

## **Economists' Voice**

### **Special issue on climate change policy**

#### **Climate change policy: lessons from the UK**

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#### **1. UK's approach to climate change**

The UK provides a valuable case study to those contemplating new policy initiatives to address climate change. As with privatisation and liberalisation, the UK has led the way, with results that have not been quite what was intended. Contrary to the political rhetoric, the record has not been particularly good, and the costs have yet to prove to be as low as claimed.

The UK caught on to the climate change agenda early on. Margaret Thatcher famously accepted the science in 1988, and since then successive governments have built up a set of targets and instruments to mitigate climate change. Adopting Kyoto targets was straightforward as Britain was in the process of closing most of its coal industry and shifting towards gas-fired electricity generation in the 1990s (Helm 2004). No extra policy measures were needed to achieve the target.

Since the election of the Labour government in 1997, there has been a host of new policy initiatives. In 1997, a domestic target was adopted to reduce CO<sub>2</sub> emissions by 20% by 2010, and a domestic emissions trading system was established ahead of the EU Emissions Trading Scheme (EU ETS), *and* a Climate Change Levy (a tax on energy, not carbon) was also introduced, alongside a range of measures aimed at energy efficiency. The renewables sector of the electricity generation market was protected through a quota (the Renewables Obligation), with tradeable certificates (Renewables Obligation Certificates). R&D tax concessions have been introduced. A strategy of multiple targets

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and multiple instruments therefore gradually evolved in the UK—in the latter case, market-based instruments specified on both price *and* quantity, command-and-control regulations and voluntary agreements. Almost every available instrument in the economists’ toolbox has been applied in a piecemeal fashion.

This application has been conducted against a background set of economic assumptions about the costs and benefits of tackling climate change. From the 2001 election onwards, there has been a series of policy reviews, notably the Performance and Innovation Unit of the Cabinet Office (PIU 2002), the Energy White Paper (DTI 2003), the Energy Review (DTI 2006) and most recently the Stern Review (HM Treasury and Cabinet Office 2006). More are to come, including a further Energy White Paper in 2007. The common feature of all these reviews is the assumption that the costs of mitigating climate change are small—indeed so small as to be less than the error term in forecasting GDP—at around 1% GDP or possibly less. This assumption has pervaded policy formulation: since it is a comparatively trivial number, there has been almost no focus on the question of the efficiency of a policy approach of multiple instruments adopted in a piecemeal fashion. In particular, official documents do not provide any analysis of the impact of adopting a specific instrument on the other instruments already in place. The analysis is strictly a partial equilibrium one.

## **2. The adoption of domestic targets and the leadership argument**

How did the UK come to have such an approach? Given that climate change is a global public bad, domestic actions are of limited value. The UK argument has been that in order to encourage appropriate global climate change action, it needs to show ‘leadership’. This leadership argument is best understood in game theory terms: it is an attempt to induce steps towards a global carbon cartel to reduce the quantity of emissions. It has four components: demonstrating a willingness to play an equitable part; meeting the polluter-pays principle in respect of emissions since the Industrial Revolution; demonstrating that ambitious targets can be met at low cost; and others being willing to be persuaded by the UK.

Of these, the relationship between the first two and success in concluding international agreements is unclear. They are at best necessary conditions. The third requires that the targets are actually achieved, and that the costs turn out to be low. Neither holds: the

UK will miss its 2010 target by a wide margin—possibly 14–15% against 20%; and the costs (largely related to wind electricity generation) are already high relative to both official predictions and to other sources of electricity generation (NAO 2005). Thus far, the UK has in fact demonstrated that it will not meet its targets; that the efforts so far have been relatively high-cost; and that, in the process, it has not met the first two conditions. UK emissions are in fact rising at a rate comparative to that in the US and, if the impact of the coal industry closures (for other reasons) is factored in, performance is significantly worse than in the US. On the fourth—the willingness of others to be persuaded—the leadership argument sits uncomfortably with the prisoner’s dilemma: why would large and growing economies (like the US, China and India) be more willing to collude to reduce emissions because the UK was willing to do so? So far, although the US position in particular appears to be shifting, there is no evidence to suggest that it has been persuaded by the UK’s leadership policy.

