



House of Commons  
Environmental Audit  
Committee

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**Personal Carbon  
Trading**

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**Fifth Report of Session 2007–08**

*Report, together with formal minutes, oral and  
written evidence*

*Ordered by The House of Commons  
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## The Environmental Audit Committee

The Environmental Audit Committee is appointed by the House of Commons to consider to what extent the policies and programmes of government departments and non-departmental public bodies contribute to environmental protection and sustainable development; to audit their performance against such targets as may be set for them by Her Majesty's Ministers; and to report thereon to the House.

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The Reports and evidence of the Committee are published by The Stationery Office by Order of the House. All publications of the Committee (including press notices) are on the Internet at: [www.parliament.uk/parliamentary\\_committees/environmental\\_audit\\_committee.cfm](http://www.parliament.uk/parliamentary_committees/environmental_audit_committee.cfm).

A list of Reports of the Committee from the present and prior Parliaments is at the back of this volume.

### Committee staff

The current staff of the Committee are: Gordon Clarke (Clerk); Sara Howe (Second Clerk); Richard Douglas (Committee Specialist); Oliver Bennett (Committee Specialist); Susan Monaghan (Committee Assistant); Stella Kin (Secretary); and Elizabeth Gardner (Sandwich Student)

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## Summary

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If the Government is to stand the slightest chance of meeting its 2050 carbon emissions target it cannot afford to neglect the domestic and personal sector. Reductions in carbon emissions from business and industry will be meaningless unless accompanied by significant and equal reductions from households and individuals.

Existing initiatives are unlikely to bring about behavioural change on the scale required, with many individuals choosing to disregard the connection between their own emissions and the larger challenge. Personal carbon trading might be the kind of radical measure needed to bring about behavioural change.

We believe that personal carbon trading has the potential to drive greater emissions reductions than green taxation. Personal carbon trading could guarantee a reduction in emissions because it places a ceiling on the carbon available for consumption, rather than seeking to reduce demand. Equally important, a carbon allowance could be more effective at incentivising behavioural change and engaging individuals in reducing their emissions than the price signals resulting from green taxation. There is also potential for a well explained personal carbon trading system to be better received and accepted than green taxation, because instead of all households being penalised, many would actually stand to benefit.

What is needed, urgently, is a shift in the debate away from ever-deeper and more detailed consideration of how personal carbon trading could operate towards the more decisive questions of how it could be made publicly and politically acceptable. It is these questions that will ultimately decide the viability of personal carbon trading.

Opposition to personal carbon trading could be reduced if the public could be convinced of three things. First, that it is absolutely essential to reduce emissions; second, that this can only be achieved if individuals take personal responsibility for reducing their own emissions; and third, that personal carbon trading is a fairer and more effective way of reducing personal emissions than alternatives such as higher taxes. The public must be persuaded of the first two parts of this argument as soon as possible if the Government is ever to convince them of the third. Persuading the public depends on perceptions of the Government's own commitment to reducing emissions, and of the priority given to climate change in its own decision making.

Personal carbon trading will inevitably highlight existing inequalities of income and opportunity. Any instrument designed to restrict and reduce domestic carbon emissions would raise the same concerns. As with any other policy, these inequalities will need to be identified, assessed and, where appropriate, compensated for.

Personal carbon trading could be essential in helping to reduce our national carbon footprint. Further work is needed before personal carbon trading can be a viable policy option and this must be started urgently, and in earnest. In the meantime there is no barrier to the Government developing and deploying the policies that will not only prepare the ground for personal carbon trading, but which will ensure its effectiveness and

acceptance once implemented.

We regret that, following its pre-feasibility study into personal carbon trading, the Government has decided to wind down its work in this area on the grounds of high implementation costs and public resistance to the concept. We recognise the extent of these challenges, but we believe that work on personal carbon trading must be continued in earnest if these difficulties are ever to be overcome. Although we commend the Government for its intention to maintain engagement in academic work on the topic, we urge it to undertake a stronger role, leading and shaping debate and coordinating research. Without action of this kind it is unlikely that personal carbon trading could become a viable policy in the foreseeable future.

We acknowledge the many difficulties that will have to be overcome in the development and implementation of a personal carbon trading scheme, not least work to bring about acceptance of such a concept and considerable further research on many aspects of personal carbon trading. However, we believe that, through designing and implementing a sensitive and moderate scheme, these obstacles could be overcome.

# 1 Introduction

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1. Personal carbon trading has been the subject of academic study for over a decade, but it is yet to be seen as a truly viable policy. Its potential is undeniable, but this enticingly simple idea has grown into a tangle of different proposals and has come up against genuine obstacles. However, where incentives to useful behavioural change by individuals remain disappointingly elusive, personal carbon trading has great potential as a policy tool.

2. In July 2006 David Miliband, appearing before our Committee as Secretary of State for Environment, Food and Rural Affairs, called for a ‘thought experiment’ on the idea, where the challenges could be explored and the concept tested against other proposals.<sup>1</sup> Defra developed a plan to research possible schemes in further detail, and personal carbon trading found a place on the political agenda. We hope that this Report contributes not only to the ‘thought experiment’ but also advances the prospect of personal carbon trading becoming a genuine policy option.

3. Thinking on personal carbon trading is still evolving; there is a need for further research and our conclusions reflect this. We have not attempted to address all of the practicalities of making a personal carbon trading scheme work; rather, we have focused on assessing the value of the concept, and how it can be made both politically and publicly acceptable.

4. We are grateful to all those who submitted evidence to the inquiry or appeared before us; their names are published at the end of this Report.

# 2 Background

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5. In a personal carbon trading scheme, individuals are allocated an allowance of carbon from within an overall national cap on the quantity of carbon emissions produced by individuals within the jurisdiction. People surrender their credits as they make certain purchases that result in emissions, such as electricity and fuel. Those who need or want to emit more than their allowance have to buy allowances from those who can emit less than their allowance. The market effect encourages people to pursue energy efficiency in the home and to reduce their carbon emissions in other areas, such as transport. Over time, the overall emissions cap (and therefore individual allocations) can be reduced in line with international or national agreements.

6. Most of the work conducted so far on the feasibility of personal carbon trading has taken place in the academic domain. There are three key models (although all are variations on the basic concept described above): Tradeable Energy Quotas (TEQs) proposed by David Fleming; Domestic Tradable Quotas (DTQs) proposed by Richard Starkey and Kevin Anderson at the Tyndall Centre (a development of Fleming’s work); and Personal Carbon Allowances (PCAs) proposed by Mayer Hillman, Tina Fawcett and Brenda Boardman’s team at Oxford’s Environmental Change Institute.

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1 Oral evidence taken before the Environmental Audit Committee on 19 July 2006, HC (2005–06) 1452, Q 293

7. Broadly, there are three issues that differentiate these approaches:

- **Participation:** Generally, this concerns whether the scheme is limited to individuals, or also allocates a proportion of the overall carbon allowance to companies.
- **Allocation:** The main areas of contention here are whether children should receive an allocation and how disadvantaged groups should be accounted for.
- **Scope:** This concerns which carbon emissions are included. For example, whether or not personal air travel and / or public transport are included in the scheme.

8. The Centre for Sustainable Energy summarised the differences between the schemes as follows:

	TEQs	DTQs	PCAs
<b>Participation</b>	Individuals (40% free) and organisations (60% tendered, principally to market makers from whom organisations then buy as required)	As TEQs	Individuals only (assumes organisations covered by another, unspecified scheme). At least 40% of UK emissions (i.e. all domestic plus aviation)
<b>Allocation</b>	Adults only equal per capita (plus organisations as above) on weekly rolling basis	As TEQs	Adults full equal per capita allowance; children under 18 half an allowance
<b>Scope</b>	Gas, electricity, coal, oil, road fuels	As TEQs plus personal aviation	Gas, electricity, coal, oil, road fuels, personal aviation, (not public transport)

Source: Simon Roberts and Joshua Thumim, Centre for Sustainable Energy, Report to Defra, 'A Rough Guide to Individual Carbon Trading: The Ideas, the Issues and the Next Steps', November 2006, p3

## Alternative schemes involving individuals

9. Personal carbon trading is not the only mechanism that aims to encourage behavioural change in individuals through monetary penalties and rewards. A number of other options, some more developed than others, have identified the prospect of financial loss or gain as the most effective lever for persuading individuals to take responsibility for their own emissions. Although the most obvious of these is a systematic programme of 'green taxation', others take more direct inspiration from carbon trading. The two main alternative proposals to personal carbon trading, other than green taxation, are outlined below.

### Cap and Share

10. Cap and Share was originally developed by the Irish NGO Feasta (the Foundation for the Economics of Sustainability). Cap and Share aims to achieve the same results as personal carbon trading (i.e. a guaranteed reduction in emissions), but in a form that claims to be simpler, faster and cheaper to implement. Under a Cap and Share scheme, a cap would be set for all UK carbon dioxide emissions. All adults would then receive a certificate entitling them to an equal share of the emissions under that cap. These certificates would be issued monthly, and could then be sold at banks or post offices. The certificates would then be bought by primary fossil fuel suppliers, who would be required



to buy and surrender certificates equal to the emissions from burning the fossil fuels they introduced into the economy. The price of the certificates would be built into the cost of fossil fuels, which would then cascade down through the economy. Consumers would therefore have to pay more for carbon intensive products and services, but would be compensated to an extent by the money from selling their certificates.

### Hybrid Scheme

11. The Hybrid Scheme has been developed by Steve Sorrell of the Sussex Energy Group at the University of Sussex. The scheme aims to achieve environmental and economic benefits that are comparable with personal carbon trading, but claims to be a simpler and more practical alternative, both for the short- and long-term. Under the scheme, the EU ETS would operate alongside a second upstream scheme covering all other carbon emissions from fossil fuels, including emissions from households, other buildings and transport. The fossil fuel producers or suppliers would be responsible for the carbon content of fuel sold to downstream consumers not participating in the EU ETS, surrendering an allowance for each tonne of carbon. The cost of the allowance would be passed on to consumers, and would act like a tax on carbon-intensive goods and services.

### Government Interest

12. David Miliband, when he was Secretary of State for the Environment, supported the idea of personal carbon allowances as a promising policy option:

It is easy to dismiss the idea as too complex administratively, too utopian or too much of a burden for citizens. Do we really want another Government IT programme? Are there not simpler ways of achieving the same objective by focusing on business to change their behaviour not citizens? And will it ever be politically acceptable?

But, as the Tyndall Centre's work shows, in the long term, there may be potential to make a system work, and in a way that is arguably more equitable, more empowering and more effective than the traditional tools of information, tax, and regulation.<sup>2</sup>

13. On 4 June 2007 Mr Miliband appeared before us, and was again asked about personal carbon allowances.<sup>3</sup> He noted that the process was being carried forward through further research (for example, a pilot scheme was being undertaken by the RSA<sup>4</sup>) and the increased public debate on the matter. Mr Miliband also said he believed personal carbon trading was an idea that 'all the main parties will think about' when preparing their next manifestos.<sup>5</sup>

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2 *'The Great Stink: Towards an Environmental Contract'*—Speech by David Miliband, Secretary of State for Environment, Food and Rural Affairs, at the Audit Commission Annual Lecture, 19/07/06 [www.Defra.gov.uk/corporate/ministers/speeches/david-miliband/dm060719.htm](http://www.Defra.gov.uk/corporate/ministers/speeches/david-miliband/dm060719.htm)

3 Qq 39–55

4 The RSA (Royal Society for the Arts, Manufactures and Commerce) operates a pilot and research project called CarbonLimited [www.rsacarbonlimited.org/default.aspx](http://www.rsacarbonlimited.org/default.aspx)

5 Q 48

My approach to this is that as a party of Government that has been in ten years it is right that we are looking for bold solutions. We have got to test them out, we have got to make sure they are sensible, we have to make sure that they are in tune with our values and the considerations of equity are paramount in that for my party, but it is right that we look at it. I do not think we should make any excuses about saying we have not decided but we think it is worth working through.<sup>6</sup>

14. In August 2006, Defra commissioned the Centre for Sustainable Energy to produce an initial analysis of some of the ideas and issues involved in the concept of personal carbon trading. The resulting paper, entitled *A Rough Guide to Individual Carbon Trading—The ideas, the issues and the next steps*,<sup>7</sup> examined the advantages and disadvantages of different approaches and concluded that a personal carbon allowance and trading system had the potential, with further research, to achieve emissions savings in a fairer way than carbon taxes.

15. Defra told us:

The concept of a personal carbon allowance is one of a number of potential long term ideas being explored by the Government that could help to make individuals better informed about, and involved in, tackling climate change. [...] The Government remains committed to exploring the potential of personal carbon trading.

[...] The Government believes that the current system of taxation strikes the right balance between protecting the environment, protecting the most vulnerable in society and maintaining sound public finances. There remain many high-level questions about whether a personal carbon allowance scheme could be a proportionate, effective, socially equitable and financially viable policy option, particularly when compared or combined with existing policies and other options for controlling carbon emissions; whether it could be a practical and feasible option; how such a scheme might work in practice; and whether it would involve placing undue burdens on individuals.<sup>8</sup>

## 3 Evaluating personal carbon trading as a policy option

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### The need to restrain personal carbon use

16. The UK Government has committed itself to reduce carbon dioxide emissions to 20% below 1990 levels by 2010. Further targets in the proposed Climate Change Bill aim to reduce emissions by at least 60% below the 1990 baseline by 2050. This may eventually be raised as high as 80% following criticism of the 60% target as inadequate. Carbon emissions

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6 Q 50

7 Simon Roberts and Joshua Thumim, Centre for Sustainable Energy, *A Rough Guide to Individual Carbon Trading: The idea—the issues and the next steps*, November 2006  
[www.defra.gov.uk/environment/climatechange/uk/individual/carbontrading/pdf/pca-scopingstudy.pdf](http://www.defra.gov.uk/environment/climatechange/uk/individual/carbontrading/pdf/pca-scopingstudy.pdf)

8 Ev 113

from households and personal transport account for around 40% of UK carbon emissions. **It is quite clear that if the Government is to stand the slightest chance of meeting its 2050 target it cannot afford to neglect the domestic and personal sector. Reductions in carbon emissions from business and industry will be meaningless unless accompanied by significant and equal reductions from households and individuals.** This is a matter of urgency. Ambitious targets must be accompanied by equally ambitious emissions reduction trajectories and bold policies.

17. Awareness of climate change and carbon emissions has increased significantly over the last decade. Opportunities to reduce emissions, through improving technology, consumer-friendly labelling, and grant schemes have multiplied. But, in general, individuals are relied upon to reduce emissions either through the promptings of their own conscience, or to avoid the rather minimal attempts at green taxation. The Energy Saving Trust's *Green Barometer* programme reveals that 80% of people believe that climate change is having an impact on the UK, with 75% feeling pressure to change the way they live because of climate change. However, while 39% say that they are 'doing a few, small things' to reduce their contribution to climate change, 40% are doing nothing at all.<sup>9</sup>

18. Dr Nick Eyre, Director of Strategy at the Energy Saving Trust, summarised the challenge the Government faced in changing attitudes:

There is a big group of people in the middle who are now *convincible* to take action but not convinced. They conceptualise the problem as your problem. They see it as an issue for government, perhaps for politicians, perhaps for big business. I do not think we have yet won the argument with the majority of the British public that it is also an issue for them.<sup>10</sup>

For behavioural change to take place individuals must accept a degree of responsibility for their own emissions.

