



# Plan B?

The prospects for personal carbon trading

## SUMMARY

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ENVIRONMENT

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# Executive summary

To avoid dangerous climate change, deep cuts in carbon emissions will be needed. These cuts will have to be made in all parts of the economy, including in emissions produced directly by individuals. Just over 40 per cent of UK carbon emissions result from the behaviour of individuals, from heating and powering our homes and making personal journeys by car and plane. However, there is currently no sign of any decline in emissions from residential energy use, car use or aviation.

This report examines the cases for and against personal carbon trading (PCT) as a policy to help reduce personal carbon emissions in the UK, and sets out the conditions under which this approach might become a realistic proposition.

## **What is personal carbon trading?**

There are different variants of PCT, but they all share a common basic idea: a certain amount of allowed emissions under a cap are allocated free to individuals in the form of carbon permits, usually on an equal per-capita basis. Individuals then surrender these permits whenever they purchase domestic heating fuel, electricity, and petrol or diesel for their cars. Remaining permits are auctioned to businesses, which must similarly surrender permits when they purchase fossil fuels. The permits are tradable, so that individuals with low-carbon lifestyles can sell excess permits to the market, while those who have higher carbon emissions can buy extra.

The cap is tightened gradually over time, allowing fewer and fewer emissions of carbon (and hence fewer permits) year on year. If the cap on emissions is set at a level below 'business as usual', then demand will exceed supply, thus creating a positive price for carbon allowances.

## **Views on personal carbon trading**

In recent years PCT has developed an increasingly high profile within the political agenda, with expressions of interest by successive Secretaries of State for the Environment, and also from senior opposition politicians. However, PCT would be a wide-ranging intervention in an already crowded policy landscape. At the same time, the current direction of travel is to expand trading schemes that are located further upstream in the economy, such as the European Union Emissions Trading Scheme (EU ETS). Given this background, PCT would be a major change. So, the key question is whether this change should take place at all. Is there a good policy and political case for it? For there to be a convincing imperative PCT would have to be stronger than upstream trading in at least some areas, and not drastically worse in any area.

Supporters of PCT argue that the approach delivers on all three criteria for environmental policy – effectiveness, efficiency and equity. However, critics, including the Department for Environment, Food and Rural Affairs (Defra), argue that PCT is politically infeasible and would involve very high administrative costs. As our report describes, the arguments on both sides depend heavily on the assumptions that underpin them, and in some crucial areas it is not possible to generate credible evidence to reduce uncertainty about the approach – partly because the options for trialling a mandatory PCT scheme are very limited. In addition, the policy context for personal carbon trading is itself constantly changing.

In this context this report seeks to clarify the assumptions made in the debate, and the political and policy conditions under which PCT is likely to become a realistic strategy for emissions reduction.

### **Environmental effectiveness**

Proponents of PCT argue that such a scheme would be environmentally effective, because the declining cap on emissions would guarantee that emissions reduction targets would be met. However, this approach assumes that governments would be willing to allow prices to rise to very high levels if this were needed to maintain the cap. In practice, governments have not been willing to bear this kind of political risk, and when pollution trading schemes have been introduced in practice, they have always included mechanisms that may limit their effectiveness – the most common being a ceiling on the permit price. Such an arrangement is known as a ‘soft cap’ scheme, since it no longer guarantees that emissions will be below the original cap.

Without such a ceiling price, PCT would be adopted only if the risks of an uncontrollably high carbon price were outweighed by the political risk of not having a guarantee of effectiveness in the face of extreme climate change. This is not yet the situation in the UK. Clearly, the current political limits to a hard-cap scheme present a challenge to the claims of the environmental effectiveness of PCT (or indeed any cap-and-trade scheme).

### **Efficiency**

In 2008, Defra conducted a detailed investigation of PCT as an option (*An assessment of the potential effectiveness and strategic fit of personal carbon trading*). At the heart of its assessment was the conclusion that, compared with an upstream trading scheme covering the relevant sectors, PCT would be a very expensive way of inducing a relatively small amount of additional reduction in emissions. The central estimate of the study is that the costs – in other words, the administrative costs of setting up and running the scheme – would be more than 15 times the value of the potential additional benefits.

The potential additional benefit of an emissions trading scheme at the downstream individual level, over that of an upstream trading scheme, depends on two factors:

- How much *extra* reduction in emissions, in tonnes of carbon dioxide (tCO<sub>2</sub>), a personal scheme can deliver
- The *value* of reducing each tonne of carbon dioxide, in £ per tonne of CO<sub>2</sub>.

