption has decreased by approximately 9 percent and public transport use has increased by approximately 4 percent. In the UK, in spite of its having a grievously underfunded public transport system, bus use increased by 5 percent in the same period.

**Emissions Sources and Ecotax Rates**

The ecological tax structures of both countries levy higher rates of taxation on vehicle fuel energy than on energy from electricity. Assuming that a passenger car using unleaded petrol consumes 8 litres of petrol per 100 kilometres, the rate of taxation per kilowatt hour on unleaded, sulphur-free petrol in the UK is 7.1 Euro cent, while the full rate of ecological tax on electricity amounts to just 0.71 Euro cent per kilowatt hour. In Germany, the difference is less, but considerable nevertheless, amounting to 6.6 and 2.05 Euro cent per kilowatt hour respectively.

This differentiation in the rate of taxation may be justified by a number of factors: the generally high price of motor fuels reflects the cost of constructing and maintaining traffic infrastructure; traffic causes other important environmental and non-environmental externalities such as noise, emissions, traffic casualties, etc. far more than other systems of energy use – indeed, research suggests that the external costs of transport typically amount to almost 10 percent of GDP, and 90 percent of these externalities are attributable to road transport\textsuperscript{20}; many people do have a viable alternative to the consumption of motor fuels in the form of other means of transport; and finally, the growing share of CO\textsubscript{2} emissions deriving from road transport in the EU. Transport is the second-largest contributor to CO\textsubscript{2} emissions after energy industries – and almost 97 percent of this derives from vehicles. Between 1990 and 2002, CO\textsubscript{2} emissions from transport increased by 23% and in 2002, transport emissions accounted for 19 percent of the EU’s total greenhouse gas emissions – a proportion predicted to increase to 35% by 2010.\textsuperscript{21} It may be that high rates of taxation may have played a part in keeping increases in CO\textsubscript{2} transport emissions in the UK and Germany below the EU average of 18.4 percent\textsuperscript{22}.

\textsuperscript{16} The directive stipulates that diesel taxation per 1,000 litres fuel must amount to €302 in 2003 and €330 in 2010. Luxembourg complied with the directive in 2003 and increased diesel taxation accordingly, while Austria, along with Belgium and Spain, has special status in this regard and is not required to raise diesel taxation to €302 per 1,000 litres until 2007 and to €330 in 2012.
\textsuperscript{19} Due to lack of reliable information, these calculations do not take through traffic or tank tourism – both phenomena that are almost certainly more prevalent in Germany – into account.
\textsuperscript{20} Source: International Union of Railways and Community of European Railways.
\textsuperscript{21} Predictions differ depending on whether the ACEA agreement is implemented; if so, transport CO\textsubscript{2} emissions are expected to make up 25% of the EU’s total CO\textsubscript{2} emissions, if not, transport is predicted to make up as much as 35%. Transport emissions statistics accessed at www.eea.eu.int on 04.08.2004.
Nevertheless, the relatively limited impact of the high rates of taxation in the two countries reveals that the minimum taxation rates stipulated by the EU energy tax Directive are in all probability too low to have a real impact on this trend – indeed, these price increases are much lower than the rate of inflation. Furthermore, transport fuel prices have actually fallen in terms of income-corrected figures, taking manifold higher incomes in comparison to the previous decade. For this reason, the UK Fuel Duty Escalator is in addition to inflation – a policy measure which conference participants noted merits serious consideration in the German context, as inflation is not taken into account in the German ecotax system, which results in tax rates losing value and thus their incentive function over time.

On a more positive note, new legislation currently being drafted on passenger car emissions, as discussed by Christos Liolios from the European Commission, DG Taxation and Customs Union in his presentation (below), may well supplement the energy tax Directive in the near future.

Conclusion

Some aspects of energy saving in relation to electricity and heating fuels have not been sufficiently incentivised in either country. In Germany, for example, while domestic users and those industrial sectors not qualifying for exemptions have certainly felt the pinch of the ecotax, significant sectors of German industry have enjoyed very much reduced rates. In the UK, both commercial and domestic energy users have profited from falling electricity prices and have felt little incentive to save energy. While fuel poverty remains an issue in the UK, the increased cost of heating as a result of an ecological tax on domestic energy use could be offset by reductions or exemptions for less affluent consumers, or, better still, by the provision of grants for home insulation. What is more, several of the presentations below reveal a great deal of potential for energy saving in business. Many of these methods are equally applicable to household use.

The conference revealed that one of the most fundamental stages in the process of implementing ecological fiscal reform is succeeded in putting an initial instrument in place. Once an instrument exists, it may be adjusted to target particular emissions sources, to raise more or less revenue, or extended to cover other fuels. In short, it can be finely tuned. Thus, while some elements of this introduction may seem critical of ecological taxation in Germany and the UK, now that these systems exist, they can be developed and improved – for example, as set out in Green Budget Germany’s Memorandum for 2004.

DANIELA SETTON, HEINRICH-BÖLL-Foundation, WELCOMING SPEECH

I would like to welcome all conference participants to the Heinrich-Böll-Foundation. I am here to represent Barbara Unmüßig, one of our executive board members, who is not able to be here today due to an unexpected illness.

On behalf of the Heinrich-Böll-Foundation, I would like to say how delighted we are that this event is actually taking place. The topic is more important than ever before. If we do not take action, climate change will be unstoppable. To quote Sir David King, the UK Chief Scientific Adviser: "There is no bigger problem than climate change. The threat is quite simple, it is a threat to our civilisation."

The ecological tax reform is one of the central instruments which offers a constructive solution not only to climate change, but also to other environmental problems. For this reason, it is so important to work with two countries – Britain and Germany – that are forerunners in the field of ecotaxes; to collaborate, exchange best practice and learn from one another, and to promote the ecological tax reform with the support of as many interested parties as possible.

I am particularly pleased to see that this conference is examining the business perspective, as it is very important to get companies on board – their business perspectives are influenced by the design of ecotaxes, and they are after all very influential actors. Ecotaxes affect almost everybody, and they all too easily fall prey to populist campaigns, as we have had to learn in Germany.

I would particularly like to thank our partners who arranged this conference and everyone who has come here today. Interestingly, one of the first projects of the newly created Heinrich-Böll-Foundation, the result of a merger of three foundations in 1997, was to support a campaign for the ecological tax reform by an umbrella organisation of German Environment NGOs. So we are of course very happy to continue this tradition with this conference.

For all these reasons, we are looking forward to an interesting discussion. I hope you enjoy your time here at the foundation and hope that we go home with a great deal more knowledge at the end of the day.
RAY CUNNINGHAM, ANGLO-GERMAN FOUNDATION, WELCOMING SPEECH

Ladies and gentlemen, sehr geehrte Damen und Herren, good morning, my name is Ray Cunningham and I’m the deputy director of the Anglo-German Foundation and its representative in Germany. It’s a great pleasure to welcome you here today on behalf of the Foundation. Its full name is the Anglo-German Foundation for the study of industrial society or “die Deutsch-Britische-Stiftung für das Studium der Industriegesellschaft”.

The foundation’s purpose is to support comparative and collaborative research and policy exchange on social and economic issues affecting both Great Britain and Germany. We are currently concentrating our activities on four priority areas: migration and the labour market, the ageing society, healthcare systems and work-life balance. But by means of a small grants programme, we also continue to address a wider range of important issues relevant to both countries and to the development of industrial society. (Under the term “industrial society” we mean not so much the narrower German understanding of manufacturing but the whole process of wealth generation in modern societies.)

One of the most important of the areas addressed in our wider programme since the inception of the foundation has been environmental policy, and today’s event provides some evidence that our activities do indeed bear fruit, if sometimes fairly slowly.

In 1995, Stephen Smith – our speaker today from the UK research community – completed a comparative study on the prospects for ecotaxes in Britain and Germany. The study was called, “Greening the Tax System in Britain and Germany”; and obviously, someone in both governments – or more accurately perhaps, in both oppositions at the time – was paying attention. Now that both governments have introduced ecotaxes of a kind analysed by Stephen in this report, the next logical step is to optimise those taxes in terms of both their environmental and their fiscal impact. This demands logically as well that we ensure they do not place a disproportionate handicap on national industries or on particular sectors as that would weaken their overall impact. That is the purpose of today’s event as I see it – to help to optimise ecological taxation in both countries. Although I assume that Stephen has updated his research for the presentation he is giving today, his report remains, at the theoretical level, relevant and well worth reading, and I commend it to you. But I commend even more heartily the presentations and discussion you are about to hear.

Finally, I would like to thank Kai Schlegelmilch and his colleagues for their initiative and hard work in putting this event together. Thank you.
ANSELM GÖRRES, GREEN BUDGET GERMANY CHAIRMAN, WELCOMING SPEECH

Our organisation can be very proud of this conference. Given that Green Budget Germany24 only has about 150 members, an attendance of about 70 or 80 conference guests is extremely impressive. This is also an achievement in relation to other ecotax conferences – we have seen many ecotax conferences throughout Europe over the last few years and there have not been many that have had such a great number of people attending. We have guests here from about a dozen different countries, from Austria, from Estonia, from Greece, from Ireland, from Portugal and Spain, from Sweden and Switzerland, from the UK, the United States and even a representative from the United Nations.

There are numerous companies represented here, from BP to Volkswagen, and also a number of people who represent industrial associations or federations. Government organisations are also represented, ministries from countries such as Hungary, Sweden and the Czech Republic, representatives from German institutions, German ministries and German regional governments, even some embassies are represented. There are people from the scientific community, from the London School of Economics to the Technical University of Tallinn. Finally, we have a number of people here from NGOs, ecological institutions and consulting firms.

As Chairman of Green Budget Germany, I am obliged to include some commercials for our organisation during the course of the day. This is the first.

This year and this day have a very special meaning for our organisation. The year 2004 is the fifth birthday of the German ecological tax reform – we celebrated this event in the Munich city hall with Munich's mayor, Christian Ude. As well, 2004 is the tenth anniversary of the foundation of our organisation. And today is very important for our organisation, because we moved our annual general meeting and advisory board meeting to June (it usually takes place in March) in honour of this conference.

I particularly have to thank the Anglo-German-Foundation – especially you, Ray Cunningham – for their friendly support and their patience. Kai Schlegelmilch and Ray Cunningham have been working on this conference project for more than two years. Sometimes it seemed almost impossible – but we finally did it. Furthermore, this is not the first time and it will not be the last that we have to thank the Heinrich-Böll-Foundation for their hospitality. I should also mention a representative of the small team we have in the Green Budget Germany office in Munich, Jacqueline Cottrell. Jacqueline has run the preparation of this conference like a professional and I would like to thank her and all our other interns – our interns are all volunteers, they work in our office, prepare our newsletter and even organise conferences like professional event managers.

The debate on ecological tax reform began in Germany in the early 1990s. One of the main concerns was the potential loss of competitiveness. The general response was that people agreed in principle that ecological tax reform was a good idea, but argued that it would risk the total loss of Germany's competitive position on international markets. Perhaps this argument carries even more weight in Germany than the UK, because a higher proportion of Germany's gross national product is derived from industrial production. The counter-argument to ecological tax reform was always that it would damage German industry.

24 In German, the Förderverein Ökologische Steuerreform – the Ecological Tax Reform Support Group.
But our impression is, and this will be the topic of today, that the reaction in the UK has been less anxious and less hostile. In Germany, opposition sometimes reached degrees of anxiety and hostility which made life very difficult for us, yet when we look at the figures, despite all these fears and dire prophecies, German industry is a net winner from ecological taxation – as shown on the graph below.

**Net Winners and Losers by Sector as a Result of the Ecotax Reform in Germany (In Million Euro)**

The domestic and trade/transport sectors are most heavily taxed, while industry and services profit from the tax

![Graph showing net winners and losers by sector](source)

Unfortunately, although we begged the BDI – the German Industry Association – to send a representative today, they declined. We do not consider it necessary that everyone speaking at and attending the conference agrees with our views – but we are interested in open and fair debate. We will go on inviting the BDI, however, in the hope that someone from the BDI will one day be prepared to discuss with us. It must be possible for discussions to take place between those who fight for the environment and those who represent German industry.

Another reason for these different public discussions in the UK and Germany seems to have been the difference in the relative weighting of the ecotax burden borne on the one hand by industry and on the other by private consumers and households. In Germany, partly because of our different competitive position, there have been considerable reductions to the rates paid by industry. At first, industry had to pay only 20 percent of the normal rate, but now, they have to pay 60 percent – which is still a 40 percent reduction. In Germany, industry pays proportionally less than other consumers, whereas in the UK, this situation is reversed. We hope today to be able to discuss how we can increase the burdens on German industry without jeopardising its competitiveness.

I would like to take this opportunity to welcome Sir Charles Nicholson, senior policy adviser for British Petroleum, BP. Although the Brent Spar incident was not BP but Shell, it shows that sometimes a mishap in one organisation can influence what happens within other organisations. However, I understand that BP began to develop a climate change policy long before the Brent Spar incident itself. Within BP, there have been discussions of how the company can stand for not only British Petroleum but Beyond Petroleum – and there are many examples of this. There has been an internal emissions units trading scheme at BP for quite some time – a fine example of very impressive corporate policy – and BP is also active in the field of photovoltaic solar cells. BP is for us an example of how industry ought to react – as we cannot deny the ecological challenge, it is our duty to react to it in a constructive way and not simply to ignore it.

I hope you all enjoy the conference and its discussions very much. Thank-you all very much for coming today.
SESSION 1: THE INTERNATIONAL PERSPECTIVE

CHRISTOS LIOLIOS, EUROPEAN COMMISSION, DIRECTORATE GENERAL TAXATION AND CUSTOMS UNION, THE PERSPECTIVES OF APPLYING ECOTAXES IN THE EU

This conference is extremely interesting, even for what are often called “bureaucrats” at the EU – we need a fresh input directly, from business, from those who are ‘on the spot’.

Please note that this presentation represents my own views and not those of the Commission.

Environmental taxes – Background Information

I will begin by addressing the issue of taxation at its most basic level. For many years, taxation was a method of raising revenue for the budget. This changed after the Rio conference in 1992, when people discovered that taxation can have functions other than simple revenue raising. This is a very important issue in EU member states, and for Green Budget Germany – raising money for the budget. Taxation is considered to be an aspect of national sovereignty and because of its importance, each member state wishes to retain decision-making on taxation within its own national parliament. Thus, the EC Treaty Article 93 provides that tax legislation requires unanimity at the Council. This is very important, because it means that every decision that is made at community level has to be agreed unanimously. The main driving force behind taxation today is to ensure the smooth functioning of the internal market and to promote sustainability and sustainable development. This sustainability has three aspects; social, economic and environmental.

The first elements of harmonisation at Community level were introduced in 1992 in Directive 92/81/EEC on mineral oils. Although this Directive did not cover natural gas, coal or energy directly, but only oils, it still covered about 45 percent of all energy products. This Directive allowed member states to adopt national laws and apply taxes on energy products and was valid until 31st December 2003. It harmonised the tax bases but not tax levels. It introduced some minimal levels of taxation to apply throughout the Community, but member states were allowed to introduce much higher levels at their discretion. For instance, the minimum level of taxation for diesel was €245 per 1,000 litres, but the UK applies approximately €708 tax per 1,000 litres, while Greece and Luxembourg apply more or less the minimum.

During this time it became clear that taxation did have a strong incentive value. A good example was the case of leaded and unleaded petrol. When fiscal benefits for unleaded petrol were introduced, leaded petrol disappeared. Taxation and tax differentiation proved to be very efficient tools for the promotion of fiscal and other Community policies, as they have such a strong incentive value. For this reason, people increasingly came to consider taxation for other transformational objectives, particularly in relation to environmental policy.

Instruments used to promote Environmental Policy

Technical regulations rather than fiscal incentives have traditionally been applied in this area. After the 1992 Rio conference, employing market-based instruments (MBIs) to promote environmental objectives came increasingly under consideration. The term MBI covers a wide range of instruments – environmental taxes; greenhouse gas emissions trading allowances; voluntary agreements, such as those made by the car industry to reduce carbon dioxide emissions to 140 grams per kilometre; subsidies; green certificates; and many other incentives.

European Community initiatives after the 1992 Rio conference were very ambitious at first. In 1992 a proposal was put forward for a harmonised environmental tax on carbon dioxide throughout the EU. This tax was to be based 50 percent on emissions, 50 percent on the energy content of products. It failed as a result of the unanimity rule and after four years of negotiations, it was abandoned in 1996.
Following this, a new Proposal on taxation of energy products was presented in 1997, which later became Directive 2003/96/EC in 2003 after six years of negotiations. I will return to this Directive later.

Attempts were also made to harmonise and enhance the communication of ecological taxation. In 1997, the Commission published the Communication on Ecological Tax and Charges in the Single Market (COM(97)9), which contains guidelines for member states on how ecological taxation can be introduced while still respecting Community rules on competitiveness within the internal market, Community definitions of state aid and the Community’s legal framework related to the functioning of the single market.

Directive 2003/96/EC on the taxation of energy products and electricity

I will now turn to Directive 2003/96/EC on the taxation of energy products and electricity, which entered into force on 1st January 2003. At the Commission, we are currently investigating how best to apply it, as it is a very difficult and complex Directive. It includes many new aspects of ecological taxation.

First of all, all energy resources are covered – with the exception of peat – rather than just 45 percent of them. The minimum taxation rates for mineral oils – stable since 1992 and not subject to inflation – have been increased and new positive minimum rates have been introduced for electricity, gas and coal. There are only few compulsory exemptions: aviation fuel; maritime fuels; fuels used for the production of electricity. However, aviation is slightly more differentiated – member states may tax domestic flights and potentially intra-Community flights as well. There are also many optional tax differentiations, to promote alternative energies and renewables, like bio-fuels for instance, and there are provisions for energy-intensive industries and household consumption. There are other possibilities for further tax differentiation, something which we refer to as ‘Article 8(4) derogations’ – a member state can gain authorisation from the Commission to tax below the minimum rate of taxation, but this is very much the exception and not the rule, as it was in the previous Directive. The Directive has also introduced specific rules for electricity, natural gas and coal.

This new Directive offers member states a great deal of flexibility. Once they respect the minimum, they can differentiate rates of taxation for quality reasons, for quantity reasons, for business and non-business use. There are also specific rules for electricity, in cases where electricity is produced from renewable energy sources. This Directive has made a great deal of progress in relation to the previous one.

Competitiveness Issues in Directive 2003/96/EC

Turning to competitive issues in industry; this taxation differentiates considerably between business and non-business. Normally, business pays less. There are normally two minimum rates of taxation on electricity from national gas and goal. One for business use, which is lower, one for household consumption, which is higher. Businesses that produce products such as chemicals or metals that require a great deal of energy are excluded from the Directive. Whether these industries are taxed or not is left to the discretion of member states. Article 17 of the Directive defines so-called, “Energy Intensive Companies” (EICs): in brief, businesses where purchases of energy products and electricity amounts to at least 3 percent of the production value, or where national energy tax payable amounts to at least 0.5 percent of the added value. These industries can enter into additional voluntary agreements with their governments and will pay zero rates of taxation on the energy they use as a result. Non-Energy Intensive Companies have a similar opportunity to enter into voluntary agreements and obtain reductions, but are still required to pay 50 percent of the normal taxation rate.

Directive 2003/87/EC, which was introduced in 2003, established a scheme for greenhouse gas emission allowance trading. It is possible that there will be a degree of overlap between Directive 2003/87/EC and the energy taxation Directive 2003/96/EC – this issue is currently being examined by the European Commission, which might publish a Communication soon identifying potential problems with the smooth functioning of the Directive when it becomes obligatory in 2007. This Energy Directive might potentially require some degree of adaptation as a result.

Perspectives for further Community action

Any perspectives for further Community action must take the unanimity rule in Council into account. Certainly, the sixth Environmental Action Programme, adopted in 2002, recommends the use of the most effective MBIs to achieve the Community’s environmental objectives. All possibilities provided for under Directive 2003/96/EC (for tax differentiation, use of renewable energy sources, etc), should be explored and applied in
an optimal manner by the member states themselves. In 1997, it was estimated that 20 percent of the Kyoto
target could be achieved by optimally applying this Directive.

The Commission – and myself – is also currently working on a new proposal for Community legislation in ar-
eas having a serious environmental impact and particularly that of passenger cars (we anticipate drawing up
a new proposal by end of 2004). This is important, because passenger cars are responsible for most of the
pollution created by the transport sector – approximately 25 percent comes from HGVs, the remainder from
buses and passenger cars.

Furthermore, it is important to increase legal certainty particularly concerning the consistency between tax
measures, state aid rules and emissions trading, by applying the 2001 Community rules on state aid for envi-
ronmental protection, and perhaps by amending the Directive 2003/87/EC. The Commission published some
guidelines on state aid rules in 2001 to distinguish which aspects of so-called state aid cannot be considered
state aid. For instance, the Energy Tax Directive provides for some reductions in taxation for some business
and some kinds of energy that could be considered state aid. These guidelines are very detailed and may
well be renewed in 2007. Finally, the Commission plans in the long term to propose legislation aiming at en-
SESSION 1, THE INTERNATIONAL PERSPECTIVE, DISCUSSION

Jan F. Wagner, Correspondent for Environment Daily: When you talk about the Directive 2003/96, are you suggesting that was the first step towards the harmonisation of energy taxes in the European Union?

Christos Liolios, European Commission, DG Taxation and Customs Union: I said the first step towards some sort of harmonisation was Directive 81 of 1992, which was valid until 31st December last year.

Jan F. Wagner: But the 2003/96/EC Directive you spoke of – would you argue that it is the first step toward EU harmonisation of energy taxes?

Christos Liolios: When the European Union talks about tax harmonisation, we mean we want the same tax base, but not the same tax levels – we do not talk about harmonisation of tax levels, we try to harmonise tax bases. We do not intend at all to have tax harmonisation. The 1992 carbon dioxide Proposal was a harmonisation proposal, but it failed in 1996, as I said earlier.

Jan F. Wagner: The other question is, of course, now that we have the Emissions Trading Scheme, there are a lot of people saying that ecotaxes have become redundant, that we do not need them because we have a mechanism to reduce CO2 emissions that works better and is market-based. How does the EU Commission respond to that?

Christos Liolios: The Community very recently introduced new legislation which will become obligatory in 2005-2007 – at present, everything is very experimental. Now the Commission is preparing to apply this system and trying to make it function. We are now preparing a Communication to investigate whether there is some overlap, or extra burdens on industry, as a result of these two instruments. If this were the case, the Commission would be prepared to amend this Directive, but we at a very early stage in this process and we do not yet have any results – so it would be premature to say that this would result in increasing charges. We are most certainly trying to avoid overlaps by working in cooperation with the Directorate General for the Environment.

Raivo Vilu, Tallinn Technical University: You described the instruments the Commission is recommending to use, but you did not mention targets, deriving from Kyoto or elsewhere. If we do not define our targets, then it is very difficult to assess the effectiveness of instruments.

Christos Liolios: It is true that we need targets on the environment. The main target is Kyoto – which stipulates 8 percent less greenhouse gas emissions than in 1990. These reductions have been allocated to the member states, and each member state has different targets. As I said earlier, a 1997 European Commission study showed that the optimal application of the Directive could contribute 20 percent to the Kyoto target. We also have a new initiative on a taxation proposal for passenger cars, which we hope will also contribute to achieving our Kyoto targets.

The Commission also sets targets for its sustainable development strategy and we use these targets for our environmental goals. There are many programs running within the Community and the Directorate General for the Environment, one of the biggest departments of the Commission. Ecotaxes normally function within the Kyoto target of reducing greenhouse gas emissions but we also have sustainability targets, for example, the Lisbon target to create within the Community one of the most competitive economies in the world by 2010. We will see the results of Kyoto during the period from 2008 to 2012. There are some strategic objectives within the context of which fiscal measures such as the market-based instrument ecotax is functioning.

Peter Menke- Glückert, Chairman, Forum for Sustainable Medium-Sized Enterprises: You told us that you are aiming to harmonise the tax bases. Have you ever considered including the harmonisation of tax bases for the value-added tax system within this target? One of the consumption taxes that has a huge impact on the environment is the value-added tax system. In this respect, I wonder if you will be able to achieve your targets without taking other tax instruments you have at your disposal into account?

Secondly, I fully agree that the ecotax system will become more and more redundant as many new instruments come into force – not only emissions trading. What will be your response to create a stable tax basis in the common market – will it be an integrated system or will it be a tunnel system, just looking at one of the targets rather than looking at the interrelated problems?

Jakob Klok, Swedish Ministry of Finance: You briefly mentioned the relationship between state aid guidelines and the energy tax Directive, and the forthcoming revision of the state aid guidelines. I find that very interesting, because it seems today that there are two parallel systems in operation – the new Directive on the one hand and the system of court decisions and Commission decisions within the state aid area on the other. For this reason, I would like to ask if the Commission has any idea of to what extent the new guidelines will reflect the structure established in the energy tax Directive.
**Bernd Strobel, European Topic Centre on Air and Climate Change:** Why doesn’t the current Directive include the transport sector? You mentioned the new proposal, but this is only targeted at passenger cars. But freight transport remains immune – although its emissions are predicted to increase by 80 percent relative to 1990 levels. I believe that the main issue for the Commission is to push a Directive into force that targets this emission source.

**Christos Liolios:** Taxation and its development are not simple issues. No-one can find simple replies, no-one can find replies that satisfy anybody. When we focus on tax differentiation, in the area of passenger cars for instance, some will have to pay more than they pay now, others will have to pay less, because they drive more environmentally friendly vehicles. This means that introducing taxation – as you always ask somebody to pay more – is not an easy task, as everyone is very much interested in his or her own particular case. So it is almost impossible to find solutions which satisfy everyone, that protect the environment, and that don’t increase the fiscal revenue.