19. There is no denying the commitment of certain individuals and the efforts made by many to change aspects of their lifestyles. However, **existing initiatives are unlikely to bring about behavioural change on the scale required, with many individuals choosing to disregard the connection between their own emissions and the larger challenge. We conclude that more radical measures must be introduced if emissions reductions from the individual and household sector are ever to make a meaningful contribution to UK targets. Personal carbon trading might be the kind of measure needed to bring about behavioural change.**

## The potential of personal carbon trading

20. Under a personal carbon trading scheme, a cap is placed on total emissions from households and individuals, and allowances to the value of that cap are distributed within the market. In theory, irrespective of where and how emissions reductions are made, emissions will remain within the cap as further emissions rights will simply not be available. The Centre for Sustainable Energy noted that the potential of personal carbon

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9 The Energy Saving Trust, *Green Barometer—Measuring environmental attitude*, April 2007

10 Q 102 [Dr Eyre]

trading lay in its ability to deliver guaranteed reductions in emissions from individuals, a ‘theoretical certainty’ that was not shared by all instruments.<sup>11</sup> **Personal carbon trading could guarantee a reduction in emissions because it places a ceiling on the carbon available for consumption, rather than seeking solely to reduce demand.**

21. One of the key strengths of a personal carbon trading scheme would be the incentive of saving (or even gaining) money by cutting personal emissions. Carbon accounts and statements, receipts at point of purchase, and energy bills, would show the positive results of a change in behaviour. As well as penalising those who emitted carelessly, a personal carbon trading scheme would reward those who were making the effort to change. In this sense it has a potentially progressive impact, unlike carbon taxes which are regressive and would apply to even low emitters, including the poorest households. The combination of incentive and visibility could be a potent mix for ensuring engagement in the scheme.<sup>12</sup> Personal carbon trading has a greater potential for engaging individuals in climate change than ‘upstream’ emissions trading schemes.<sup>13</sup> This potential could spread beyond simple adherence to the scheme: personal carbon trading would spearhead behavioural change across a range of environmental concerns by bringing the environment to the forefront of decision-making and massively raising awareness of the challenge of climate change.

22. The RSA argued that personal carbon trading ‘would by its nature be engaging and, arguably, empowering as citizens hold for themselves the right to pollute’,<sup>14</sup> an entitlement that individuals could control as they saw fit. Simon Roberts told us: ‘it also takes away from the issue any moral decision about whether flying to New York is any better or worse than any other kinds of carbon emissions—it just treats them all as equal and you make your own decisions’.<sup>15</sup>

23. Personal carbon trading would focus consumer attention on low-carbon alternatives. Provided that it was introduced as a long-term measure, the personal carbon trading allowance would also provide a clear signal to those individuals who could afford it that improvements and lifestyle changes involving a substantial capital outlay (such as installing certain types of home insulation or a microgeneration capacity) merited the investment—and the sooner it was done, the greater the reward. The potential to save, or even make, money could encourage action even from those with no interest in environmental issues, who would otherwise be difficult to motivate. These long-term signal should lead to significant investment in the market for green goods and services. All of this could lead to a more substantial action being taken, and sooner.

24. While the potential of personal carbon trading is evident, there is no doubt that there are many obstacles to its successful implementation, not least the administrative cost and effort. In their memorandum to us, the Tyndall Centre posed the following question:

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11 Simon Roberts and Joshua Thumim, Centre for Sustainable Energy, *A Rough Guide to Individual Carbon Trading: The ideas, the issues and the next steps*, November 2006, p 8

12 Simon Roberts and Joshua Thumim, Centre for Sustainable Energy, *A Rough Guide to Individual Carbon Trading: The ideas, the issues and the next steps*, November 2006, p 8

13 Ev 83

14 Ev 56

15 Q 4

It has been argued that a tax or upstream auction with lump sum recycling would be significantly cheaper than implementing a PCT scheme [...] It is also argued that C&S [Cap and Share] would be cheaper to implement than PCT as it does not require the use of carbon accounts, carbon cards and carbon statements. The question thus arises, if the same degree of fairness can be achieved at a lower cost by other instruments, why consider a PCT scheme? The answer, I think, is that one would consider a PCT scheme if it brought with it additional benefits that justified any additional costs.<sup>16</sup>

Personal carbon trading must be cost-effective. More focused research will be required in order authoritatively to demonstrate where added benefit is in practice likely. In particular, the relative merits of personal carbon trading must be assessed against the Government's existing strategy of green taxation.

### **Personal carbon trading vs green taxation**

25. We have been unconvinced of the Government's real commitment to implementing meaningful green taxation. In our Report into the 2006 Pre-Budget Report we concluded:

The picture is of an ongoing retreat from the Treasury's announcement in 1997 of a policy to shift the burden of taxation towards taxing environmentally damaging activities. As the latest figures show, the proportion of all taxation made up by green taxes is markedly less than in 1997, and is indeed at a lower proportion than as far back as 1994. This Pre-Budget does contain some limited announcements of rises in green taxes, but these are still very modest when set in the context of several Budgets and Pre-Budgets in recent years in which many environmental taxes have not even been raised in line with inflation.<sup>17</sup>

26. We made a similar point in our Report into the 2007 Pre-Budget Report. However, the shortcomings of existing environmental taxes should not be taken to mean that green taxation is inadequate as an instrument in itself. It is clear that the actual implementation of green taxation is preventing its full potential for reducing carbon emissions from being realised.

27. Green taxation and personal carbon trading both affect individuals. While carbon taxation is a cost even to those who produce very few emissions, carbon trading *rewards* those with low emissions, and only penalises those who exceed their allocation. Both methods use a stick, but personal carbon trading offers a carrot, too. The UK Energy Research Centre (UKERC) concludes that 'the key arguments in favour of PCA include its effectiveness, equity, distributional impacts and certainty of delivering savings'.<sup>18</sup> Richard Starkey told us that the benefits provided by personal carbon trading, though different from those of taxation, were no less valid:

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16 Ev 24

17 Environmental Audit Committee, Fourth Report of Session 2006–07: *Pre-Budget 2006 and the Stern Review*, para 61

18 Ev 67

You are saying to people that if they are a below average emitter they will have their surplus emissions rights that will have a value and they will be better off than they were prior to the implementation of this scheme.<sup>19</sup>

28. With personal carbon trading, allowances are given to you, which, if you are prudent, could be converted into money. It is this direct quality—a *personal* allowance, greater visibility, the opportunity to benefit personally—that convinces us that personal carbon trading would also lead to far higher levels of engagement. The Tyndall Centre argues:

The hypothesis regarding PCT and C&S [Cap and Share] is that actually holding emissions rights will increase individuals’ “carbon consciousness”, i.e. they will become more aware of their emissions and more engaged with and focused upon the task of emissions reduction than under other instruments. And if individuals spend more time and effort considering ways to manage and reduce their emissions, then emissions reduction may be more efficient than under other instruments.<sup>20</sup>

29. Simon Roberts agreed that, in general, individuals are used to dealing with and absorbing price fluctuations from taxes, and need the provocation of a personal carbon allowance to make real decisions about their lifestyle.<sup>21</sup> Steve Sorrell pointed out that:

[...] price elasticity of energy consumption is very low in this [household] sector, which means that carbon prices would need to be very high to have a significant impact on behaviour and emissions. The associated distributional impacts are unlikely to be acceptable.<sup>22</sup>

These analyses suggest that ‘green’ taxes would need to be set at high levels in order to match the emissions-reducing potential of personal carbon allowances, seriously testing the public’s level of acceptance and leading to significant disadvantage among certain groups. **We believe that personal carbon trading has the potential to drive greater emissions reductions than green taxation. A carbon allowance could be more effective at incentivising behavioural change and engaging individuals in reducing their emissions than the price signals resulting from green taxation.** It is also important to bear in mind the difficulty of introducing significant green taxation at a time of general concern over the burden of taxation and in a period of economic slowdown. Even so, it must be acknowledged that a period of significant recession would dampen enthusiasm for most environmental measures, and that personal carbon trading would not be exempt from this trend.

30. Cap and Share offers personal carbon trading’s sense of empowerment and entitlement, yet imposes no direct form of ration or limit. Cap and Share also claims to guarantee emissions reductions through the setting of a slowly reducing cap. It relies on price signals transmitted down through the economy to deter customers from buying carbon intensive goods or services—with the same downstream effect as a carbon tax. We remain to be convinced that price signals alone, especially when offset by the income from selling the

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19 Q 96

20 Ev 24

21 Q 4

22 Ev 97

certificate, would encourage significant behavioural change comparable with that resulting from a carbon allowance. Laurence Matthews argued that raising awareness ‘is only a means to an end, and not something we should have to rely on in order to implement a scheme’,<sup>23</sup> but awareness is crucial if behaviours are to change. A meaningful reduction in emissions will only be achieved, and maintained, with significant and urgent behavioural change.

**31. We acknowledge that personal carbon trading could be complex administratively and more challenging to implement than green taxation and other alternative proposals. However, its potential to change behaviours and engage individuals means the Government should seriously and urgently assess how to take personal carbon trading forward.**

## Obstacles and difficulties

32. The challenges surrounding personal carbon trading are multi-faceted and will not easily be overcome. Beyond technical questions, personal carbon trading would have to overcome significant obstacles of political and public acceptance. The following issues rank among the most significant obstacles to the introduction of a personal carbon trading system:

- Coverage: who receives an allocation? Of what size? How frequently? Which emissions are included?
- System and operation: the need to provide efficient and reliable systems which can cope with massive amounts of data, processing transactions in different formats and providing real time updates of account levels. Such systems will also need to be resilient to fraud.
- Administration: the need to have a trusted and capable administrative body; and the sensitive setting of the allocation curve on the fine line between public acceptability and driving down emissions.
- Finding space in the policy landscape: many carbon emissions are already counted as part of existing policy instruments, such as the EU ETS. For personal carbon trading to work, it would need to fit with other schemes.
- Public acceptability: personal carbon trading would be a major initiative, affecting every individual in the country. Perceptions of the scheme as over-restrictive, unnecessary, inequitable, or burdensome, whether or not rightly founded, would prove very difficult to overcome in certain quarters.
- Engagement with the scheme: measures will need to be taken to ensure that individuals understand the scheme and know how to use it. The public’s involvement with the scheme will be needed, both for its effectiveness and for its acceptance. Mechanisms and strategies accounting for those who are unable or unwilling to participate will be needed.

- Ensuring equity: measures would have to be taken to prevent unfair distributional impacts, including protecting high risk groups such as those suffering from fuel poverty and people with disabilities, or deciding whether or not to provide children with an allowance. The extent to which issues of inequity are deemed to have been tackled successfully will significantly affect the public's acceptance of the scheme.
- Obtaining political commitment: the long-term commitment and political courage required of any government must be substantial if it is to introduce such a radical and potentially unpopular scheme. If it is to work, personal carbon trading will require support across a wide political spectrum.

## Conclusion

33. We acknowledge the many difficulties that will have to be overcome in the development and implementation of personal carbon trading, not least work to bring about the public and political acceptance of such a concept; considerable further research is required on many aspects of personal carbon trading. However, we believe that, by designing and implementing a sensitive and moderate scheme, these obstacles could be overcome.

# 4 Towards a practical personal carbon trading scheme

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## Key considerations

### Scope

34. The concept of a full economy scheme, such as that proposed under TEQs and DTQs is undoubtedly appealing. In the words of Richard Starkey of the Tyndall Centre, 'it is one scheme that encompasses the entire economy, so it is simple and efficient'.<sup>24</sup> Yet, the concept of such a scheme is so vast that it is difficult to envisage when, and how, it could realistically be implemented. The policy landscape is already increasingly crowded in terms of upstream carbon reduction mechanisms. The introduction of a full economy scheme would therefore necessitate a complex revaluation of participation in mechanisms such as the EU ETS. We do, however, have more or less a clean slate for a trading scheme purely between individuals. This is the territory in the policy landscape that has so far been neglected.

35. We believe that trying to solve all the problems involved in introducing an economy-wide system would unacceptably delay the introduction of a personal carbon trading scheme. The most realistic option is to introduce a scheme with restricted participation. Companies and other aspects of the economy could be covered by different trading schemes, with the consolidation of schemes considered at a later date once the principle of personal carbon trading had been satisfactorily established.



36. Even if different schemes which applied to different sectors were to operate on separate carbon currencies, they would still have an effect on each other. The Tyndall Centre calculated that:

Currently, EU ETS covers around 50% of the UK's CO<sub>2</sub> emissions. The proposed Carbon Reduction Commitment will cover slightly less than 10% of additional CO<sub>2</sub> emissions and the proposed Supplier Obligation, which might take the form of a cap and trade scheme, could cover around another 15% of CO<sub>2</sub> emissions. The Commission has proposed the inclusion of aviation emissions within the EU ETS in Phase 3 and the UK government has proposed that emissions from surface transport also be included. Hence, it is possible that the majority of UK emissions will be captured under one or other cap and trade scheme by 2013. [...] Implementing a PCT scheme in parallel with these trading schemes would thus result in the majority of UK emissions being covered by PCT and another trading scheme. In other words there would be a very considerable degree of "double counting".<sup>25</sup>

The fact that there would be double counting in some parts of the carbon chain is not in dispute. However, evidence as to what impact this double counting would have on the efficacy of the instruments concerned seems to be inconclusive. While the Tyndall Centre and the Centre for Sustainable Energy both suggested in evidence that double counting could only be avoided by fundamentally altering the nature of the EU ETS to allocate emissions rights to energy end-users,<sup>26</sup> thus creating a single, economy-wide scheme, other witnesses argued persuasively that double counting would not present a significant problem. Professor Ekins believed that 'in principle, it does not seem to me that there is a problem if there is overlap',<sup>27</sup> while Matt Prescott of RSA told us: 'so long as the carbon market that was set up to support a personal carbon trading scheme was a separate currency from the EUAs of the ETS and EU ETS, then the two schemes would be able to operate side by side'.<sup>28</sup> Further research is required in this area. However, on the face of it the issue of double counting would not reduce the effectiveness of personal carbon trading or detract from the other advantages of the whole concept.

**37. We do not believe that double counting is a serious handicap. However, we recognise that concerns over double counting of carbon emissions do exist and need to be addressed. In the meantime they must not be a barrier to investigating and developing the concept of personal carbon trading.**

### ***The Climate Change Bill***

38. Any consideration of personal carbon trading will need to take place in the context of the Climate Change Bill. Although the Bill will contain enabling powers for introducing new trading schemes through secondary legislation, the Government has made clear that it does not envisage using these powers for introducing a personal carbon trading scheme. **We agree with the Government that the introduction of a personal carbon trading**

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25 Ev 22

26 Ev 22 [Tyndall Centre]; Q 11 [Simon Roberts]

27 Q 204

28 Q 175

**scheme should be a matter for primary legislation, rather than using the delegated powers contained in the Climate Change Bill.**

39. However, the provisions of the Climate Change Bill would provide an appropriate framework for the setting of caps and budgets under a personal carbon trading scheme. The Bill provides for a statutory basis of five-year carbon budgets, setting binding limits on emissions, with three successive budgets (set 15 years ahead). This system of long-term, fixed national budgets is exactly the framework that would be required for setting caps for personal carbon trading. Personal carbon trading caps could be set as a sub-category of the national budget. The Energy Saving Trust told us that the targets under the Climate Change Bill ‘would provide the necessary long-term emissions reduction signal to business and individuals and should therefore be consistent with any PCA allocation’.<sup>29</sup> Personal carbon trading caps would need to be subject to the same accountability and independent scrutiny as we have insisted upon for national carbon budgets.<sup>30</sup> **We believe that the setting and managing of caps for personal carbon trading would be wholly consistent with the provisions for emissions budgets and targets as set out under the draft Climate Change Bill.**

### **Technology**

40. Although there is no direct precedent for a personal carbon trading scheme, there are established technologies that fulfil the functions required, not least the banking and transaction system itself. Richard Starkey was clear that this could be easily adapted for a personal carbon trading scheme: ‘technologically you are using a well-established tried and tested credit card system, all the readers are in petrol stations and you are using systems of direct debit which are very well understood’.<sup>31</sup>

41. The CSE have also found the success of store loyalty cards particularly encouraging:

Estimates vary between 65% and 85% for the proportion of households which have at least one loyalty card. However, the scale and rate of take up of loyalty cards is probably less relevant to individual carbon trading systems than the findings that: (a) people seem perfectly prepared to buy things using more than one card per transaction, and; (b) these companies have established enormous databases which securely store personal data and vast amounts of transaction data.<sup>32</sup>

The CSE calculated that the Tesco Clubcard database collects some 50 billion pieces of data per year. Based on the Tyndall Centres’s estimations of transaction figures, the CSE calculated that a personal carbon trading database would have to process 15 billion pieces of data per year.<sup>33</sup>

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29 Ev 37

30 Environmental Audit Committee, Seventh Report of Session 2006–07, *Beyond Stern: From the Climate Change Programme Review to the Draft Climate Change Bill*, HC 460, para 131.