### **3. Which instruments? Market-based or command-and-control?**

Why have the costs turned out higher than government projections? There are two possible answers: that it turns out that decarbonising the economy to a relatively rapid timetable just is expensive—involving the rapid replacement of much of the capital stock; and that the policy instruments are inefficient. Both turn out to be contributory explanations, but here the argument is confined to the second.

Economists typically approach the choice of instruments from an efficiency perspective, and in particular focus on the substitution effect of a change in the price of the pollutant. They tend to favour market-based instruments for good reasons: such instruments are less informationally demanding; they signal to both the demand and supply sides; they tend to have a longer-term time perspective, hence stimulating not only immediate savings but also R&D; and they are less open to capture (Helm 2006a). In the case of climate change, given the nature of the slopes of the marginal cost and damage functions, carbon taxes have considerable advantages over marketable permits (unless climate change induces non-marginal changes).

But politicians, not economists, select instruments. All instruments create a price of carbon—explicitly or implicitly. Whilst economists focus on the substitution effects of that price, vested interests focus on the income effects—the rents. Thus, permits are

more attractive to taxes when they are grandfathered (as they have been in the UK and the EU ETS); they can act as powerful barriers to entry; and, in the case of the EU ETS, have delivered windfall profits to incumbent electricity generators. (In the UK ETS, subsidies of around £300m were paid to industry to take on tougher targets than already in place under conventional command-and-control regulation). Finally, the relative ease of capture under command-and-control (and the rents to providers of specific technologies) attracts industrial vested interests too.

#### **4. The ‘lets have as many instruments as possible’ approach**

Why has there been such a plethora of instruments? The rents associated with the income effect are not evenly distributed. Specific technologies have specific economic rents from the choice of policy instruments. Thus, not only will vested interests (to which politicians respond) prefer quantity instruments to price, but there will also be strong incentives to lobby for a ‘picking winners’ policy approach. In creating political coalitions at elections, the incentive is to gain the widest domain of support. By providing each constituency with specific policies—and therefore matching each interest with a specific rent-increasing policy—this can be achieved.

The UK approach has been very technology-specific. The two key technologies have been wind and energy efficiency. Wind has been protected through the way the Renewables Obligation has operated, and a specific institution, the Energy Saving Trust, has provided the vehicle through which targeted aid has been provided for energy efficiency measures—including the expenditure of a levy on all electricity consumers.

‘Picking winners’ has also worked against certain technologies—notably nuclear power. A new nuclear programme threatens the economic interests of those investing in wind and other non-nuclear, non-carbon technologies, since its contribution to the carbon reduction might crowd out other expenditures. As a result, in the UK, nuclear is excluded from the Renewables Obligation.

#### **5. Lessons**

The UK example demonstrates the importance of getting the economic analysis right before embarking on policy initiatives. That analysis begins with the problems of international cooperation and solving the prisoner’s dilemma: identifying the costs and

benefits to each of the main players; and finding mechanisms and side payments to induce a credible global agreement (Barrett 2003 and 2005). The UK's approach has been to largely ignore these issues, and instead to assert that the costs of mitigation are low, and to attempt to demonstrate this through short-term domestic targets. It has demonstrated that the costs are in fact higher than predicted and that the target has proved politically impossible to achieve. Emissions in the UK, after all the interventions, are rising.

The economic analysis of the selection of policy instruments provides a very different prescription from the approach adopted in the UK. The lesson here is that the political economy of instrument selection matters: that unless economically efficient instruments specifically design in the income effect, they will not be successful. Carbon taxes have large income effects (as do auctioned permits). This is because, contrary to the claim that the costs of mitigation are low, demand for carbon-emitting activities is relatively inelastic at least in the short to medium term. Unless these income effects are hypothecated—either directly to the climate change objective, or indirectly through ring-fenced explicit tax reductions elsewhere—vested interests will push for grandfathering and command-and-control regulation. Though the Climate Change Levy in the UK has some notional hypothecation, this has turned out *ex post* not to be credible.

In the UK, the result of a failure to think through the economic analysis and to factor in the income effects, climate change policy has had limited success. In addition to failing to meet the targets, it has a large number of piecemeal policy interventions. These have favoured politically sensitive technologies (such as wind) and discriminated against large-scale technologies (such as nuclear), rather than provided a level playing field for the different technologies (and demand-side responses) to compete to provide the least-cost solutions.

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