I would like to first turn to the issue of VAT. I am not involved in value added tax – a different department deals with it. I take it on board that VAT can also be used to promote sustainability and to some extent, differentiated VAT rates do exist. However, to what extent they exist; whether studies have been carried out on this issue; and whether the Commission is about to make proposals on this, are all questions on which I reserve my position to avoid giving you incorrect information. I will make a note of the question – whether and to what extent VAT can be used to achieve environmental goals, while providing stable legislation and not ‘surprising’ anybody unduly – and discuss its potential at the Commission. I will keep Green Budget Germany informed of any developments as regards procedures to make VAT greener and promote sustainability.

As regards the question from Jakob Klok, about state aid and the environment. In its very early stages, the 1997 proposal which became the new Directive faced enormous opposition from some member states, who claimed that there was no legal clarity regarding how states had the right to apply exemptions or provide for tax reforms. But now you can apply Articles 87-88 of the EC Treaty, send us to the European Court, or impose penalties on us by means of state aid.

The Commission studied this issue for years in collaboration with member states in Brussels, and then they published the 2001 guidelines on environmental protection. This contains a more detailed list than the earlier guidelines – there have been guidelines in this field since 1974. The new guidelines are very clear and simple, contain clear examples what can – and cannot – be considered state aid, they specify the so-called *diminimis* amount that is not considered state aid. So far, this seems to have worked well, although the Commission has in the past accused states of giving tax reductions that are considered state aid.

Furthermore, one can argue that the Directive is relatively new – it only came into force on 1st January 2003 and for this reason, the Commission is ready to revise the guidelines in 2007 and they presume that this process will be commenced before this date. The Swedish Ministry of Finance and other member state finance ministries will certainly collaborate in this process and your experience from the application of the Directive will certainly be taken into account. I know that this is a very difficult issue, which is also dealt with in the Commission by the Directorate General for Competition – but so far, I think the situation is not particularly dramatic and the rules are applied sufficiently well. There are certainly particular cases which I feel should be taken into account during revision in 2007.

Now, moving on to the third question. I feel far better qualified to answer this, because I am personally responsible for drawing up the proposal for the taxation of passenger vehicles. Heavy goods vehicles are not included in this proposal because they are taxed on the basis of other criteria, particularly on their use of infrastructure. Taxation is based on the idea is that heavy goods vehicles have to pay the infrastructure damage they cause – they are taxed in relation to how heavy they are, how many axels they have, how long they are, and so on. The Community has been examining this so-called infrastructure charge for some time now.

As for passenger vehicles – and they are in the majority and pollute more – we are basing our proposal on the Commission’s 1996 strategy for how to reduce passenger vehicle emissions. While HGVs pay an infrastructure charge, no legislation exists for passenger vehicles. This proposal is the first attempt to introduce measures in this regard and the Commission hopes to have a proposal by the end of this year.

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SESSION 2: ECOLOGICAL TAXATION IN THE UK

PROF. STEPHEN SMITH, UNIVERSITY COLLEGE LONDON, DEPARTMENT OF ECONOMICS,
COMPARING FEATURES AND EXPERIENCES OF THE ECOLOGICAL TAX REFORM IN GERMANY AND
THE CLIMATE CHANGE LEVY IN THE UK

Stephen Smith has kindly allowed Green Budget Germany to include in this report a draft article he wrote for the Fifth Global Conference on Environmental Taxation: Issues, Experience and Potential (Pavia, Italy, 9-11 September 2004). The notes below contain a summary of Stephen Smith’s presentation at the ecotaxes conference itself, also included for your information.

Introduction

- What the UK has done
- CCL and the ideal carbon tax
- Carbon taxes and emissions trading
- The way forward: taxes and/or trading?

The UK's climate change programme: Three linked elements

- Climate Change Levy
- Climate Change Agreements
- UK Emissions Trading Scheme

The Climate Change Levy

- Announced in 1999 Budget
- Introduced April 2001
- Tax per unit of energy
- Applies to industrial and commercial energy use, not households
- Revenue-neutral introduction. £1billion annual revenues finance cut in employers’ payroll tax (National Insurance Contributions)

Climate Change Levy tax rates

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Climate Change Agreements

- Negotiated agreements between industry groups and government
- 46 energy-intensive sector (6000 companies) have CCAs
- CCA members qualify for 80% reduction in CCL
- In return, undertake to meet quantitative target for reduction in energy use or CO2 emissions
- Targets may be absolute (tonnes) or relative (tonnes per unit output).
- Compliance possible through reduced energy use, or trading.
- Were some targets “hot air”?

Motor fuel taxes in the UK

- Motor fuel taxed much more heavily than other fuels throughout EU
- UK has the highest rates of motor fuel excise in the EU
- No fuel duty preference for diesel
- Fuel duty “escalator” (FDE) between 1993 and 2000. Introduced as climate-related measure, abandoned after fuel protests.
  - Over 1993-2000 FDE raised fuel prices in real terms by 17p /litre (petrol) and 21p /litre (diesel).
  - FDE fuel price rise equivalent to carbon tax of $405 /tonneC (petrol) and $440 /tonneC (diesel).

How do these taxes compare to a systematic carbon tax?

An ideal carbon tax would:

- Tax fuels in proportion to their carbon content
- Apply uniformly to all sectors (industry, households, etc.)
- Have no exemptions for energy-intensive sectors
- Exempt non-fuel uses
- Tax fuel inputs to electricity generation
- Tax carbon at a rate equal to marginal damage costs of CO2 emissions
- Be levied worldwide at the same rate

The optimal carbon tax rate

- Most studies estimate the marginal damage costs of current carbon dioxide emissions at $5-20 /tonne C
- Some are much higher, over $100 /tonne C
- Uncertainties are mainly downside risks (“nasty surprises”)
- UK government uses £70 (approx $105) / tonne C for policy assessment
The role of CCAs and trading in the UK system

- World’s first large-scale greenhouse gas trading scheme
- “Direct” participants: 34 successful bidders in March 2002 auction
- Descending clock auction, budget £215 million. Purchased approx 4 million tonnes C.
- Market clearing price £53.37. Equivalent to £17.79 ($27) /tonneC over the life of scheme.
- “Agreement” participants – firms within CCAs can achieve compliance by trading
- Market price has fluctuated, but always well below auction price. Currently about £2.50 ($3.75) /tonneC

What role for taxes in future climate change policy?

EU Emissions Trading scheme will provide systematic market-based approach to climate change policy. Is there still a need for energy taxes?

There is a strong case for taxes within climate change policy package, for three reasons:

- Permits tend to be issued free, which foregoes revenues, and hence potential “double dividend” benefits
- Taxes provide a safety net, reducing risk of overgenerous “hot air” permit allocation
- Future international agreements should discuss carbon prices, and not just quantity targets. Co-ordinated carbon taxes would be a simpler agreement to define, implement and monitor.
1. Introduction

The commitments to control emissions of carbon dioxide and other greenhouse gases that the EU and some other developed countries have entered into as a result of the Kyoto Protocol process are substantial. For the EU countries as a whole, a reduction in emissions of 8 per cent is required by 2008-2012, as measured against a baseline of the 1990 emissions level. Achieving emissions reductions on this scale will require significant policy effort, and will entail significant economic cost. Nevertheless, the impact on global emissions will still be modest, because many large and/or rapidly-growing sources of emissions lie outside the agreement.

Individual member states of the EU have taken on various quantitative commitments to contribute to the overall 8 per cent EU abatement target. The UK's contribution is an abatement target of 12.5 per cent. In addition, however, the UK has unilaterally stated a policy goal of reducing CO2 emissions to 20 per cent below 1990 levels by 2010.

Although there are both political and economic obstacles, it seems clear that pricing measures of some sort (either in the form of carbon taxes or emissions trading) must inevitably form part of the long-term policy package, if significant reductions are to be achieved in the use of carbon-based energy. Reducing emissions of carbon dioxide sufficiently to halt the rise in atmospheric carbon dioxide concentrations would require far-reaching changes in patterns of energy use, and, more fundamentally, in patterns of human activity. Reliance on the conventional instruments of environmental policy alone, such as direct regulation of emissions or technologies, financial incentives to develop or adopt new technologies, and various forms of exhortation and propaganda runs the risk of being wholly inadequate to the scale of the changes required in carbon dioxide emissions. Alternatively, if such instruments are to be used to achieve changes in fossil fuel use on the scale required, they would require such extensive regulatory intervention into the detailed workings of the economy that the efficient working of the market economy could be undermined.

The United Kingdom has in recent years taken an increasingly market-based approach to environmental regulation in a number of fields, including climate change policy. The UK's Climate Change Programme includes a significant tax on industrial energy use, as well arrangements for carbon emissions trading. The tax on industrial and commercial energy use, the 'Climate Change Levy', was announced in the 1999 Budget and took effect from April 2001. It takes the form of a tax per unit of energy used by industry, at initial rates of 0.15 pence per kWh for coal and natural gas, 0.43 pence for electricity, and 0.07 pence for liquid petroleum gas. There are exemptions from the tax for energy generated in CHP (combined heat and power) plants, and for renewable energy sources such as wind and solar power. An 80 per cent discount from the Climate Change Levy is awarded to energy-intensive sectors which have negotiated 'Climate Change Agreements' with the environment department (DEFRA), under which they have taken on collective quantitative targets for improvements in energy-efficiency or carbon emissions. The Climate Change Agreements then function as the baseline in a baseline-and-credit emissions trading scheme.

This paper comments on a number of issues concerning the use of taxes and emissions trading in UK and European climate change policy. Following this introduction, and by way of policy context for some of the later discussion, Section 2 outlines briefly the economic issues underpinning international climate change policy, and the main features of the Kyoto Protocol. Section 3 discusses the UK's Climate Change Programme. Section 4 focuses on some issues prompted by UK and international experience. Section 5 draws some conclusions.

2. The Policy Context: International Climate Change Policy

While the scientific and environmental issues surrounding the carbon tax debate have been extensively researched, and a major effort by the Intergovernmental Panel on Climate Change (IPCC) has provided a consensus analysis which has been broadly accepted by governments as the basis for policy intervention, the economic issues remain contentious.
2.1 The economic issues

Economists would naturally tend to think of global warming policy in terms of a conceptual framework which draws together the various relevant costs and benefits.

- On the one hand, we need to weigh up the damage costs of global warming, in terms of the consequences of higher global temperatures, increased climatic volatility, etc. How large would these costs be if global warming were to be allowed to continue unchecked, and by how much would these costs be reduced if carbon dioxide emissions were to be reduced by various given percentages?

- On the other hand, we need to assess the abatement costs of controlling the carbon dioxide emissions that are the source of the problem; these may include higher production costs of more energy-efficient equipment, reductions in household living standards if certain energy-using activities such as travel and tourism have to be curtailed, a greater risk of catastrophic accidents if we switch away from fossil fuels towards nuclear power, etc.

The issue of emissions control is not, of course, a simple all-or-nothing choice, but involves a range of possible degrees of stringency. If we decide to do anything at all about global warming, how much should we do? The economist's approach would be to look at this question in terms of the relationship between marginal costs and benefits, in other words, the costs and benefits of each successive tightening of the policy. The conclusion (given certain conditions about the relationship between marginal costs and benefits and the level of abatement) would then be that policy should be tightened (i.e. emissions reduced) up until the point where an extra unit of emissions reduction is more costly than the benefits it yields. So long as all relevant costs and benefits are included in the analysis, this would be the optimal reduction in carbon dioxide emissions.

Although it is relatively straightforward to set out this conceptual framework, it is much harder to operationalise it in practice. Estimating the benefits from abatement, in particular, is far from easy. Despite the work of IPCC to clarify the scientific and environmental effects of greenhouse gas emissions, enormous uncertainty still surrounds both the magnitude and timing of the various climatic effects (on global temperatures, climatic volatility, and the climate of particular regions). There is, likewise, disagreement and uncertainty about some key issues that would be central to an economic assessment of the costs of any particular climate change scenario, including the relative weight to be given to the interests of current and future generations (i.e. the discount rate to be applied to future costs and benefits), the valuation of biodiversity effects, the role of equity weighting in assessing the costs of damage in rich and poor countries, etc.

Tol et al. (2000) provide a survey of estimates of the damage costs of climate change, and Table 1 summarises their discussion of the key reasons for differences in the estimates of these costs. Most studies assess the marginal damage costs of current carbon dioxide emissions at between $5 and $20 per tonne of carbon, but some estimates are considerably higher, in excess of $100 per tonne. These higher estimates are typically obtained in studies that assume high physical vulnerability to climate change, or give higher weight to the interests of future generations (reflected in lower discount rates), or where an equity weighting is used that places greater weight on each dollar of damage in poorer countries. Tol (1999), for example, has a 'best guess' estimate of marginal damage costs of $9 per tonne of carbon, using a 3 per cent interest rate and no equity weighting. This rises to $23 at a 1 per cent discount rate and $73/tonne at a zero discount rate. With an equity weighting to place higher value on effects in developing countries, Tol's estimates rise to $26/tonne (3 per cent discount rate) and $171/tonne (zero discount rate). Tol et al. (2000) note that uncertainty about marginal damage costs is right-skewed, so that the expected value of marginal damage costs (i.e. the mean) generally lies significantly above the 'best guess' estimate, or, as they put it, 'nasty surprises are more likely than pleasant surprises'. Nordhaus (1994), for example, estimates marginal damage costs per tonne of carbon, using a 3 per cent discount rate, at $5 (best guess) and $12 (expected value).
TABLE 1: MAJOR REASONS FOR DIFFERENCES IN ESTIMATES OF THE MARGINAL DAMAGE COSTS OF CARBON DIOXIDE EMISSIONS

<table>
<thead>
<tr>
<th>Reason</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assumptions about physical processes</td>
<td>There are uncertainties about some of the key physical processes involved in global warming, affecting the rate of climate change, its geographical pattern, the possibility of abrupt discontinuities, etc.</td>
</tr>
<tr>
<td>Assumptions about economic responses</td>
<td>There are different approaches to modelling adaptation to climate change. These differ in terms of the speed, scale and costs of adaptation by private sector decision-makers. Government policy interventions may also reduce adaptation costs.</td>
</tr>
<tr>
<td>Scope of the analysis</td>
<td>Studies differ in terms of geographical scope (which countries are included, and in how much detail?), and time horizon (how are distant benefits and costs treated?)</td>
</tr>
<tr>
<td>Welfare criteria</td>
<td>The discount rate employed affects the weighting given to effects in the distant future (and hence to the weight given to the interests of future generations). Some studies also include explicit distributional weighting.</td>
</tr>
</tbody>
</table>

Source: Based on the discussion in Tol et al. (2000).

Despite the great uncertainty about the basic facts and forecasts of global warming and its economic consequences, it may not be possible to postpone policy action until conclusive evidence has been obtained, without in the meantime risking irreversible changes in climate and in the global environment. Although it could turn out that gradual adaptation of the pattern of economic activity and human settlement might be far cheaper than prevention, the risk of catastrophic and irreversible climatic effects would justify some level of precautionary policy to restrict greenhouse gas emissions. Where policy measures can be taken which have low cost (including any 'no regrets' measures), immediate action would avoid the risk of irreversible damage, whilst leaving the full range of policy options open, should future studies make major revisions to the scientific and economic assessments of the risks of global warming. This, then, would imply that some policy action should be taken now, if for no other reason than as an insurance policy against the eventuality that the most pessimistic forecasts of global warming turn out to be right.

2.2 International co-ordination: the Kyoto deal and EU implementation

To be effective, action to combat climate change has to be taken by all countries (or, at least, a large part of the world economy), acting in concert. Since global warming is a function of global emissions of greenhouse gases, the impact on global warming of national policy measures taken by any individual country acting alone will be negligible, since they can at best reduce that country's carbon dioxide emissions, and the emissions of any individual country (other perhaps than the US, China and the former Soviet Union) constitute a small percentage of the global total.

TABLE 2: GREENHOUSE GASES COVERED BY THE KYOTO PROTOCOL

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Carbon Dioxide (CO₂)</td>
<td>1</td>
<td>63.4</td>
</tr>
<tr>
<td>Methane (CH₄)</td>
<td>23</td>
<td>18.6</td>
</tr>
<tr>
<td>Nitrous Oxide (N₂O)</td>
<td>296</td>
<td>4.4</td>
</tr>
<tr>
<td>Hydrofluorocarbons (HFCs)</td>
<td>12 – 12,000</td>
<td></td>
</tr>
<tr>
<td>Perfluorocarbons (PFCs)</td>
<td>5,700 – 11,900</td>
<td></td>
</tr>
<tr>
<td>Sulphur Hexafluoride (SF₆)</td>
<td>22,200</td>
<td></td>
</tr>
</tbody>
</table>


Under the Kyoto Protocol, the 'Annex I' countries (industrialised market economies, and formerly centrally-planned 'transition' economies) are assigned targets to limit or reduce their emissions of key greenhouse gases. The emission limitations and reduction obligations cover a weighted 'basket' of the six gases shown in Table 2.
The EU negotiated a single commitment (a 'bubble' covering the EU) on behalf of member states. The member states subsequently reached a 'burden-sharing' agreement in 1998 which divided the EU total commitment as shown in Table 4. Within this agreement, some member states are permitted to increase emissions up to a specified percentage, reflecting the fact that the process of economic development will tend naturally to lead to increased emissions.

The rules for entry into force of the Kyoto Protocol require 55 Parties to the Convention to ratify the Protocol, including Annex I Parties accounting for 55 per cent of that group's carbon dioxide emissions in 1990. Since the USA has declared that it will not ratify the Protocol, the prospects for the Protocol turn on ratification by other large industrialised and transition countries. Most have now ratified, and Russia's pending decision whether or not to ratify now seems likely to be the decisive event, which would achieve the required percentage coverage.

In addition to ratification, the success of the Kyoto Protocol, even in the rather limited sense attainable in the absence of US participation, will depend crucially on whether the commitments that countries have entered into are achieved in practice. The current evidence on EU performance is, at best, mixed (Table 4). Two of the largest countries, Germany and the UK, appear likely to meet their emission reduction targets on current evidence. But three other large countries, France, Italy and Spain are currently forecast by the European Environmental Agency (EEA) to fall short of their commitments, and, in aggregate, and on the basis of current policies, the EEA forecasts that the EU as a whole might achieve a reduction of some 5 per cent in emissions, compared with the 8 per cent Kyoto commitment.

### Table 3: Countries Included in Annex B to the Kyoto Protocol

<table>
<thead>
<tr>
<th>Country</th>
<th>Emissions Target (percentage change in weighted emissions of greenhouse gases during 2008-2012 'Commitment Period' compared with 1990 base year)</th>
</tr>
</thead>
<tbody>
<tr>
<td>EU15</td>
<td>- 8%</td>
</tr>
<tr>
<td>Switzerland, Liechtenstein, Monaco, Bulgaria, Czech republic, Estonia, Latvia, Lithuania, Romania, Slovakia, Slovenia</td>
<td></td>
</tr>
<tr>
<td>US</td>
<td>- 7%</td>
</tr>
<tr>
<td>Canada, Japan, Hungary, Poland</td>
<td>- 6%</td>
</tr>
<tr>
<td>Croatia</td>
<td>- 5%</td>
</tr>
<tr>
<td>New Zealand, Russian Federation, Ukraine</td>
<td>0</td>
</tr>
<tr>
<td>Norway</td>
<td>+ 1%</td>
</tr>
<tr>
<td>Australia</td>
<td>+ 8%</td>
</tr>
<tr>
<td>Iceland</td>
<td>+ 10%</td>
</tr>
</tbody>
</table>

Note: The USA and Australia have declared their intention not to ratify the Kyoto Protocol, and therefore they will not adopt the above Kyoto emission reduction targets.
**Table 4: Emissions Performance of EU Member States, Compared with Kyoto Targets**

<table>
<thead>
<tr>
<th></th>
<th>Target (max. percentage permitted change in emissions, 1990 - 2008/12)</th>
<th>Performance to date (percentage change in emissions, 1990 – 2001)</th>
<th>Projected percentage emissions change by 2010 on current policies (compared with 1990 baseline)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Luxembourg</td>
<td>-28</td>
<td>-44</td>
<td>-23</td>
</tr>
<tr>
<td>Denmark</td>
<td>-21</td>
<td>0</td>
<td>-18</td>
</tr>
<tr>
<td>Germany</td>
<td>-21</td>
<td>-18</td>
<td>-34</td>
</tr>
<tr>
<td>Austria</td>
<td>-13</td>
<td>10</td>
<td>12</td>
</tr>
<tr>
<td>UK</td>
<td>-12.5</td>
<td>-12</td>
<td>-14</td>
</tr>
<tr>
<td>Belgium</td>
<td>-7.5</td>
<td>6</td>
<td>13</td>
</tr>
<tr>
<td>Italy</td>
<td>-6.5</td>
<td>7</td>
<td>8</td>
</tr>
<tr>
<td>Netherlands</td>
<td>-6</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>Finland</td>
<td>0</td>
<td>5</td>
<td>17</td>
</tr>
<tr>
<td>France</td>
<td>0</td>
<td>0</td>
<td>9</td>
</tr>
<tr>
<td>Sweden</td>
<td>4</td>
<td>-3</td>
<td>1</td>
</tr>
<tr>
<td>Ireland</td>
<td>13</td>
<td>31</td>
<td>40</td>
</tr>
<tr>
<td>Spain</td>
<td>15</td>
<td>33</td>
<td>48</td>
</tr>
<tr>
<td>Greece</td>
<td>25</td>
<td>26</td>
<td>29</td>
</tr>
<tr>
<td>Portugal</td>
<td>27</td>
<td>36</td>
<td>58</td>
</tr>
<tr>
<td>EU</td>
<td>-8</td>
<td>-2</td>
<td>-5</td>
</tr>
</tbody>
</table>


3. The Role of Market Mechanisms in UK Climate Change Policy

3.1. The case for market mechanisms

The case for market mechanisms in environmental policy comes from the recognition of the limitations of environmental policies pursued solely through conventional regulatory instruments. Increasingly, there is recognition that some environmental problems cannot be tackled purely as technical issues, to be resolved straightforwardly through regulations requiring the use of appropriate abatement technologies. To make any serious impact on global warming, environmental policies will need to achieve extensive and far-reaching changes to existing patterns of production and consumption. Achieving the necessary changes will inevitably entail substantial economic costs. The search for instruments capable of minimising the costs of environmental regulation, and capable of achieving behavioural changes across all sectors, has led policy-makers in the last decade to pay much closer attention to the potential for incentive-based environmental regulation, through taxes, charges, tradable permits, and other ‘economic instruments’. Advocates of market mechanisms have stressed the potential for efficiency gains (greater cost-effectiveness) in environmental policy when the price mechanism is used to encourage reduced pollution than when 'command and control' regulatory policies are applied.

3.2. Policy developments in the UK

Since the 1980s, UK environmental policy has, at least in principle, been favourably disposed towards the case for employing market mechanisms. A clear statement of the potential contribution that could be made by "market mechanisms" in environmental policy was included in the 1990 environment White Paper, "This Common Inheritance" (Department of the Environment, 1990) and subsequently reiterated in other DoE and Treasury documents. (Jordan et al, 2003)

From the mid-1990s onwards, both Conservative and Labour Chancellors of the Exchequer have included environmental tax measures within annual budget proposals, and a number of environmental tax measures have now been implemented. These have recently included a tax on industrial energy use, implemented as part of the wider Climate Change Strategy. However, the process by which this tax came to be accepted has been complicated, and the measure finally implemented bears scars and imperfections that reflect a number of the earlier controversies and false starts in this area of policy.
The European Commission’s proposal for a carbon-energy tax in the early 1990s (European Commission, 1991) was opposed by the UK government, primarily on the grounds of fiscal sovereignty (Zito, 2000). However, as the 1990s progressed it became clear that the UK would have other difficulties in implementing a carbon tax in this form, even if the issue of sovereignty were somehow overcome, and if the tax were to be introduced in an international context (extensive international co-ordination) where significant issues of competitiveness were avoided.

In 1994, the UK government ended VAT zero-rating on domestic energy as part of a package of revenue-raising measures. The decision raised such a political storm that the initial proposal to tax energy at the standard VAT rate of 17.5 per cent was abandoned half-way, and subsequent retreats have reduced the tax rate on energy to 5 per cent. 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 spending, for environmental or any other reasons, seem to be regarded as politically impossible. The only scope, it would appear, for employing energy taxes within the UK’s climate change policy, has been to confine proposals to taxes on the industrial use of energy, where the "fuel poverty" objections that had such political resonance in the VAT debate do not apply.

The Labour government elected in 1997 began giving serious consideration to the possibility of taxing industrial energy use. A Task Force, chaired by Lord Marshall, reported in late 1998 on the scope for using economic instruments to reduce energy use and emissions of greenhouse gases by the industrial and commercial sectors. Its report argued that a ‘mixed approach’ would be needed, combining existing forms of regulation with economic instruments, to provide clear signals for longer-term emissions reductions (Marshall Report, 1998).

The Climate Change Levy

The 1999 Budget announced the introduction of a new tax on industrial and commercial energy use, the 'Climate Change Levy', as part of the government’s Climate Change Programme. The tax took effect from April 2001. It takes the form of a single-stage excise, imposed at the time of supply to energy users in industry, the public sector and agriculture. Fuels supplied for transport, for non-fuel uses, for electricity generation and to the household sector are exempted from the tax. The tax is applied to gas, coal, non-transport LPG and electricity, at the rates per unit of energy shown in Table 5; these rates have remained unchanged since the introduction of the tax. There are exemptions from the tax for energy generated in 'good quality' CHP (combined heat and power) plants, for fuels derived from waste, and for renewable energy sources such as wind and solar power.