31 Q 84

32 Simon Roberts and Joshua Thumim, Centre for Sustainable Energy, *A Rough Guide to Individual Carbon Trading: The ideas, the issues and the next steps*, November 2006, p 23

33 *ibid.*

42. The most significant operational difficulty lies in the administration of allowances and accounts. Simon Roberts told us:

We have a very good transaction system and we have a very good accounting system [...] you could create a carbon account and you could link it up with the transaction systems and you would not need to build anything new to do that. [...] Where I think you have an issue is with the allocation system, how do you identify and get the right amount of carbon credits to the right accounts smoothly with a tolerable level of fraud.<sup>34</sup>

This view was shared by Richard Starkey:

Perhaps technology is not the biggest challenge, it is more the administrative challenges of enrolling 45 million people into a scheme, giving them a card, dealing with lost and stolen cards, closing people's account when they die or they emigrate, or if people are entitled to emissions when they are 18, making sure that when they hit the age of consent their account is open for them.<sup>35</sup>

43. The Government operates large-scale systems, but a great part of the expertise in managing systems of this kind resides in the private sector. This expertise will need to be harnessed, and it may also be appropriate for the private sector to play a substantial role in the operation of a personal carbon trading scheme. An expert seminar run at the RSA concluded that, while Government could be responsible for allocating credits and data protection, the private sector could undertake day to day operation of the scheme.<sup>36</sup> The London Congestion Charge was cited as an important example. Like personal carbon trading it is a statutory scheme, involving multiple transaction methods, but which has been successfully operated by the private sector (admittedly at a cost that some people consider unacceptably high).

44. The RSA is enthusiastic about the participation of business, in particular the role the banks could play:

We [...] envisage a major role for business in organising and facilitating the personal carbon market. The opportunities associated with this would be dictated by its governance, but must exist in order to provide an incentive for businesses to seek to play a role in the operation of the scheme. Given the likely role of existing banking and IT infrastructure, a range of organisations would be in a strong position to play a role. [...] There is a strong case to be made for banks and credit card companies to handle the PCAs. Banks have the system and knowledge in place.<sup>37</sup>

45. If the Government takes advantage of the expertise and infrastructure of the private sector, the technical and operational aspects of a personal carbon scheme could be easily realised. **We are confident that the technical and operational challenges of**

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34 Q 7

35 Q 84

36 RSA Carbon Limited *'Technology for Personal Carbon Trading—Outputs from an RSA expert workshop—December 2006'* February 2007, p 6 [www.rsacarbonlimited.org](http://www.rsacarbonlimited.org)

37 Ev 57

implementing personal carbon trading can be overcome. Suitable technology and systems already exist. Although a personal carbon scheme would operate on a larger scale than most existing schemes, the concept has been successfully demonstrated.

46. The private sector could play a vital role in operating a personal carbon trading scheme. Further research and consultation is required in order to determine precisely what the most appropriate role for business would be.

### Achieving acceptability

47. The current debate on personal carbon trading has largely ignored crucial questions of acceptability. CSE, in their report to Defra, said:

In assessing the current state of the debate on individual carbon trading, we found a range of interests largely focused on the operational minutiae of specific schemes and on examining the minor theological differences between them. Yet the differences between the schemes appear to be less important at the stage than the largely untested assumptions shared by them all about public responses and political feasibility [...] It is important at this stage to ground the debate quickly in considerations of political and practical feasibility – and that all potential policy instruments for achieving UK carbon emissions goals are considered on a similar basis.<sup>38</sup>

In considering the question of public acceptability, it is important to recognise that we should not be trying to drop a fully-formed, all-encompassing scheme into place. The necessary policy framework does not yet exist, the operational challenge would be immense, and such an approach risks overwhelming and alienating the public. **We agree with the Centre for Sustainable Energy that it is crucial to shift the debate away from ever-deeper and more detailed consideration of how any personal carbon trading scheme could operate towards the prior questions of how it could be made publicly and politically acceptable. It is these questions that will ultimately decide the viability of personal carbon trading, and until they have been fully analysed and properly answered, further work on the operational details of schemes adds little value to the main debate.**

48. Personal carbon trading will require sustained support across a broad political spectrum. There would need to be consensus both on the need to implement the scheme, and on the importance of sticking with the scheme in difficult periods. In order for the scheme to have a meaningful effect on behaviour, the public would need to accept it as a long-term measure, rather than as an interim policy that could end at the next election. This consensus will not be easy to achieve, although the Climate Change Bill will go some way to creating the right conditions. Professor Ekins told us:

The Climate Change Bill is a very important political innovation because that will make it more difficult for politicians to opt out of the agenda altogether. I think it will mean that politicians, given these targets, if they do not like one set of policies for

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<sup>38</sup> Simon Roberts and Joshua Thumim, Centre for Sustainable Energy, *A Rough Guide to Carbon Trading: The ideas, the issues and the next steps*, November 2006, p 3

carbon reduction, they will have to put forward another set of policies for carbon reduction instead of just saying, “We do not like that.” That is potentially an important discipline.<sup>39</sup>

49. Political acceptability will inevitably rest on public acceptability. Although Simon Roberts told us there was an increasing public appetite for Government intervention to help people reduce emissions,<sup>40</sup> personal carbon trading is a radical step. Recent experiences of public opposition to road pricing and fortnightly waste collections suggest that any move to implement carbon trading or extensive carbon taxation could be very difficult indeed. Research by the Energy Saving Trust revealed that only a third or less of individuals questioned thought that measures such as green taxes (34%), road pricing (tolls and congestion) (30%) and carbon rationing (28%) were socially acceptable.<sup>41</sup> Professor Ekins told us:

I do not think that either of them [green taxes or personal carbon trading] are politically acceptable at the moment. It is not politically acceptable to impose policies that will cause people to reduce their emissions. That is the baseline where unfortunately we are.<sup>42</sup>

**50. Public opinion may be hostile to any policy instrument designed radically to reduce emissions from individuals. The Government must be courageous on this point. Widespread public acceptance, while desirable, should not be a pre-condition for a personal carbon trading scheme; the need to reduce emissions is simply too urgent. However, significant opposition could undermine any proposal. Further research is required in order to obtain a more detailed picture of the extent of public resistance to personal carbon trading and in what ways this opposition could be tackled.**

51. Our witnesses agreed that opposition to personal carbon trading often stems from a lack of understanding either of the *need* for such a mechanism, or of *how* the scheme would actually work. Acceptance increases if this is explained. Richard Starkey’s experience was that ‘people’s hostility to a personal carbon trading scheme is inversely proportional to the amount of detail they have about it’.<sup>43</sup> Simon Roberts told us that arguments against personal carbon trading are usually founded on general arguments against constraining carbon use, rather than anything solely attributable to personal carbon trading:

It is not a question of doing this or nothing but it is a question of doing this or doing those other things instead—would you rather have a carbon allowance or a heavy tax on petrol and domestic fuel? That is, in a way, the kind of choice you need to be putting in front of people rather than, “What do you think about this?”<sup>44</sup>

**52. Opposition to personal carbon trading could be reduced if the public could be convinced of three things. First, that it is absolutely essential to reduce emissions;**

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39 Q 218

40 Q 48

41 The Energy Saving Trust, *Green Barometer—Measuring environmental attitude*, April 2007

42 Q 202

43 Q 99

44 Q 17

second, that this can only be achieved if individuals take personal responsibility for reducing their own emissions; and third, that personal carbon trading is a fairer and more effective way of reducing personal emissions than alternatives such as higher taxes. The public must be persuaded of the first two parts of this argument as soon as possible if the Government is ever to convince them of the third. Persuading the public depends on perceptions of the Government's own commitment to reducing emissions, and of the priority given to climate change in its own decision making.

### *Emissions caps*

53. The allocation curve of the personal carbon budget will need to be set sensitively. A cap that is too taxing, too soon, risks breaking any fragile covenant between public and government on this matter. On the other hand, the later action is taken the steeper the curve will need to be. Paul Allen, of the Centre for Alternative Technology, told us:

The optimum carbon descent steepness curve is one that begins immediately. The longer we leave it, we are moving away from the optimum because we are making the descent steeper and steeper, and therefore the social transition harder.<sup>45</sup>

Also, the Stern Report noted that early benefits can be gained by disproportionate effort at the beginning, making a stricter cap, earlier, even more attractive. A balance will have to be struck between achieving meaningful carbon emissions and gaining public acceptance of the scheme.

54. Even after the initial phase, the setting of the allocation curve is not as simple as drawing a straight line down to the 2050 target level. Complex considerations of distributional effects and 'crunch points' must be taken into account if the curve is to stimulate the correct balance of emissions reductions and public engagement. Simon Roberts of the CSE told us:

All those things [such as choosing not to go on holiday] are relatively low cost, if not zero cost, and therefore the cost of getting down that curve to start off with may be very, very low, in which case the cost of carbon in that particular system would be low as well. What we do not know at the moment is where you start the hits and the marginal abatement cost curve. Where does it suddenly get steep and how does that distribute across different types of households, different types of people? Some people have very immediate, very high costs to reduce emissions and other people have an awful lot of spare capacity to cut emissions through choices they are making which are actually just about habit and behaviour, and I think you need much more of that kind of information to start to map out who would be suffering and where the squeeze would be depending on what curve you introduced.<sup>46</sup>

Although personal carbon trading aims to drive change in a way that less restrictive policies could not, careful consideration will need to be given to the point at which further change becomes unachievable at a reasonable cost.

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45 Q 153

46 Q 6

55. If a personal carbon trading scheme is ever to see the light of day then the first stages of the scheme, at least, will need to focus on gaining public and political acceptance. Any scheme must limit emissions, but we must accept that initially caps might be more lenient than is ideal, in order to achieve public acceptance. Once the scheme is better established, more demanding caps could be set. This approach will have to be carefully balanced against the need to ensure the scheme effectively reduces emissions in line with national targets.

### *Emissions included under the scheme*

56. Emissions that could realistically be included under a personal carbon trading scheme—although with varying degrees of difficulty—are:

- Domestic energy consumption
- Road fuels
- Air travel
- Public transport

In each case, an approved rate of exchange would need to be set between the product or service purchased and the number of carbon allowances to be surrendered. This would need to vary for different fuels (so a green electricity tariff would require the surrender of fewer allowances); or, in the case of aviation and public transport, the length or method of travel. Retailers would calculate the carbon value of a product or service according to this rate of exchange, and the consumer would surrender carbon allowances accordingly. Individuals themselves would not be required to make complex carbon footprint calculations for their purchases.

57. Some types of emissions would be easier than others to include under a personal carbon trading scheme. Household electricity and gas use would be measured by the power companies as usual, the carbon allowance total calculated according to the energy mix and amount consumed, and communicated to customers as part of their normal bill. Gas canisters and bags of coal would be worth a certain amount of carbon units. For road fuels, the cost per litre would be calculated firstly in pence, and secondly in carbon, with the customer required to surrender a certain number of carbon allowances at the same time as paying for the fuel. Aviation would involve single transactions, comparatively few in number when compared with public transport in general, and highly significant in terms of carbon impact. However, the inclusion of aviation under a personal carbon trading scheme would present inevitable difficulties as to which flights should be eligible, and how the system could be fairly implemented beyond domestic flights. These difficulties would need to be overcome not only due to the carbon intensity of air travel, but also because the use, or otherwise, of air travel would represent a key variable for individuals in balancing their carbon allowance.

58. It is less clear whether it would be possible, or perhaps more crucially, worthwhile, to apply personal carbon trading to the use of public transport. Although the development of systems such as the Oyster card have proved that quick and easy surrender of units (whether cash or carbon) for individual journeys is possible, there remain concerns over

the inclusion of public transport. The memorandum from the Environmental Change Institute listed a number of reasons why it might not be prudent to include public transport in a personal carbon trading scheme, at least at the beginning of its life. Among these were:

Surface public transport comprises only a small percentage of individuals' total emissions;

Inclusion of public transport could easily double or treble the total number of carbon credit transactions per year, while only affecting a small proportion of personal emissions;

It is difficult to accurately calculate the emissions associated with an individual's travel on different public transport modes due to fuel choices, occupancy and distance travelled.<sup>47</sup>

59. Certainly it might be possible in future stages of a scheme to envisage the inclusion of some areas relating to public transport: most simply, perhaps, substantial purchases such as long distance rail travel or season tickets. However, any such move would need to be carefully analysed in order to assess its impact on the shift towards lower-carbon lifestyles. It is important that the public are not faced with a mixed signal: although the surrender of allowances for public transport would be minimal in comparison to the purchase of road fuels, a public transport system that was entirely exempt from personal carbon allowances would provide a far clearer incentive for individuals to leave their cars at home.

60. The more types of emissions included at the beginning of a scheme, the more complex the implementation of the system, and the greater the leap of faith required from the public. A careful balance will need to be struck: on the one hand, a scheme encompassing many emissions risks making individuals feel under siege and confused by comparing different types of emissions; on the other hand, the more emissions covered under personal carbon trading, the greater the flexibility individuals would have in deciding how to manage their emissions and carbon allowance.

61. Stern has shown that the sooner action is taken, the more effective it can be. It is for this reason that we believe it is more important to implement a reduced scheme than to delay action while worrying over how to develop the perfect, fully-formed, all-encompassing scheme. **We believe that personal carbon trading could be made workable if it was acknowledged that it may not be possible to cover all eventualities from the very beginning. A basic programme covering certain emissions could be a useful stepping stone to a more comprehensive scheme. We recommend that the Government investigate the possibility of a phased initial implementation, including all individuals, but concentrating on certain basic areas of carbon use, such as household energy. The scheme could then be developed, expanded, and integrated with other schemes over time, as appropriate.**



### *Access, participation and engagement*

62. Individuals who are either highly environmentally or fiscally conscious are likely to engage more closely with personal carbon trading, tracking their carbon use and managing their accounts. To a degree, they would stand to benefit from this, in the same way that any financial management provides benefits. Most individuals will surrender allowances at point of purchase with little further interaction. Some individuals will not understand the system and will require assistance and encouragement.

63. Professor Ekins was confident that the association between carbon emissions and financial loss or gain could bring about significant engagement with the scheme.

If people understood that carbon was money, they would take it very seriously. They would participate in any scheme that was set up. [...] The challenge will be to really connect that very abstract, transactional environment which will resemble the money environment with people's energy use and perceptions of energy use and a recognition that, when they turn the central heating up, that will mean that this parallel money as well as their normal money is going to be hit. The big difference about the parallel money is that it is rationed. There is a fixed amount out there in the nation and they will need to buy in a market that is fixed. That is quite a different kind of market to the one people are used to.<sup>48</sup>

64. A significant misconception is the amount of active 'trading' required in order to participate in the scheme. Unless an individual chooses to involve themselves in the speculative buying and selling of carbon allowances, the trading aspect of the scheme is largely invisible. An individual will have a certain balance in their carbon account. When they make carbon purchases, allowances are surrendered from this account. If the individual's carbon account is empty, allowances must still be surrendered at point of purchase. The retailer will automatically buy carbon allowances on the customer's behalf, and surrender them immediately. The cost of the carbon allowances bought in this way will be added to the amount paid by the customer. The customer does not have to actively search for extra allowances, though the price of these point of sale allowances will vary with the carbon market.

65. This process would also be used to account for those who were unable or particularly unwilling to participate directly in the scheme. Richard Starkey explained how it would work in this case:

If you do not want to think about emissions rights you do not have to think about emissions rights. Just one thing has to happen. Your emissions rights are automatically placed into your electronic account, let us say, once a month. Either you yourself, or if you are not capable of doing that, someone on your behalf can set up an arrangement whereby those emissions rights are automatically sold to a bank as soon as they hit your account. You make that one arrangement and then for the next 15 or 20 years, however long you are alive, you do not have to think about it again. Then whenever you go to a petrol station to buy petrol, or pay your electricity

bill, you simply just pay in money. The electricity company or the petrol station is adding on the cost of the emissions rights to your bill.<sup>49</sup>

In this way, non-participants still receive their allowance of carbon, and still receive money when these allowances are automatically surrendered without being used. They simply pay higher prices for the products and services included under the scheme. They will experience the scheme as a carbon tax, but with an extra sum of money arriving in their accounts every month. The personal carbon trading scheme is not undermined as it still has a full number of participants, who are still paying for their carbon use.

66. This ‘pay as you go’ approach to carbon trading would have some disadvantages. Firstly, it is less effective at raising public awareness and understanding of carbon use, because the carbon transaction is less visible. Secondly, customers would have to buy carbon at its market price. If carbon prices were high, customers could be worse off than if they had used their own allowances to pay for goods.