The total monetary value of additional benefits can then be compared with the additional administrative *costs* of running a personal carbon trading scheme, above and beyond the costs of running an upstream scheme.

The Defra study assumes that the main additional effect of a PCT scheme, above and beyond the pure price signal, will be to increase the visibility of emissions, and on this basis assumes that it will offer only marginally greater emissions reduction than other policies. However, a review of the literature of behavioural economics and social psychology suggests that PCT would probably induce a wider range of effects, including greater price visibility and higher motivation to reduce emissions. However, there is insufficient evidence to estimate the scale of these effects, although they are likely to be larger than those assumed by Defra.

On the second issue, the value of each tonne of CO<sub>2</sub> emissions reduced, the Defra study adopts the shadow price of carbon, which at the time of the study was based on a social cost

of carbon methodology and was estimated to be in the region of £30/tCO<sub>2</sub> up to 2020. However, the Government has since changed its approach to carbon valuation, which is now based on a marginal abatement cost methodology – an approach that points to a higher estimate, in the region of £60/tCO<sub>2</sub>.

These two conclusions suggest that the value of adopting PCT may be somewhat greater than that assumed by Defra. But what about the administrative cost of running a PCT scheme with more than 40 million adults – again compared with an upstream scheme involving just a few thousand fossil fuel suppliers and importers?

Defra's central estimate of the costs of setting up and running PCT is £2.6 billion a year. However, this estimate is highly sensitive to assumptions made about the specific costs of administering personal carbon accounts, which it is envisaged would run by piggy-backing on the banking system, and are costed by analogy to the administration of current accounts. An alternative set of assumptions about this and other costs leads to a somewhat lower (but still large) estimate of the annual costs of PCT, in the region of £1.4 billion.

At this cost estimate, and a valuation of CO<sub>2</sub> reduction at £60/tCO<sub>2</sub>, PCT would have to offer additional savings of at least 25 Mt (million tonnes) CO<sub>2</sub> annually on average over the period 2013–20, above and beyond alternative low-cost policies such as upstream trading, in order to be a cost-effective way of reducing emissions over the period to 2020.

The main problem for PCT, in this case, is that the gap between targets for emissions reduction for 2020 and the expected impact of existing policies is not that large. So PCT's place in future policy depends partly on the actual impacts of existing policies. Nevertheless, historically the Government has tended to err on the side of optimism, so there are reasons for keeping the door open to policies such as PCT if existing policies turn out to be less effective than is hoped.

### **Political acceptability**

Existing studies, based on focus groups, suggest that while PCT is seen as fairer and slightly more popular than carbon taxation, it is still unpopular with the general public. Our own research builds on these studies, based on a nationwide opinion poll and three day-long deliberative workshops, which allowed us to explore people's reactions to PCT, upstream trading and carbon taxes in more depth, and to provide a greater opportunity for participants to ask questions and gain a fuller understanding of what was to most people a brand-new idea. Wider political acceptability is also heavily influenced by the views of experts and representatives of actors such as civil society and business, so we also conducted interviews with a range of these stakeholders.

As with previous studies, our research showed that although PCT was seen as a more favourable intervention than carbon taxation or upstream trading, it was still not popular among the public. The perceived fairness or unfairness of the approach was a particularly important concern for members of the public. On the face of it, equal per-capita allocations of carbon permits would be broadly progressive, with most low-income households ending up with a net surplus, because poorer people tend to use less energy in their homes and, especially, in transport. However, some low-income households would end up worse off – and often those with particular characteristics that do not allow for immediate or easy emissions abatement, such as those with children, or those that are not connected to the gas network.

The majority of respondents to our poll grasped this point, arguing that equal per-capita allocations would be unfair because some people would need more credits than others by virtue of circumstances.

By and large, the stakeholders we spoke to had not given much previous consideration to the prospect of PCT. Although many were supportive of the idea once it had been presented to them, this tended to be heavily qualified, with many interviewees suggesting that although it was a nice idea in theory, it would not be workable in practice. Again, the question of fairness was considered important, and concerns about practicalities and costs were also salient.

The lack of public and political support for PCT is an important concern, and it seems clear that the current levels would be insufficient to bring in such a scheme in the near future. However, looking to the longer term, there is still scope for opposition to decline. The framing of arguments and formulation of messages around PCT will be vital – for example, support could be boosted if carbon credits were presented as an endowment rather than a ration, and if delivery agents were chosen carefully. The process through which the scheme is developed would also be important in determining support levels. Ensuring procedural fairness in the process, whereby members of the public have a clear and genuine opportunity to contribute to the development of a PCT scheme, could also help to improve perceptions of fairness.