An 80 per cent discount from the Climate Change Levy is awarded to energy-intensive sectors which have negotiated 'Climate Change Agreements' with the environment department (DEFRA), under which they have taken on collective quantitative targets for improvements in energy-efficiency or carbon emissions. Initially, the energy-intensive sectors qualifying for climate change agreements, and hence for this discount, were defined on the basis of the Integrated Pollution Prevention and Control (IPPC) Directive, but in 2003 the government announced that it was considering broadening the scope of CCAs beyond the sectors defined as energy-intensive on the IPPC criteria.
**TABLE 5: UK CLIMATE CHANGE LEVY: TAX RATES FOR DIFFERENT FUELS, AND RATES OF "IMPLIED" CARBON TAX**

<table>
<thead>
<tr>
<th>Fuel</th>
<th>Tax rate (pence per kWh)</th>
<th>Implicit tax rate per tonne of carbon content</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gas</td>
<td>0.15</td>
<td>£30</td>
</tr>
<tr>
<td>Coal</td>
<td>0.15</td>
<td>£16</td>
</tr>
<tr>
<td>Liquid Petroleum Gas (LPG)</td>
<td>0.07</td>
<td>£11</td>
</tr>
<tr>
<td>Electricity</td>
<td>0.43</td>
<td>£31</td>
</tr>
</tbody>
</table>

Note: Tax rate for LPG is defined as 0.96 pence per kg

Revenues raised from the tax (approximately £1 billion in a full year) are mainly used to finance a reduction of 0.3 percentage points in the rate of employers' National Insurance Contributions. A small part of the revenues (currently less than 5 per cent) is assigned to the Carbon Trust, an organisation established to stimulate the development and adoption of low-carbon technology. Overall, the Climate Change Levy was introduced on a revenue-neutral basis, raising no net revenues.

The evolution of this tax has shown the political difficulties of immediate introduction of large-scale environmental taxes on energy (Pearce, 2001). The political legacy of the previous government's attempt to impose standard-rate VAT on domestic energy has been that the Climate Change Levy excludes the domestic sector. This obviously foregoes the possibility of equal energy-saving incentives in the domestic and business sectors, but, less obviously, has led to some messy compromises in the design of the tax, requiring it to be imposed nearer the point at which energy is sold to final users, so that the domestic sector can be exempted. Fear of the impact that a tax on carbon content might have on the coal industry has led the government to choose energy content, rather than carbon content as the base for the tax, thus foregoiing the possibility that carbon emissions could be reduced through fuel-switching incentives. Concern about the impact of the tax on the competitiveness of energy-intensive sectors has led to arrangements that will exempt these sectors from the levy, in return for negotiated agreements with these sectors to achieve equivalent improvements in energy efficiency. This again complicates the design of the levy, reduces further the proportion of the economy experiencing the incentive effects of the tax, and relies on the questionable assertion that the negotiated agreements will achieve energy savings at least as great as those that the Levy would achieve.

**Climate Change Agreements**

'Climate Change Agreements' are negotiated agreements between sectoral industry organisations and the government. 43 industry associations, representing some 6000 companies, have negotiated CCAs with the environment department (DEFRA), under which they have taken on collective quantitative targets for improvements in energy-efficiency or carbon emissions, in return for an 80 per cent discount from the Climate Change Levy.

The agreements can, in principle, take a number of different forms. They can relate either to carbon emissions, or to energy use. In addition, they may be specified in either absolute or relative terms, in other words, as a reduction of energy use or emissions in tonnes, or as a reduction in the rate of energy use or emissions per unit of output. In practice, the overwhelming majority (38 of the 43 agreements) have set targets for energy use, relative to output, in other words, have been agreements for improvements in energy efficiency. Four agreements have specified absolute targets for reduced energy use – those concerning agricultural suppliers, steel, supermarkets and wall coverings. One agreement, for the aluminium industry, sets a target for emissions, relative to output.

The agreements all have a two-tier structure, specifying obligations for the sector as a whole, and translating these obligations into targets for each individual firm. Enforcement procedures pay attention both to the sectoral outcome, and to individual firms' responsibility for the sectoral outcome. No enforcement action is taken if the sector as a whole meets its obligations, but where the sector falls short of its target, non-compliant firms are identified and are open to penalties.

Each CCA sets a final target for 2010, and interim targets for alternate years (2002, 2004, 2006 and 2008). Compliance arrangements differ as between the interim and final targets. Failure to meet the target in one of the interim years carries a penalty in the form of the loss of the 80 per cent Climate Change Levy discount for the subsequent two years, while failure to meet the 2010 target is penalised by a requirement to repay all of the CCL discount that the firm has enjoyed over the lifetime of the agreement.
Emissions trading

The third element in the Climate Change Programme was an emissions trading scheme for greenhouse gases, which was launched in April 2002, with an initial five year lifespan (2002-06). The scheme aims to provide flexibility for individual firms in their compliance with greenhouse gas abatement obligations, so as to reduce the economic cost of achieving a given abatement total. A second, overt, objective of the emissions trading scheme is to establish the London financial markets as the global location for environmental permit trading. The scheme regulates overall emissions of the six groups of greenhouse gases covered by the Kyoto Protocol (Table 2), weighted according to global warming potential. Individual emission limits defined under the scheme, and the unit used for trading, are defined in terms of tonnes of carbon dioxide equivalent (tCO2-e).

There are two groups of potential participants in emissions trading, referred to as "agreement participants" and "direct participants".

- **Agreement participants** are the 6000 firms covered by Climate Change Agreements (CCAs). These firms can generate and sell allowances by exceeding their negotiated emission-reduction targets, or alternatively, can achieve compliance with their obligations under the agreement by purchasing permits in place of some or all of their abatement obligations. For these firms, emissions trading is effectively a baseline-and-credit system of emissions trading, and participation in trading by individual firms is wholly voluntary.

- **Direct participants** are the 31 firms who entered the scheme as a result of an incentive auction conducted by the government in March 2002. In the ETS auction it was open to any organisation to offer abatement of its UK emissions over the period 2002-6, as against baseline emissions in 1998-2000. The auction aimed to "buy" as much abatement as possible, using a fixed budget of £215m. The auction was conducted using a descending clock format, with a starting price per tonne of abatement in 2006 of £100. After nine auction rounds a market-clearing price was established of £53.37 per tonne of CO2-equivalent, and the 31 DPs were assigned abatement commitments totalling 3.96 million tonnes of CO2 (1.1 million tonnes C) in 2006, and the corresponding phased abatement obligations for the intermediate years.

An evaluation of the first year of ETS (DEFFRA, 2003) reported some 200 trades, involving about 1 million allowances. In aggregate the direct participants substantially exceeded, by a factor of almost 5, their abatement targets for the first year (set at 20% of the abatement required in 2006), achieving aggregate abatement of 4.46mtCO2-e compared with a target of 0.79 mtCO2-e. Only two of the 31 direct participants fell significantly short of their 2002 target, and about a dozen had significant over-compliance. Two firms in particular accounted for a large part of the total abatement, each achieving more than one million tonnes of carbon-dioxide equivalent abatement in excess of their 2002 target. Direct participants as a group were consequently substantial net sellers of allowances to agreement participants. A report by the National Audit Office (2004) drew attention to the ease with which some direct participants have achieved their targets, and has suggested that this may partly reflect failings in the way that baseline emissions levels were assigned to participants. The emissions of a number of DPs were already well below their baseline at the start of the scheme, and as a result they may have been able to achieve compliance without further abatement action. It is suggested that this over-generosity in the allocation of baseline emissions levels may partly reflect the short timescale in which the allocations had to be made, and also may reflect the difficulty experienced in finding enough firms willing to participate in the auction.

Prices at which allowances have traded since the start of emissions trading have been substantially lower than those paid in the March 2002 ETS auction. The auction closing price of £53.37 per tonne of abatement in 2006 is equivalent to a price of £17.79 per tonne of abatement in a single year, once the intermediate-year commitments implied by the 2006 target are taken into account. Market trading appears to have begun at a price of about £6 per tonne, about one third of the level of the £17.79 auction price, rising to a peak of about £12 per tonne in October 2002, and then declining to about £3 by the end of the year (NAO, 2004, page 24).

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26 The basic unit of the system, tonnes of carbon dioxide, can be converted into tonnes of carbon, the units more commonly used in discussion of the social cost of greenhouse gas emissions, by multiplying by 0.273. Equivalently, a price of x per tonne of carbon dioxide corresponds to a price per tonne of carbon of 3.67x.

27 A further three firms were successful bidders in the auction, but subsequently withdrew.

28 Direct participants were required to achieve their specified level of abatement in 2006, and to make phased progress towards it in the intermediate years 2002-5, with the 2002 target being 20% of the 2006 target, rising to 40%, 60% and 80% in each of the subsequent years. As a result, a direct participant making a commitment to abate by 1 tonne in 2006 would be committed to a total abatement of 3 tonnes over the period 2002-6 as a whole.

29 Despite extensive marketing efforts the auction was postponed twice in an attempt to attract more participants.
A complication to the trading scheme arises because most of the sectoral Climate Change Agreements have been defined in relative terms, in other words as targets for energy use per unit of output, while other parts of the scheme are specified in absolute terms. Trading between the absolute and relative sectors could potentially erode the effectiveness of the overall scheme in terms of control of overall emissions. Firms in the relative sector can comply with their obligation even if their emissions increase, so long as they are experiencing a sufficiently large growth in output. If such firms exceed their targets, and then sell permits to firms in the absolute sector, emissions in both sectors could potentially rise. To prevent this outcome, the scheme includes a mechanism, the "Gateway", to restrict the flow of allowances from the regulative to the absolute sector. Individual sales of allowances by firms in the relative sector to firms in the absolute sector are permitted, only if there is no net aggregate flow of allowances out of the relative sector into the absolute sector. In practice, the Gateway controlling the flow of allowances from the relative sector to the absolute sector has been open continuously since the scheme began, reflecting the large generation of surplus allowances through over-compliance by the direct participants.

**ROCs and EECs**

In addition to the "direct" and "agreement" participants in emissions trading, there are two further groups of potential participants in the market, electricity producers, who are subject to an obligation to use a given level of renewable sources for electricity generation, and electricity and gas suppliers, who have targets to achieve energy efficiency improvements in the domestic sector. Over-compliance with these obligations on energy producers and energy suppliers creates certificates (Renewables Obligation Certificates and Energy Efficiency Certificates respectively), which are convertible into tradeable emission permits, valid in the emissions trading scheme.

For example, the Renewables Obligation, introduced in April 2002, requires all electricity suppliers to demonstrate to the energy market regulator (the Office of Gas and Electricity Markets, OFGEM) that they have sourced a specified percentage of their output from renewable sources. For 2002 the required percentage was set at 3%, to rise in stages to 10.4% by 2010. Compliance is demonstrated through Renewables Obligation Certificates (ROCs), which are tradeable. Each ROC represents 1MWh of electricity generated from renewable sources (e.g. landfill gas, wind power, biomass, some hydro, etc). Firms have the option of "buying out" their obligation at a set price of £30 per MWh in 2002, indexed for subsequent years, which places an upper bound to the cost per MWh of complying with the Renewables Obligation. The revenue generated by buyouts is redistributed to suppliers sourcing renewable energy, in proportion to their use of renewables. ROCs can be banked to a limited extent, and can be converted to Emissions Trading allowances at 0.43 allowances per ROC.

The primary purpose of allowing these certificates to be traded within the wider emissions trading scheme is to ensure that they can be traded in a reasonably active and liquid market. Without the link to the wider scheme, ROCs and EECs would have to be traded in a rather thin market, with a limited number of potential participants, many of whom would perceive the other participants as direct product market competitors. Willingness to trade might be inhibited by this. In addition, there might be problems of monopoly power in the permit market from the small number of market players, and there might be relatively few buyers and sellers at any particular time. Linking these markets to the wider market obviously carries with it the risk that trading might erode the achievement of the specific objective for renewables, or for energy efficiency, but does have the significant advantage that these certificates can be traded in a much more active and efficient market.

### 4. Reflections on UK policy and the future

#### 4.1 The Climate Change Levy

The UK Climate Change Levy has attracted considerable criticism for not being a coherently-structured carbon tax (e.g. Helm). As Table 5 showed, the rate at which the Climate Change Levy is applied to different fuels varies considerably, if considered in terms of the rate of tax per tonne of carbon. This "implicit carbon tax" varies from about 11 per tonne of carbon in the case of LPG, to about 30 per tonne of carbon in the case of gas and electricity. In practice, probably the most significant issue is that coal is taxed much less heavily, relative to other fuels, than it would be if carbon embodied in all fuels was taxed at a uniform rate. The reason for the relatively generous treatment of coal within the UK CCL has been the government's concern about the political impact of further accelerating the run-down of the domestic mining industry. How far is this uneven tax on carbon a serious economic objection to the UK arrangements?

A 'first-best' tax structure for an excise tax to reduce carbon-dioxide emissions would achieve the most efficient pattern of abatement responses by taxing fuels in proportion to their carbon content. Different fossil fuels would therefore be taxed at different rates per unit of energy. Fuels with a higher carbon content per unit...
of energy (such as coal, for example) would bear a higher tax burden than fuels with a lower carbon content per unit of energy (such as natural gas). Such a tax structure, combined with tax rates set at the first-best level, would encourage efficient responses, of two sorts. By raising the price of energy relative to other industrial inputs, and relative to other household spending, the carbon tax would act to discourage energy use in general. In addition, by raising the price of fuels differentially, in proportion to their carbon content, the tax would encourage substitution away from high-carbon energy sources towards lower-carbon fuels. Both the reduction in overall energy use and the substitution towards lower-carbon fuels would have the effect of reducing carbon-dioxide emissions.

However, if the overall level of energy taxation is, for some reason, constrained below the first-best level, it may no longer be appropriate to tax fuels in proportion to their carbon content. The direction in which the relative taxation of fuels should then depart from the 'carbon yardstick' will reflect the nature of the constraints. Constraints on the aggregate burden of energy taxes, for example, will imply that the tax structure should be designed to maximise the environmental impact from the relatively low environmental taxes that are feasible. This would require the tax structure to be shifted in the direction of taxing relatively more heavily those fuels where consumption responses are price-elastic, and taxing less heavily those fuels in more inelastic demand.

This line of argument might, for example, justify tackling carbon emissions with higher taxes on motor fuels than on other energy sources, if demand for the former is thought to be more price-responsive than the latter. However, there are potential efficiency losses if fuels are taxed at different rates, without any justification in terms of differential elasticity, or if undue weight is placed on the more elastic energy uses. It will be noted that the implicit rate of carbon tax on motor fuels is already very high in all EU countries. Baranzini, Goldberg and Speck (2000) estimate that existing taxes on petrol in France, Germany and the UK are equivalent to carbon taxes of some $750 - $950 per tonne of carbon (while the implicit carbon tax on petrol in the US was some $150 per tonne of carbon). Unless a substantial part of this higher tax can be justified in terms of other (non-climate change) externalities an efficient structure of incentives for carbon abatement would be likely to require significant reductions in motor fuel taxes, while at the same time increasing the tax rates on other energy uses, closer to the rate of tax on motor fuels.

4.2 The role of the Climate Change Agreements

There is considerable difficulty in attempting to assess the success of the Climate Change Agreements in securing genuinely-additional energy efficiency improvements or carbon abatement by CCA participants, in the sense of changes that would not have occurred in the absence of the agreement. There has been controversy over the reductions claimed, relative to baseline, with the Association for Conservation of Energy (ACE) claiming that the CCA targets amount to little more than 'business as usual', while the government's consultants, ETSU, claim a substantial difference between the targets and the energy use that would have occurred in the absence of the agreements (de Muizon and Glachant, 2003).

There are, on the one hand, good reasons to doubt that any government would be in a strong position to negotiate tough abatement targets with industry, given the relatively weak informational position of the government compared to the firms on the other side of the negotiation. Generally the government may be able to do little more than project past trends, as a business-as-usual baseline for the negotiations, while the industry side of the negotiation may be in a position to reveal considerably more information, if it helps their case to do so.

On the other hand, the structure of the climate change agreements being negotiated gave the government considerable bargaining power, in that the 80 per cent discount on the climate change levy gave the industry negotiators a strong incentive to reach a successful deal. From the point of view of the firms, a deal would involve abatement costs on the negotiated reductions, in exchange for 80 per cent of the total Climate Change Levy bill that they would otherwise pay. It is not possible to be certain that whether the maximum abatement that it would be worthwhile firms offering in exchange for reaching a Climate Change Agreement would be higher or lower than the abatement that would be undertaken if the firms instead had to pay the full rate of Climate Change levy. However, where the Marginal Abatement Cost Schedule is reasonably steep, it is probable that the maximum that firms would be willing to offer for an agreement would exceed the abatement they would undertake without it. Whether, in practice, the government has been able to extract anything like this level of abatement in exchange for the negotiated Climate Change Agreements is, however, a different matter.
4.3 Emissions Trading issues

How effective has the UK emissions trading system been at reducing the aggregate cost of reductions in energy use and emissions? The market seems reasonably liquid, and an appreciable amount of trading activity took place as firms approached the end of the first compliance period. However, prices are now quite low, at around £3 per tonne of carbon dioxide, and well below the auction price of about £20 per tonne, at which the government sold its budget to finance additional carbon abatement. The relatively low trading prices are an indication that firms appear to be able to meet their commitments at relatively low marginal abatement cost – and thus are perhaps an indication that at least some of the climate change agreements impose obligations that are not in fact particularly demanding. The rather higher auction prices may reflect the difficulties the government encountered in finding enough willing participants for the auction, and the limited information available at the time of the auction about the likely future value of carbon allowances. It is noteworthy that the ex ante assessments of likely permit prices for the US acid rain programme were substantially higher than the prices at which trading ultimately took place. Whether there are common features lying behind these two experiences – such as, perhaps, unanticipated cost-reducing innovation in abatement once trading begins – is unclear.

4.4 Moving to EU Emissions Trading

A number of problems will be encountered in integrating the UK emissions trading system with the EU emissions trading regime, scheduled to begin in January 2005. The EU regime will differ from the UK scheme in a number of ways. Some of these differences will make it difficult to integrate the EU scheme into the UK's existing arrangements. The UK has applied for a temporary exemption from the EU scheme for those firms within the UK scheme, which will postpone some, but not all, of the adjustment and integration problems.

The key differences between the UK and EU schemes include the following:

- The UK scheme is in terms of the weighted basket of greenhouse gases, while the EU scheme is in terms of carbon dioxide alone.
- The time periods of the two schemes differ. The UK Climate Change Agreements run to 2012, with the first round of the ETS ending at the end 2006, while the first round of the EU scheme begins in 2005 and runs to 2007 with a further period to 2012.
- Participation in the UK scheme is voluntary, while the EU scheme is compulsory.
- The two schemes treat electricity differently. The UK scheme does not include the electricity industry, while the EU scheme treats the electricity industry like any other industrial sector.

One important difference of some substance between the UK scheme and the EU scheme is that – with the exception of the relatively small number of direct participants who entered the scheme as a result of the auction – firms participate in the UK scheme only as a result of their participation in a sectoral Climate Change Agreement. As discussed above, these agreements involve a deal, in which firms are exempted from 80 per cent of the Climate Change Levy, in exchange for quantitative commitments to reduce energy use or emissions below a ‘business-as-usual’ baseline. Despite the reservations discussed above about the genuine ‘additionality’ of some of the abatement undertakings in the negotiated CCAs, the 80 per cent CCL discount does provide the government with significant bargaining power that it can exploit in negotiating the terms on which firms enter the UK ETS. It is the abatement required under the CCAs that effectively makes permits valuable in the UK system, and the ETS provides a way of arbitraging differences in marginal abatement costs between different firms.

The EU scheme will, by contrast, be compulsory, and will rely for its impact on the constraint on the overall allowance issue. The price of permits will be greater than zero, because fewer permits will be allocated than firms’ existing emissions. Initially the EU permits will be allocated free (“grandfathering”), though scope has been left in the Directive for a small proportion of the permits to be auctioned from 2008. Relatively little will be extracted from firms in exchange for the issue of permits in the EU scheme, and this represents a significant lost opportunity. It is desirable that the EU scheme should seek, as rapidly as is politically feasible, to move to a situation where firms do not receive permits for free, but where some form of charging is applied to the initial permit issue.

The most important insight of the ‘double dividend’ literature concerns the choice between revenue-raising and non-revenue raising instruments, such as, on the one hand, carbon taxes and auctioned carbon permits, and, on the other hand, permits issued for free. Apart from the issue of their performance in conditions of uncertainty, there is a close equivalence between tax and tradeable permit instruments. Tradeable permits distributed by auction would trade at a price per tonne of carbon equal to the carbon tax rate that would have
the same impact on carbon emissions, and the tax revenues and auction receipts would be equal. Tradeable permits distributed free to existing energy-using firms (‘grandfathered’ permits) would be equivalent to a carbon tax, the revenues from which were given back to firms as a lump-sum windfall. This latter equivalence highlights the fiscal wastefulness of grandfathered tradeable permits, in the sense that they forego the opportunity to raise revenues which could be used to cut the rates of existing distortionary taxes in the fiscal system.

Recent work by Parry (2003) indicates the scale of the economic losses that would be involved in wasting the revenue-raising potential of auctioned tradeable permits (or equivalent, a carbon tax), by distributing permits free through a grandfathering allocation process. On his estimates, a revenue-raising instrument such as carbon tax or the equivalent auctioned permits, set at $20 per tonne of carbon, would produce an annual welfare gain of somewhat over $1 billion, while grandfathering rather than auctioning permits would generate an overall welfare loss of some $6 billion annually. Grandfathered permits may perhaps have political attractions, in buying off the opposition of affected firms, but they have the potential to do substantial economic damage by foregoing revenues which could be used to cut other tax rates.

4.5 Looking ahead: the future form of international co-ordination

Following the USA’s decision not to ratify the Kyoto treaty, there has been increasing discussion about the future shape of international climate change policies. Part of this has concerned the deficiencies in the structure of the Kyoto agreement that made participation unattractive for the US30, while other work has considered more general deficiencies in the structure of Kyoto-type deals, and the merits of alternative approaches, including those based on agreements to co-ordinate carbon ‘prices’ rather to agree quantity targets.31

A key issue, in my opinion, which has been given insufficient attention in the development of the current agreements, is the issue of credibility, and its relationship, with issues of visibility and verifiability (Smith, 1995). The international agreements on climate change have, to-date, set targets for emissions levels for the countries signing the agreement, but have not specified the policy measures which should be taken in order to meet these emissions levels. This might be argued to be a sensible approach. Individual countries may be in a better position to judge the measures needed to meet their particular national target, and they may have a much better awareness of the political constraints on policy, so that they can avoid measures which would be liable to face excessive domestic opposition. However, it does have a drawback which needs to be noted. This is that individual countries may not necessarily act in the interests of the global community in their domestic implementation of an international agreement on climate change policy. Since the impact of any individual country’s emission reductions on the global climate is small, the benefit to the country itself from its own domestic carbon dioxide control policy will generally also be small. The country may gain significantly from the co-ordinated international policy, but may perceive its own actions as involving large domestic costs (of abatement measures, etc.) but negligible domestic benefit. In these circumstances, there is an incentive for the country to free ride, if it can, on the international agreement, by taking no action itself to control carbon dioxide emissions, but still hoping to benefit from the actions taken by other countries. Such a strategy is, of course, more attractive if other signatories to the global agreement cannot see when free-riding is taking place.

It is at least arguable that an international agreement which specifies targets, but which does not specify the policy measures which should be taken to meet these targets, will be particularly prone to free-riding by individual signatories. Countries face an emissions target for a date in the future, and their compliance with the target can only be fully judged when the future date is reached. They may fail to meet the target despite trying to do so, if their policy was knocked off-course by unexpected events; alternatively, they may meet the target even without trying, if other factors reduce their emissions over the period. Achieving the target, ex post, is therefore a poor indicator of the ex ante adequacy of the measures taken. Compliance monitoring may therefore be difficult. At the same time, countries face considerable temptation to put little effort into meeting the targets. If the date is sufficiently far in the future, the current generation of politicians may expect to have retired, and, even if they expect to be still in office, they may place higher weight on the immediate domestic opposition to the costs of abatement policies than on the costs of international disapproval if they do not meet their target. In these circumstances, where compliance is costly and non-compliance cannot easily be observed by other signatories to the agreement, the risk that countries will try to free-ride on the actions of others is high.

30 See, for example, the discussion in McKibbin and Wilcoxen (2003), Nordhaus (2002), and Aldy et al. (2003).
By contrast, an international agreement which specifies the measures to be taken may have the attraction that compliance with the agreement can be readily verified. This will be particularly true where the policy measures required are of a straightforward, transparent, and non-discretionary form. A carbon tax has these characteristics, and it may be relatively straightforward for countries to observe whether or not all of the signatories to an international agreement on carbon taxation have indeed introduced a tax in compliance with the terms of the agreement. Where they can do this, the chance is increased that individual countries will comply with the agreement.