**67. Personal carbon trading will pose particular difficulties in accommodating and engaging the financially excluded. It is unrealistic to ask those who find it difficult, or even impossible, to manage their standard finances, to also understand and manage a carbon account. While the possibility of a ‘pay as you go’ option goes some way to relieving these difficulties, it is imperative that any personal carbon trading scheme includes a detailed and determined strategy for assisting the financially excluded. Research is required to assess the likely proportion of people who would choose this type of option, and whether they would face any significant disadvantage as a result. It would be important to make the scheme sufficiently simple and accessible that remaining involved seemed as easy, or indeed easier, than opting out.**

68. A regular issue (for example weekly, or monthly) of allowances onto the market should ensure that the allowance market remains fluid and that there is minimal risk of the market itself ‘running out’ of allowances. However, as with any market, regulation would be required in order to safeguard against market failure, and to provide contingency plans in the case of extraordinary events such a particularly cold winter.

69. Personal carbon trading is often associated with the idea of a carbon card. The carbon card is one of the most regularly cited manifestations of a personal carbon trading scheme, and such a card could indeed play an important role in bringing visibility to the scheme, as well as engendering a sense of ownership. Matt Prescott explained why a card could have an important role to play in achieving public acceptability for the scheme:

The purpose of the scheme is very much to give ownership down to the level of the individual and the community and enable them to control it, hence the interface would need to be something that was comprehensive for the scheme but also comprehensible from the point of view of individuals. The original suggestion of a stand-alone credit card, of sorts, which has been talked about for probably the last 12 months would give you that “in the wallet” visibility that you are involved in the scheme.<sup>50</sup>

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49 Q 74

50 Q 164

However, a personal carbon trading scheme would need to operate on a number of different platforms in order to facilitate different kinds of transactions: for example, allowances could be surrendered via a carbon card (at a petrol station, for instance), via direct debit (for electricity bills), or through an internet transaction (for online purchases). All of these transactions would draw on the same carbon account. Matt Prescott emphasised the range of transactions required:

It is obvious to see that domestic household utility bills are not often paid using one of the existing card systems but more often either through a pre-paid meter or direct debit and hence we would be looking at a mixture (a) of technologies and (b) of interfaces that we would need to tie in in an understandable way, such that the scheme looked neat and tidy to the public but actually properly did dovetail a number of different infrastructures in order to deliver that.<sup>51</sup>

This range of interfaces is also important for the public's acceptance of the scheme: it makes the scheme more versatile and accessible, meaning that the public can engage with the project in the way which is most convenient for them. This extends not only to transactions, but also to the ways in which individuals can access and manage their account.

70. Some of the most vehement objections to personal carbon trading are based on fears of state control and data storage. However, there is no reason why access to a carbon account and use of a carbon card could not be protected with some of the same measures used to protect bank accounts and credit or debit card (i.e. such as passwords and pin numbers) with the similar protection against fraud and even provisions for lost and stolen cards.<sup>52</sup> It would be practically impossible to eliminate fraud entirely, but measures can be taken to manage and minimise the risk of fraud to the point where security is no longer a barrier to public acceptability.

### ***Supporting measures***

71. Public acceptability for personal carbon trading can only be achieved if the public feel they are being supported in meeting the requirement placed upon them by Government. The public will need to be given help and guidance to achieve these carbon reductions. Nick Eyre told us:

Personal carbon allowances would set an overarching instrument for individuals and carbon but that would not address every barrier to behavioural change and investment [...] There would still be a need for specific interventions.<sup>53</sup>

Similarly, the Environmental Change Institute noted in their memorandum that 'If PCA were to be introduced, it would not be a stand alone policy. It would simply form the umbrella mechanism within which a wide range of other policies would operate'.<sup>54</sup>

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51 Q 164

52 A number of witnesses supported the view that existing banking technology could meet requirements of identity and account protection. See Qq 37–8, Q 76, Q 162, Ev 74.

53 Q 107 [Dr Eyre]

54 Ev 66

**Personal carbon trading provides only the incentive to reduce emissions, not the means. It is clear that a personal carbon trading scheme would need to be accompanied (and, indeed, preceded) by a raft of other policies. The Government would need to make sure that the opportunities and resources to help people reduce emissions were readily available and well publicised.**

72. Most importantly, individuals would need to have the knowledge and means to assess their own carbon footprint and where they stood to fall in the personal carbon market. Nick Eyre was insistent on this point:

If people do not know what their carbon footprint is, they do not know whether they would be a buyer or a seller within a trading scheme. That is a pretty fundamental thing that they need to understand before they can engage with the system.<sup>55</sup>

The obvious tool for this purpose is a carbon calculator. Defra have recently introduced their Act on CO<sub>2</sub> calculator, which enables individuals to calculate their carbon footprint from home energy use and transport patterns. **We commend Defra's Act on CO<sub>2</sub> calculator.<sup>56</sup> It is accessible, engaging, and simple to use. Under a personal carbon trading scheme it could be adapted to provide further information related to personal carbon allowances, and link to personalised advice on how to save carbon units.** This could build upon the important work already being undertaken by the Energy Saving Trust. Nick Eyre told us:

People need help to figure out how to reduce their emissions. The Energy Saving Trust programme, which advises people on what their energy use is, what their carbon footprint is, and, more importantly, how it can be changed, provides the key piece of information that any individual needs to participate effectively in a personal carbon allowance market. Until we have that sort of information the market will not work because it is a fundamental principle of markets that they only work properly when people are informed.<sup>57</sup>

The Energy Saving Trust also suggested that better metering systems would be essential in order to rise the energy and carbon awareness of households.<sup>58</sup> **We firmly support the introduction of smart metering in households. This would be an essential supporting measure of a personal carbon trading scheme. At any rate, smart metering should be introduced as soon as possible in order to raise carbon consciousness and thereby lay the ground for carbon restricting measures.**

73. We also await with interest the outcome of new programmes providing individually-tailored, paid-for domestic assessment services, such as the pilot being planned by the Energy Saving Trust, and the Green Concierge Service running as part of the Mayor of London's Green Homes Initiative.<sup>59</sup> These schemes aim to provide, at a cost, a personalised

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55 Q 105

56 The Carbon Calculator can be found at: [actonco2.direct.gov.uk/index.html](http://actonco2.direct.gov.uk/index.html)

57 Q 114 [Dr Eyre]

58 Ev 37

59 See the Energy Saving Trust [www.energysavingtrust.org.uk/help\\_and\\_support/green\\_homes\\_service](http://www.energysavingtrust.org.uk/help_and_support/green_homes_service) for further details of their pilot, and the Mayor of London [www.londonclimatechange.co.uk/greenhomes/green-concierge-service/](http://www.londonclimatechange.co.uk/greenhomes/green-concierge-service/) for details of the Green Concierge Service.

carbon footprint assessment (in the case of EST, also including emissions from transport) with structured action plans and follow-up assistance. Such schemes will provide useful data on the effectiveness of more personal and structured forms of advice, and on the willingness of individuals to pay for energy-saving services. Under a personal carbon trading scheme, more direct programmes such as these could have a significant role in helping households to meet the challenges and opportunities offered by personal carbon trading.

74. It is not enough to know one's carbon footprint and understand its implications for the personal carbon allowance. Individuals must also be provided with the opportunities to reduce their emissions. In part, this can be resolved by the provision of information and advice. For changes involving significant capital outlay, such as home insulation or the installation of microgeneration capacity, assistance and grant schemes may be required. The Environmental Change Institute emphasised that 'new and existing efficiency and carbon emissions standards would [need to] continue to be tightened'.<sup>60</sup> In the future, policies will need to go beyond facilitating changes to existing lifestyles, and focus on encouraging significant changes in lifestyle trends:

Transport and planning policy would need to find more effective ways of encouraging the use of lower carbon modes and, eventually, lower mobility lifestyles. Not only would these policies enable and encourage people to live lower carbon lives, they could also be used comprehensively in advance of PCA to broaden the low carbon options available.<sup>61</sup>

Personal carbon trading could form the backbone of a wide programme of policies designed to facilitate the move not only to low-carbon households, but also to a low-carbon economy.

75. Finally, any development of a scheme would also need to take into account the costs and demands on business, especially fuel retailers, energy providers and travel services, arising from personal carbon trading. The handling of carbon credits will require training, equipment and publicity. Government will have to assist in providing these facilities in order to make any proposals to introduce personal carbon trading palatable to the businesses who will have to implement the scheme as part of their transactions with customers.

### ***Accounting for disadvantaged groups***

76. The question of 'fairness' will be central to the public acceptance of a personal carbon scheme. Emissions from the domestic sector will have to be reduced or constrained in some way if we are to meet our emissions targets. The question is whether personal carbon trading would create greater inequalities than any other scheme used to do this. Professor Ekins was adamant that there was little chance of finding a truly 'fair' scheme:

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60 Ev 66

61 Ev 66

No one model is going to be perceived by everybody to be fair. Fairness is something that is fought out in the political process day by day. This will have to be too.<sup>62</sup>

77. Richard Starkey identified many groups who could feel disadvantaged by an equal *per capita* allowance, most notably those suffering from fuel poverty. He insisted that the cause of such inequalities needed to be carefully assessed:

There is the specific issue of fuel poverty which is well recognised, but again it is important to recognise that it is an issue under personal carbon trading and it would also be an issue under carbon tax and it would also be an issue under an upstream carbon emissions scheme. So if it is a problem, it is a problem that is not specific to this particular instrument. I think it is important to distinguish between problems specific to this particular instrument, for instance enrolling 45 million people under the scheme and problems that are generic to the whole gamut of these instruments.<sup>63</sup>

78. The memorandum from the Centre for Sustainable Energy also recognised that the existing policy landscape was unlikely to favour any instrument of this kind:

None of these situations [of inequality] are the result of PCAs; they are simply the reality of a society and an energy market—already blighted by inequalities and socially regressive pricing practices. Indeed, these situations are the reality within which any policy designed to constrain and cut individual carbon emissions will have to act.<sup>64</sup>

**79. Personal carbon trading will inevitably highlight existing inequalities of income and opportunity. Any instrument designed to restrict and reduce domestic carbon emissions would raise the same concerns and it would be wrong to reject the proposal of personal carbon trading because of these difficulties. As with any other policy, these inequalities will need to be identified, assessed and, where appropriate, compensated for.** However, it must be remembered that a personal carbon trading system could be much less onerous for disadvantaged groups, including those suffering from fuel poverty, than alternative policies designed to cut carbon emissions, such as green taxes.

80. In all the proposals for personal carbon trading, allowances are hypothetically distributed on an equal *per capita* basis: every adult individual receives the same allowance, irrespective of his or her circumstances. It is from this basis that allowances are then bought or sold, to account for the inevitable inequalities in carbon usage. Richard Starkey explained that an equal *per capita* allowance, although not perfect, was perhaps the most straightforward solution:

It really is not the case that it is done and dusted by saying it is completely fair for everybody getting the same amount of emissions rights. If you do not go down that route on the other hand you get into the whole knotty problem of how do we adjust everybody's equal share to take account of their particular circumstances and one

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62 Q 208

63 Q 85

64 Ev 2

can imagine getting bogged down in lots of disputes and lots of bureaucracy about that.<sup>65</sup>

However, while an equal *per capita* allowance may be the fairest method in a philosophical sense, its failure to account for individual circumstance may make it seem less appealing from a political point of view.

81. Varying allowances would, however, create a raft of difficulties. Firstly, there is the difficult decision of to whom to award extra allowances, how much to give, and the bureaucratic challenges of administering this. Secondly, there would be the near impossible task of satisfying all parties that their interests were being adequately taken into account, and thereby maintaining support for the project. Thirdly, and most crucially for the success of the scheme, there is the question of how individuals can be encouraged to reduce their carbon emissions if they know that there is a long list of exceptions. Dr Fawcett summed up the resentment which might arise from such a set-up:

If you go round saying that a person who has ten times higher emissions than me is allowed a lot more because there are all these factors that are problematic for them, like they have a big house and they live in the country or they simply have to drive 100 miles a day or whatever, how am I as a low emitter going to feel about that? Pretty irritated, I would think. There are more low emitters than there are high emitters. There are moral reasons for not varying the allowance, except perhaps in a small number of cases. The practical reasons completely dwarf the argument and principle about why you simply could not run a system like that.<sup>66</sup>

Having said this, there could be simple allowances (comparable to those used in the tax and benefits system) that give extra credits to groups, such as parents with children, the elderly, and disabled people, whose greater need for private transport and warmer homes is unambiguous.

**82. In order to be effective, a personal carbon trading scheme will have to impose a degree of inconvenience and additional cost. The urgency with which we need to address climate change means the Government should not be afraid of this. When accounting for distributional impacts it will be essential to strike a balance between addressing genuine difficulty and allowing the inconvenience that will encourage change to persist. The groups in genuine need of support must be identified.**

83. Identifying this genuine need is not as simple as assuming that those with lower incomes will inevitably be worse off under such a scheme. It is important to remember that individuals will not incur any cost for carbon provided they remain within their allowance, and could even gain money if they have excess allowances to sell. The RSA reflected that:

There is received wisdom and some research to show that carbon emissions and socioeconomic status have a positive correlation—those on higher incomes and in more stable social conditions are responsible for higher carbon emissions. They are more likely to live in a larger house, have more than one car and travel frequently by

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65 Q 86

66 Q 195

air. Those in lower socioeconomic groups use less carbon. This is one of the attractive elements of the scheme—it is progressive and largely redistributive. It would be socially fairer than a flat tax on carbon, which would penalise those causing fewer emissions in the same way as those causing high levels. However, there are some who are the exception to the rule, and it is important to distinguish between those who choose to use more carbon, due to lifestyle choices, status and luxury, and those who have few or no relevant choices to make due to housing condition or lack of public transport.<sup>67</sup>

84. It is essential this general redistributive trend is emphasised if personal carbon trading is to gain public acceptance. The Centre for Sustainable Energy encountered a number of negative reactions to the idea of a scheme, of which the two most fervently held were: ‘the poor would be trading their deprivation for cash’ and ‘this is just another scheme/scam/rip-off where the rich can pay to pollute and the poor suffer’. The CSE countered these reactions as follows:

Such reactions, usually driven by well-meaning social consciences, unfortunately ignore the facts that at present the poor receive no cash for their deprivation and the rich currently pollute without paying anyone. Under a system of PCAs, at least the poor would, on average, be paid for their deprivation. And, on average, it would be the rich who would be paying the poor in order to sustain their carbon-intensive lifestyles. [...] These facts do not make such a system perfect and PCAs will certainly not create an ‘equal society’. But by starting from an equitable distribution of rights to emit carbon dioxide amongst the population, it is undoubtedly socially progressive.<sup>68</sup>

One way to persuade the public of the generally progressive nature of PCT would be to publicise, at the outset, examples of a range of typical households whose lifestyles in terms of travel choices and home heating, etc., are commonplace, and who can be shown to be net gainers from the scheme.

85. It would be wrong to assume, nonetheless, that there will be no need for additional support. Some poor people will require further assistance, most notably to make the capital investments (in, for instance, home insulation) that will allow them to cut their carbon emissions. This would be the case under any carbon pricing mechanism. Groups at risk will include not only those on low incomes, or suffering in fuel poverty, but also those who are financially excluded and unable to budget successfully even without the additional demands of a carbon allowance. These groups could also be unable to access or understand the financial services that will help them make the most of their allowance. Although the ‘pay as you go’ option could go some way to accommodating the financially excluded, it could also entail a number of difficulties: the opportunity to gain money by managing allowances would be less visible, and there would be a particular risk of disadvantaged households ‘cashing in’ their allowances upon receipt, and then struggling to meet the cost of carbon purchases. It will be essential to provide guidance and support to help bring

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67 Ev 57

68 Ev 1



people inside the system and to avoid situations where the personal carbon allowance actually results in greater deprivation.

**86. Public acceptance of personal carbon trading will depend on the success of the scheme in engaging and protecting disadvantaged groups. These groups will require reassurance and assistance, both to help them meet the cost of their carbon allowances, and also to make the capital investments or lifestyle changes that will remove them from this category. Assistance should focus on helping households to reduce emissions, rather than rely on providing exemptions. Support programmes should be carefully targeted to provide appropriate assistance to those who genuinely need it, including the financially excluded.**

87. The inclusion or otherwise of children under a personal carbon trading scheme presents a similar dilemma. The presence of children in a household will clearly contribute to some increase in carbon emissions, both through household energy use and transport patterns. Any failure to accommodate this additional energy use would disadvantage families (especially those on low incomes) and would have severe implications for the popular acceptance of the scheme. Again, the crucial question is that of *how* parents should be compensated, and this is dependent on a proper assessment of the contribution of children to a household's carbon footprint. The answer, in this case, is far from clear. The Energy Saving Trust told us:

‘We do not have the research to tell you what the marginal energy and carbon impact of having children is. Clearly, there is a positive one. Households with children use more energy and carbon than similar households without children, but we do not know by how much’.<sup>69</sup>

It seems unlikely that the average child would contribute enough to a household's carbon footprint to merit a full adult allowance. If children received a full adult allowance (a notion dismissed by David Fleming as ‘bizarre’<sup>70</sup>) childless households would be doubly disadvantaged: not only would families be receiving extra allowances, which would likely exceed the additional energy use, but the national allowance cap would be divided not between the UK's 49m adults but between 61m adults and children, meaning smaller allowances for all.