## **Equity**

Perceptions of fairness are crucial to the political acceptability of PCT, but schemes based on a simple, equal per-capita distribution of carbon credits are seen as unfair. This is because most people recognise that people in different situations have different needs for energy use, and that, at least initially, some may produce higher emissions as a result of factors largely beyond their own control. For example, people with children, people who are not connected to the gas network, and people living in rural areas without good public transport all might have a valid claim to higher allocations. Under an equal per-capita allocation, individuals in these situations would be worse off. This view does assume that they would not take measures to reduce their emissions while maintaining the energy services they currently consume, but this is perhaps not an unreasonable assumption given their situations.

A key issue is therefore how the initial allocation of permits could be modified to meet these concerns. We commissioned the Centre for Sustainable Energy to undertake such an analysis, using a dataset based on the Food and Expenditure Survey from which emissions data can be inferred.

We specified a simple set of rules for modifying allocations according to type of house, location (rural versus urban), number of children, being on or off the gas network, and age. In the scenario where these modifications are applied across all households, between 60 and 80 per cent of households receive extra allowances, leaving a minority with lower allowances (by an average of 13 per cent) than would be the case under an equal per-capita allowance arrangement. Not surprisingly, the resulting division of allocations is ‘fairer’, in the sense that the impact of circumstances on a household’s allocation is markedly lower. However, these modifications do not make a significant difference to how low-income households are affected in aggregate. Rather, they create groups of winners and losers within low-income households.

We also investigated how far it would be possible to compensate net low-income losers under the modified allocation rules by increasing cash payments through the benefits system. There

are limits to how far this can be done. Overall, there are around 1 million households that would be in net deficit under a modified carbon-allocation scheme and that do not receive means-tested benefits. It is these households that would be hard to reach through a compensation scheme based on the benefits system.

Including households on the state pension would improve the coverage of low-income households, and would reduce those in the bottom three income deciles who were also beyond the reach of the benefits and pension system, down to a quarter of a million households. Not surprisingly, however, including those households with people on the state pension makes the targeting of compensation less efficient, and increases its cost.

### **Vulnerable groups**

Although modified allocation rules should help to overcome some of the distributional impacts associated with PCT, the scheme would still be dependent on everyone being fully able to understand and use it. In reality, some groups of people may well find it difficult to adjust to the introduction of PCT, and could be disadvantaged as a result. For example, people without access to bank accounts could lose out – as could anyone who has not developed the necessary skills to monitor and plan carbon expenditure and to keep track of a varying carbon price.

It should be possible to minimise these problems through a combination of careful scheme design, targeted education programmes and additional supportive policy measures. However, it is important to note that this is likely to increase the overall running costs.

### **Conclusions**

This report identifies how the often implicit assumptions made by proponents and opponents of PCT affect conclusions about the efficiency and environmental effectiveness of the policy. These include assumptions about:

- how the shadow price of carbon is defined and calculated
- what the impact of PCT is likely to be
- how set-up and running costs are defined and calibrated
- how effective existing policies will be in reducing emissions.

On our review of the evidence, in order to be cost-effective a PCT scheme would have to offer considerable additional carbon emissions reductions over those from an upstream trading scheme. However, the policy space is already crowded, and if current policies deliver as predicted by the Government, then PCT may not be needed before 2020.

New evidence may provide a reason for changing some of these assumptions – for example, in relation to the efficacy of existing policies. However, in other areas (especially relating to the crucial issue of the potential behavioural impact of a mandatory carbon-rationing scheme) this is not the case, and it is hard to see how differing assumptions can be reconciled.

Politically, it is clear that there is no widespread support for PCT – even though personal carbon taxation is even less popular. The most likely situation in which PCT could become a more serious option is if existing policies were to manifestly fail to make a dent in emissions from the personal sector. At the same time, if the impacts of climate change within the UK were to dramatically worsen by that time, so that it became clear that drastic action by all was necessary, then the political space for PCT would increase.

In any circumstances, PCT is a politically risky approach, because of the inherently unknowable dimensions of its effects and the range of possible costs. A government would consider it seriously only if other policies were seen to be failing, or were seen to be unable to reach the deeper emissions cuts needed, at a time when the political pressure to act on climate change increased. This could still be some time off, but policymakers should keep open the option of some version of PCT for the future.

In the meantime, there are steps that the Government can, and should, take to prepare the ground for PCT. These include increasing financial inclusion and literacy, building carbon literacy, and understanding better how the public see fairness in climate policy – steps that will be useful in themselves.