This conclusion, that it would be preferable to agree on co-ordinated use of the carbon tax rather than on a series of national quantitative targets for emissions reductions, also fits in with the conclusions of some other recent strands of thinking among economists. A key issue has been how different agreements are affected by the nature of the uncertainties about climate change costs and benefits. Pizer (1998) and Newell and Pizer (2000) develop the insights of the literature on instrument choice under uncertainty to argue that the uncertainties in climate change point strongly in favour of using instruments that regulate the level of emissions by price (such as a carbon tax) rather than those that regulate by fixing an emissions quantity (as with a system of tradeable permits). The key observation is that the level of climate change damage is a function of the stock of greenhouse gases in the atmosphere, with the result that variation in annual emissions probably has a broadly constant marginal effect on climate change damage. On the other hand, marginal abatement costs may well be highly sensitive to the level of abatement. In these circumstances the costs of error in policy are likely to be lower when price-based emissions regulation is employed than when tradeable permits or other fixed quantity targets are set.

Nordhaus (2002) enumerates further potential advantages of basing future international agreements on climate change around harmonised carbon taxes, rather than country-by-country quantitative targets. He argues that quantity-based international agreements are more liable than harmonised taxes to lead to excessive volatility in the price signals facing polluters (i.e. volatility in permit prices), that they may be more vulnerable to risks of fraud and corruption, that they expose governments to the temptation to grandfather allowances for free rather than to use revenue-raising instruments and that they raise difficult ‘baseline credit’ arguments which a carbon tax would neatly sidestep.\(^\text{32}\)

5. Conclusions

The Kyoto protocol commits signatories to substantial restraint in greenhouse gas emissions. Across the EU as a whole, emissions of the weighted 'basket' of six greenhouse gases are required to be cut by 8 per cent by 2008/12, as compared with emissions in the agreement's base year, 1990. For individual member states, varying targets have been agreed. For the UK, the EU agreement requires that 2008-12 emissions should be at least 12.5 per cent lower than in 1990. In addition, the UK government has declared a policy goal of reducing CO2 emissions to 20 per cent below 1990 levels by 2010. By 2000, however, UK abatement appeared on track for the 12.5 per cent Kyoto target, though not necessarily the higher 20% limit. A number of other member states will need to make significant changes to current trends in energy use and if they are to meet their emissions targets.

Member states have discretion over the policies to be adopted to achieve the Kyoto targets. Most member states have relied heavily on conventional 'command-and-control' instruments of environmental policy such as direct regulation of emissions or technologies, supplemented by financial incentives to develop or adopt new technologies, and various forms of information provision and moral exhortation. 'Voluntary agreements' with major energy-using sectors have also been a frequent ingredient in the portfolio of climate change policies, although there is a danger that such agreements may consist of little more than hot air, and may achieve little that would not have happened in any case. A number of member states are making use of various forms of market mechanism, including carbon and energy taxes, to discourage energy use, or carbon dioxide emissions, through the price mechanism.

This paper has described the three, interlocking, elements of the UK Climate Change programme, the Climate Change Levy, Climate Change Agreements, and Emissions Trading. The offer of an 80 per cent discount on the Climate Change Levy has played a key role in encouraging industrial sectors to negotiate Climate Change Agreements with specified sectoral targets for reductions in carbon dioxide emissions, or for improvements in energy efficiency. For those firms which are not part of a negotiated Climate Change Agreement the levy provides an incentive for reduced energy use (at roughly half the level that would have been given by the EU carbon/energy tax proposed in 1990). Those firms that are included within a Climate Change Agreement face clear and enforceable individual targets for reduced energy use, together with fur-

\(^{32}\) Aldy et al. (2003) are more sceptical about the value of basing future agreements on harmonised taxes.
ther incentives from two sources, the remaining 20 per cent of the Climate Change Levy, and the opportunity to obtain credit for reductions in excess of their agreement target, and to sell this in the Emissions Trading system.

The paper has noted a number of issues about the UK arrangements:

- the uneven tax per unit of carbon implied by the uniform tax rates per unit of energy on coal and gas
- the treatment of electricity as a fuel product, subject to the levy at a higher rate, rather than as an industry using taxed input fuels
- the restriction of the Climate Change Levy to industrial and commercial users of energy, and the exemption of the household sector, which means that the system does not provide equivalent incentives for reductions in household energy use
- complications introduced into the trading regime by the existence of both relative and absolute abatement targets. Special arrangements (the "Gateway") have been needed to ensure that trading between the relative and absolute sectors does not undermine the effectiveness of the system as a whole. In practice, because the absolute sector has been a net seller of permits these arrangements have not imposed any major constraint on trading, but in other circumstances they could have done
- the difficulty of measuring the success of the Climate Change Agreements, and their dependence on negotiations between industry bodies and the government, in which the government has a relatively weak informational position
- over-compliance by participants, and consequent weak prices for permits
- future problems in integrating the UK system with the EU emissions trading regime, scheduled to begin in January 2005

In the medium term, if countries continue to try to control global warming by reducing greenhouse gas emissions, energy pricing measures, such as carbon taxes and emissions trading, should become increasingly important in the overall policy mix. Achieving the major changes that will be needed in patterns of energy use and economic activity through the use of conventional, inflexible 'command-and-control' would be liable to damage the efficient functioning of the market economy. The package of instruments being employed by the UK provides important evidence on the ways in which effective use can be made of incentive-based approaches to greenhouse gas abatement. The move to EU wide emissions trading will greatly expand the use of market-based instruments by signatories to the Kyoto Protocol.

References


Sir Charles Nicholson, Senior Policy Advisor, BP, BP’s attitude to ecotaxes in general and its experiences in the UK with the climate change levy

Introduction

All societies have sets of conflicting objectives. For example, one objective is that of raising revenues to meet what I think in most of our societies are constantly increasing expectations, which are proving more or less impossible to fund. I think that’s very clear. Our government in the UK has been under our present chancellor notoriously skilful at extending the range of taxes. I do not know whether you’re familiar with the frog principle – if you put a frog in boiling water, it will jump out, but if you put it in cold water and warm it up, it doesn’t jump out, it dies. I think we in the UK are subject to the second principle rather than the first, and the increasing range of taxation in the UK clearly exposes this dilemma.

From the perspective of a company like my own – and let me start by saying BP does pay a lot of tax, everywhere in the world – the approach we take to the questions posed by governments and societies can be best characterised as enlightened self-interest. Our approach is essentially based on looking for constructive solutions to these dilemmas and contradictions, and working to try and create the space for that. In my opinion, it is very clear from what has gone before that the answers are very difficult to find. This approach constitutes the basis of everything we have done in terms of climate change – and please note I am going to restrict my context to global warming and climate change – I do not intend to deal with ecotaxation or other market instruments in other contexts.

BP acknowledged climate change after Kyoto in 1997 and set ourselves a set of targets to reduce our own emissions by 10 percent from our base year. Our original goal was to achieve this by 2010 but in fact we had already achieved it by 2000, and we are now moving on to a rather more challenging set of goals. To put this into context – our initial focus was entirely on our own operations and in practice we only consume ten percent of all the energy we are in one way or another responsible for handling. So something like 90 percent of the energy and therefore the emissions that come within our grasp are actually the result of the use of our product by others – by you and I as motorists, by industry, and so on.

BP recognises the challenge in climate terms of trying to be part of the solution to that very complex and difficult process. It will take us down the road towards new technologies and towards making decisions on what kind of policy instruments are best to achieve our goals.

BP and the Climate Change Levy

The climate change levy in fact only affected BP’s chemical operations, which received an 80 percent reduction, and our gas business, which incurred limited administration costs as a result. Our refineries and oil and gas operations are subject to other forms of taxation and were therefore exempt from the levy. So it really impacted only our energy intensive chemicals operations but we were able, by setting the appropriate targets within BP’s larger target setting process, to achieve an exemption from those targets and thus, the impact of the levy on the company has not been significant.

Having said that, I’d like to pick up on point made by the previous speaker, Professor Stephen Smith, who said he was very sceptical of the results of the levy. Although I can quite understand why he said that, I would point out that in terms of finding the answers to global warming, carbon reduction, and transfer to a lower carbon economy, we are in one way or another responsible for handling. So something like 90 percent of the energy and therefore the emissions that come within our grasp are actually the result of the use of our product by others – by you and I as motorists, by industry, and so on.

BP recognises the challenge in climate terms of trying to be part of the solution to that very complex and difficult process. It will take us down the road towards new technologies and towards making decisions on what kind of policy instruments are best to achieve our goals.
there to see. What I think is a critical underpinning of any policy approach to climate change is to start the ball rolling.

**Emissions Trading in BP**

Let me use BP as an illustration at this point. As I already mentioned, when we took on the goal of reducing our own greenhouse gases we actually set ourselves targets. The question we had to ask ourselves then was; if we set ourselves targets, how do we actually go about best achieving those? In our case, we came up with an internal emissions trading system and the approach behind that was a recognition by our chief executive that he did not actually know where the best answers to this would come from, or from which of the many BP operations around the world: he didn’t know where the marginal cost most effectively would be. So, instead of giving a series of commands, he set a series of general targets and devised a trading system for parts of BP to operate within. That way, he believed, we would find the most cost-effective reductions within our system.

Clearly, any internal system has limitations. In one sense, the money is not real money. But in our case, it provided a very effective way of focussing on the issue of carbon reduction and carbon management. We found some $650 million of savings – and although one might ask why on earth BP didn’t explore these possibilities before – whether we are in business or not, we are only human and we tend to focus on those things that either engage our interest or that we are asked to do. So in a well-run company, if safety becomes an issue and management produces a series of notices on safety, people will respond. When we started to focus on the management of greenhouse gas issues, produced the targets and produced the system, results started to come in.

We stopped the system in 2001 when we moved on – at least within the UK – to the UK emissions trading system. But our own experience proved for us that emissions trading was a very effective instrument. The UK emissions trading system has been running for 2 years now – originally there were 35 companies who entered it directly and of course all the climate change levy companies who entered it less directly – so it is still at an early stage. If we take it that the principle purpose is to start focussing on the issue of carbon reduction, then I think in some sense we can start scoring success. What clearly has to lie ahead is a review of what is actually happening - policy must be able to do that.

**Emissions Trading in the UK and Europe**

You have to try to initiate a policy focus while remaining uncertain of the result. Put it this way: if you wanted to achieve a very dramatic result in terms of carbon reduction, you would probably have to introduce policies which would bring about precisely the kind of reaction that is already evident to some of the rather less demanding targets that have been set and you would run the real risk of distorting all kinds of other objectives and other policies for the achievement of this one goal. But that isn't how life works and it can't work. What we have to do is to find a set of climate policies, certainly using emissions trading and sensibly taking into consideration the conundrum of ecotaxes and the role they have to play to start down that road of discovery. When you begin to see the results, either positive or negative, then you are in a better position to start tuning the instruments you have put in place.

I would still argue that the way the UK emissions trading process worked, albeit that it didn't deliver the results that some people have asked for, albeit that it started with a grandfathering process (which I do not believe will be the long term consequence) – a very necessary way to introduce the system and get the system started. In the UK – and I was one of the architects of this – we worked with the government for eighteen months on emissions trading and we gave them a choice of either setting mandatory targets or incentivising the process, because there is no way that pro bono publico as companies we are simply going to assume these commitments on behalf of society. There has to be a policy framework for that. The government decided to introduce an incentivised process and although that was a way of starting the scheme, I believe that we will transit to some form of auctioning system in the longer term. It won't be easy, it won't be very palatable, but I believe that is the way things will have to develop. The critical thing here was to actually begin the process.

Trading systems have to start small. We started in our own case in BP with our own internal system then very much became, with other companies, the architects of the UK trading system, and have been very closely involved in the development of the EU system, which I sincerely hope will start up at the beginning of next year. Of course, it will have a lot of teething troubles, but I believe in our talks with the Commission that by and large we have succeeded in persuading them of the virtues of learning by doing. There will be mistakes, clearly it has to be very flexible in concept and people have to learn to come back and make the nec-
necessary adjustments to achieve a range of goals and of course, in the beginning it is not tackling the difficult domestic and transport sectors. It is planned to bring both these sectors into play for the next phase in 2007, which will not be at all easy, but I believe that we should all contribute to the effort of finding the answers, particularly as I believe that emissions trading will continue to make an important contribution to climate change policy.

**Ideal Economic Instruments**

For economic instruments to be efficient they have to be:

- well designed, i.e. revenue/investment neutral, influence behaviour according objectives, non inflationary
- part of stable long-term policy framework and agreed objectives
- non distortive
- minimum compliance costs
- distributional impact acceptable
- according to state aid rules
- securing international competitiveness
- life cycle based

I think this list will probably be quite familiar to anyone who deals with the system of taxation. The above are ground rules, quite difficult to follow completely and although they are not unique and not original, they should not be forgotten. These rules simply point to the challenge that is well understood – it is actually very difficult to design ecotaxes so that all these conditions are met.

To take the example of motor fuel taxation. There has been considerable debate in Germany about the recent rise in motor fuel taxes – I am uncertain whether these are ecotaxes or revenue raising mechanisms as I think they clearly are in the UK – and some have claimed that results in terms of energy efficiency gain have not been achieved as a result of the tax, but are attributable to other developments, such as the recession. Being simplistic and not an economist and having spent the last three years working with a group of oil and auto companies on future mobility issues, I feel justified in contrasting the efficiency of the US private vehicle fleet with the efficiency of the European vehicle fleet. One can argue there are a number of reasons for this contrast, and their economies are not saying that taxation is very clearly a significant difference. But I believe that we can argue quite successfully that the right kind of targeted tax can have an effect – whether it is an ecotax or not is quite another issue.

As for the double dividend, I am a little sceptical of it in some ways. If you find that there is something implicitly wrong in the level of social taxation that you are incurring, then it seems to me that it would be better to address that issue. Secondly, as we have seen in the UK, if you in fact reduce social taxation and transfer it to a form of ecotaxation, then the resulting distribution is not even. In this case, it is very often the energy intensive industries who end up paying the greater part of the ecological tax, whereas companies who employ larger numbers of people gain in terms of their tax rebate. One of the biggest beneficiaries of this process in the UK was ironically enough the government itself, because they have a huge number of employees. There are some peculiar redistribution effects that need to be taken into account. The notion of the double dividend needs to be looked at a little bit more closely than I think sometimes it is.

**Conclusion**

I would like to conclude by reiterating that a combination of policy instruments to achieve carbon reductions is most certainly in my view going to involve emissions trading and it will very likely involve some form of ecotaxation as well, as I do not believe that that will go away. However, I do think that there are a number of flaws in what is often said about ecotaxation and I would very strongly point out that the elements I listed above need thoroughly examining. As well, we need to do a strong cost-benefit analysis for much of this. For example, I would say that some of the subsidies for renewables – while my own company is strong on renewables and has a very large solar operation – can be misplaced in terms of the immediate cost and/or benefit to society. What we are striving for is the transition to a lower carbon economy. We have to recognise that the use of energy underpins all our societies and therefore that transition has got to made in such a way
that we do not add such an unacceptable cost to various forms of energy that it has a distortionary effects that undermine other objectives.

Equally, we are working at the moment on the transition to future technologies and policy – in whatever shape or form – must understand and align with those. There has been a great deal of divergence on this point in the past, for example in relation to Kyoto: certainly, the protocol had some strong points in its favour, but one of the things it was not able to do was to align around where our future options lay. In the past five or six years, BP and other companies have done a lot of work trying to determine where the future answers to carbon management and carbon reduction will be. Any future set of policies must understand and relate to those. If they don’t, whatever form a market instrument takes, it cannot actually focus on the objectives required.

Finally, please let me point out that we must always be very clear in designing any form of greenhouse gas policy using whatever instrument we choose – it must be focussed on carbon, because that’s what the problem is. If you misdirect an instrument for some other purpose, then you’re not actually achieving the objective you set out to achieve.

Thank you very much.
GUY TURNER, ENVIROS CONSULTING,
THE IMPACT OF THE UK CLIMATE CHANGE LEVY AND AGREEMENTS ON CORPORATE BEHAVIOUR

Introduction

First of all, I would like to make a couple of observations pertaining to the climate change debate. I have been involved in environmental economic instruments for twelve years in the UK, in climate change, waste policy and the costs of compliance with environmental legislation on business. This combination leads me to make two observations about ecological taxation in general.

The first is a positive comment: there is an increasing body of evidence to show that the expected costs of environmental legislation are always far higher than the actual costs. Industry is full of highly intelligent, creative and innovative individuals who will always find a way to avoid paying taxes and incurring costs. Even policy makers often cannot foresee the creative ways businesses come up with to avoid paying a tax or avoid incurring the costs of environmental legislation.

The second is a more negative comment: there is a policy dichotomy inherent in the dual purpose of ecotaxes – to drive a change in behaviour and to raise revenue. Typically, taxes are levied on inelastic goods and inelastic behaviours and generally, finance departments do not wish to see a rapid change in behaviour that will suddenly reduce their tax revenues. The London congestion charge is a prime example of how this dichotomy can hit home – the charge is now losing money, because it was anticipated that revenue from the charge would pay for all the fixed costs incurred for the cameras, software and technology necessary to control the system, but it has been so effective at dealing with congestion and so many people have switched to public transport that it runs at a slight deficit.

Nevertheless, there have been several examples of highly successful ecotaxation in the UK. One example is a tax on waste to landfill, which was split between municipal waste and construction waste. Construction waste to landfill fell by around 30 percent, because recycling presented a lower cost alternative. Unleaded petrol taxation had a dramatic effect on changing consumer behaviour. We would like to see ecotaxes driving changes in behaviour, but for that to happen, there have to be alternatives, otherwise they are just a cost to business that either impacts on competitiveness or effects consumers. In such cases, it might as well be a form of VAT or general taxation. For ecotaxes to be effective there must be cost-effective opportunities to afford paying those taxes.

Enviros’ Experience with the UK Energy Tax System

Firstly, a brief overview of Enviros Consulting: We have a long history of advising on and delivering energy efficiency in industry and we employ 350 staff with 8 offices throughout the UK and Ireland and also have offices in Spain, the Czech Republic, Canada and South Africa. Our staff comprise engineers, economists, financial experts and MBAs. We employ 60 staff in our energy / climate change practice division and the key sectors we cooperate with include oil & gas, chemicals, food & drink, glass, cement, brick, packaging, general manufacturing and buildings.

I hope that talking here today will provide a broad overview of the business response to climate change policies in the UK. This is quite a challenge given the diversity of opinion and businesses affected, but our company has been heavily involved in the scheme at a policy level and also in working with business.

The UK climate change levy (CCL) and the climate change agreement (CCA) system have been central to our work for the past four years. We helped a number of industry sectors negotiate their Climate Change Agreement (CCA) targets with government in 2000 and we were an active participant in the UK Emissions Trading Group, chaired by Charles Nicholson, which helped define the detailed rules of the CCA scheme. We now manage on behalf of industry the CCA activities of 6,000 sites in the food and drink and metal packaging sectors – i.e., we are intimately involved in business decision-making. Of these 6,000 sites, 4,000 are very small (e.g. chicken houses). We hold training seminars for business on CCA issues and energy management programmes and we have set up a verification scheme so that businesses can verify their emis-
sions at low cost. Furthermore, since the start of the CCA scheme we have undertaken various reviews for the UK government on business responses.

**Key Features of the UK Energy Tax System**

To try to simplify the terminology, the climate change levy was introduced in the UK as a downstream tax on energy, not necessarily on carbon. It was introduced as a downstream tool for two main reasons. Firstly, so that one could avoid rapid changes in the energy supply industry. In particular, the government was concerned about coal communities, as they had already been decimated by changes to energy infrastructure. Social problems caused by more rapid decline in employment in the UK’s remaining coalfields would have been politically unacceptable, and the government wanted to ensure that this didn’t happen by producing a carbon tax. Secondly, the government were concerned about the domestic sector. A tax on upstream energy inputs would have been automatically passed on to the consumer in the form of higher domestic fuel prices and the government was very concerned about fuel poverty and the domestic sector, as they estimated that 4 million people were struggling to heat their homes each winter. By targeting a downstream instrument towards business, the government could dictate more accurately who paid the tax and where the burden fell.

The gross effect of the CCL was to increase the costs of energy for business by about 10 to 15 percent, depending on the fuel mix. However, underlying energy prices decreased at the same time as a result of new trading arrangements in the UK electricity industry due to ongoing liberalisation, which offset the effect of the climate change levy for business to a large degree. This is not to say that the climate change levy does not have any beneficial effects – it certainly has as discussed below. In any case, electricity prices have now bottomed out and are increasing again.

There are a number of exemptions from the levy. Good quality combined heat and power, renewable energy sources and electrolysis are exempt. There were partial exemptions of 80 percent for Energy Intensive Users through Climate Change Agreements (CCAs) and for some sections of industry, such as commercial greenhouses.

**The Structure of UK Emissions Trading Scheme**

In the above diagram, the Climate Change Agreements on the left are negotiated between large intensive energy using industries and government, which allocate these industries an 80 percent reduction to the CCL. The direct participant scheme on the right encompasses a separate group of emissions trading companies that signed up voluntarily to accept absolute targets for emissions reductions and receive incentive money from the government in return.

Both of the above groups can trade CO₂, so there is a liquid market in CO₂ and one of the issues in the UK is the influence these direct schemes – encompassing 34 companies – have had on providing excess CO₂ credits for heavy industrial users that have to comply with these targets. The introduction of emissions reduc-
tion projects was under discussion at some point, but this has now been superseded by the EU Emissions Trading Directive.

**Key Features of the Climate Change Agreements**

Climate change agreements are crucial to the implementation of climate change policy in the UK. Some of their key features include:

- **Voluntary participation.**
- **Eligibility for the agreements was not based on an energy intensity criteria, but was based on criteria specified in the integrated pollution prevention and control legislation, the IPCC (but ignoring the size threshold). This was because the government had to use an existing piece of legislation due to time constraints. By and large, it was a very good approximation for energy intensive businesses.**
- **Climate change agreements include electricity consumption as well as direct use of fossil fuels.**
- **Targets are in terms of energy efficiency, i.e. they are relative targets. For instance, a target of kilowatt hours or CO₂ per unit of production. Some sectors have nevertheless chosen to take on absolute targets. Relative targets are far more flexible from a business point of view and one has to question why any company would take on an absolute target unless it was in their interest.**
- **Targets have to be achieved every two years, in 2002, 2004, 2006, 2008 and 2010. They are currently being renegotiated for 2006 (they will be tightened).**
- **Targets are very flexible. Businesses can undertake emissions reduction measures, energy efficiency measures, they can trade CO₂ if the price of CO₂ is less than the cost of internal reduction and they also have other “risk management” measures. Businesses can claim they have changed e.g. their product mix, have changed the energy intensity of their production process due to market demand, or they can claim that there has been a force majeur that has rendered their targets more difficult.**
- **A typical target profile:**

<table>
<thead>
<tr>
<th>Year</th>
<th>2002</th>
<th>2004</th>
<th>2006</th>
<th>2008</th>
<th>2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>% improvement</td>
<td>2%</td>
<td>4%</td>
<td>6%</td>
<td>8%</td>
<td>10%</td>
</tr>
</tbody>
</table>

- **A 10 percent improvement in efficiency by 2010 was used as a benchmark for the ten year period, but many industries have much higher targets. Chemicals were given an 18 improvement efficiency target, cement 26 percent, semi-conductors 59 percent and aluminium 32 percent. These were all based on detailed negotiations between industry and government.**
- **If a sector passes its target, all its constituent members pass. If a sector fails its target, liability falls to the individual company / installation. This has created some odd sector behaviour – some sectors comply as a “block” or “pool” – but it is unclear why as there is no obvious benefit for participant companies.**
- **Firms “long” of allowances will not realise their true value – but if “long” firms want to sell at a discount, why should they sell to their competitors?**

**Structure of the Climate Change Agreements**

We now have 44 umbrella agreements between trade sectors and the government. They cover about 10,700 sites. Of these, 6,700 are quite small – bakeries, supermarkets, etc. Of the remaining 4,000 sites, 2,000 are in the food and drink industry, leaving 2,000 traditional heavy energy using sites. By any measure, that is a very comprehensive coverage of agreements between industry and government. In contrast, the EU Emissions Trading Scheme (ETS) will cover only approximately 1,500 sites in the UK, including the power sector; while the ETS covers more emissions, CCAs have a far deeper penetration across industry.
The Impact of the Climate Change Levy

Moving on to the question of how effective this legislation has been and how business has responded: any conclusions we make are based on only a few years of information. For this reason, my comments are based on personal experience and the limited data that has been published thus far.

Firstly, the climate change levy has actually had very little effect on energy consumption for those businesses paying the full rate. This is for several reasons: firstly, those that pay 100 percent of the climate change levy are by definition not energy-intensive businesses, or they would have entered into climate change agreements with the government; secondly, the rate of the levy itself is very low – for those firms liable to pay 100 percent of the levy, 10 to 15 percent is not a material increase to energy prices; and finally, the levy has been offset by reductions in electricity prices.

The Impact of Climate Change Agreements

If we assume that there are 5,000 firms in climate change agreements, then they cover approximately every other business in the UK. The climate change agreements had a much greater impact on businesses than the climate change levy because they effect the main energy using sectors and because businesses have a very strong incentive to achieve their targets. The climate change levy at its full rate would have had a very serious financial impact on energy-intensive sectors – millions of pounds would have been incurred in tax.

In 2002, DEFRA calculated that there has been a reduction of 15.8 mt CO2 from baselines and a reduction of 10.4mt CO2 compared to 2002 using base year energy efficiency. If we calculate the foregone tax income of CCAs at 500 million pounds (assuming 50 percent of the full rate of the levy), then the cost effectiveness of CCAs = c. £50/tCO₂. However, DEFRA’s emission reduction figures are likely to be overstated as measures of “real” improvements in energy efficiency because baselines were chosen by firms as the worst within a ten year period (1990 – 2000) and thus, reductions are not from either the historical average or business as usual. Also, the calculation of expected energy consumption is simplistic and ignores the beneficial effect of increasing output. If we assume savings were overstated by factor of 2, cost effectiveness would be around £100/tonne.