88. The alternative would be to offer either financial compensation (essentially as an extension of child benefit) or additional, partial allowances (although this would still lead to a reduced personal allowance, overall). The Environmental Change Institute (ECI) confirmed that early research has favoured the latter option: ‘preliminary research by UKERC, which has included a number of workshops with teenagers, suggests that a partial allowance for children, which is allocated to their parents (as in the case of child benefit), would be the most socially acceptable option.’ However, this conclusion is a tentative one, with ECI insisting that further research is required.

**89. Any personal carbon trading scheme must take account of children; to allocate no further allowance for children risks severely punishing family households, especially**

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69 Q 125

70 Q 159

low-income and single parent families. On the other hand, childless households could be unfairly disadvantaged if full allocations were given to children. Significant further research is required to determine the likely impact of children on their household's carbon footprint. Until this research has been carried out, it is not possible to determine the best method of accommodating children in the scheme.

## 5 The way forward

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### Filling the research gaps

90. In both written and oral evidence witnesses returned time and again to the lack of available or reliable research on personal carbon trading and related areas. A number of these have already been highlighted in the course of the report. The road map produced for Defra by the Centre for Sustainable Energy made filling these research gaps a priority for taking the personal carbon trading project forward.<sup>71</sup>

91. One of the most striking gaps in the research lies in the extent and accuracy of assessments of current levels of household energy use and transport patterns. Simon Roberts told us that research of this kind was essential to 'get a better picture of who are the winners and losers'.<sup>72</sup> Dr Fawcett and Professor Ekins made similar calls for further research in this area.<sup>73</sup> Without this type of data it is difficult to assess how the fundamental question of personal carbon trading would affect households.

92. Many other areas where further research was required were flagged up by witnesses. Dr Fawcett named research into likely reactions to personal carbon trading as a second priority,<sup>74</sup> while Dr Eyre called for more research into the likely price of carbon allowances and the consequences of a high or low price.<sup>75</sup> Simon Roberts drew particular attention to the need to assess the political acceptability and feasibility of personal carbon trading.<sup>76</sup> Richard Starkey called for further research on a range of issues, to assess the relative costs and benefits of personal carbon trading as compared to other instruments.<sup>77</sup>

**93. Witnesses told us repeatedly that existing research data is too sparse to allow meaningful decisions in vital politically-sensitive areas such as public acceptance, distributional impacts, and operational costs. Crucially, a lack of comprehensive profiling data on current energy use and transport patterns is restricting the accuracy of predictions of the effect on personal carbon trading on different groups. These research gaps are preventing not only the development of personal carbon trading as a viable policy, but also its fair comparison against other policy instruments. Without more extensive data, the merits of personal carbon trading cannot be fully assessed.**

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71 Simon Roberts and Joshua Thumim, Centre for Sustainable Energy, *A Rough Guide to Individual Carbon Trading: The ideas, the issues and the next steps*, November 2006, pp 37–39

72 Q 17

73 Q 199 [Dr Fawcett] and Q 216 [Professor Ekins]

74 Q 199

75 Q 122

76 Q 45

77 Q 100

94. Defra has been undertaking a pre-feasibility work programme with the aim of assessing the value of personal carbon trading. However, the CSE, who have cooperated with Defra on studies into personal carbon trading, were concerned about the ability of Defra to pursue the recommendations set out in their ‘road map’.

We do believe there is interest and willingness in Defra to pursue these recommendations. Moreover, we do not believe there are coherent efforts to pursue them currently in any other organisation or research programme on a timely basis. However, we are concerned that funding restrictions at Defra may undermine genuine effort (at what should be modest cost) to establish a robust and coherent research programme.<sup>78</sup>

In oral evidence, Simon Roberts of the CSE told us bluntly that: ‘there is a slight feeling in Defra that it would be really nice if someone else was doing it already but I do not see that happening’.<sup>79</sup> This view was supported by Dr Fawcett, who was particularly concerned about the inadequate resources dedicated to the topic, both inside and outside Government.<sup>80</sup> It is particularly important that Defra’s role is one of coordinating and enabling further research, rather than retreading ground already covered by academics.

**95. Shortly before publication of our Report, Defra released the results of their preliminary study into personal carbon trading.<sup>81</sup> We welcome the level of work and analysis that has gone into this study, and we hope that it serves to progress the case for personal carbon trading. We note that Defra’s study agrees with our findings in a number of crucial areas: firstly, that personal carbon trading is fiscally progressive, and secondly, that there are no insurmountable technical barriers to such a scheme. We recognise the extent of the Government’s concern over public resistance to personal carbon trading and the potentially high cost of implementing it. These are undeniably difficult areas. However, we regret that, as a result of this, the Government is indicating that it will wind down its work on personal carbon trading. Public acceptance of personal carbon trading may seem a distant or unlikely prospect to the Government, but without some leadership and co-ordination it is unlikely to move beyond the realm of academic study. Although we commend the Government for its intention to maintain engagement in the academic debate, we urge it to do more. Work needs to be done now if we are to ever reach the point when the concept becomes acceptable to the public and we would like to see the Government leading and shaping debate and co-ordinating activity and research. Without action of this kind it is unlikely that personal carbon trading could become a viable policy in the foreseeable future.**

## Pilot scheme

96. At first glance, the complexity and sensitivity of personal carbon trading seems to demand a pilot scheme. A pilot scheme could provide valuable evidence about how easily the public would understand and participate in trading and about what variation in

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78 Ev 3

79 Q 45

80 Q 199

81 Defra, *Synthesis report on the findings from Defra’s pre-feasibility study into personal carbon trading*, April 2008.

allowances would be needed to achieve the maximum degree of fairness. Furthermore a pilot scheme in a defined geographical area could be operated on a virtual basis with no money changing hands. However, there are a number of restrictions to a pilot scheme's effectiveness. Under a fixed-term, geographically-restricted pilot there might be little incentive to make behavioural changes, especially if there was no guarantee that the pilot would evolve into a nationwide scheme. Without this incentive for long-term investment it would prove difficult to assess the extent of likely behavioural changes that would occur under a full scheme.

97. There are alternatives to a public pilot scheme that do not attract the same risks. Broadly, these fall into two categories: activities which help researchers to assess and improve different aspects of the project, and activities which help acclimatise and prepare the population for the implementation of the full scheme. For example, RSA told us about their plans to undertake a pilot of a carbon credit card, and the development of their voluntary online carbon trading model, CarbonDAQ,<sup>82</sup> while Dr Fawcett discussed the benefit of using focus groups and small exercises to assess attitudes and responses to personal carbon trading.<sup>83</sup> A pilot is not a prerequisite for the implementation of large schemes, however complex the operation or preparations may be. The CSE noted that the Congestion Charge was implemented without a pilot, and instead used simulations and behind the scenes testing to refine the technology and systems. Complex and wide-reaching schemes can be implemented successfully without a pilot phase, provided that there has been significant backroom work, trials and testing in advance. Trials, focusing on separate, limited aspects of the whole project offer an opportunity to assess different components of the scheme without the demands and risks of a full-scale pilot.

**98. Personal carbon trading does not lend itself easily to a pilot or comprehensive trial. The conditions required accurately to simulate behaviour and transactions under a full personal carbon trading scheme would be difficult to replicate in a pilot with limited participation. We do not believe that it is feasible to address all aspects of personal carbon trading under a single pilot. An alternative approach involving smaller, separately targeted activities focused on particular aspects of the proposed scheme may be preferable.**

**99. Personal carbon trading could be essential in helping to reduce our national carbon footprint. Further work is needed before personal carbon trading can be a viable policy option and this must be started urgently, and in earnest. In the meantime there is no barrier to the Government developing and deploying the policies that will not only prepare the ground for personal carbon trading, but which will ensure its effectiveness and acceptance once implemented.**

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82 Ev 58

83 Q 198

# Conclusions and recommendations

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## Evaluating personal carbon trading as a policy option

1. It is quite clear that if the Government is to stand the slightest chance of meeting its 2050 target it cannot afford to neglect the domestic and personal sector. Reductions in carbon emissions from business and industry will be meaningless unless accompanied by significant and equal reductions from households and individuals. (Paragraph 16)
2. Existing initiatives are unlikely to bring about behavioural change on the scale required, with many individuals choosing to disregard the connection between their own emissions and the larger challenge. We conclude that more radical measures must be introduced if emissions reductions from the individual and household sector are ever to make a meaningful contribution to UK targets. Personal carbon trading might be the kind of measure needed to bring about behavioural change. (Paragraph 19)
3. Personal carbon trading could guarantee a reduction in emissions because it places a ceiling on the carbon available for consumption, rather than seeking solely to reduce demand. (Paragraph 20)
4. We believe that personal carbon trading has the potential to drive greater emissions reductions than green taxation. A carbon allowance could be more effective at incentivising behavioural change and engaging individuals in reducing their emissions than the price signals resulting from green taxation. (Paragraph 29)
5. We acknowledge that personal carbon trading could be complex administratively and more challenging to implement than green taxation and other alternative proposals. However, its potential to change behaviours and engage individuals means the Government should seriously and urgently assess how to take personal carbon trading forward. (Paragraph 31)
6. We acknowledge the many difficulties that will have to be overcome in the development and implementation of personal carbon trading, not least work to bring about the public and political acceptance of such a concept; considerable further research is required on many aspects of personal carbon trading. However, we believe that, by designing and implementing a sensitive and moderate scheme, these obstacles could be overcome. (Paragraph 33)

## Towards a practical personal carbon trading scheme

7. We believe that trying to solve all the problems involved in introducing an economy-wide system would unacceptably delay the introduction of a personal carbon trading scheme. The most realistic option is to introduce a scheme with restricted participation. Companies and other aspects of the economy could be covered by different trading schemes, with the consolidation of schemes considered at a later

date once the principle of personal carbon trading had been satisfactorily established. (Paragraph 35)

8. We do not believe that double counting is a serious handicap. However, we recognise that concerns over double counting of carbon emissions do exist and need to be addressed. In the meantime they must not be a barrier to investigating and developing the concept of personal carbon trading. (Paragraph 37)
9. We agree with the Government that the introduction of a personal carbon trading scheme should be a matter for primary legislation, rather than using the delegated powers contained in the Climate Change Bill. (Paragraph 38)
10. We believe that the setting and managing of caps for personal carbon trading would be wholly consistent with the provisions for emissions budgets and targets as set out under the draft Climate Change Bill. (Paragraph 39)
11. We are confident that the technical and operational challenges of implementing personal carbon trading can be overcome. Suitable technology and systems already exist. Although a personal carbon scheme would operate on a larger scale than most existing schemes, the concept has been successfully demonstrated. (Paragraph 45)
12. The private sector could play a vital role in operating a personal carbon trading scheme. Further research and consultation is required in order to determine precisely what the most appropriate role for business would be. (Paragraph 46)
13. We agree with the Centre for Sustainable Energy that it is crucial to shift the debate away from ever-deeper and more detailed consideration of how any personal carbon trading scheme could operate towards the prior questions of how it could be made publicly and politically acceptable. It is these questions that will ultimately decide the viability of personal carbon trading, and until they have been fully analysed and properly answered, further work on the operational details of schemes adds little value to the main debate. (Paragraph 47)
14. Public opinion may be hostile to any policy instrument designed radically to reduce emissions from individuals. The Government must be courageous on this point. Widespread public acceptance, while desirable, should not be a pre-condition for a personal carbon trading scheme; the need to reduce emissions is simply too urgent. However, significant opposition could undermine any proposal. Further research is required in order to obtain a more detailed picture of the extent of public resistance to personal carbon trading and in what ways this opposition could be tackled. (Paragraph 50)
15. Opposition to personal carbon trading could be reduced if the public could be convinced of three things. First, that it is absolutely essential to reduce emissions; second, that this can only be achieved if individuals take personal responsibility for reducing their own emissions; and third, that personal carbon trading is a fairer and more effective way of reducing personal emissions than alternatives such as higher taxes. The public must be persuaded of the first two parts of this argument as soon as possible if the Government is ever to convince them of the third. Persuading the public depends on perceptions of the Government's own commitment to reducing

emissions, and of the priority given to climate change in its own decision making. (Paragraph 52)

16. If a personal carbon trading scheme is ever to see the light of day then the first stages of the scheme, at least, will need to focus on gaining public and political acceptance. Any scheme must limit emissions, but we must accept that initially caps might be more lenient than is ideal, in order to achieve public acceptance. Once the scheme is better established, more demanding caps could be set. This approach will have to be carefully balanced against the need to ensure the scheme effectively reduces emissions in line with national targets. (Paragraph 55)
17. We believe that personal carbon trading could be made workable if it was acknowledged that it may not be possible to cover all eventualities from the very beginning. A basic programme covering certain emissions could be a useful stepping stone to a more comprehensive scheme. We recommend that the Government investigate the possibility of a phased initial implementation, including all individuals, but concentrating on certain basic areas of carbon use, such as household energy. The scheme could then be developed, expanded, and integrated with other schemes over time, as appropriate. (Paragraph 61)
18. Personal carbon trading will pose particular difficulties in accommodating and engaging the financially excluded. It is unrealistic to ask those who find it difficult, or even impossible, to manage their standard finances, to also understand and manage a carbon account. While the possibility of a 'pay as you go' option goes some way to relieving these difficulties, it is imperative that any personal carbon trading scheme includes a detailed and determined strategy for assisting the financially excluded. Research is required to assess the likely proportion of people who would choose this type of option, and whether they would face any significant disadvantage as a result. It would be important to make the scheme sufficiently simple and accessible that remaining involved seemed as easy, or indeed easier, than opting out. (Paragraph 67)
19. Personal carbon trading provides only the incentive to reduce emissions, not the means. It is clear that a personal carbon trading scheme would need to be accompanied (and, indeed, preceded) by a raft of other policies. The Government would need to make sure that the opportunities and resources to help people reduce emissions were readily available and well publicised. (Paragraph 71)
20. We commend Defra's Act on CO<sub>2</sub> calculator. It is accessible, engaging, and simple to use. Under a personal carbon trading scheme it could be adapted to provide further information related to personal carbon allowances, and link to personalised advice on how to save carbon units. (Paragraph 72)
21. We firmly support the introduction of smart metering in households. This would be an essential supporting measure of a personal carbon trading scheme. At any rate, smart metering should be introduced as soon as possible in order to raise carbon consciousness and thereby lay the ground for carbon restricting measures. (Paragraph 72)
22. Personal carbon trading will inevitably highlight existing inequalities of income and opportunity. Any instrument designed to restrict and reduce domestic carbon

emissions would raise the same concerns and it would be wrong to reject the proposal of personal carbon trading because of these difficulties. As with any other policy, these inequalities will need to be identified, assessed and, where appropriate, compensated for. (Paragraph 79)

23. In order to be effective, a personal carbon trading scheme will have to impose a degree of inconvenience and additional cost. The urgency with which we need to address climate change means the Government should not be afraid of this. When accounting for distributional impacts it will be essential to strike a balance between addressing genuine difficulty and allowing the inconvenience that will encourage change to persist. The groups in genuine need of support must be identified. (Paragraph 82)
24. Public acceptance of personal carbon trading will depend on the success of the scheme in engaging and protecting disadvantaged groups. These groups will require reassurance and assistance, both to help them meet the cost of their carbon allowances, and also to make the capital investments or lifestyle changes that will remove them from this category. Assistance should focus on helping households to reduce emissions, rather than rely on providing exemptions. Support programmes should be carefully targeted to provide appropriate assistance to those who genuinely need it, including the financially excluded. (Paragraph 86)
25. Any personal carbon trading scheme must take account of children; to allocate no further allowance for children risks severely punishing family households, especially low-income and single parent families. On the other hand, childless households could be unfairly disadvantaged if full allocations were given to children. Significant further research is required to determine the likely impact of children on their household's carbon footprint. Until this research has been carried out, it is not possible to determine the best method of accommodating children in the scheme. (Paragraph 89)

### The way forward

26. Witnesses told us repeatedly that existing research data is too sparse to allow meaningful decisions in vital politically-sensitive areas such as public acceptance, distributional impacts, and operational costs. Crucially, a lack of comprehensive profiling data on current energy use and transport patterns is restricting the accuracy of predictions of the effect on personal carbon trading on different groups. These research gaps are preventing not only the development of personal carbon trading as a viable policy, but also its fair comparison against other policy instruments. Without more extensive data, the merits of personal carbon trading cannot be fully assessed. (Paragraph 93)
27. Shortly before publication of our Report, Defra released the results of their preliminary study into personal carbon trading. We welcome the level of work and analysis that has gone into this study, and we hope that it serves to progress the case for personal carbon trading. We note that Defra's study agrees with our findings in a number of crucial areas: firstly, that personal carbon trading is fiscally progressive, and secondly, that there are no insurmountable technical barriers to such a scheme.