Enviros’ view is that CCAs have had little impact in changing energy consumption of business to date. This is because targets were originally set generously in favour of business. The negotiation process gave more cards to the hand of business than to that of government, because business knew very well what their position was in these negotiations, far better than the government did. As a result, 86 percent of participants passed their first target. Climate change agreements are very flexible, there are opt-outs businesses can use to reach their targets: risk management measures are quite generous in terms of product mix and output algorithms and thus, economic growth directly benefits business, as increasing output reduces specific energy consumption. As well, the price of CO₂ in the UK trading system has been so low that many companies preferred to buy CO₂ than implement measures themselves. This is the problem we have with the direct participation scheme – it created a great many cheap CO₂ allowances. Finally, it is difficult to see significant shifts in energy efficiency over such a short time frame.

To summarise:

<table>
<thead>
<tr>
<th>Type of Firm</th>
<th>Typical sectors</th>
<th>Energy costs as % of turnover</th>
<th>Impact of CCA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very high energy intensity</td>
<td>Cement, chemicals, steel, glass</td>
<td>&gt; 10%</td>
<td>Little – already doing everything they can</td>
</tr>
<tr>
<td>Medium energy intensity</td>
<td>Packaging, food &amp; drink</td>
<td>1 – 10%</td>
<td>High – CCA provides impetus for improvement</td>
</tr>
<tr>
<td>Low energy intensity</td>
<td>Some food &amp; drink</td>
<td>&lt; 1%</td>
<td>Energy costs / CCL not significant</td>
</tr>
</tbody>
</table>
The Benefits of Climate Change Agreements to Date

However, although the benefit of the climate change agreements thus far has not been in terms of massive improvements to energy efficiency, we have seen benefits in other, very important areas. There is much greater awareness of energy consumption than before these agreements were in place. The UK’s largest supermarket chain, for example, did not know what its energy consumption actually was until two years ago. The chain had no idea how many kilowatt hours of energy it actually used, just the price it paid. These climate change agreements have forced industry to start measuring how much energy they use. Better data enables better policy decision-making.

Not only are businesses more aware overall, but the issue of energy consumption is now being raised at a much higher level. Finance Directors are now aware of the climate change levy – it is not treated like higher energy costs, perceived as being unavoidable, but as a tax, which can be avoided. There are numerous consultants and businesses who help business to try and avoid paying these taxes. As well, trade associations meet four times a year and compare and benchmark each other and exchange information on the levy. This benchmarking helps industry and policy makers.

To summarise, the first two years of the scheme have not yet stimulated a great deal of investment in energy efficiency because of low CO₂ prices and relatively small targets. But this will come and as the tighter targets start to bite over the next few years, we expect to see real improvements in energy efficiency as well. The immediate benefits have been in terms of behaviour and awareness and in systems for the measurement of this. This is the platform from which business can now move forward.

The Business Response to the CCL and CCAs

The chronology of business response to the scheme was as follows: at first, when the climate change levy was introduced, there was a great deal of opposition from business. They threatened not to pay and claimed it would put thousands out of work. Whether the apparent severity of the initial policy draft was a bargaining tactic on the part of the government or not, they certainly succeeded in frightening industry a great deal at this initial stage. Business then felt it had achieved a great success in negotiating with government to achieve an 80 percent discount – a considerable shift from having to pay 100 percent of the levy. Then came the process of negotiating with government and trying to sort out the complexity of these agreements. Business generally felt despondent, negotiations were quite drawn out and everything became rather burdensome.

Now it seems we are moving into a fourth era. Having gone through this negotiation process and having got the documents signed, business is now feeling relatively comfortable. It knows what it has to do, it can see the targets stretching out ten years into the future, it is familiar with the CCL system and the efficient trading system. In short, it seems for business that the worst is behind them and it is starting to settle in to this ecological tax system. What business has in the UK is a flexible system that strikes – as well as possible – a balance between environmental objectives and the protection of competitiveness and jobs.

Policy Implications

- The CCL is still too low to change behaviour in non energy intensive sectors.
- CCAs seem to be addressing important aspects of failures in the market for energy efficiency (awareness, senior level engagement).
- The threat of sanctions (full rate of CCL) was key to setting up CCAs.
- The high administrative burden was (mostly) necessary – and the UK now has a scheme with 10,700 performance contracts between government and industry.
- It is important to pursue policy one step at a time – for a complex scheme, it is best to get the scheme in place first. Once accepted, targets can then be tightened, taking into account international competitiveness.

Finally, potential areas for future research in the field include: investigating the competitive impacts of energy and climate change legislation to find the optimal rate of energy/carbon tax; investigating the reasons for certain business responses, such as why businesses choose sub-optimal strategies such as pooling; and investigating when tradable permit schemes really are efficient policy tools, for example, an examination of whether the EU ETS will actually change business behaviour.
SESSION 2, ECOLOGICAL TAXATION IN THE UK, DISCUSSION

Jan F. Wagner, Environment Daily: Professor Smith, if I understand you correctly, you think the Climate Change scheme hasn’t done what the UK government had said it was supposed to do, because you noted the problem with determining how much CO₂ emissions could have been cut if the tax had been evenly applied.

Stephen Smith, University College London: I wouldn’t like to give the impression that I am hostile to the Climate Change Levy. I think that it’s a major and significant step forward. The point I was making was that there are respects that could be improved to improve its environmental performance – more systematic taxation across different fuels, for example. Furthermore, I am particularly sceptical about the effectiveness of those deals that get companies the 80 percent exemption. I’m not sure that these companies did achieve the 80 percent emissions reduction that would have been required had the Climate Change Levy been applied. But, I do recognise the political difficulties in getting to this point.

Jan F. Wagner, Environment Daily: Why doesn’t the UK government have any figures regarding the extent to which emissions have been cut? In Germany we do have the figures – at least, we are able to say that the ecotax scheme is having a particular effect and to quantify it.

Stephen Smith, University College London: Well, you can measure emissions and you can say how they’ve changed, but the critical thing is to say whether that is the result of the measures that have been implemented and if so, which components of the measures. That is actually quite a difficult evaluation and the UK government has certainly worked on that topic and there may be things that they could say. The fundamental question of evaluating impacts is actually rather difficult.

Guy Turner, Enviros Consulting: The effectiveness of the agreements is difficult to measure – you can’t just look at trends in energy consumption or CO₂ over time, you have to compare it to some measure of what would have happened if business had continued as usual. That is really quite a complex equation, which takes into account base load energy consumption through to site-product mix and a range of other independent variables that enable you to calculate expected energy consumption. More recent research the government has done examines this in a lot more detail and has tried to look at this business as usual case and identify departures from that.

Marie Pender, DEFRA: I would like to point out that climate change agreement targets are not just hot air – negotiations were not easy and I think the government got the best deal they could at the time, in view of the situation, which was negotiating something no government had ever negotiated before.

With reference to the effect of voluntary agreements: Econometric analysis at the time revealed that the top 10 energy consuming sectors paying the full rate of the levy would have achieved 0.25 million tonnes of carbon. The targets in the agreements amount to 2.5 million tonnes of carbon – that’s ten times as much. Industry is not simply responding to a price incentive – to keep its money in its pocket and not to pay it to government, industry has had to take action, and so it has.

I understand from an independent consultant that the effect on energy consumption in these sectors is quite apparent in changes between 2001 and 2003.

The Marshall report that precursed the introduction of the levy and the agreements pointed out that energy-intensive industry could not pay 100 percent of the levy. Therefore, if you are suggesting that they should have paid 100 percent of the levy, one can only presume that the rate of the levy would have had to have been very much lower.

I am currently conducting a review of target achievement based on the evidence we have from industry. The government too was very sceptical that industry in general exceeded their targets by such a large amount and believed that this could not be the result of heavy investment over such a short time period. In fact, the sectors I have spoken to so far are bringing forward evidence of substantial, multi-million pound investment to have achieved what they have so far. They are claiming that this is early action, that their finance directors are advising to take action immediately rather than wait until later. Obviously, the government is demanding hard evidence that this has been the case – but if it has been the case, we are not intending to penalise this early action because it has been good for the environment.

Guy Turner, Enviros Consulting: This kind of instrument can never achieve everything in the first year. These things take a long time. The emphasis needs to be to get the instrument in place, get industry on board and then the rest is relatively easy. Once the instrument is in place, it can be fine-tuned to achieve optimal levels of tax or targets that are acceptable to industry and achieve environmental improvements.
Stephen Smith, University College London: In designing practical policy it is important to remember that “the best can be the enemy of the good”. As Marie Pender from DEFRA pointed out, it would have been extremely difficult to introduce a climate change levy applied uniformly to all sectors at the tax rate we actually achieved. The levy would have met with much more opposition and implementation might have become unfeasible. I quite accept that there is a complicated process involved in generating a policy outcome.

I believe that what we have got is good – it may not be the best and it may be that there are improvements we can make – but I'm certainly impressed by the progress that has been made.

Charles Nicholson, Senior Policy Advisor, BP: Certainly when we were devising the UK trading system some of our UK government colleagues who were involved said that they wished that they had never gone down the road of the Climate Change Levy and Climate Change Agreements, and how much simpler it would have been to go straight for a trading system. But we do have a Climate Change Levy and Agreements, and I think the points that have been made echo what could be said about the trading system. It is early days. If you try and get substantial results too quickly, you won't succeed, because you will just cause people to resist you. Once you get people to start this process of awareness creating and learning by doing, then you can start turning up the volume – and that will happen within the trading system.

Of course, it is possible to argue about whether the trading system delivered more than would have happened anyway. The UK national audit office has just done a study on that and the answer is yes and no. But at least there is an instrument now, people are committed to it, and it will develop. It is much better to go through this kind of process than to be like boxers in a ring who only meet to deliver each other blows.
SESSION 3: ECOLOGICAL TAXATION IN GERMANY

MICHAEL KOLHLAAS, GERMAN INSTITUTE OF ECONOMIC RESEARCH, TAX RELIEF FOR ENERGY-INTENSIVE BUSINESS IN THE FRAMEWORK OF THE ECOLOGICAL TAX REFORM AND THE CLIMATE CHANGE LEVY

Introduction

I am going to discuss special provisions for business – in my opinion, one of the most difficult issues in the ecotax debate. As time is short, I've tried to set some priorities and I won't go into great detail, but will try to give you a rough idea of the ecotax reform in Germany. I intend to focus on Germany, because I have discovered that it is very difficult to say something about policies in other countries when you have not been closely involved in the debate. I will try to give you an economist's view on how one should approach the issue of special provisions for energy-intensive business.

My presentation is structured as follows: first of all, I will give you a brief overview of ecological tax reform in Germany; then I will try to define special provisions, or tax concessions, or whatever you like to call them; then I will look at some of the motives, criteria, and constraints for such provisions; and finally, I will look at tax concessions as they have been designed in Germany and the UK and try to give you some perspectives on the debate in Germany.

Ecological Tax Reform in Germany

Germany embarked on their ecological tax reform in 1999. It was supposed to be a revenue neutral tax reform, i.e. a tax reform consisting of two components: on the one hand, an increase in energy taxation, on the other hand, revenue recycling by means of reductions in social security contributions amounting to approximately the same volume. The energy taxation consisted of an increase in taxes on petroleum products and a new tax on electricity, incorporating special provisions for energy-intensive production – what I will focus on today. The additional revenue raised by the tax amounts to about €18.6 billion.

TAX RATES IN GERMANY (EURO PER GIGAJOULE)

[Chart showing tax rates for various energy sources before April '99 and tax increase from 1999 to 2003.

1) Average efficiency
Special Provisions: Definitions and Motives

It is very hard to find a general definition of special provisions, so I will try to give you an impression of the economic flavour of them. As Stephen Smith said this morning, economic theory states that uniform taxes are an efficient way to induce a reduction of energy use or emissions. This is the point of reference we are starting from. But there are deviations from uniform taxation – and these deviations are what I want to consider in the most general sense as special provisions. Such tax differentiation takes place on several different levels: for example, there is tax differentiation on the level of energy carriers, between different users of energy and different usage of energy.

What are the motivations underlying special provisions? The main motive seems to be fears that these taxes may have adverse effects. On the one hand, these effects may be economic: there is the issue of international competitiveness, the fear that there may be a premature retirement of capital – physical as well as human – and the fear that there may be unacceptable distributive effects. But there are also environmental concerns, that these taxes may lead to what is called ‘carbon leakage’ – the relocation of production away from the country where taxation is increased to other countries, which may partially offset or even overcompensate for the reduction of CO2 emissions in the country itself. However, because the environmental problem we are facing is global, it does not make sense to undertake unilateral measures against carbon leakage in the long run – even within the framework of international agreements such as Kyoto, individual countries are required to reduce domestic emissions and, as relocation of production is treated in the same way as an increase in energy efficiency or fuel switching, countries are likely to fulfil this obligation in the cheapest way possible, even if this implies carbon leakage. For this reason, managing structural change seems to be the only valid cause for special provisions in the long term.

What it generally seems to boil down to, however, is political acceptance. Politicians seem to believe that without some kind of special provisions, it will not be possible to introduce environmental taxes.

Special Provisions: Constraints and Criteria

Primarily, as I already mentioned, special provisions aim to avoid negative economic effects and to avoid carbon leakage. But the issue is more complex: the incentive effect of an ecotax must be preserved, because if it is not, we do not need to introduce an ecotax at all. There are also legal constraints on national, European and international levels, e.g. world trade organisation law. There are administrative constraints: special provisions should not be so expensive and time-consuming that business has good reason to complain. On the other hand – and this is a point that economists very much stress – ecotaxes are supposed to be market-based instruments: special provisions contain an inherent risk of discretionary decision-making, meaning that it is not the market which rules the process, but the decision-making of bureaucrats.

These are conflicting objectives and therefore, some kind of process of weighing up is necessary. For this reason, we will never find one clear answer or one right type or way to have special provisions. Different countries decide this in different ways and there are good reasons for whatever countries decide to do – the most important thing is that countries are aware of why they are doing what they are doing.

Demarcation of Beneficiaries

One of the most important questions which has to be addressed when you want to introduce special provisions is who is to profit from these special provisions. One of the issues where these criteria have to be taken into consideration is that the more precise the demarcation of the beneficiaries – the more precisely you define those enterprises subject to international competition and unable to pay for this tax – the more information is necessary. The more precisely you are able to identify such companies, the less the loss of associated incentives and tax revenues will be. But at the same time, there is a risk that precise definition may result in administrative procedures becoming so complicated and subject to lobbying that the system becomes unacceptable from the point of view of an economist.
My conviction is that in the long run, we need environmental taxes as a market-based instrument – and if we are on our way to a sustainable market economy, then we should try to avoid discretionary decisions in the context of special provisions as far as possible.

**Special Provisions in Germany**

In Germany, broadly speaking, special provisions have two main characteristics: they do not apply to road fuels, and they are based on a broad and rules-based system. Germany has tax rates differentiated by energy carriers, reduced rates for broad-based categories of business or industry, and firm-specific tax rebates.

With reference to tax rates differentiated by energy carriers – in Germany there is no tax on coal, which is basically due to the fact that industries that use coal are very often energy-intensive industries subject to international competition. There is also a huge difference between taxation on diesel fuel and gasoline, which has always been justified by the fact that road transport, freight transport, is in international competition. Thus, differentiating tax rates on energy carriers is one way of protecting certain kinds of business.

**Three Options for Special Provisions**

I will now discuss three options for implementing special provisions which have been discussed or implemented in Germany at different points in time. The first is a draft law that has never been implemented. This law stated that there should be reduced rates of 25 percent of regular tax rates for all producers of the goods and materials sector (i.e., manufacturing industry, energy/water, mining and the construction sector) as well as agriculture, forestry and fishery, and that there should be tax exemptions for producers belonging to energy-intensive sectors – where energy intensity was defined at a rate of more than 2 percent.

This proposal has been heavily criticised. One of the reasons was that energy intensity itself is an inappropriate indicator of the burden resulting from energy taxes. Take the case of an industry that mainly uses coal: they might have a high energy intensity but a low energy tax burden, because there is no tax on coal. Another criticism was that statistical categories imply unequal treatment. That is, broad statistical categories cannot tell you what the specific activities are within these broad categories. Furthermore, there is a net reduction of the tax burden for energy-intensive industries – on the one hand, they don't pay energy taxes and on the other, they profit from a reduction in social security contributions. So there might be what economists refer to as a perverse incentive effect – that these industries are given an incentive to growth because of their reduced tax burden.

In response to these criticisms, a revised proposal was drawn up, which was actually implemented in 1999 and was enforced until the end of 2002. This incorporated a reduced tax rate of 20 percent of the regular rate for all producers in the goods and materials sector and then, individual compensation for all tax payments that exceeded the reduction of pension contributions by more than 20 percent – i.e., there was a tax cap.

How does this compare to what we had before? Firstly, there is no perverse incentive effect. Individual company data is used and not statistical categories for tax rebates. But still, there is a restriction to the goods and materials sector which may imply unequal treatment and in fact, this issue was brought before the German constitutional court, which ruled that this unequal treatment was not unconstitutional.

Furthermore, this ecotax does not create an incentive to improve energy efficiency for energy-intensive enterprises: once these industries are above the threshold, increasing their energy intensity or even reducing it will not change their tax burden. However, this regulation was changed in 2003. Whereas the reduced tax rate was previously 20 percent of the regular rate, this has been increased to 60 percent of the regular rate for all producers in the goods and materials sector. It was argued that this was possible because companies had had a couple of years to adjust to the new tax regime. The tax cap system was also changed and now, tax rebates are 95 percent of the tax payments which exceed the reduction of pension contributions. This means that there is at least a slight incentive for energy-intensive industries to reduce their energy intensity, but they nevertheless pay in effect only 3 percent of the regular tax rate.

Thus, if we compare the two structures, we can say that the incentive effect is higher for some enterprises and lower for others. The net effect on energy use is thus ambiguous. However, the average tax burden is higher for most enterprises and there is a positive revenue effect. I personally have been quite critical of the reform of these special provisions, because I think there is a certain danger that revenue raising may start to dominate environmental objectives. It might be that the finance minister gets used to having the extra money, but doesn't really care about the environment enough.
Special Provisions and the Climate Change Levy

I do not wish to discuss the Climate Change Levy as a whole, but to look at some of its special provisions compared to what we have seen in Germany. In the UK, there are some tax exemptions and there are two important points in this context. The first one is there is a general exemption for electricity used in electrolysis processes, such as aluminium smelting, and chloro-alkali processes. This means that from the first, some of the most energy-intensive processes in industry are exempt from taxation. The other thing that is important in this context is the 80 percent tax reduction granted to energy-intensive sectors. Again, this exemption is based on a broad statistical definition, which I criticised in the German context. On the other hand, this exemption is only granted to enterprises or sectors covered by Climate Change Agreements. This is an important point, because what I think it shows is that what Germany did was surrender the idea of providing a strong incentive effect through ecological tax reform. In the UK, only those companies prepared to enter into a Climate Change Agreement with the government were granted this tax reduction.

Climate Change Agreements are also a very difficult issue, however, and Stephen Smith and others already mentioned what the problems might be (see above). It means that the government has to negotiate these agreements with sectors and enterprises, that government is supposed to know to what extent an enterprise is able to reduce its energy use and to what extent an enterprise is subject to international competition.

In this respect, the UK and Germany drew on two different models for their special provisions – on the one hand, the German model acknowledges that we probably cannot create that much of an incentive effect in the case of energy-intensive industries. On the other hand, the UK system still wishes to create this incentive effect by means of negotiating agreements and it is these agreements, their associated administrative costs, the time-consuming nature of the process and the quality of this process which will decide in the end whether we reach our targets or not.

Perspectives for Germany

Let's move on to some perspectives for the German ecological tax reform in the future and what this might mean for special provisions. Ecological tax reform in Germany will be reviewed in 2004 and one of the most important questions will be whether Germany should continue with the ecological tax reform – and in my opinion, Germany certainly should, even if we do have emissions trading. This is because we only have partial emissions trading – only large installations are covered by emissions trading and we do need incentives in other areas as well – especially transportation and private households. Furthermore, I think the idea of the double dividend, reducing labour costs with ecotax revenue, is sensible and has a strong basis in economic theory. If you want to reduce energy consumption and you can do so and raise revenue at the same time, basically all research shows that this is a good thing to do, because it helps you to raise revenue without causing distortions in the system.

Should the emissions trading sector be exempt from the energy tax, or the ecological tax reform in this case? Well, no, I don’t think so. This sector also profits from the reduction in social security contributions and thus, as long as emissions certificates are issued for free, I think this sector necessarily has to contribute to the financing of the reduction of these social security contributions.

What does this mean? It means that the issue of special provisions and how to design them will not go away. The bad thing about this – I have not seen any good, convincing answers to this issue. This may be bad news, or it may be good news for the researchers who will have a look at this issue in the future.
I would like to do three things. Firstly, give you an insight into how the automobile industry works and functions; secondly, to show how this effects customers; and finally, to focus on the ecological tax reform itself.

**The Automotive Industry Today**

First of all, the automotive industry does not provide its own fuel – it simply designs and builds vehicles and sells them in the hope that sufficient fuel is available to run them. The chart below shows that the oil industry will obtain maximum production in around 2006 and after that, crude oil extraction rates will gradually decrease over time. We can already safely predict that oil prices will rise during this period – but it is too early to tell whether these prices increases will be gradual or not. Extraction of North Sea oil already peaked in mid-2001 and has been decreasing ever since.

**The Situation – Crude Oil Resources**

There is considerable uncertainty regarding how long crude oil resources will really last. Different sources provide different forecasts – from 60 to 160 years – for example because the East Asian states are rapidly industrialising and motorising, particularly the Chinese economy which itself encompasses 1.3 billion people and are likely to claim an increasing share of crude oil resources in the future.

Obviously, the automotive industry is very much aware of this uncertain situation, just as they know that increasing traffic and industrial site concentrations causes more noise and more emissions that have a detrimental effect, particularly on urban areas. Thus, the vehicle industry has set out to create the strategy of “sustainable mobility” – for the simple reason that they want to continue to build and sell vehicles.

“Sustainable mobility” in their sense comprises almost every aspect of vehicles: fuel consumption, exhaust emissions, production process efficiency, affordability. But changes are done in line with customer demands and their broad spectrum of wants and needs. So changes appear to be slow – and one might suspect that there are other reasons for the automobile industry to behave in this way.

In the West, the demand for mobility is saturated – there are no new additional customers available. If sales increase, they are conquest sales. Production capacity has exceeded demand by approximately 20 percent for many years. This has led to more competitive action and depressed margins. To lower the total cost bill and regain sufficient margins, OEMs (Original Equipment Manufacturers) have reduced their costs by effec-
tively outsourcing research and development of components and even modules to their suppliers. The result was that technology has also become available to new competitors in low-cost countries, e.g. Daewoo, Hyundai, and others, because suppliers in turn sold the technology and products to as many customers as possible in order to minimize their rising research and development costs. This has enabled the low cost country based OEM’s to manufacture and sell vehicles at a sufficiently good quality and durability at considerably lower prices and hence this has led to further a margin depression. The result is that now, any investment in research, development or in new plants must be amortised within even shorter time spans, and the timing of this has once more become crucial for the profitability of the investments. In short, the OEM’s do not have funds available for ‘deadlock investments’ that do not turn into mass products.

In conclusion, the automobile industry has exceeded its cyclic maximum: it is a “ripe industry”.

Customer Demands

Generally, consumers focus on three things. They want vehicles that are more roomy and more powerful and hence, bigger ‘van-type’ cars have become increasingly popular, requiring engines with more power which usually consume more fuel than before. Consumers also want a greater degree of comfort in their vehicles. Thus, more vehicles than ever have electrically powered windows and door-locking systems, air conditioning, power-assisted steering and even on-board TV and video. As a result, vehicle weight and size has increased, undermining the positive effects of improvements to the fuel efficiency of vehicle engines and reductions in exhaust gas emissions.

The effect of German and European legislation

Legislation has forced vehicle manufacturers to do a lot to reduce harmful exhaust gas emissions, e.g. to add catalytic converters and particulate filters to their vehicles – new, costly parts – and to comply with more complex test procedures. Furthermore, legislation has stipulated improved passenger and incident security, which has meant increasing the number of crash tests, the installation of air bags, etc. Stipulations for noise reduction have led to the development of low noise tyres and new engine and body dampening materials, which have also made vehicles much heavier than before.

As well, the ecological tax reform has been introduced to address CO₂ issues. The ecotax has focussed the consumer and OEMs on the issue of CO₂ emission-reduced mobility, which has prompted fuel and cost efficiency improvements. The ecotax also led to the shift from petrol to diesel engines for the customers tried to lower their fuel bill. The fiscal support of alternative fuels, particularly CNG (compressed natural gas) has led to a CNG fuel pricing in Germany at about half the price of petrol and 65 percent of diesel. This fuel taxation measure has been extended until the end of 2020 – and hence, has shifted the focus of the OEMs to alternative fuels with more force than anybody expected.

Let us take Ford as an example. Ford produce vehicles that run on almost all kinds of alternative fuel: they are researching FCV (fuel cell vehicles)/hydrogen engines and hybrid alternative fuel concepts and today, they already have ethanol, natural gas, and LPG (liquefied petroleum gas) vehicles. Notably, the latter were especially developed for the congestion charge in London – a clear example of research and development as a reaction to government policy. Other companies are also taking action: BMW are developing hydrogen-reciprocating engines for the future; DaimlerChrysler already have natural gas vehicles and are working towards producing FCVs; Opel/General Motors produce natural gas vehicles and are developing FCVs/hydrogen engines; finally, VW also have natural gas vehicles and are researching synthetic-fuel generation, so called Syn-fuel (methane/natural gas-based) and sun-fuel concepts (biomass-based).