We recognise the extent of the Government's concern over public resistance to personal carbon trading and the potentially high cost of implementing it. These are undeniably difficult areas. However, we regret that, as a result of this, the Government is indicating that it will wind down its work on personal carbon trading. Public acceptance of personal carbon trading may seem a distant or unlikely prospect to the Government, but without some leadership and co-ordination it is unlikely to move beyond the realm of academic study. Although we commend the Government for its intention to maintain engagement in the academic debate, we urge it to do more. Work needs to be done now if we are to ever reach the point when the concept becomes acceptable to the public and we would like to see the Government leading and shaping debate and co-ordinating activity and research. Without action of this kind it is unlikely that personal carbon trading could become a viable policy in the foreseeable future. (Paragraph 95)

28. Personal carbon trading does not lend itself easily to a pilot or comprehensive trial. The conditions required accurately to simulate behaviour and transactions under a full personal carbon trading scheme would be difficult to replicate in a pilot with limited participation. We do not believe that it is feasible to address all aspects of personal carbon trading under a single pilot. An alternative approach involving smaller, separately targeted activities focused on particular aspects of the proposed scheme may be preferable. (Paragraph 98)
29. Personal carbon trading could be essential in helping to reduce our national carbon footprint. Further work is needed before personal carbon trading can be a viable policy option and this must be started urgently, and in earnest. In the meantime there is no barrier to the Government developing and deploying the policies that will not only prepare the ground for personal carbon trading, but which will ensure its effectiveness and acceptance once implemented. (Paragraph 99)

## Formal Minutes

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**Tuesday 13 May 2008**

Members present:

Mr Tim Yeo, in the Chair

Mr Martin Caton	Nick Hurd
Colin Challen	Mark Lazarowicz
Mr David Chaytor	Mr Graham Stuart
Mr Ian Liddell-Grainger	Jo Swinson
Mr Martin Horwood	Dr Desmond Turner

The Committee considered this matter.

Draft Report (*Personal Carbon Trading*), proposed by the Chairman, brought up and read.

Motion made, and Question proposed, That the draft Report be read a second time, paragraph by paragraph.—(*The Chairman.*)

Amendment proposed to leave out from ‘That’ to the end of the Question, and add ‘this Committee declines to read the draft report a second time because it unfairly criticises the concept of green taxation and does not adequately address the problems that would be faced by those who already struggle to manage the competing demands of low incomes and high living costs and limited options for changing their lifestyles and circumstances’, instead thereof.—(*Martin Horwood.*)

Question put, That the Amendment be made.

The Committee divided.

Ayes, 1	Noes, 7
Martin Horwood	Mr Martin Caton
	Colin Challen
	Mr David Chaytor
	Mark Lazarowicz
	Mr Ian Liddell-Grainger
	Mr Graham Stuart
	Dr Desmond Turner

Main Question put, and agreed to.

Paragraphs 1 to 99 read and agreed to.

Summary read and agreed to.

*Resolved*, That the Report be the Fifth Report of the Committee to the House.

*Ordered*, That the Chairman make the Report to the House.

Written evidence was ordered to be reported to the House for printing with the Report.

*Ordered*, That embargoed copies of the Report be made available, in accordance with the provisions of Standing Order No. 134.

[Adjourned till Tuesday 20 May 2008 at 10.00am]

## Witnesses

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### Tuesday 10 July 2007

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**Mr Simon Roberts**, Chief Executive and **Mr Joshua Thumin**, Head of Research, The Centre for Sustainable Energy Ev 1

**Mr Richard Starkey**, Researcher, The Tydall Centre for Climate Change Research Ev 26

### Tuesday 17 July 2007

**Dr Dick Eyre**, Director of Strategy and **Mr Brian Samuel**, Head of Policy Research, The Energy Saving Trust Ev 35

**Mr Tim Helweg-Larsen**, Project Leader for *zerocarbonbritain* and Director, Public Interest Research Centre, **Mr Paul Allen**, Project Director for *zerocarbonbritain*, and Development Director, Centre for Alternative Technology and **Dr David Fleming**, Director of The Lean Economy Connection Ev 48

### Tuesday 24 July 2007

**Mr Matt Prescott**, Project Director, *RSA Carbon Limited* Ev 56

**Dr Tina Fawcett**, Senior Researcher, Environmental Change Institute Ev 65

**Professor Paul Ekins**, Policy Studies Institute Ev 75

## List of written evidence

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1	Centre for Sustainable Energy	Ev 1
2	Department for Environment, Food and Rural Affairs	Ev 113
3	Dr Mark Roodhouse, Department of History, University of York	Ev 114
4	Dr Tina Fawcett, Environmental Change Institute, University of Oxford and UK Energy Research Centre	Ev 65
5	Energy Saving Trust	Ev 35
6	Laurence Matthews	Ev 99
7	Professor Paul Ekins, Policy Studies Institute	Ev 73
8	Public Interest Research Centre (PIRC), Centre for Alternative Technology (CAT) and The Lean Economy Connection	Ev 45
9	RSA Carbon Limited	Ev 56
10	Steve Sorrell, Senior Fellow, Sussex Energy Group, SPRU, University of Sussex	Ev 84
11	Sustainable Development Commission	Ev 83
12	The Tyndall Centre for Climate Change Research, University of Manchester	Ev 16, 20

# List of Reports from the Committee during the current Parliament

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The reference number of the Government's response to each Report is printed in brackets after the HC printing number.

## Session 2007–08

First Report	Are biofuels sustainable?	HC 76-I & -II (HC 528)
Second Report	Reducing Carbon Emissions from UK Business: The Role of the Climate Change Levy and Agreements	HC 354
Third Report	The 2007 Pre-Budget Report and Comprehensive Spending Review: An environmental analysis	HC 149-I & -II
Fourth Report	Are Biofuels Sustainable? The Government Response	HC 528
Fifth Report	Personal Carbon Trading	HC 565

## Session 2006–07

First Report	The UN Millennium Ecosystem Assessment	HC 77 (HC 848)
Second Report	The EU Emissions Trading Scheme: Lessons for the Future	HC 70 (HC 1072)
Third Report	Regulatory Impact Assessments and Policy Appraisal	HC 353 (HC 849)
Fourth Report	Pre-Budget 2006 and the Stern Review	HC 227 (HC 739)
Fifth Report	Trade, Development and Environment: The Role of FCO	HC 289 (HC 1046)
Sixth Report	Voluntary Carbon Offset Market	HC 331 (HC 418)
Seventh Report	Beyond Stern: From the Climate Change Programme Review to the Draft Climate Change Bill	HC 460 (HC 1110)
Eighth Report	Emissions Trading: Government Response to the Committee's Second Report of Session 2006–07 on the EU ETS	HC 1072
Ninth Report	The Structure of Government and the challenge of climate change	HC 740 (HC 276)

**Session 2005–06**

First Report	Greening Government: the 2004 Sustainable Development in Government Report	HC 698
Second Report	Sustainable Timber	HC 607 (HC 1078)
Third Report	Sustainable Procurement: the Way Forward	HC 740
Fourth Report	Pre-Budget 2005: Tax, economic analysis, and climate change	HC 882 (HC 195)
Fifth Report	Sustainable Housing: A follow-up report	HC 779
Sixth Report	Keeping the lights on: Nuclear, Renewables, and Climate Change	HC 584 (HC 196)
Seventh Report	Sustainable Development Reporting by Government Departments	HC 1322 (HC 1681)
Eighth Report	Proposals for a draft Marine Bill	HC 1323 (HC 1682)
Ninth Report	Reducing Carbon Emissions from Transport	HC 981
Tenth Report	Trade, Development and Environment: The Role of DFID	HC 1014 (HC 197)
Eleventh Report	Outflanked: The World Trade Organisation, International Trade and Sustainable Development	HC 1455 (HC 354)
Twelfth Report	Transport Emissions: Government Response to the Committee's Ninth Report of Session 2005–06 on Reducing Carbon Emissions from Transport	HC 1718

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# Oral evidence

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## Taken before the Environmental Audit Committee on Tuesday 10 July 2007

Members present

Mr Tim Yeo, in the Chair

Mr Martin Caton  
Colin Challen  
Mr David Chaytor  
Martin Horwood

Mr Nick Hurd  
Dr Desmond Turner  
Joan Walley

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### Memorandum submitted by the Centre for Sustainable Energy

1. The Centre for Sustainable Energy (CSE) welcomes the Environmental Audit Committee's enquiry into Personal Carbon Allowances (PCAs). Our Chief Executive, Simon Roberts, and our Head of Research, Joshua Thumim, were the authors of a comprehensive assessment of PCAs for Defra published last December as *A Rough Guide to Individual Carbon Trading: The ideas, the issues and the next steps* (see [www.cse.org.uk/pdf/pub1067.pdf](http://www.cse.org.uk/pdf/pub1067.pdf)).

2. We would be pleased to have an opportunity to explore further with the Committee the full range of issues raised by that study. However, for this brief written evidence we have focused on three particular issues in relation to PCAs which we have considered further since the publication of our study for Defra.

- a. The limited understanding but significant interest in the concept (and the emergence of entrenched but ill-considered positions).
- b. The potential distributional impacts of PCAs and the need to enhance data, modelling and analysis to improve understanding.
- c. The urgent need to follow through on the Road Map identified in our study to build up knowledge systematically and inform debate and decision-making effectively.

We are carrying out at present a short "snap-shot" assessment for Defra of the current status of initiatives seeking to experiment with individual carbon trading. It is reasonable at this stage to conclude that these are proving to be rather less well developed and considered than some of the "hype" that surrounds either them as particular programmes or the issue in general.

a. *The limited understanding but significant interest in the concept (and the rapid emergence of entrenched but ill-considered positions)*

3. We have been somewhat taken aback by the vehement but largely ill-considered attacks on the notion of Personal Carbon Allowances which we have received since publication of our study. We do not "fly a flag" for the concept as there are many issues to be resolved to make it a practicable and acceptable approach. Nevertheless, we do consider PCAs to be such a potentially powerful tool to engage and drive individuals towards lower carbon lifestyles that it should not be dismissed so cavalierly and, from some political quarters, irresponsibly.

4. Two of the most fervent knee-jerk reactions to individual carbon trading we received were:

"The poor would be trading their deprivation for cash".

"This is just another scheme/scam/rip-off where the rich can pay to pollute and the poor suffer".

5. Such reactions, usually driven by well-meaning social consciences, unfortunately ignore the facts that at present the poor receive no cash for their deprivation and the rich currently pollute without paying anyone. Under a system of PCAs, at least the poor would, on average, be paid for their deprivation. And, on average, it would be the rich who would be paying the poor in order to sustain their carbon-intensive lifestyles (see also discussion of distributional impact below).

6. These facts do not make such a system perfect and PCAs will certainly not create an "equal society". But by starting from an equitable distribution of rights to emit carbon dioxide amongst the population, it is undoubtedly socially progressive.

7. There have also been knee-jerk rejections of PCAs from a different perspective but which make equally untested assumptions about public acceptability (or lack of it), operational problems, scheme costs, and political feasibility. Such arguments often make far more positive (but still largely untested) assumptions about the relative merits of other policies to curb carbon emissions, particularly carbon taxes.

8. Anecdotally, we find that if the PCAs concept is explained clearly to people in ways which they understand and which addresses their concerns (usually about how it might work practically and what might happen to “the poor”), their interest in—and support for—the concept grows considerably.

9. As we warned in the introduction to our study for Defra:

We believe there is a strong risk that the debate on the relative merits of individual carbon trading will descend quickly into confrontational debate in which practical understanding and analysis take second place to the preservation of increasingly entrenched positions.

We conclude that it is important at this early stage to ground the debate quickly in considerations of political and practical feasibility—and that all potential policy instruments for achieving UK carbon emission reduction goals are considered on a similar basis.

b. *The potential distributional impacts of PCAs and the need to enhance data, modelling and analysis to improve understanding*

10. Analysis by Dresner and Ekins (2004) for the Joseph Rowntree Foundation<sup>1</sup> and reviewed in our *Rough Guide*, underpins the reasoning outlined above in relation to the poor being “on average” better off under PCAs than they are now.

11. However, it is of course not quite as simple as this (which is why we have been hiding behind the “on average” qualifier thus far).

12. Dresner and Ekins showed that there are still some poor households who lose out and some rich households who “win”. This is because there are significant differences in expenditure on energy and travel within income deciles as well as between income deciles. Thus, while most poorer households emit less than average, some emit more (and vice versa with richer households).

13. Yet, even with this taken into account, Dresner and Ekins calculate that fewer than 1 in 5 of households in the lowest equivalent income decile would be worse off under a system of PCAs, and most of those would be worse off by only a small amount (depending on the price of carbon).

14. However, Dresner and Ekins considered only actual expenditure on fuel and travel, not the required expenditure on fuel at the heart of definitions of fuel poverty. Their research, which also relied on quite dated data, therefore may be missing negative impacts on fuel poor households, particularly those households whose fuel poverty is determined less by their very low income than by their high costs of warmth.

15. There is a lack of good data linking required and actual expenditure on fuel and carbon emissions by individuals and households. Further, we know very little about how carbon emissions are distributed across the UK population by income and geography. And we know even less about how opportunities to cut carbon emissions are distributed. In economists’ terms, we do not know the shape of the “marginal abatement cost curves” for carbon emissions in different segments of the population.

16. Nevertheless, while noting that these research gaps should urgently be filled (and we are currently working with the RESOLVE programme at University of Surrey to try to do so), some more general observations can be made. For example:

- Some fuel poor households will undoubtedly be causing higher carbon emissions than average in their attempts to keep warm (and be suffering other deprivations to compensate for their excessive energy spend). Such households are unlikely to be able to afford the additional cost of purchasing PCAs from someone else.
- Fuel poor households who have less-than-average emissions may be tempted by the prospect of “instant cash” and so deprive themselves still further by “cutting back” to have more unused allowances to sell.
- Any system which relies on carbon accounting and carbon trading will tend to by-pass the financially excluded, leaving them vulnerable to manipulation by the unscrupulous or paying the higher costs of being “outside the system”.<sup>2</sup>
- Access to opportunities to reduce emissions (information and advice, services, products and capital) are not evenly distributed across the population by income or geography.

17. None of these situations are the result of PCAs; they are simply the reality of a society—and an energy market—already blighted by inequalities and socially regressive pricing practices. Indeed, these situations are the reality within which any policy designed to constrain and cut individual carbon emissions will have to act.

<sup>1</sup> Dresner S and P Ekins (2004) *The distributional impacts of economic instruments to limit greenhouse gas emissions from transport*, Policy Studies Institute, London, 2004.

<sup>2</sup> Most proposed PCA systems allow for ‘parties’ to sell their allowances on day one and then buy the necessary carbon allowances at the going rate each time they pay a fuel bill or buy petrol or an air flight. While it depends on trends in the cost of carbon allowances, the trading ‘spread’ is likely to make it more expensive to ‘pay as you go’ than submitting the requisite number of carbon allowances from your carbon account at the point of purchase.



18. The test for a system of individual carbon trading (or PCAs) in terms of its social impact is therefore whether, as a mechanism to stimulate cuts in individual carbon emissions, it is more positive—or at least less negative—than other possible policy mechanisms to stimulate cuts in individual carbon emissions.

19. Our general view at this stage is that PCAs are probably better—certainly than carbon taxes and regulations which spread costs regressively across all consumers in proportion to their energy consumption rather than their income. But much more research is needed to fill the information gaps mentioned above—so that we understand how the level of emissions, the opportunities to cut emissions, the costs of cutting emissions and the need for warmth and other fundamental energy services are distributed across UK households.

20. We also need to consider more carefully what must happen in a society rightly focused on reducing carbon emissions in order to enable an inclusive approach in which all individuals are supported to contribute, especially the needy and vulnerable. It will not be enough to stimulate individuals to act through a system like PCAs unless effort is simultaneously made to ensure the opportunities to act to curb emissions are well distributed and the most vulnerable are assisted—through grants, advice and direct support—in accessing them.

*c. The urgent need to follow through on the Road Map identified in our study to build up knowledge systematically and inform debate and decision-making effectively*

21. Our study for Defra made some clear recommendations in terms of next steps for research and analysis. These were detailed in a Road Map (see pages 35–39). The first year “next steps” in the road map focus on:

*Political acceptability:*—Understanding the basis on which politicians would decide to do this.

*Institutional feasibility:*—Exploring how our political system (electoral cycles, oppositional politics, need for independent authority) could handle this.

*Public reaction:*—Understanding the basis on which people will judge a system “acceptable”.

*Modelling:*—Improve models of individual carbon emissions and improve understanding of abatement opportunities and costs to create “testing rig” for systems and model distributional impacts (particularly fuel poverty).

*Systems design:*—Examine potential for full alignment with banking system and simple allocation system based on existing registries.

22. We believe there is interest and willingness in Defra to pursue these recommendations. Moreover, we do not believe there are coherent efforts to pursue them currently in any other organisation or research programme on a timely basis. However, we are concerned that funding restrictions at Defra may undermine genuine effort (at what should be modest cost) to establish a robust and coherent research programme.

23. Yet the Government appears willing to spend significant resources on technology development (carbon capture and storage, marine energy, the energy technologies institute etc). It would be inexcusably short-sighted of the Government to fail to give similar (or arguably higher) priority to thorough analysis of policy tools like PCAs which have such significant potential impact on carbon emissions.

24. This is particularly important because climate change is not simply an energy problem or an environmental problem that can be solved with technocratic fixes. Climate change is a “way of life” problem. To tackle climate change we need to change our way of life—with real cuts in our energy demand, less private car and air travel, and personal responsibility for our carbon emissions. It would therefore be supremely reckless to focus scarce financial resources on testing out high tech long-shots at the expense of analysing and refining potentially far higher impact policy tools like PCAs.

## **Appendix**

### **ABOUT THE CENTRE FOR SUSTAINABLE ENERGY**

The Centre for Sustainable Energy (CSE) is a charity and company limited by guarantee that started life in 1979 as the Urban Centre for Appropriate Technology. Based in Bristol, we have 35 staff and student placements and a turnover of £1.5 million earned from 60–70 projects funded variously by government agencies, local authorities, charitable foundations and private business. More details can be found at [www.cse.org.uk](http://www.cse.org.uk).

Our mission as a charity is to advance sustainable energy policy and practice, engaging people and communities in meeting real needs for environmentally sound and affordable energy services. We believe this mission is best achieved through a combination of:

- innovative local energy efficiency and renewable energy projects—mainly in the Bristol and Somerset area;
- activities to empower and support effective action by others across the UK; and
- research and analysis to use our experience “on the ground” to influence policy and practice at local, regional and national level.

We focus, possibly uniquely amongst UK charities, on both the social and environmental aspects of energy. Sustainable energy is not just about cutting the pollution which damages future generations. It is also about ensuring that people today can meet their basic needs for affordable warmth.

Our local activity means we are delivering sustainable energy solutions directly to people—and it provides a “test bed” for new ideas and approaches. It also grounds in real experience our activities to support the work of others and our research and policy analysis.

Empowering others through education, training, advice and support unleashes their potential to become sustainable energy activists in their own families, communities and organisations. This extends our reach, embedding sustainable energy in the learning of thousands of school children and the work of hundreds of organisations.

We believe we must follow through our own direct experiences “on the ground” with effort to change policy and practices more widely, regionally and nationally. That way the exceptional and innovative—sustained features of our work—can transform the mainstream and make a genuinely sustainable energy future a reality.

Over the last 27 years, CSE has developed several nationally significant initiatives, many of them innovative and ahead of their time:

- We established the first phone and software-based energy efficiency advice service, which became the model for the national network of Energy Efficiency Advice Centres. Our own advice centre continues to reach more than 20,000 householders in the Bristol and Somerset area each year.
- Our energy education programmes like Energy Matters have reached tens of thousands of school children and proved that children are effective energy advisers for their families.
- CSE’s training modules have built awareness of energy issues and capacity, engaging with some 10,000 experts and non-experts over the years.
- Working with the University of Bristol, we developed the Fuel Poverty Indicator, a unique tool to enable local targeting to tackle fuel poverty and now widely used by local authorities and regional government.
- Our innovative processes for engaging stakeholders in the development of policy, strategies and action plans are securing new support for sustainable energy, and renewable energy in particular.
- CSE’s research is improving understanding of consumer experiences of energy markets and the need for stronger protection of their interests.

June 2007

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*Witnesses: Mr Simon Roberts, Chief Executive and Mr Joshua Thumim, Head of Research, The Centre for Sustainable Energy, gave evidence.*

**Q1 Chairman:** Good morning and a warm welcome for you both. This is the very first evidence session we have had on this subject although quite a number of us are extremely interested in it and therefore have been thinking about it for some time. But as it is the first one and you are the first witnesses do you want to give an outline of how you think a personal carbon trading system would actually work and what it would mean for the individuals who are taking part?

**Mr Roberts:** That is quite a big question. What I would say is that you would end up with a situation where the government or an independent committee determined the amount of emissions that the domestic sector was allowed to emit. In most of the models of domestic carbon trading you then divide those equally amongst the domestic population of individuals within the household sector, and you can give them each an equal share of that amount of carbon, rights to emit on an annual basis. People would then submit those rights or give up those credits as they used up energy through buying fuel, electricity, gas, or buying petrol for cars or by buying air travel—those are usually the combination of things that are included. You would also almost inevitably have some kind of “pay as you go” systems for those people who did not have access to

their credits or run out and they would be able to buy some on an open market. Individuals would end up having to make decisions about the best way in which they could reduce their carbon emissions. They would have to take the carbon content of their purchasing decisions into account and they would have a choice across these either to reduce their own emissions or to pay someone else through the trading system in effect to reduce it for them. This will effectively increase the cost of their lifestyle if it is a carbon intensive lifestyle: or it would reduce the cost of their lifestyle if it was a less carbon intensive lifestyle.

**Q2 Chairman:** The tax system reflects through varying allowances, extra allowances and so on, the different position of certain individuals or indeed families and given that, for example, people with certain physical conditions might of necessity have to keep their houses at a warmer temperature than other people, do you envisage that to make such a system equitable and indeed acceptable it would be necessary to complicate it by having a series of allowances or differences in the allocations which reflected the different circumstances of the individual people?

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**Mr Roberts:** I think you can either complicate the system, which is probably an approach you would not want to follow through, or you look at ways in which you support households that would find it harder, for example, to respond to a limited allowance because of their need. You would look at ways of doing that outside the system, as we do at the moment, for example, with schemes for giving grants for insulation to low income households; as deliberate intervention above and beyond whatever system one has. You also need to remember that this is not coming into a system which is fair and equitable at the moment, as you are indicating that some people have more opportunities to reduce emissions than others. What the cap and trade system would actually mean is that those people who have most opportunities to reduce and the lowest cost opportunity to reduce would take those steps first.

**Q3 Chairman:** Do you think it is a concept that would lend itself to having a pilot model, say in a local authority area so that people could get used to how it would work and it could be done without financial penalties for a trial period?

**Mr Thumin:** I think there are some problems with that approach, partly because one of the fundamental definitions of a national personal carbon trading scheme would be its compulsory nature and the fact that everybody was included, which, by definition, would not be true of a local area pilot. Two, you would have boundary problems with people going outside and obtaining energy services with carbon content that they would then use within the area, so it might be difficult to establish and run. Also a lot of the public reactions to the system will be based around the way it works and the way they interface with it. With a pilot you would probably be in a situation where it was a very sub optimal version of what you would end up rolling out. So people's first encounter with this concept would be a slightly rough and ready version of the system which you might end up with, and that might contaminate public opinion unnecessarily. A couple of examples of systems, whether you like them or not, where that was avoided (so that any objections are not on the way the system operates), would be, for example, the London Congestion Charge where there was not a pilot and it works, and the introduction of the Euro, which, whether you like it or not, was fairly operationally smoothly handled and is a very geographically wide area system.

**Mr Roberts:** I think the key question is what questions are you trying to answer with a pilot. What you will not be able to answer is "do the systems work?" because you will have a sub-optimal system that you have kind of knocked together to try and create a transaction based system for a local area. People have talked about annexing the Isle of Wight for this benefit but I suspect the Member representing that constituency might decide that that was not the best place to do it, but the way you try and constrain it. But the transaction system, which is actually the interface most people will have

with it and the ability to keep track of where they are with their allowance and get feedback on it and think about products and services so that they are labelled and all the other accoutrements of the scheme, you hope would be put in place in order to make people find it as easy as possible to act within a scheme. But those will not be there within any pilot because it will be too limited geographically. And I think there is a danger, as Josh is saying, of contaminating the concept and people's response to it when actually their response is to a poorly working operational system. You could liken it to putting in ATMs before they actually really work so that sometimes you get the right cash out of it and sometimes you do not and sometimes when you go on the system has crashed, and all those kinds of things. What people will get is not a response to getting cash out of a bank by putting in a card but actually a response to a system which was sub optimal and not working properly, and I think you would contaminate any assessment of the public's response to such a system.

**Q4 Chairman:** Do you think it is a desirable idea?

**Mr Roberts:** I think it is best to say that we are probably agnostic on the issue at the moment because there are a lot of issues that need to be sorted out as we identified in the report, the work we did for Defra. Having said agnostic, as with all agnostics there is something about it that is quite appealing and that is basically that it is very difficult to see how you get individuals around the UK engaged with the carbon impacts of their lifestyle and starting to have to do something about it on a long-term sustained basis, which is fair, and where the burden is not carried by those people who have done cuts and where the cost is not borne by them while other people who cannot be bothered to do something about their lifestyle carry on without any implication for them. On that basis in terms of actually constraining carbon in the economy it is one of the few policy tools that makes you have to face up to that fact and think about it, so it is quite useful from the political science point of view. But on a medium to long-term basis how else do you get 60 million people to think about the carbon implications of what they are doing. It does it in terms of consciousness, I think, in ways that things like taxes do not do because we are rather used to money and we are rather used to dealing with fluctuations in the prices of things which actually go up and down all the time. What we are not used to dealing with is trading in our minds a decision between whether I fly to New York or insulate my house, and that becomes very interesting. It also takes away from the issue any moral dimension about whether flying to New York is better or worse than any other kinds of carbon emissions—it just treats them all as equal and you make your decisions. If you want to fly but live in a carbon zero home then that is a choice you would actually be forced to make in the end or you would have to be paying someone else to do it and paying for the pollution that you are currently causing for free.

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**Q5 Mr Challen:** I can confirm, Chair, that I have already been upbraided by the Member for the Isle of Wight for volunteering his constituency for a pilot scheme, so that is pretty clear! If we did introduce personal carbon allowances what kind of contribution do you think they could make to help the government to achieve its overall carbon reductions target, which is currently set at at least 60%?

**Mr Roberts:** It depends on how tight politicians were prepared to set the cap, basically, and over what timescale, but obviously if you have 42% of the emissions being caused directly by individuals buying energy for their use in the home or travelling by petrol or aviation in any system—and I do not think the government has yet been entirely clear about how it shares out the burden of achieving those reductions across the economy—if you have a situation of 42% emissions which need constraining then you need some mechanism for doing that. If you set the cap effectively on the trajectory you want to achieve you do not actually need to have another instrument to do it somewhere else. You might know what instruments stimulate markets for any of these services and so forth, but you could set it so that it was actually on a trajectory from now until the target you want to achieve on a drop down, steep curve, or a gentle start curve or a straight line, whatever you wanted. There is a separate question though: “are politicians prepared to sustain that?” because it will get harder as you go further down and the costs will go up, but it has the potential to do precisely that, which is one of the reasons why it has that enticing element to it.

**Mr Thumin:** It is really important to add that you must not confuse the instrument with the target that is in place to deliver. So any target can be delivered this way. You can deliver an increase in emissions with it by setting the cap at 20% higher than current emissions. So the issue is that it does create the thinking which faces up to the target as a reality because that is what is exciting and perhaps kind of scary about this policy idea, when you think it through you actually think, “Hang on a minute, that is going to constrain carbon emissions in the economy in all these different ways, there can be a lot of effects from that, what are they going to be like, do we like them?” That is completely separate from have we got a carbon emissions target, do we want to cut emissions, and it links them effectively. So the answer to your question is any target, but the tighter the target the more profound the effects.

**Q6 Mr Challen:** The target we have is up to 2050 but you have already referred to one of the problems that we might have with such a system in that if you have a shallow curve you might be able to introduce it more smoothly and iron out any problems before people started complaining, but on the other hand Stern reminds us that early benefits can be gained by disproportionate effort at the very beginning. Do you have any evidence that would show which kind of approach is the most optimal?

**Mr Roberts:** No, is the simple answer to that. I think it comes back to the political reality, which is that the cap is set politically and not scientifically—although under the Climate Change Bill there would be a committee, in theory, which would be contributing to that process, but ultimately the ministers decide. I think it is a question: “how are we going to constrain carbon issues in the economy and achieve those reductions?” And you need some policy tools to achieve that. What you get with a cap and trade is some certainty over the fact that you are going to achieve that; what you do not know is what the price of doing that is going to be. It may well be, because we do not have a lot of data about it, that the cost of reducing carbon emissions for most households is relatively slim because they can simply choose to take a holiday that does not involve flying or they can actually take advantage of one of the many energy supply schemes to insulate their home or just improve their habits and reduce the carbon intensive lifestyle through behaving differently. All those things are relatively low cost, if not zero cost, and therefore the cost of getting down that curve to start off with may be very, very low. In which case the cost of carbon in that particular system would be low as well. What we do not know at the moment is where you start to hit the steep part of the marginal abatement cost curve? Where does it suddenly get steep and how does that distribute across different types of households, different types of people? Some people have very immediate, very high costs to reduce emissions and other people have an awful lot of spare capacity to cut emissions through choices they are making which are actually just about habit and behaviour, and I think you need much more of that kind of information to start to map out who would be suffering and where the squeeze would be depending on what curve you introduced. My suspicion would be that taking history as a lesson it will be introduced gently. But then I think we are seeing that in terms of the way in which the efforts are being made to constrain carbon in the economy at the moment: we are introducing it very, very gently at the moment, certainly in the sense we are not actually managing to do it! So on that basis it at least has the potential for doing rather more than that.

**Q7 Mr Challen:** Looking at the technology of such a scheme I think it is correct to say that the Tesco Clubcard has about 40 billion transactions a year and it is envisaged that this scheme might have about 15 billion, does that indicate that the technology side of it is going to be a bit of a doddle or are we not really comparing like with like?

**Mr Roberts:** From the work we have done—and we have not gone into that side in a lot of depth, but from some time in my background working in the banking sector where I had a brief foray—we have a very good transaction system and we have a very good accounting system—we have a banking system and a system for transacting—so think of your carbon account as being another type of financial account. If the banks are happy to do it, which I have no doubt they would for the right price, you could

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have a euro account a dollar account a pound account and you could create a carbon account. And you could link it up with the transaction systems and you do not need to build anything new to do that. That holds far more information than the Tesco Clubcard system does at the moment in terms of the banking system as a whole. Where I think you have an issue is with the allocation system: how do you identify and get the right amount of carbon credits to the right accounts smoothly with a tolerable level of fraud—you are never going to eradicate it altogether—and I think that is the bit where you have more systems. We have at the moment government systems which get money to people, child benefit, tax allowances, all kinds of other things like that—your Public Accounts Committee equivalent has raised some interesting points on that. It is a question of how accurate you want it to be and how resilient to fraud you want it to be. I think the systems bit is probably the most straightforward as long as you are not asking for something completely independent to be set up, which you would not want for this; you would want it to be part of the transaction system, which is effectively what the club card is—it goes through the till, it is not complicated.