The View of German OEMs today

Investments in research and development or new production facilities are extremely expensive – building one new vehicle with one new engine costs – including R&D and tooling – approximately 1 billion euros or dollars. Therefore, OEMs have some issues with doing something that is not immediately necessary, particularly within the current competitive environment, which forces mass production to achieve viability.
OEMs in Germany more or less regard governmental regulations as a risk to their competitiveness, particularly as here in Germany more than 70 percent of vehicles and automobile products are exported and every seventh job in Germany still depends on the vehicle industry. Self-commitments like the ACEA CO₂ commitment represent the strategy the automotive industry would prefer, particularly in lieu of “prematured” governmental regulations. The automotive industry will certainly ask for government support in the future for the research, development and launching of new alternative fuels at the move away from our current crude oil based fuels.

Conclusions and Recommendations

In conclusion, OEMs do not actively support governmental actions like the ecotax reform, but they watch them and they react to them – and this is an achievement in itself.

The depressed margins of the automotive industry need to be carefully considered when further measures are introduced to avoid production transfer to other countries.

European coordination and the synchronisation of the implementation of measures is a prerequisite for the acceptability of ecological tax reforms. When future actions are implemented, they should be developed jointly by all the market partners involved and well in advance of their planned implementation.
GEORG RIEGEL, FOUNDER OF DEZEM GMBH,
ENERGY TRANSPARENCY: BRIDGING THE GAP BETWEEN HUGE ENERGY-SAVING POTENTIALS AND THEIR ACTUAL REALISATION BY STAKEHOLDERS IN LARGE ORGANISATIONS

1 Introduction

In this presentation I would like to focus on:

- eco-taxes & their alternatives – a personal perspective
- introducing an astounding market deficit
- and its grand solution, “energy-transparency”

2 Prices Do Matter

First of all, I strongly believe that prices do matter. For this reason, we should never align prices in the market against our societal goals, be they environmental – e.g. the consumption of energies that are environmentally relevant – or otherwise. The following diagram exemplifies this argument.

**Gasoline Prices in Relation to Per Capita Gasoline Consumption**

So prices do matter – and as we do influence and change prices in any case, we should be conscious of the necessity of not changing prices in a way that will hinder the achievement of our goals.
3 Guessing “Real” Instrument Costs

In the following diagram I have attempted to depict my best estimate of the real costs of alternative instruments for achieving CO₂ abatement goals per unit of climate benefit.

**REAL INSTRUMENT COSTS IN RELATION TO CLIMATE BENEFIT**

Regulation has a high cost associated with it per tonne of CO₂ abated as a result. The spread of these costs does not depend particularly much on the regulatory system, i.e. it does not vary that much.

Emissions trading schemes have a much larger spread of costs. Based in particular on my experience in South America, I believe that their cost can be much higher than that of regulation – if a trading scheme is implemented poorly or in the wrong arena. However, in ideal settings it can also be considerably lower than in the case of regulation. The costs of implementing emissions trading throughout the EU are much higher than many people would estimate, also due to the large number of service providers – consultants, lawyers – which have sprung up as a result of the policy. The amount of money that is actually invested in CO₂ abatement is relatively small.

The CDM (Clean Development Mechanism) and JI (Joint Investment) projects also tend to involve similar elevated hidden costs.

The costs of C.A.F.E. (Corporate Average Fuel Economy) per unit of climate benefit, which establishes standards for passenger cars and light trucks in the USA and which apply on a fleet-wide basis for all vehicle manufacturers, are absolutely horrendous. The implementation of this policy has even resulted in counter-productive developments.

In contrast, ecotaxes, even if they are poorly implemented, do not reach the cost levels per unit of benefit that characterize the other instruments. However, the political cost of ecotaxes is probably the highest: Their effect of increasing certain prices is “too transparent” (although it is precisely this transparency that makes eco-taxes so powerful, effective and efficient). Thus, for politicians, there is very little to be gained by the implementation of ecotaxes. Ecotaxes will continue to face a great deal of resistance, but the ratio of climate benefit per unit of political effort is probably still the best if we continue favouring ecotaxes over other instruments.
4 An Astonishing Market-Deficit

There may be a means of resolving the political cost associated with the introduction of ecotaxes. What I refer to as an “astonishing market deficit” can be best characterised by multi-billion-spending on relatively small environmental improvements (e.g.: investment in the car industry, exhaust emissions) while the enormous and economically viable conservation potentials in the consumption of energy, water, etc. remain almost untouched and ignored by companies and other large organisations – and have been for decades.

For example, DaimlerChrysler has an annual electricity bill of some 500 million euro. The company employs hundreds of people dedicated to lowering these costs and professionals agree that the economically viable potential savings are probably in the region of 20 percent – at least – which would mean savings of 100 million euro per annum. For any enterprise, savings of this magnitude are extremely interesting. Nevertheless, these saving potentials have not yet been realised.

Of course, this raises the question of whether ecotaxes and prices are the wrong mechanism. In my opinion, while they are the best mechanism in principle, what happens in practice is that these price incentives do not reach the relevant actors in key segments of the economy. The relevant actors in relation to energy use within a large company are not primarily the energy experts, but employees at large, top management and purchase departments – who do not know anything about energy, who do not know what a kilowatt hour really is. Thus we can identify an information gap, a communication problem – and a market deficit.

5 The Problem

Primarily, the problem rests on the fact that actual measurements of energy consumption are far too scarce – they do not occur often enough to enable us to implement user-pays principles or similar measures – and they are too centralised as well.

Cost centres, for example, pay their energy bills based on square metres, in a socialised manner, but this does not bear any relation to the energy they actually consume, to a user-pays principle. Purchase departments consider the sticker price of an investment and not its long-term cost aspects, which for most buildings and production facilities, machines, etc. is much higher than the sticker price. Moreover, facility managers usually feel no real incentive to conserve energy for their clients – it is not part of their contract, for the simple reason that energy use is currently not measured enough to be worked into such contracts.

In short, energy-cost related transparency and incentive systems are particularly lacking at the lowest levels of large organisations.

6 “Radical Energy Transparency”

Having researched this topic while working at Daimler-Chrysler, I founded a new company, the dezem GmbH in February 2003. Radical energy transparency is the company’s goal – and to create a new quality in energy conservation. I had many opportunities to identify the clear necessity for this kind of transparency and how to do it, to make it palatable to the actors I want to address, to our target groups. Large conservation potentials abound in the distributed consumption of energy, conservation potentials of 20 or even 50 percent. Yet surprisingly little is being done.

Dezem’s three theses are: firstly, that conservation options and success monitoring must be made extremely easy to understand for top management and everyone else involved, because you cannot expect top managers to know about energy issues; secondly, technical and behaviour-based measures are equally important, because behaviour-based measures are necessary to transmit information on energy conservation to lower levels of an organisation; and thirdly and most importantly, this message must reach target groups emotionally.

7 DEZEM’s Contribution: Transparency

Dezem contributes technologies for monitoring en masse – we develop hardware modules that do this at low cost.

- We provide easy-to-use transparency for professionals, top management and unskilled workers: detailed/relevant/real-time/mouse-click information in money terms – not in physical terms only.
- This information is all available on the intranet, so that every worker has full and easy access from their own workstation.
- Clear-cut success-monitoring for all activities.
- New services based on complete energy and cost transparency.
- Development of incentive systems and “stories” for the emotional component in implementing reductions in the cost of energy, water, etc.

8 The Need for and Implementation of Energy Conservation Measures

The base-level energy consumption of a typical office building amounts to more than 50 percent of its total consumption overall. This 50 percent is almost completely unnecessary. Dezem currently has some 65 large office buildings online in their energy consumption and in no case has base consumption been less than 50 percent of the total before starting each project. This is something that everyone can understand immediately: there is a great deal of potential here and not only to save 3 or 4 percent, but to save much more.

It is possible to reduce the energy consumption of an office building by 50 percent within one year. Dezem makes detailed measurements of consumption to enable the immediate identification of concrete saving options. For example, when floor lighting in an office building has been reduced by 57 percent based on a simple measure, we can relate this measure to the actual costs saved. This enables us to estimate amortisation times accurately.

Even "peanuts" matter: Installing movement sensors in the toilet lighting on one of our client's office buildings saved 160 euros per pair of toilets. As the client has some 1,000 toilets, they are now able to save 160,000 euros per annum just as a result of this simple measure. It was important, however, to make employees understand the idea behind the measure first.

9 Dezem’s Usual Project Steps

Step one:
- visualisation of the consumption patterns of the client's office buildings or production facilities on one attractive platform and in real time, via either internet or intranet.
- ranking and benchmarking of those facilities, based on those online-measurements, according to simple criteria.

Step two:
- inserting more measurement points to create greater transparency reflecting the needs arisen from the above ranking: building sections, machines and – if necessary – down to the individual wall outlet; all on the same platform.

Step three:
- development of incentive systems to ensure the involvement of all relevant groups and actors.

10 Conclusion

Emotionally attractive energy transparency:
- is able to resolve the above market-deficit and as such it is a catalyst to lower the political cost of ecotaxes
- bridges the gap between saving-potentials and actual success
- brings life into the issue
- makes energy costs a matter of choice

Thus, smart energy transparency should lower the political cost of ecotaxes and catalyse progress toward climate protection, because people are thus empowered to tackle the issue. In all probability, companies will be able to lower the base of what produces the cost far more rapidly than the tax will increase, and thus, improved energy transparency can catalyse a great deal of progress towards climate protection.
SESSION 3, ECOLOGICAL TAXATION IN GERMANY, DISCUSSION

Kai Schlegelmilch, Green Budget Germany, Moderator: One comment: in relation to energy conservation at a macro-level, for the first time since the foundation of the Federal Republic of Germany back in 1949, transport fuel sales have fallen for 4 consecutive years – which is at least partly attributable to the ecological tax reform. As well, sales of 3 and 5 litre cars have increased considerably, and the number of passengers using public transport have also increased steadily over the last five years.

Guy Turner, Enviros Consulting: A question to Michael Kohlhaas – is draft law 3 of the ecotax reform currently implemented? And if so, what is the net impact for industry in terms of industrial energy prices – I didn’t understand the level of tax that businesses are going to be paying under that law. In the UK it was an increase of 10-15 percent and I would be interested to hear a comparable figure.

Michael Kohlhaas, DIW: Draft 3 is currently in force. As to your second question, I do not have the comparable figures.

Helmut Jansen, German Finance Ministry: Mr. Kohlhaas, Dr. Dübel – you said that lower tax on diesel was to protect the transport sector, but this is incorrect – the main reason was to support the development of modern diesel technology. Moreover, diesel passenger vehicles have increased over the last few years; in this context, what do you think of having the same taxation levels for diesel, as in the UK, or even higher rates for diesel, as in Switzerland?

Franz-Martin Dübel, Managing Director of the Institute for Market Creation for Alternative Fuels: First and foremost, it is necessary to differentiate between cars and HGVs in this context: the increase of diesel engine sales has particularly taken place in the car sector because lorries, vans, etc. have operated on diesel for longer. The ecotax may have initiated more research and dedication to the efficiency of the diesel process. Emotionally at least, the impression consumers had was that they needed to find ways to reduce the operating costs of their vehicles and for this reason, they came to focus upon diesel engines. The taxation of diesel engines is more costly than that of petrol engines, but this did not compensate for the apparent fuel cost reduction on diesel. For this reason, the demand for diesel engines has increased.

Helmut Jansen, German Finance Ministry: My main question was: what would you expect from the same taxation rates for diesel and petrol as in the UK, or perhaps a higher taxation level on diesel, as in Switzerland?

Franz-Martin Dübel, Managing Director of the Institute for Market Creation for Alternative Fuels: A diesel engine is somewhat more expensive in terms of injection equipment than a petrol engine – so diesels are more costly than petrol vehicles. So if taxation rates on petrol and diesel were the same, then the number of diesel cars would fall once more, particularly in view of legislation that stipulates that passenger cars must have particulate filters, which increases all cars prices by 500 Euros. That would revert the trend back to petrol, or otto cycle engines.

Michael Kohlhaas, German Institute for Economic Research: We might in fact see such a development now that the EU Directive on energy tax harmonisation permits differentiation between diesel tax on commercial and private vehicles. Some countries might move in this direction. I anticipate exactly the same thing as Dr. Dübel. Diesel has always been attractive for car-users who drive long distances. Maybe this was another implicit motive for reducing the tax rate on diesel, to make long distance car travel cheaper.

Kai Schlegelmilch, Green Budget Germany, Moderator: The European Commission might also pick up on the proposal they once made on real harmonisation in the haulier sector, to introduce a uniform diesel taxation rate throughout the EU. However, although this proposal is on the agenda, it has not been discussed for the past one and a half years. This would represent true harmonisation, if only for the haulier sector.

Georg Riegel, founder of dezem GmbH: A question for Michael Kohlhaas – are you aware of a study that looks at the hidden costs of these instruments? Obviously there are different amounts of hidden costs associated with each kind of instrument, and these costs are differently spread. When I prepared this presentation, I thought about research in this direction.
Michael Kohlhaas, German Institute for Economic Research: I don’t think there has been a systematic study on this. There have been studies on, for example, transaction costs and administrative costs of emissions trading and taxation, and some on regulation as well, but not a systematic comparative study as far as I know.

Kai Schlegelmilch, Green Budget Germany, Moderator: The administrative costs for the ecotax reform is 0.13 percent points of the total revenues it raises. This is far lower than for other taxes, even taking special regulations and exemptions into account.

Eva Kraav, Estonian Ministry of the Environment: As in Germany, the EU Energy Taxation Directive taxes energy production as an output tax, but this means that it does not matter what kind of fuel is used to produce electricity. Where is the environmental protection in such a measure? Secondly, when only output tax is levied, how can consumers choose electricity that is more environmentally friendly?

Michael Kohlhaas, German Institute for Economic Research: I think there is one main reason for the construction of the tax as a final energy tax. If you have a primary energy tax or an emissions tax, you tax the inputs but not the electricity. If Germany were to implement input tax, then electricity imports from other countries without a comparable tax would be far cheaper than electricity produced in Germany. Because the EU does not permit differentiation between electricity from Germany and imported electricity, an output energy tax was introduced for legal and technical reasons. Of course, this does cause problems because it is impossible to distinguish between different energy inputs and there is no incentive to increase energy efficiency in power generation. As for consumer choice: in Germany today, many companies state which energy sources have been used to produce their electricity - so there is some degree of choice. Some producers give consumers the choice between different tariffs according to the structure of the energy supplied.

Eva Kraav, Estonian Ministry of the Environment: Your environment ministers should make a great deal more effort to advertise these better sources of energy and better energy producers. I think there are some differences in the new EU member states in this respect: in Estonia, for example, we have a monopoly and our producers are very much interested in this tax rather than a charge, because this tax will hit consumers and not the producers themselves.

Kai Schlegelmilch, Green Budget Germany, Moderator: There is some advertising for green electricity in Germany, but actually the most effective instrument in favour of green electricity generation is the Renewable Energy Act, which provides feed-in tariffs for companies that generate electricity from renewables, which receive a guaranteed electricity price for twenty years. This is a perfect investment situation – having such long-term security. This is how we favour green electricity.

Turning to the issue of input taxation for electricity generation again – in Germany we only tax natural gas, which is a relatively clean fossil fuel, whereas we do not tax coal or uranium. This actually hinders the development of CCGTs – very efficient Combined Cycle Gas Turbines – on the German market. We are about to phase out this anomaly, because in the EU Energy Tax Directive, Germany is obliged to completely phase out the energy tax for gas electricity generation. We hope to create a level playing field in the future.

Dr. Ulrike Beland, DIHK – German Association of Industry and Trade Chambers: Georg Riegel – I found the slide on the estimated costs of instruments very interesting and for me it was astonishing, as I would have thought that an emissions trading system is much cheaper to administer than an ecotax system. May I remind you of what our British colleagues have already stated, namely, that the administration of the British ecotax system is quite complicated. The German system is as well, in my opinion. I do not think one can be overly proud of having low administrative costs for the ecological tax in Germany, since these costs are borne by business. The German ecotax is so complicated that businesses do not understand how to apply for special purpose tax rebates and, as is always the case for indirect taxes, the administration costs fall on businesses themselves. The only administration undertaken by the government is controlling the taxation paid. In short, I doubt very much that what is calculated as administration costs is the true figure.

Kai Schlegelmilch, Green Budget Germany, Moderator: As I said, these administration costs only refer to the public sector – but I would be interested to receive the figures for the administration costs for the business sector as well.

Martin Bursík, Ecoconsulting GmbH, formerly Environment Minister of the Czech Republic: With reference to taxation on the input of electricity production. Germany is going to review its ecological tax reform and I think the situation has changed in relation to 1998 when the reform began, in at least two respects. First of all, in the new Electricity directive 2003/54/EC on opening the internal electricity market, suppliers will be obliged to provide final consumers with information regarding the origins of all types of electricity. This
requirement must be introduced into national legislation. Secondly, Council Directive 2003/96/EC on environmental tax reform permits tax to be levied on primary energy sources and on electricity as its output. These are two new inputs from European legislation which might initiate changes while negotiating new steps in the German reform.

For your interest: The Czech Republic has put environmental tax reform on its governmental program and we plan to introduce the first measures in 2007 and to introduce full taxes in 2008. The main debate will focus on if and how to differentiate taxes on primary energy sources. In view of the fact that 42 percent of CO₂ emissions come from energy production, 55 percent of primary sources are hard coal and lignite, we should introduce incentives to shift electricity production from coal to more environmentally sound energy sources and renewables.

**Michael Kohlhaas, German Institute for Economic Research:** During discussions on emissions trading in Germany, political figures told us that we do not want emissions trading to have a strong influence on the structure of electricity generation, on primary inputs. So I doubt that the current German government is interested in implementing primary energy taxation, because this is a deliberate instrument to change the structure of electricity generation. For regional and economic reasons, I do not anticipate such a policy being introduced.
SESSION 4: THE POLITICAL VIEWPOINT

SUE DOUGHTY MP, LIBERAL DEMOCRAT SHADOW MINISTER FOR THE ENVIRONMENT, EXPERIENCES AND PROBLEMS WITH THE CLIMATE CHANGE LEVY IN THE UK FROM A POLITICAL POINT OF VIEW

The Background to the Climate Change Levy

Consultation on the Climate Change Levy began in early 1998 with a report from the Advisory Committee on Business and the Environment. Then some form of levy was recommended by Lord Marshall’s far-thinking report, Economic Instruments and the Business use of Energy (October 1998). This report noted that if Britain did have a climate change levy, it would stimulate the take-up of renewable energy. In Germany, the decision has been made to phase-out nuclear energy and to replace this with renewable energy, whereas Britain has approached this issue from a different angle, saying that we want to reduce CO₂ emissions – Kyoto has put that pressure on us – and so how do we achieve that take-up of renewables? At that time, we were considering renewables, solar and wind energy and more efficient energy generation in the form of CHP (combined heat and power).

Following the announcement of plans for a levy in the Chancellors Budget 1999, a Customs and Excise consultation, parliamentary debate and Government negotiation with industry took place. Following this, the Climate Change Levy (CCL) was introduced in April 2001 through provisions in the Finance Act 2000.

The Climate Change Levy is part of a package of measures known as the Climate Change Programme (CCP) and needs to be understood in the context of this full package of measures.

The Climate Change Programme

The Climate Change Programme was published in November 2000 and detailed plans to deliver Kyoto targets and domestic climate change goals. It aimed to reduce green house gas emissions by 12.5 percent and CO₂ emissions by 20 percent by 2010 in relation to their 1990 levels.

It's main policies and measures include:

- The Climate Change Levy (April 2001)
- Establishment of the Carbon Trust (April 2001)
- Emissions Trading Scheme (April 2002)
- 10 year transport plan (£180 billion investment in public transport)
- Double UK CHP capacity by 2010
- Renewables Obligation: electricity generators target of 10 percent renewable by 2010 and 15 percent by 2015
- New regulations for energy efficiency of buildings
- Home energy efficiency scheme for domestic sector
The CCL: consultation responses & outcomes

It is worth noting at this point that if one makes political proposals, somebody – the electorate – has to agree them. Although we can impose things on companies and on people, we are dependent upon them to vote us back into power, so we have to be realistic.

The Conservatives were opposed to the climate change levy because they consider it to be anti-business – they labelled it “badly thought out, badly targeted, damaging, anti-competitive and wrong”. While competition is certainly an important argument, Conservative party resistance to environmental policy in general is such that we currently have a political vacuum on the Conservative side in the UK.

Of course, there has also been some response from industrial sectors, and the levy was opposed by those industrial sectors most likely to be affected by the levy itself. However, we have already discussed how climate change programmes sweetened the pill to make the levy more attractive to those industrial sectors – and I think a lot of good work has gone in there. In the end, the Government agreed to the following outcomes: the levy should target industrial and commercial energy use but not domestic energy use; the levy should be fiscally neutral and with revenues recycled to business; special provisions should be made for energy intensive industries; and exemptions from the levy should be made for electricity generated from renewable sources.

Although I am quite critical of the government on environment in a lot of areas, I do not have any problem in saying that one of the areas that has been more successful is working with business to make sure that we don’t use that anti-competitiveness as a barrier to dealing with climate change. The CCL was supported, albeit with serious reservations, by the Liberal Democrats and environmental NGOs that favoured a carbon tax. But we nevertheless have to see the CCL in the context of what we are doing overall. We are concerned – as the Green party is concerned – about the complexity of the levy in the long-term.

The CCL: Climate Change Agreements (CCAs)

CCAs were introduced to assist energy intensive sectors (currently 46 sectors, e.g. cement, steel, aluminium, ceramics) and require negotiable targets for energy efficiency and carbon reduction to be met (negotiated with trade associations). Businesses qualifying for climate change agreements receive an 80 percent discount on the climate change levy and the tax differential for CCAs worth around £300 million per year. In their first year, CCAs saved 13.5 million tonnes of CO₂ and 88 percent of CCA businesses met their targets.

However, while considerable savings in carbon have been made and 88 percent of targets met, it must be said that some of those savings were delivered when the UK steel-making business collapsed. The UK’s main steel-making business, Corus, was the largest contributor to carbon emissions and when that collapsed, the UK had a quick win in terms of CO₂ reduction, although it was of course extremely bad news for the manufacturing industry in the UK. That is what a lot of what the climate change levy is about – delivering quick wins – and businesses have taken the opportunity to see what else they could do. Some of these things were going to happen anyway. Indeed, some of our climate change wins have been quick wins as well. These aspects were not only important in the past, but they are important today because we have to consider where improvements to the CCL are going to come from in the future. But how will we continue delivering these benefits?

The CCL: Current Criticisms

- Inefficient and unfair

The CCL is inefficient, because it only targets certain energy users. Moreover, it is unfair, because although it is fiscally neutral on a macroscopic level, it impacts on some businesses more heavily than others. For example, the CCL generates around £1 billion per year – and one of the principle routes for recycling this revenue is a 0.3 percent discount for employer’s National Insurance contributions33, which does not include a focus on energy and can benefit non-energy-intensive businesses with a large number of employees, such as call centres. There is no environmental gain whatsoever in reducing the employment costs on a call centre – although they have a large number of people on low wages, they do not use a great deal of energy in terms of what they are producing. So the CCL benefited these sectors without environmental gain.

33 A tax on employment that goes into general taxation.
• Complexity of the scheme undermines its effectiveness

Firstly, the complexity of the CCL makes it extremely difficult to measure the effect of the CCL amid a plethora of schemes, including the Carbon Trust, which is partly supported by CCL revenues. The Carbon Trust received £69 million funding in 2003, £33 million of which was from CCL revenue. It runs the following programmes: the Action Energy Programme; the Enhanced Capital Allowances (£100-140 million pa) scheme; the Low Carbon Innovation Programme; the Emissions Trading Scheme (£43 million pa).

The scheme is also too complicated and bureaucratic, for example, in its provision for exemption certificates for combined heat and power and renewable energy generation.

• The CCL does not focus on carbon emissions

The CCL does not focus on carbon emissions but is a downstream tax on energy use.

• Little impact on SMEs

The CCL appears to have had little impact on SMEs (small to medium enterprises), indeed a survey carried out by the Federation of Small Businesses, an industry group which tends to gather in employers of 15 or less people, revealed that the CCL is virtually ignored by them. When the Federation asked their members what difference the CCL had made to their business, how they had changed their operations – and this is a very large number of small employers – over 92 percent of them said they had not responded at all. The complexity of the scheme makes it totally unattractive for SMEs to do anything. So unless they’re in an industry group which uses a lot of energy and they can coat-tail on the back of what the rest of the scheme is doing, there’s very little interest for them.

To put this in context: Lord Marshall’s 1998 report stated that 60 percent of small to medium enterprises (SMEs) were responsible for 60 percent of business carbon emissions. So the CCL has made a large impact on the big single emitters, such as high energy use plants, etc., but there are still untapped resources to be had in terms of emissions reduction. But if we wish to impact on them, we have to consider what we can do to change the scheme. With the current complicated scheme, we won’t get to those people.

• Lack of supporting policy, planning and direct investment

In the UK, there is a lack of direct investment in renewable energy sources. At present, we have a problem in the UK because electricity is incredibly cheap at the moment. This is because British Energy, the UK’s nuclear energy business, is hugely subsidised and we do not pay the full cost of ownership – as such, this company has almost gone bankrupt a couple of times and has been rescued by the government, which continues to invest a great deal in keeping Britain’s nuclear show on the road. However, we also have to bear in mind that we haven’t got such a strong renewables base in the UK as in Germany, and that the UK coal industry has been declining in a different way to the German coal industry – for different reasons and on a different economic basis. The problems Germany faces in terms of where it goes next with energy supply are somewhat different to the ones in the UK, although we could probably be self-sufficient in wind energy if we only could persuade everybody in planning to locate turbines all around the coast of Britain. However, as an overcrowded island, we face huge resistance when trying to deliver wind turbines.

Let me give you an example from my constituency. The European headquarters of BOC, the British Oxygen Company tell me they are ready to go with combined heat and power (CHP) – their electricity is their highest cost. But because they’re going to be charged a lot of money for getting onto the national grid, they are stalling on going with CHP. So the opportunity for a beneficial bio-fuel system exists, but it is being delayed until we get that problem overcome.

• The CCL has had little impact on the public

Finally, the CCL was targeted towards industry, and has thus had little impact on the general public. Unfortunately, this means that it is hardly likely to change the behaviour of the general public in relation to energy consumption and greenhouse gas emissions.

**CCL: Potential Improvements**

To improve the CCL, CCAs should be extended to more businesses, or all businesses. The revenues from the CCL must be increasingly targeted towards energy-related schemes. The levy itself must be increased, in order to strengthen the fiscal incentives for investments in renewables. The scheme itself must be simplified or alternatively, replaced with a much simpler carbon tax.
Carbon Tax: The Liberal Democrat Policy

The Liberal Democrats believe that we need to move towards a simpler system that directly and transparently targets carbon, i.e. a carbon tax, similar to the European system. We believe that the CCL should develop in this direction. A carbon tax would have many advantages. It would harmonise easily with other EU countries that already have a carbon tax or will in the future, it would reach the small businesses that do not qualify for the Emissions Trading Scheme, and it would impact on the domestic sector – although additional measures would be necessary to protect the less affluent against fuel poverty. Moreover, it would reach the transport sector, could be expanded to include aviation fuel in the long term. Such a tax could also introduce measures to assist carbon intensive industries – although this should be limited in terms of time – and is favoured by environmental NGOs and the Royal Society.

Conclusion: The Need For More Renewable Energy

It is going to be interesting to see how we can make sure that we have a cap on emissions, that we have trading, that we have the opportunity for auction. It will be interesting to see if the UK actually lets electricity prices rise to their true cost – in this regard, the Liberal Democrats would not subsidise British Energy because of the huge cost of ownership, and this would certainly push up energy prices. But that doesn’t solve the problem of the dirtiest industries, because nuclear is not our dirtiest producer of electricity.

But one thing that the UK has to do is create trading arrangements which are very much better in relation to renewable energy. We have still failed to include renewable energy sufficiently in the UK, because our pricing arrangements are wrong and in this respect the UK’s trading arrangements need tweaking – they’re not attractive at the moment to business. Until we get renewable energy that’s really working that won’t happen.

Although we in the UK are taking these quick wins and saying that we are progressing well towards our Kyoto targets, what we forget is that we have very happily failed to develop our alternative energy market in the way that Denmark has done, in the way that Germany has done, that we are not exporting a great deal. What we are exporting is very dirty technology. In fact, the environmental audit committee found that almost all our gains and wins on Kyoto at home are almost completely negated by our dirty exports.
Introduction: A Landscape of Conflict

First of all, I would like to say that the ecological tax reform is a success story in Germany, but nobody knows it. This is one of the policy’s key problems. Although I'm afraid not everybody shares this point of view. The context of the ecological tax reform in Germany is a landscape of conflict.

The background to the implementation of the ecological tax reform was as follows: resistance to ecotax was strong among the German public, and public debate was extremely polarised and very extreme. Demonstrations attended by miners, truckers, and farmers were held against the ecological tax reform in front of the Reichstag. Worse still, politicians from German opposition parties went out to support the demonstrators and to show them solidarity – which was good for their reception in the public eye, but was definitely very problematic in terms of policy-making.

Another enemy of the ecotax was the Bild Zeitung – the German equivalent of the Sun – which published extremely polarised arguments against the reform. The German Industry Association (BDI) was very much opposed to ecotax reform, as was the German Car Drivers Association (ADAC). Another problem was that support was quite weak from the environmental camp, at least in the beginning, because they regarded the reform as too weak and not far-reaching enough. Furthermore, those who really profited from the ecological tax reform, those who make money from energy efficiency, from energy conservation, from home insulation, from renewable energies and so on, didn't strongly support the ecological tax reform either.

So for these reasons, the situation was somewhat frustrating, at least during the first two years when we were introducing the reform.

Nevertheless, we were re-elected in 2002, ironically enough for two energy-related reasons. The first was Iraq, as many believed that there was a hidden oil-related agenda behind the Iraqi war. Secondly, there was an enormous flood in Germany in late August / early September, just four weeks before the elections took place, and a lot of people thought that this was probably related to climate change and the way we waste energy. At the end of the day, the situation was good for the government and for the Greens, because when the government was asked what it had done to combat climate change, to promote energy conservation, to reduce our total dependence on oil imports, we were able to give some answers, including the ecological tax reform.

In the coalition agreement between the Greens and the SPD, we agreed to re-evaluate the ecological tax reform in 2004. We want to consider if and how we will develop the ecological tax reform in the light of energy prices, the economic situation and our previous experience with the reform.

The Instrument Mix

The Green party believes that ecological tax reform is only one element in a mix of instruments for ecological fiscal reform. Some have already been mentioned, standards have been laid down in some areas, and there is strong state support for renewables in Germany, not only through subsidies, but also by means of a mechanism that we call the feed-in Directive. This means that everyone that generates electricity from renewable sources and feeds it into the national grid is offered very attractive conditions – and this has increased the share of renewables enormously. Our national target is to increase the share of renewables by as much as 20 percent by 2020 through this law.

In view of this extremely wide range of instruments, one of our most important political tasks is to make these instruments as compatible and as coherent as possible.
The Ecological Tax Reform: Implementation and Impact

The ecological tax reform was implemented in five stages, starting in 1999 and running to 2003. Taxes on gasoline were increased in five stages, an electricity tax was introduced and increased in five stages, tax burdens were applied to gas and oil for heating purposes. Interestingly, 90 percent of the revenue raised was used to reduce ancillary wage costs – what is referred to in Germany as pension insurance. This rested on the age-old philosophy of killing two birds with one stone – improving energy efficiency, reducing CO₂ emissions and creating new jobs at the same time. Five percent was used for improving home insulation and for renewable energies, and the other five percent was used for the consolidation of the budget.

I think the underlying idea behind the tax is still is a very good idea. Particularly because in Germany we have a comparatively low level of direct taxes – in this case, we are low down in the European ranking. In terms of indirect taxes – consumer taxes – we are somewhere in the middle. But in the third tax category, ancillary wage costs, we are right at the top of the leader board. We effectively penalise the creation of jobs. This is still the key problem in Germany. Restructuring the tax system away from high ancillary wage costs and towards indirect taxes is still a very necessary measure and a good general approach which does not have much to do with energy or climate protection but has a great deal of relevance in relation to our poorly structured tax system.

Thus, the ecotax substantially reduced ancillary wage costs. Without the ecotax, the contribution of employers and employees to the pension insurance would have been 21.2 percent and now it is 19.5 percent – which is almost 10 percent less, a significant amount. As regards the environment, gasoline consumption fell constantly in Germany from 1999 onwards by about 2 percent each year. It is difficult to attribute this development directly to the ecological tax reform, as it is largely attributable to the general development of gasoline prices, but nevertheless, these changes are also as a result of the ecological tax reform and the general public perceives them as such. Additionally, consumption in private households was reduced by between 0.5 and 1 percent every year. This is a very fundamental change compared to the period from 1990-1999. At this time, in energy consumption in the private household and traffic and transport sectors was increasing rapidly, a trend that was broken in 1999 – and in these areas, consumption has been falling ever since, albeit modestly as a result of the ecological tax reform.

We also introduced other legislation in the period, including tax exemptions for bio-fuels and for gas in electricity generation if it is used in highly efficient power plants, i.e. combined heat and power plants. To sum up, the ecological tax reform has been a relevant instrument over the past 5 years.

Future policies

The question is now what to do in the future – as I said, the Greens wish to re-evaluate the tax in 2004. What I would like to propose is what I would call a three basket approach. The first basket is for the removal of environmentally harmful subsidies; the second is for tax incentives for more environmentally friendly behaviour in the existing system; and the third is for ecological tax reform.

The first basket for the removal of environmentally harmful subsidies is geared towards lessening the considerable number of environmentally harmful subsidies in the German system, such as subsidies for housing or commuting. This costs the taxpayer € 25 billion per year in total. Reducing these subsidies is a huge challenge, because the interest groups involved are well organised and powerful, but we are quite optimistic that we will be able to make a difference in relation to households and commuting – at least this is most likely – so this is our first aim. We could use the revenues saved for future-oriented purposes, such as education, research and development, etc. This is the will of the government as a whole.

The second basket aims to create tax incentives in the existing system, as we would like to create a more environmentally friendly tax system. There are a great many tax distortions in Germany – for example within the Value-Added Tax system, where there is no VAT on air tickets, but there is on rail tickets. What we will present soon is a proposal to increase VAT on air tickets and to reduce VAT on rail tickets in the inner-European transportation system. This would allow for fairer competition between rail and air travel. Another example is car tax. We wish to restructure the system to provide more incentives for low-emission cars, to provide incentives to drive more efficient vehicles, to reduce particulates.

The third basket refers to ecological tax reform in general. We have agreed on a timetable saying that we wish to present our results to the general public in October 2004. We have to learn from our mistakes, not only in terms of communication, but also because channelling fresh money from the ecotax into the German pension system overshadows the need to reform, restructure and modernise the system as a whole and bring it into line with demographic realities.
Conclusion

In conclusion, we should maintain the relationship between indirect consumer taxes, energy taxes and ancillary wage costs, but we should not channel all the revenues raised into the social system. Perhaps we should simply leave it to parliament to decide how it should be used. The more money is earmarked, the more the capacity of parliament to shape the future is reduced.
SESSION 4, PANEL DISCUSSION WITH THE SPEAKERS

Moderator: Anselm Görres, Green Budget Germany Chairman

Panel:

- Sue Doughty MP, Liberal Democrat Shadow Minister of the Environment
- Franz-Martin Dübel, Managing Director of the Institute for Market Creation for Alternative Fuels
- Christos Liolios, European Commission, DG Taxation and Customs Union
- Reinhard Loske, Vice-Chairman of the Green Group in the German Parliament
- Guy Turner, Enviros Consulting

Eva Kraav, Estonian Ministry of the Environment: I know that there were energy taxes on fuel in Germany before 2001. I understand that these taxes were spent on pensions reform – they were earmarked – and that this process was labelled ‘ecological tax reform’. But now, I would like to know where this reform is? You had these taxes before 2001 – where was the reform here?

Secondly, where are the limits of this reform? How much would you like to increase these energy taxes by?

Dr. Alfred Rädler, Green Budget Germany Advisory Board: I think that one important point was missing in our discussion of reform in Germany – the European aspect. We have an internal market within the European Union, and the internal market as it exists today limits national possibilities of increasing taxes on petrol and diesel. If we increase taxes too much, consumers, particularly those from the transport industry, simply go abroad to buy diesel.

Anja von Moltke, United Nations Environment Program: The United Nations has been interested in the use of incentive measures and taxes for a long time and although we focus on developing countries, the issues are much the same everywhere. One of the focuses of our work has been on subsidies – the environmentally harmful nature of subsidies and their market distortiveness.

I’m glad that this issue was brought up in Reinhard Loske’s presentation, but I felt this was not sufficiently addressed by the other speakers today. So my question is to the other speakers: to what extent are the efforts being undertaken with regard to ecological tax reform compatible with the existence of environmentally harmful subsidies?

Guy Turner, Enviros Consulting, panel: With reference to the question of intra-EU competitiveness: yes, it’s clearly an issue, but as Europe tends towards greater harmonisation, I think the issue is becoming increasingly an issue of extra-EU competitiveness. If you look to the legislation on the European emissions trading Directive, when DG competition looks at state aid or issues regarding the allocation of emissions allowances they give member states flexibility for allocating allowances where there are extra-EU competition issues, but not when there are intra-EU competition issues.

Reinhard Loske, Vice-Chairman of the Green Group in the German Parliament, panel: The ecological tax reform is not a case of re-naming. The figures show that in 1998, when we came to power, the share of energy taxes on the total income of the federal government was 7 percent. Now, after five steps of ecological tax reform, it is 8.7 percent, so there has been some development. Of course, we did have energy taxes before this. We did have gasoline taxes and we increased them. We did have taxes on gas and oil for heating purposes and we slightly increased them. But we did not have taxes on electricity, so we introduced and increased them. This was really restructuring – we earmarked the money for a special purpose, for the reduction of pension payments.

Secondly, on the question of limits – the German Green party learnt a bitter lesson in this respect during the 1998 election campaign, when we said that a litre of gasoline should cost 5 Deutschmarks, that is, two and a half Euros. We dropped in the polls from 8 to 4 percent – a considerable drop. But our main argument has been and still is that there are limits to taxation, and for this reason we argue in favour of revenue neutrality – we do not want more taxes, just different taxes, a different structure of taxation.

As for the European context: tax policies are not within the jurisdiction of the European Union, these are left to the member states. However, a certain degree of standardisation and harmonisation is definitely needed, at least in relation to minimum standards, to avoid competitive distortions. When we look at the German tax
structure, however, it is almost perverse. While low income taxes can be regarded as acceptable and we are in the lower half of the mid field for consumer taxes in Europe, our ancillary wage costs are extremely high – in this respect, there is still room for restructuring.

Finally, subsidies are often not taken into consideration. Money is spent on the wrong things due to political debate. I agree, subsidies should be removed, but it is a very controversial issue. If we want to invest in the future and not keep old structures alive against market tendencies, it is very clear that we have to reduce subsidies.

**Sue Doughty MP, Liberal Democrat Shadow Minister of the Environment, panel:**

In the UK, we raised gasoline and diesel prices using the Fuel Duty Escalator, but we did not allow for the world-wide increase in oil prices, which resulted in fuel becoming very expensive. Today, freight from Europe is entering the UK on lorries that fill-up their very large fuel tanks before they come into Britain, which has a considerable impact on our domestic freight industry. Although environmentalists would like to see less freight transport on lorries in any case, the reality is that petrol pricing in the UK provides a way in for overseas lorries, which is of course a big problem for the UK freight industry. For this reason, we have now decided in the UK that there will be an upper limit on fuel duty – but this did come a bit late.

Another group that was seriously affected by the Fuel Duty Escalator were less affluent individuals in rural areas, because they need to use cars in the absence of public transport. While it is possible to argue that the policy encourages good public transport use in cities, public transport is simply not an option in rural areas.

Secondly, with reference to subsidies, we carried out an investigation into what the export credit guarantee department is doing in relation to the export of technologies. The department is seen as an arm of the department of trade and industry, and it unintentionally but nevertheless very effectively subsidises the arms trade. Obviously, we are extremely concerned about this issue. Furthermore, the department also fails to consider the suitability of technologies for the recipient country. We discovered that many of the technologies we export would not be used in the UK because they were very heavily polluting. Thus, we urgently need to build up our experience and expertise in exporting clean technologies and promote them more – because they often bring about change faster than complex technologies that require expensive infrastructures.

**Anselm Görres, Green Budget Germany Chairman, moderator:**

International studies indicate that the value of worldwide environmentally harmful subsidies is between $500 billion and $1 trillion. With reference to the limits of ecological tax reform – we must explain to people that the price level does not have to increase any more once we reach the point where we switch from bad energy to good energy.

**Christos Liolios, European Commission, DG Taxation and Customs Union, panel:**

With reference to the question of limited opportunities to increase taxes on fuels - states that are willing to increase taxes on fuels can only do this to a limited extent if their neighbours do not – and for this reason, minimum taxation rates have been made obligatory for all member states. However, as I have already said, the Commission failed to harmonise energy tax based 50 percent on emissions and 50 percent on energy content in 1992, largely because member states did not want to lose sovereignty on the issue. There is no easy solution to the problem of higher tax rates in some member states than others.

The Commission currently has a measure on the table to decouple the relationship between taxation on HGVs and passenger cars, and to tax diesel at different levels for HGVs. This is a response to the fact that lorries for international freight transport can drive 300 km on one tank of fuel – and for this reason, Luxembourg sells 5 times more diesel than the Community average. Of course, this is a problem. But in this context, the unanimity rule remains valid – and I do not know how many proposals the Commission makes in relation to the number of proposals that are successful. The last proposal was discussed for six years before it was accepted.

**Raivo Vilu, Tallinn Technical University:** I would like to support the European Commission in raising CO₂ tax and in harmonising it. But I am surprised that no one has mentioned the issue of environmental space – meaning consumption of environmental resources calculated on a per capita basis, this year e.g. two litres of gasoline per day per person. My question is, what will happen next year when negotiations on post-Kyoto mechanisms will presumably begin – what do you expect from this?

**Hans-Christoph Binswanger, Institute for Economics and Ecology, University of St. Gallen:** I would like to stick with the double dividend in the energy tax reform – I do not see why lowering the pensions burden could hinder tax reform. If the monies from tax reform are simply passed on to parliament, then there is a real danger that parliament will use this money to increase the budget. The mentality behind the ecological tax reform will be lost.
Jan F. Wagner, correspondent for Environment Daily: Reinhard Loske, you said in two weeks that the Green party would be unveiling three initiatives that pertain to the ecological tax reform. Could you tell us to what extent you think you will get what you want? Will you be able to agree on these measures with the coalition with the SPD and get them through parliament?

Secondly, with reference to your view on the development of the ecotax. Are you in favour of raising it when the review has been completed at the end of the year?

Guy Turner, Enviros Consulting, panel: With reference to subsidies, there’s one particular subsidy which has not been touched on today – the Common Agricultural Policy, a subsidy that is destroying the developing world as well as our own environment within Europe. So I would like to put a fourth question to Green Budget Germany and to the European Commission. Is it on Green Budget Germany’s agenda to tackle the problems posed by the CAP? I would also ask the European Commission what their position is on the issue, if I may.

As to the issue of contraction and convergence and possibilities for post-2012 negotiations for Kyoto - I left my crystal ball at home, but I personally think it is a valid idea, as there has to be some equivalence and convergence at some point. But sadly, I think that we are a long way away from it. I think a necessary first step is step is to get the United States involved in international negotiations, to try and get US emissions levels down to levels which India, China, Brazil and Argentina would aspire to in the long run. But I think this is many years away – a rather disappointing prognosis.

As for pensions, I entirely agree that any delay in pensions reform is just making the situation worse, so in that sense, using revenue from the ecological tax reform to delay any hard decisions on pension reform will inevitably make the decision much harder. I have seen some alarming demographics for the UK showing the imbalance between those who are paying the state pension and those who are drawing on it and how that is changing over time – and the sooner these issues are addressed the better.

Reinhard Loske, Vice-Chairman of the Green Group in the German Parliament, panel: First of all, I am very much in favour of contraction and convergence concept, developed by Aubrey Meyer of the Global Commons Institute. The supporting notion of the Kyoto protocol is this methodology, that the industrialised countries have to reduce because they are historically responsible for 80 percent of the CO2 already in the atmosphere, while developing countries are allowed to grow, but not at the same rate as they would do without new technologies. The basic idea is that these countries ‘leapfrog’ or tunnel through the energy-intensive period of development which we saw in the West.

As to the next commitment period after 2012: there is still a credibility gap in the industrialised countries, even in Europe. We have not done our homework convincingly enough to expect reduction targets or even caps from developing countries – and it is very important to get developing countries on board, countries like China, Indonesia, Brazil and others – so that they have some sort of cap, not a reduction target, not even a stabilisation target. Convergence means more sustainable levels of growth, if we want to revitalise the idea of CO2 taxation in principle. But already in 1991, proposals for this had been put forward by Carlo Ripa de Meana, the Environmental Commissioner of the time – his idea was to introduce a combined CO2 energy tax starting in 1993, of $3 per barrel of oil and increasing by $1 every year to reach $10 by the year 2000. It was thought to be a credibility package from the European Union for the 1992 Rio Summit on Environmental Development, to show the world that the EU had a CO2 and energy taxation system. But in fact what happened was that the meeting of the ministers in May 1992 agreed that this taxation would be introduced only if other OECD countries did the same – so the idea of harmonisation was behind it in some sense but as a result of this demand, it also didn’t happen. And that is the sad history of the CO2 tax.

With reference to Professor Binswanger’s point: as you know, I always argued in favour of the double dividend but looking back and being honest, the introduction of the double dividend can be attributed to the 1998 SPD election campaign. Oskar Lafontaine, the former de facto opposition leader, heavily criticised the introduction of a so-called demographic factor into the pension system by the conservative-liberal government in 1997, saying it was anti-social and unfair to pensioners, so the fresh money from the ecological tax reform was very welcome to avoid reform. But in 2001 and 2002 it was much more difficult for us to introduce a pension fund reform and to be honest we are not yet finished. I'm not saying that we should not input any
money from the ecological tax reform into the pension system, but what we need is a pension fund reform which recognises demographic realities.

With reference to the final question on the probability of getting all our proposals through. Our plans to reduce VAT on rail tickets for journeys of over 50 kilometres and to finance this through the introduction of VAT on air tickets has already been negotiated between the coalition partners. We will decide on this very soon – the issue is whether we can push this legislation through the Bundesrat.

Sue Doughty MP, Liberal Democrat Shadow Minister of the Environment, panel: With regard to post-Kyoto, one of the issues we are going to have to address is the emerging industrial nations – what stance should we take. Germany still has a very strong manufacturing base, while the UK does not, but in any case, many industrial processes will eventually relocate to China – whether it's waste recovery, materials recovery or manufacturing – we know that China will be selling to us. Developments in India are similar. We will have to make difficult decisions regarding imports – do we stipulate that we will only import goods that have been produced under good environmental and social conditions, or do we stipulate that we will support their aim of being economically self-sufficient. There is a degree of conflict in those two points of view and by the time the World Trade Organisation is involved as well, we are going to be faced by hard decisions. No matter how environmentally friendly we are, no matter how much we want to see these developments, decisions will have to made about where to draw the line with these particular countries. The answer is to weigh up the costs and benefits of these different scenarios for us, for them, and for the planet as a whole. We need to be aware that exporting our carbon generating processes does not make the world a cleaner place. Although we will become cleaner, places elsewhere will become dirtier, not only in terms of technologies but in terms of manufacturing and so on. This is a great challenge of the future.

Traditionally in the UK we have not paid VAT on public transport. There is an ongoing debate in the UK about predict and provide air travel and environmentalists argue that if we let this rise as it is predicted to do it will be hugely polluting. We are now only getting to the point where the government has acknowledged that we must somehow brake this process either through passenger, fuel or emissions taxation. It is not easy to push through such legislation, as the government has been elected by many people who believe that they have a right to cheap air fares – so this has unfortunately become an electoral issue.

Anselm Görres, Green Budget Germany Chairman, moderator: With reference to Guy Turner's comment on the Common Agricultural Policy, Green Budget Germany supported a research study on subsidies in Germany and many of these subsidies rest on European law. We do not neglect the issue.

Secondly, as to the issue of the double dividend. The German pension system costs € 200 billion annually – and before ecotaxes, that was subsidised by € 50 billion from the government – and rightly so, because a lot of what the pension system costs have nothing to do with the insurance equivalence principle but are a result of a political obligation, partly as a result of German unity. We have always said that we can support it as long as this is used to compensate for things that have nothing to do with subsidising pensions but are used to cover these social obligations. We have helped through ecotax to increase government subsidies to the pension fund from about € 60 to € 76 billion. Now what we have is a situation where every third Euro paid out as a pension is funded by ecological taxation and we believe that this is enough and fear justified criticism if we argue in favour of putting yet more money into the government budget.

Reinhard Loske, Vice-Chairman of the Green Group in the German Parliament, panel: Another problem of the ecotax was our message management. In the years 1999, 2000 and 2001 our message was absolutely clear – we said that we would increase ecotaxes and reduce pension fund contributions. In the year 2002, due to a lack of reform in the pension fund system, ecotaxes increased and ancillary wage costs remained constant. In 2003, ecotaxes were raised but pension contributions increased as well – and although we pointed out that it would have increased even more if it wasn't for the ecotax, the clear message of killing two birds with one stone was lost.

Franz-Martin Dübel, Managing Director of the Institute for Market Creation for Alternative Fuels and former Ford Manager, panel: May I add something to the taxation of fuel discussed earlier. Vehicle engine development takes about eight years – it is always a medium-term exercise to change anything on a vehicle. In Germany we have a differentiated taxation system, where engines are taxed for power, displacement and fuel. To make this taxation economically correct, it would seem much better to find a medium-range strategy to harmonise the taxation of fuels in the EU. This would encourage OEMs to develop their strategies in the right direction, towards engine and vehicle development. At the end of the day, this would pay economically.

Christos Liolios, European Commission, DG Taxation and Customs Union, panel: Just one clarification concerning the CO₂ tax - this tax is history, since the Commission officially withdrew this proposal in 2001 fol-
lowing the 1996 failure to pass it through the Council. At the time, the Council wished to follow a different approach, to introduce minimum rates. Thus, we do not discuss fuel tax harmonisation any more, but the harmonisation of tax bases. We make minimum levels of taxation obligatory for all, but not maximum.

Ray Cunningham, Anglo-German Foundation: I can see the rationale, or at least the attraction of earmarking the revenue from the ecotax to go into the pensions fund system. It meets the goal of revenue neutrality, it makes the tax easier to sell to business and to the electorate. But it seems to me these first two goals could have been met in various other ways, not least by reductions in corporation tax, assuming that you can find any companies that pay corporation tax in Germany. It has always seemed to me to leave a major suspicion that this double dividend has been used to sell the tax to the electorate – and that carries major political costs and possibly rising costs in the future, in the sense that it looks like a transparent means to sell the tax to the electorate. If you have an ecological tax, it makes much more sense to pursue consistent goals with that and to dedicate the revenues to ecological purposes. To me, it does not seem to be “killing two birds with one stone”, but rather, “buying a bird and getting a pig free”. It feels like a trick. I wonder in retrospect if you would be tempted now to decouple that link and to dedicate the revenues from ecotaxes to more obviously ecological policy objectives.

Helmut Jansen, German Finance Ministry: There has recently been a shift in policy from financing street use with charges rather than taxation, for example, the congestion charge in London and the HGV policies of the EU. What does the panel think about this shift from taxation to road tolls and charges?

Christos Liolios, European Commission, DG Taxation and Customs Union, panel: What charge means is a charge for a service rendered whereas when a tax is imposed, you are not obliged to use the revenue for the service taxed. For instance, we have been discussing a tax on aviation fuel, or alternatively, an aviation charge, levied when planes pass over a particular air space.

In my Directorate General we are competent for taxes, but not for charges, because they are proportional to a service rendered by a national authority and are a national issue, managed locally. This is the general approach at the EU. A charge has to be proportional to the service rendered, taxes finance whatever we decide.

Franz-Martin Dübel, Managing Director of the Institute for Market Creation for Alternative Fuels and former Ford Manager, panel: The congestion charge is a very good example of how OEMs respond to policy. At Ford, we developed LPG cars and vans for London in response to the congestion charge, but the public response was to transfer to public transport rather than purchase new clean vehicles. Ford spent several million pounds which could have been better used to invest in the development of CNG vehicles in Germany and other European countries. This underpins once more how necessary it is to have an EU-wide strategy. When national governments act, they effect companies – and this can be problematic if it does not coincide with other European governments.

Sue Doughty MP, Liberal Democrat Shadow Minister of the Environment, panel: Anything that looks like European taxation in the UK will be deeply unpopular bearing in mind that 20% of the electorate voted effectively to leave the EU in the recent European election. I suspect it would be very difficult for the national government, for Tony Blair, to stand by a European tax that applies in the UK.

I have a great deal of sympathy with the development of a congestion charge. One of the most difficult issues is the South East of London – and the South East of England – is that in fact one of our problems is not only the pollution from congestion but quite literally the congestion itself and gridlock. Even the Confederation of British Industry was beginning to argue in favour of more public transport. It would not be easy to introduce the congestion charge in my home constituency of Guildford, for example, without providing a cost-effective public transport alternative. In smaller towns and cities, the economics of a charge are much less viable than in London. It is not easy to make any congestion charging system cost-neutral to the traveller.

Reinhard Loske, Vice-Chairman of the Green Group in the German Parliament, panel: There have always been two schools of thought as regards ecological tax reform, as well as two factions in the Green party and in the German public as well. The first school, led by Professor Binswanger, argues in favour of
combining the ideas of job creation and environmental protection – reducing the tax burden on labour while increasing the tax burden on energy or resource consumption, which is quite an appropriate model for a red-green coalition – jobs and the environment.

The second school argues in favour of increasing tax on energy and resource consumption and using the revenues raised for environmental purposes. This is also acceptable and more attractive to the public. My argument has always been, as long as there is so much money in the public budget used for environmentally harmful things – coal subsidies, etc. – it makes more sense to put this money to good environmental use. If we were more successful in reducing environmentally harmful subsidies we would be able to say we invest part of the revenue in environmental purposes – we will see. Our concept will be submitted in autumn.

One problem with the former school is that reducing ancillary wage costs on a relevant scale costs a lot of money. The tax burden on energy and resources would need to be increased enormously. If you use ecotax revenue for environmental investments, you simply need less. Moreover, 70 or 80 percent of the public are opposed to the notion of job creation and environmental taxation. Nevertheless, it remains an open question. There have always been these two schools of thought.

**Guy Turner, Enviros Consulting, panel:** With reference to Helmut Jansen's question concerning the congestion charge, I would resort to basic economic principles to answer it – first address the objective and then design an instrument to achieve that objective. If the objective is a general reduction in CO₂ emissions from vehicles, then a CO₂ tax, or fuel tax or duty on fuel is applicable. If it is congestion that is the problem, i.e. occupation of road space at peak times, then a congestion charge is more appropriate. The efficiency of the instrument is the issue.

I did some work for the European Commission about ten years ago on this under the fifth environmental action program. One of the main points that came out was that the bluntness and broadness of instruments is very significant: the best outcome is clarity – if you want to address a particular issue, design the instrument to address that issue. Congestion is a very different thing to bad things in general about road transport, such as noise, take-up of agricultural land, CO₂ emissions, particulate emissions, etc.

With regard to revenue recycling and the double dividend – we have three examples of ecological taxes in the UK. Firstly, the fuel duty on petrol, which goes to the treasury. Secondly, the climate change levy, which was specifically directed towards reductions in national insurance contributions in a very similar way to the ecological tax reform in Germany. More interestingly, we also have an example of hypothecation back to environmental objectives from the UK landfill tax, where a tax was imposed on waste to landfill and virtually all of it was recycled through a credit scheme, originally to help communities around landfill sites. It has now been reformulated to help recycling and address the problem that the tax was designed to hit in the first place.

**Anselm Görres, Green Budget Germany Chairman, moderator:** The last two questions provide me with the opportunity to point out two real innovations in our new Green Budget Germany policy program.

Firstly, with reference to vehicle fuel tax. In Germany, cars and HGVs are two separate issues. German trucks suffer much more than in the UK because it is not difficult to drive over the border to obtain cheaper fuels if diesel is heavily taxed in Germany. The international European market dictates a limiting factor on the taxation of fuels for HGVs – for competitiveness reasons, we cannot raise taxes much beyond those of our neighbours. So, if we want to make HGV traffic more expensive, then the best instrument is to introduce an HGV toll – which we have, although it is still not operational. Road tolls for cars, on the other hand, are unnecessary, as we can maintain a certain distance to our outer borders, and although it is a problem at Germany’s borders, it is not a major competitive problem.

The question of the double dividend has been the subject of a great deal of debate within the green movement. In our new programme, we have made a concession to the saleability of the ecological tax reform to the public by conceding that 10 percent of receipts from the ecotax go into green projects. But a proportion of the ecotax should continue to go into the pensions system, not more than before. We think that the benefit of green taxation is in its existence, because people change their behaviour.

In a democracy, parliament should have ultimate authority over the budget – it's not our job to dictate this – as earmarking is not progressive in the long run.
KAI SCHLEGELMILCH, GREEN BUDGET GERMANY VICE CHAIRMAN, CONCLUDING REMARKS

Summarising such an enriching and fantastic conference is impossible. But perhaps I can highlight some of the lessons learned:

First of all, my working thesis, my motivation for initiating this conference, has partly been confirmed, although the underlying features are more complex: UK industry faces a net burden due to the climate change levy whereas German industry benefits from net tax relief overall. However, the latter communicate differently and give the impression that production is at risk of being relocated abroad, for which no indication or even evidence is available. On the other hand, the challenge facing UK industry due to the climate change levy is hardly known to the general public. And here in the UK, it is only business which pays, while in almost all other countries, the major burden is on transport and private households. Hence, in Germany there is room for manoeuvre to strengthen incentives for industry, while in the UK there is a large potential to promote more insulation and energy efficiency in housing – probably ideally by means of grants, low-interest loans and levies.

What are the other options we heard about today? I would like to draw your attention to kerosene taxation, a potential area for harmonisation in the EU in future. The new EU energy tax Directive has given EU member states the opportunity to levy kerosene tax on domestic flights and flights between two member states. Then we have seen that diesel is taxed at the same rate as petrol in the UK and Switzerland – a policy Germany should learn from. We can also learn from the Fuel Duty Escalator in the UK, which operates in addition to inflation – the automatic indexation of fuel taxation in Germany certainly merits discussion, as it would mean that politicians would not have to increase taxes every year at their discretion, but that taxes could increase in the background with inflation without political discussion. To put it more diplomatically, the incentive effect of these taxes could thus be kept intact.

During the conference we have seen the interplay of a broad range of economic instruments, emissions trading and ecotaxes. I would say that not only do prices matter, but prices and awareness matter – and a combination of the two really pushes towards reducing energy consumption – and that is what we are aiming for.

BP policy adviser Charles Nicholson pointed out that it is critical to get the process started, and I think that's what we have succeeded in doing in the UK and Germany. We would like to encourage other countries to come on board – there is some interest in this issue, but implementation is mostly slow.

We should remember as well that expected costs are always higher than real costs in the end – and for this reason, raising awareness is very important. Energy management systems might have an important part to play in triggering additional energy savings. Despite the good reception of the climate change agreements in the UK, we should also keep in mind the negative experiences we’ve had in Germany with the so-called voluntary agreements: In the year 2000, industry made environmental commitments (they are hardly really voluntary) to reduce CO2 emissions, commitments which they revoked when the environment minister tried to nail their own targets down for Germany’s national allocation plan for the EU emissions trading scheme. This does call into question the extent to which we can rely on and trust in that particular instrument. My conclusion is that an effective sanctioning mechanism is required.

The reduction of perverse subsidies is very difficult but we have some hopes for the new proposals Reinhard Loske outlined, his “three basket approach”. But the incomprehensibly high subsidisation of the German hard coal sector makes me extremely sceptical in this regard.

What we are hoping for is better EU coordination in the future – but I'm afraid we will only get the next round when we have the next accession phase. Regrettably, the UK has just succeeded in inserting into the Energy Chapter of the EU treaty that there should always be unanimity voting on fiscal matters which are explicitly energy-related issues. Here, we would have wished the UK had followed the attitude of the German government to favour qualified majority voting on all fiscal matters, or at least on energy taxation. My last hopes rest on article 96 of the current EU Treaty, which allows for qualified majority voting in certain circumstances.
The good news is, we only have to tax until we have reached backstop technology, or the solar age – we do not have to tax forever, but only until we have transferred to sustainable technologies. This is very important and this is of course the aim of the ecotax – in this sense, there is a limit to ecological tax reform. If the UK keeps this in mind, perhaps it could be more relaxed when it comes to the hot issue of qualified majority voting. But Germany has to do its homework this year as well and use the chance to further develop the Ecological Tax Reform in Germany. In addition, current approaches to initiate the exchange of information, e.g. with the Czech Republic and Poland, should be extended to increase understanding and attract more countries to follow our example.

We hope that we can build on the constructive discussions we had today in the future – Green Budget Germany is extremely interested in dialogue with companies and politicians, at conferences or elsewhere. Conferences such as this provide us with insights into how ecotaxes can be better implemented, and we hope that our productive exchange of information and experiences today will help us to improve both our ecotax systems in the future. You as speakers and discussants, as host, organisers and funding bodies, as participants and not least interpreters, made this great success possible – thank you very much!

Perhaps there will be a follow up to this encouraging and inspiring conference and we will meet again, maybe in London in 2005?
CONFERENCE PROGRAM

ECOTAXES IN GERMANY AND THE UNITED KINGDOM
- A BUSINESS VIEW
ÖKOSTEUERN IN DEUTSCHLAND UND GROßBRITANNIEN
- AUS SICHT VON UNTERNEHMEN


AGENDA / ABLAUFPLAN

10.00-10.30 (Welcome - Begrüßung)
Daniela Setton, Heinrich-Böll-Foundation / Heinrich Böll-Stiftung
Dr. Ray Cunningham, Anglo-German Foundation / Deutsch-Britische Stiftung
Dr. Anselm Görrres, President Green Budget Germany / Vorstandsvorsitzender Förderverein Ökologische Steuerreform (FÖS)
Welcome and introduction by the organisers / Begrüßung und Einleitung durch die Organisatoren

Session 1: 10.30-11.05: The International Perspective / Die internationale Perspektive

10.30-10.45
Christos Liolios, European Commission, Principal Administrator/Referent, TAXUD/Indirekte Steuern
The perspective of the EU on ecotaxes in EU-countries and the harmonization on EU-level / Die EU-Perspektive in Bezug auf Ökosteuern in EU-Ländern und die Energiespeuerharmonisierung auf EU-Ebene

10.45-11.05 Diskussion / Discussion

11.05-11.25
Coffee and tea break / Kaffee- und Tee-Pause
Session 2: 11.25-12.45: Ecological Taxation in the UK / Ökosteuern im Vereinigten Königreich

11.25-11.40
What does research tell us? / Was sagt uns die Wissenschaft?
Professor Stephen Smith, University College London, Department of Economics / Universität London – Fachbereich Wirtschaftswissenschaften
Comparing features and experiences of the ecological tax reform in Germany and the climate change levy in the UK / Vergleich der Ausgestaltung und Erfahrungen mit der Ökologischen Steuerreform in Deutschland und der Climate Change Levy in Großbritannien

11.40-11.55
The View from British Industry I / Der Sicht der britischen Industrie I
Sir Charles Nicholson, BP
BP’s attitude to ecotaxes in general and its experiences in the UK with the climate change levy / Die Einstellung von BP zu Ökosteuern im Allgemeinen und die Erfahrungen in Großbritannien mit der climate change levy

11.55-12.10
The View from British Industry II / Der Sicht der britischen Industrie II
Guy Turner, Group Director: Climate Change Policy and Strategy, Enviros / Abteilungsleiter Klimapolitik und -strategien, Enviros
The impact of the UK climate change levy and agreements on corporate behaviour / Die Auswirkungen des Climate Change Levy und anderer Vereinbarungen auf das Verhalten von Unternehmen

12.10-12.45
Discussion / Diskussion

12.45-13.45
Lunch / Mittagspause
Press conference / Pressekonferenz

Session 3: 13.45-14.45: Ecological Taxation in Germany / Die Ökologische Steuerreform in Deutschland

13.45-14.00
What does research tell us? / Was sagt uns die Wissenschaft?
Michael Kohlhaas, Research Officer, German Institute for Economic Research / Wissenschaftlicher Referent, DIW Berlin
Tax relief for energy-intensive business in the framework of the ecological tax reform and the climate change levy / Entlastung energieintensiver Wirtschaftsbereiche im Rahmen der Ökologischen Steuerreform und der Climate Change Levy

14.00-14.15
The View from German Industry I / Der Sicht der deutschen Industrie I
Dr. -Ing. Franz-Martin Dübel, Institute for the Market Development of Alternative Fuels, former Ford manager / Geschäftsführer des IMAK - Institut für die Markterschließung alternativer Kraftstoffe, früher Manager bei der Ford AG
Concrete experiences of the Ecotax Reform in Germany from the point of view of the German automobile industry / Konkrete Erfahrungen mit der Ökologischen Steuerreform in Deutschland aus der Sicht der deutschen Automobilindustrie
14.15-14.30
**The View of German Industry II / Der Sicht der deutschen Industrie II**
**Dr. Georg Riegel**, Founder of dezem GmbH / Gründer der dezem GmbH
Energy-transparency: Bridging the gap between huge energy-saving potentials and their actual realisation by stakeholders in large organisations / Energietransparenz: die Brücke zwischen enormen Energie-Einsparpotenzialen und deren tatsächlicher Realisierung durch die Akteure in großen Organisationen

14.30-15.00
**Discussion / Diskussion**

15.00-15.30
Coffee and tea break / Kaffee- und Tee-Pause

**Session 4: 15.30-17.30: The political viewpoint / Der politische Standpunkt**

15.30-15.45
**Sue Doughty MP (Liberal Democrat)**, Shadow Environment Minister / Sprecherin für Umweltpolitik
Experiences and problems with the climate change levy in the UK from a political point of view / Erfahrungen und Probleme mit der Climate Change Levy in Großbritannien aus Sicht der Politik

15.45-16.00
**Dr. habil. Reinhard Loske**, Vice-Chairman of the Green Group in the German Parliament / stellv. Fraktionsvorsitzender von Bündnis 90/Die Grünen
Ecotaxes in Germany and the United Kingdom: Status quo, analysis and perspectives / Ökosteuern in Deutschland und dem Vereinigten Königreich: Status Quo, Analyse und Perspektiven

16.00-17.20
**Panel discussion with the speakers / Podiumsdiskussion mit den Rednern:**
Christos Liolios, Guy Turner, Franz-Martin Dübel, Sue Doughty MP, Reinhard Loske MdB
Moderation: Anselm Görres

17.20-17.30
**Kai Schlegelmilch**, Vice-President, Green Budget Germany / Stellvertretender Vorsitzender des FÖS
Summarising conclusions of the Conference / Schlussfolgerungen der Konferenz

For further details of the conference, please email Green Budget Germany / Für weitere Informationen, bitte Email an FÖS: foes@foes-ev.de
For further information see / Weitere Informationen entnehmen Sie bitte: www.eco-tax.info or / oder www.foes-ev.de
**The Contributors**

**Jacqueline Cottrell**, who co-organised the conference as a Green Budget Germany intern, has worked as a freelance editor and author since 1998. She currently works for Green Budget Germany and the Gregor Luisoder Environment Foundation. She completed an M.A. in History at the Universities of Edinburgh and Vienna and has an M.A. in International Peace and Security from King’s College London.

**Ray Cunningham** has been deputy director of the Anglo-German Foundation since 2000. He is also co-founder of the British-German Environment Forum. Prior to this, he was projects director at the AGF for nine years. He has worked as commissioning editor for the Open University Press and as a lecturer at the university of Würzburg.

**Sue Doughty MP** became a Liberal in 1980 after becoming involved in a protest against the local authority continuing to dump waste within a few yards of a major housing development. In 2001, she became the first Liberal Democrat MP in Guildford since 1906 – and its first female MP ever. Today, she is shadow Environment Minister for the Liberal Democrats, a member of the Parliamentary Environmental Audit select committee and a member of the DEFRA team (Department for Environment, Food and Rural Affairs). Sue is also a member of The Howard League and Green Liberal Democrats. She lives in Shalford at the heart of the Guildford constituency.

**Dr.-Ing. Franz-Martin Dübel** is managing director and founder of IMAK – the institute for the market development of alternative fuels, situated near Cologne. The institute deals with the strategic and tactical planning of the market introduction of alternative fuels and power trains and supervises their implementation in the marketplace. Prior to this, Dr. Dübel was head of marketing of alternative fuels at Ford Werke AG and Ford Europe and has held a series of other management positions within marketing & sales at Ford Motor Corporation. Dr. Dübel came to Ford from MAN-commercial vehicles in Nuremberg, where he was head of research and pre-development of alternative fuels and spark-ignition engines. Dr. Dübel is a skilled car mechanic, studied vehicle engineering at the Cologne technical college and mechanical engineering at the Technical University of Aachen, where he gained his PhD on the combustion processes of hydrogen engines. His research work at MAN and at the University of Aachen particularly comprised alternative fuel applications, such as hydrogen, natural & bio gas as well as plant oil and methanol.

**Dr. Anselm Görres**, born 1952, economist, worked as a consultant at McKinsey from 1984 to 1991 and from 1991 to 1994 as an MBI-Investor and Managing Director of a medium enterprise in East Berlin. He has been Managing Director of ZMM Zeitmanager München GmbH since 1994 and has successfully supervised more than 100 projects in many different industrial sectors ([www.zmm.de](http://www.zmm.de)). His commitment to ecological fiscal reform began in 1994 as co-founder of Green Budget Germany (FÖS) and main author of the first FÖS Memorandum 1994, *The Route to Ecological Tax Reform*, (newest version 1998, agenda Publishing). Today he is Green Budget Germany chairman and editor of the newsletters *ÖkoSteuerNews* (in German) and *Green-BudgetNews* (in English). Further information on the FÖS is available from: Brienner Straße 44 · 80333 Munich · Tel 089-520 113-13 ([www.foes-ev.de](http://www.foes-ev.de)).

**Michael Kohlhaas** studied economics at the University of Regensburg, the Pantheon-Sorbonne in Paris and at the Institute for World Economy in Kiel (Advanced Studies in International Economic Policy Research). He worked from 1987 to 1989 as a researcher at the University of Regensburg (chair for international economic relations and development policy). He has been working at the German Institute for Economic Research since 1989, first of all, as personal representative of the president and in the administration of the institute. Since 1991, he has been researching environmental issues, focussing on conceptions and economic analyses of environmental policy instruments and strategies. His numerous publications include *Ecological Tax Reform in Germany: From Theory to Policy*.

**Christos Liolios** is principle administrator in the Directorate General Taxation and Customs Union of the European Commission responsible for energy taxation and environmental taxes. A national of Greece, he has been chief of sector B of the DG Taxation and Customs Union since 1998 and has worked at the European Commission since 1983. Prior to this, from 1977 to 1983, he worked for the Finance Ministry of Greece. He has a degree in Business Studies from the Economic University of Athens and a diploma in European Studies from the Free University of Brussels.

**Dr. habil. Reinhard Loske** has been Vice-Chairman of the Green Group in the German Parliament for Bündnis 90/Die Grünen and political coordinator of the working group on the environment since November 2002. He has been a member of the German parliament since 1998 and was immediately made speaker on environmental policy for the Green Party. He studied economics and politics in Paderborn, Nottingham and Bonn from 1980-86. In addition to holding various positions within the Green Party and the Wuppertal Institute for Climate, Environment and Energy, he completed his PhD in 1996 and his habilitation in 1999.
Sir Charles Nicholson is senior group advisor at BP on the environment. One of the architects of the BP internal emissions trading scheme, he was chairman of the UK “Emissions Trading Group” that worked closely with the UK government to develop proposals for a GHG emissions trading scheme to run alongside the Climate Change Levy. Nicholson also contributed to the development of the EU Emissions Trading Scheme. He is also a member of the World Business Council on Sustainable Development and Chairman of its Sustainable Mobility Project, “Mobility 2030: Meeting the Challenge to Sustainability” working group, which launched its final report in July 2004.

Dr. Georg Riegel studied biochemistry, physics, biology and quantenphotochemistry (PhD) in Chile, Germany and Canada. He began his career as a business consultant, then moved onto future-oriented research at the DaimlerChrysler AG (as Director of Environmental Research). The insights he gained from this position inspired his goal of creating energy transparency for all by creating technologies specifically designed for this purpose. In November 2002, Dr. Riegel founded the dezem GmbH, and he now manages and supervises its many projects large and small. His central professional interest focuses on the theoretical and practical development of an interface between business and the environment, i.e. in developing the prerequisites for the effective interplay of economical and ecological goals.

Kai Schlegelmilch has worked on environmental taxes and fiscal reform and energy/climate change issues at the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety since 1999. He is Assistant Head of the division Federal Government, Environment And Energy Climate Change Programme. Between 1993 and 1999, he worked as project leader in the Climate Policy Division of the Wuppertal Institute for Climate, Energy, and Environment and was editor of the German and English newsletter, the Wuppertal Bulletin on Ecological Tax Reform. He has worked in the fields of science and business and for several foreign governments and NGOs, as well as international organisations such as UNDP, UNEP, UNECE, OECD, the European Commission and the European Environment Agency (EEA). He was a research fellow at the EEA from 1996-97. He has a diploma in political economy and has been Vice-President of Green Budget Germany since 2001.

Stephen Smith worked for eight years in the Department of Trade and Industry as a member of the Government Economic Service after graduating. In 1985, he joined the staff of the Institute for Fiscal Studies, an independent research institute specialising in the economic analysis of taxation and public finance. He established a research group at IFS covering issues of European fiscal policy, environmental taxation and local government finance, and in 1990 was appointed Deputy Director of IFS. He joined the Department of Economics at UCL part-time in 1990 and left IFS to a full-time post at UCL in 1997. He was Head of Department at UCL from 1997 to 2002. His main research and teaching interests lie in the fields of public finance (especially European VAT policy) and environmental economics. He is a member of the DEFRA Academic Panel on Environmental VAT, and has acted as a consultant to a number of government departments and international organisations including the OECD, the European Commission and the International Monetary Fund.

Daniela Setton was born in 1974 in Cologne. She studied political science (diploma) at the Free University of Berlin and at the Johann-Wolfgang-Goethe University in Frankfurt. She played a very active role in student administration at university throughout her student years. In 2002, she started work as Executive Assistant to the Heinrich Böll Foundation executive board in Berlin. She is responsible for the provision of strategic advice and content management to the board member responsible for the subject area of international cooperation. She is also engaged in project management within the scope of the Heinrich Böll Foundation’s Globalization Program. The primary focus of her work is international financial market reform, trade policy and global environmental governance.

Guy Turner has been Consulting Group Director - Climate Change Policy and Strategy at Enviros Consulting since 1998. He has over twelve years experience in environmental consulting, he has worked extensively in the field of environmental economics and policy, climate change, negotiated agreements and emissions trading. His clients include multinational companies, the UK government and the European Commission. He has been an active contributor to the UK Emissions Trading Group, sitting on four advisory groups and heading a working group on project based credits. He has advised several companies on their participation in the UK Emissions Trading Scheme and Climate Change Agreements. He has also undertaken numerous strategy assignments advising companies on investments in the environmental sector. He is a regular speaker on emissions trading at public conferences. Guy holds degrees in Mechanical Engineering and Economics (B.Eng & B.Com, Birmingham), an MSc in Environmental and Pollution Control (Manchester) and is a graduate of the London Business School Corporate Finance Evening Programme.