**Q8 Martin Horwood:** Simon, it is good to see you again after all these years—a strange place to meet up. You and I both have some experience of marketing and the systems a bit like club card and I think you are probably right that this is a relatively simple system to set up. But surely the complications of these systems is not actually in setting them up, it is in operating them and that is when the cards get nicked, they get lost, people misunderstand them, people run up huge bills without understanding the consequences, and that is with a voluntary scheme like a club card or a credit card. This is going to compel people who cannot even cope with those kinds of schemes to take part, and is that not going to be where the real practical problems happen?

**Mr Roberts:** I think there are some issues about that but I think we need to be careful, because people will be given an allowance so there is a kind of gift for them to use up or possibly sell on the first day. But actually as people who were in the first phase of the EUETS who sold up on the first day will know that might be quite a good financial decision to make, depending on what you think the price of carbon is going to do over time. In relation to the issues, in the work we did for Defra we looked at the financial literacy issues and there is about one-fifth of the population who really are not very good at dealing with money and living within their means and all those kinds of things. But quite a lot of these are actually fairly well off as well, so I would be less concerned about them because they will effectively have to pay for their profligacy. I think it would be quite difficult—and you would not want to encourage it anyway—for people to rack up a huge carbon purchase without meaning to, other than through using an awful lot more energy than they want to, or filling up several cars worth of petrol rather than one. There are certain limits to what you

could actually do in terms of how far you could push it. So I think there are serious issues about how you make sure how you support people working with the system and managing it, in the way that they did, for example, with introducing decimalisation, with introducing the Euro, people had to get used to a whole different way of thinking about their money and the systems and the transactions they were undertaking. I think you need to think about that. Any system would have a “pay as you go” element to it which some people would prefer to use from a budgeting point of view, I am quite sure, and obviously there would be a slight spread as there is for most of those things between the sale price and the buy price, but we do not actually know how that would work because we do not know what the price of carbon is going to be; so it may actually be better to sell in the first week and take advantage of the drop of price over time in the first few years.

**Q9 Martin Horwood:** But there are people, as we know as MPs, who have difficulty coping with budgeting money, let alone carbon as well. Tax credits and things like this throw people into complete consternation and distress, and these are the people you are going to give a carbon allowance.

**Mr Roberts:** But we have not abolished money in order to deal with that, we try and educate them and support them and work through schools, as we are hearing about today, on initiatives to help people deal with money management and so forth. We are not very good at training people on how to manage money. There is a proportion of the population who would find it more difficult than others. The actual financial implication of PCAs may be quite limited in the first instance, so we should not overblow it and suddenly they are going to rack up thousands of pounds worth of carbon debt in some way or whatever because they would have to be buying as they went or using it up. So I think there is a danger of overstating it. You would need to find ways of supporting those people who find it difficult to participate in the system to their maximum advantage, i.e. people who are disadvantaged by the fact that they cannot participate or are unable or do not understand how to participate, you would have to look at ways to do that. But I do not think it would be any more complicated than a money based system, and it is far fewer transactions and it is controlled and they get an allowance to start off with, so it is a bit like saying, “Here is £100, you decide how to spend it and once you have spent it you have to buy things which will cost you more than if you just spend within it.”

**Q10 Mr Challen:** Here we are talking about a scheme, which will be national, mandatory, so pretty comprehensive, but it occurs to me that it may duplicate things that we already have. The EUETS, for example, already covers great parts of the energy sector and many other things too. Could this co-exist with other schemes? I could see how it could co-exist with taxation and regulation but other trading

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schemes offsetting, what kinds of impact would it have on those areas where it might begin to duplicate?

**Mr Thumin:** There are potential complications, if you imagine a carbon trading system running in parallel with the EUETS, and that arises where you have units of carbon that are effectively operated in both markets, so the overlap between what we are talking about now, which would be the domestic system with the EUETS, will be where you have domestic electricity use, and the domestic users have a permit and the power station operators have a permit on another system, which is in the same geographic area, i.e. Europe. So you have some at first glance (which is the analysis we have done so far), pretty odd effects from that system because if you make a reduction in the domestic system, two trading systems can take it up, one domestically and one somewhere else in Europe, so you get the reverse of what you would have thought. So, yes, that means looking at them very carefully; you could not just say, "Right, we are just going to do this in parallel with what we have already." So I think anything where the system you are talking about is also a carbon trading system you have to look at it very carefully and think about the best way of bringing it in, and it may not be something you do overnight, and you could imagine that it might be something that emerged on a European level anyway later in which we played a part. If you are comparing it to measures that are not carbon trading then there is not a problem and most of those, for example the renewables obligation or other regulatory instruments, are there to facilitate the opportunities to live within the carbon budget and you can look at it in that way. In terms of offsets, unless an offset is actually a carbon credit I am not sure what is worth anyway, so I would not be worried about that. I think this would end the need for offsets effectively; I am not sure what function they would have in a situation where you already have a carbon budget and it was effectively constraining in a real way the emissions that individuals could cause.

**Mr Roberts:** Offsets, as we know from the recent work Defra did, only create reductions in carbon if they are actually part of another capped system, so you are effectively trading between two deficits and in other words you are just leaving it—"I have reduced but have they done something else? I do not really know." So what you have here is an opportunity for me to pay you to offset my carbon by you actually doing something in terms of it rather than leaving it to some slightly onerous and difficult to understand process by which someone on the other side of the world might have done something to possibly not increase their emissions by quite as much as they would have done otherwise.

**Q11 Mr Challen:** Are you aware of any other European countries at least that are looking at personal carbon allowances?

**Mr Roberts:** I am not aware of it, no. Just to expand on this issue with the EUETS I think there is a point in time where we may need to move from focusing on the point of emitting to the point of demand in

terms of where you regulate and I think there is a discussion and issue to be addressed there, particularly in the electricity system where while it might get people switching between coal and gas as a choice and other low carbon technologies at the moment you are specifically not allowed to count demand side measures as part of your process for meeting your EUETS targets.

**Q12 Mr Challen:** It does raise the very interesting question of, if I put coal in my hearth—I do not actually have a coal fire, but if I did—and I use that coal and it was actually exported from China who would be responsible for that under a personal carbon allowance scheme?

**Mr Roberts:** You would have to give up some of your allowances when you bought the coal.

**Q13 Mr Challen:** Would that then relieve China of its need to set stiff targets?

**Mr Roberts:** It would only be an issue if you are regulating the amount of carbon emissions by telling China or anyone else how much coal they can mine out of the ground.

**Mr Thumin:** You would not apply that to oil necessarily.

**Mr Roberts:** So at the moment, like petrol some of it comes from the North Sea but a lot of it comes from elsewhere, if the regulation was on how much carbon you could buy in effect then coal of itself is not a bad thing, it is only when we burn it we start causing problems. So it is the point of combustion that is where you would want to apply the cap and the regulation. Obviously what it would do is reduce your demand for coal imports from China if you decided that rather than burn it, you decided to avoid it.

**Q14 Mr Challen:** It begs the question about embedded carbon in all products.

**Mr Roberts:** Yes, and that is a broader issue and it is why it is important that you cannot just look at domestic carbon emission rates of itself. Most of the evidence would suggest that the public would expect the rest of society, the economy in effect, to be constrained in some way as well, and some of the proposals for domestic carbon emission trading include some mechanism for auctioning off the rights of the rest of the economy and businesses and organisations and recycling the revenue in various ways, which I think may be an over complication of how one would go about it at this stage and the knowledge about how it would work.

**Q15 Joan Walley:** In your report you warned that the whole debate could very easily descend into some kind of confrontational debate and then you had that kind of response in fact to your own report. Could you give the Committee some kind of idea of some of the responses that you got which took you aback slightly?

**Mr Roberts:** I think, as has been identified in our evidence, there is quite a lot, particularly from what one might call left of centre analysis, that this is somehow going to constrain the poor and they will

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be trading their deprivation for cash and this is just a means for the rich to carry on polluting and pay for it. To which the answer is at the moment the poor get no cash for their deprivation and the rich do not pay anyone to pollute. So, yes, it is a point. But what this system actually does if you are constraining carbon emissions is to make sure that those people who are currently constraining get some benefit from those people who are not. So there is a “think it through” answer to that one. Also, more recently there was a situation where a representative of an energy supplier in response to a presentation on the issue from someone from Defra said, “Would I have to cut off my customer if they do not have enough carbon credits?” to which the knee-jerk response is, “Yes, like you do if they do not have enough money,” but a more considered response is there would be a pay as you go scheme so they would need to find a way, if they have not any carbon credits, of effectively buying some credits, which no doubt the supplier would have a system to sell them to the customer anyway because that is how they are all set up and that is how it would work, so it would end up having a similar kind of effect—it would be just a price they would be paying rather than some credits they would be giving up. It felt like people very quickly get into a position in relation to that and other people saying, “Absolutely no point, we have a tax system, just use that,” and some people say in relation to the regressive nature of it that tax is far more regressive than a personal carbon allowance because you do not give anyone anything before you even start taxing their carbon content, whereas with a carbon allowance you give them the right to emit equally, and effectively you are redistributing rights principally from the rich to the poor on average—not entirely though.

**Mr Thumin:** It is interesting that a lot of the objections, certainly from the left of centre, would be not to the rationing aspect of it—because effectively this is a combination of a rationing system where the trading happens not on the black market but above board—and you find that people do not object to the concept of rationing, the right to emit, but they sometimes object to the concept that you should be able to buy and sell that right, the trouble being that the efficiency that is expected of the carbon trading system is a product of that trading, so there is an issue there.

**Q16 Joan Walley:** So do you feel that that response is really representative of the general public at large?

**Mr Roberts:** No, I do not think we know enough about the general public; if you ask the general public they go, “What, why would we want to do that?” but you ask them the very direct question actually about a system that you cannot explain very easily, as I demonstrated at the start of this evidence session. But the public response to it will be conditioned by the fact that they have no frame of reference for what we are talking about, so in that sense how could you expect to get a response which would actually be “genuine”? I think the more interesting thing about the responses of people is what it is that they are actually about is a response

to genuinely trying to constrain carbon emissions in the UK economy and really having a strong focus on the lifestyles we lead that are too carbon intensive at the moment. So they come up with the various arguments against it but actually they are arguments about constraining carbon in the economy, generally speaking, rather than against this particular tool for doing it. Because as a tool for doing it, on most criteria of users, it is fairer, generally, and it creates a consciousness about the carbon content of decisions in ways that other mechanisms like tax do not. And it sits neatly with all other things around regulation to create the services which people would need in order to respond. So I think a lot of it is, as we said in our evidence, ill considered and not thought through, but people feeling that they desperately need to have a position in relation to it because the Secretary of State made an announcement about it and the latest Secretary of State suggested it should be a manifesto commitment in the next election in his speech at SERA back in March. So there are all kinds of places where it is coming up and people feel the need to have some response and I think in most cases they have not actually thought it through. That is what we would hope would happen, that there would be a more considered exploration of the issue so that we were actually having it based on fact rather than a knee-jerk nice sound bite type reaction to it.

**Q17 Joan Walley:** But is not the conundrum how you actually go about having an informed public debate without this sort of detail so that people could actually see how it will work? So what would need to be in place rather than perhaps a pilot project in one part of the country, the Isle of Wight or wherever, to get that informed public debate so that you could have a more seasoned, well judged response to it?

**Mr Roberts:** Two things. One is that you would need to deal with the operational feasibility issue, you would need to know roughly how much it is going to cost to get the banks to run it and how you would allocate it and deal with that side of it, which I think is fairly straightforward but needs nailing, not to actually get it done but to know what the issues would be you would have to resolve and what time it would take and how much it would cost. The other side is to get a lot more data about the domestic sector, what the cost of our emissions are and how they distribute across the domestic sector, what opportunity to distribute across the sector as well. So you can actually get a picture of who are the winners and losers because at the moment we do not have a very good picture of that. There is a bit of work which has been done but it is on quite old data. I think you need a better picture of that so that you can go out to the public to have a discussion that is actually based on real fact. But I would actually say that there is a subset of the public which is more important at this stage, which is actually the political subset of the public, politicians. I think the key question at this stage is what will the politicians need to know about how the public will react in order to make a decision about it, and there is a lot of this that

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“we need to have an informed debate”. Well, the politicians maybe should have that informed debate first in terms of actually understanding the issues and thinking it through, but I think the public at this stage are not really ready to have a discussion about whether it should be carbon rationing or carbon taxes or whatever, because they are only just getting to the point where there is a recognition we need to constrain carbon in the economy. It is only if you are having it in that context because it is not a question of doing this or nothing but it is a question of doing this or these other things instead—would you rather have a carbon allowance or a heavy tax on petrol and domestic fuel? That is, in a way, the kind of choice you need to be putting in front of people rather than, “What do you think about this?” If you were going out to the public now what I would say is go out and ask them, “On what basis do you think this would be acceptable? What are the criteria you would apply to it?” And from the limited out of work that has been to date people would say, “We do not want to see any free riders, we want it to be fair, we want it to be part of a system which covers the whole economy and we want some element of understanding that it is going to be fairly resistant to fraud and people are not going to be able to spot exactly how much energy I have bought here, there or everywhere,” so that there is not going to be some Big Brother element to it, all of which I think you can address.

**Q18 Joan Walley:** As a part of that things that would be needed would you say there should be some kind of an indication of what a year’s carbon allowance might consist of and where would you set that?

**Mr Roberts:** I think you would set it at the current level minus 2/3%. That is the other thing, people suddenly think—

**Q19 Joan Walley:** When you say “current level” whose current level?

**Mr Roberts:** The current level of carbon emissions from the domestic sector. We know it is 42% of the total UK emissions.

**Q20 Joan Walley:** That is not equally shared, is it?

**Mr Roberts:** No. All of the systems that have been proposed to date, take that amount and divvy it up equally, an equal ration, if you like, or allowance per head of population. The one area where there is discussion—and it probably depends on which side you come down on whether you have kids or not—is whether children get a full allowance, half an allowance or no allowance at all. Otherwise, if you have 30 million people they get one-30-millionth of that allowance, which works out at about five tonnes a head or something, depending on whether you are talking about carbon or CO<sub>2</sub>.

**Q21 Joan Walley:** In terms of how you are describing that, would you say that there were similarities with the arguments and discussions that are going on about how to ration the use of water?

**Mr Roberts:** Yes, you actually have far more systems to enable the rationing of the use of energy in that respect because we meter energy whereas we do not meter water, so it is rather harder to work out whether people are doing their bit or not, whereas in this case we would have a very good feedback system.

**Q22 Joan Walley:** But you would do that for water metering, would you not?

**Mr Roberts:** Yes.

**Q23 Dr Turner:** Your report refers to some untested assumptions regarding personal carbon trading. One of these is the assumption that individuals will not simply use and manage their allocations but will start trading them straightaway on the carbon market. Do you think that a significant proportion of the public would do that, or do you think it is wishful thinking? Do you think it is desirable?

**Mr Roberts:** I think you will get an interesting mix. I think you will get a proportion of the population that would pay as you go; I think you would get a proportion of the population that got quite into the idea of trading and being clever about it; I think you would get a proportion—and we found them in the bit of work we were doing very recently for Defra, which will be published quite soon, on looking at voluntary schemes that are around at the moment for exploring people living within their allowance on carbon, the Carbon Reduction Action Group type of scheme. What we have found now is a group of people who are trying to reduce their emissions; they do not want to sell those extra rights to somebody else so that they can carry on polluting. So I think you will get a group of people who would probably bury their allowances in their back garden—which I would probably count myself in—rather than sell them to someone else so that they can carry on to satisfy their wish to be driving around in their 4x4.

**Mr Thumin:** We were arguing about that on the train and I said I thought it depended on the price!

**Q24 Dr Turner:** That is an essential question, is it not, because there is otherwise a risk that the dedicated petrol head will just carry on and pay the costs willy-nilly?

**Mr Roberts:** And they would pay the costs and the costs would be determined and they would only be able to buy allowances if somebody else had actually reduced because the cap would set the total amount. So if they were carrying on and they were having to spend a lot that was because other people were fairly resistant at reducing demand, and it could go, “Actually, I could earn this much by doing that, why on earth have I not done it already?” As long as you have those kind of feedback systems. What may happen in those situations is likely to be that they buy a Prius or a rather more fuel efficient car or they decide actually to insulate their home very well and to stop taking jet holidays in order to have an allowance left to buy as much petrol as they can consume at whatever speed they want to drive.



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**Mr Thumin:** There is an issue there, which is that if people did not participate that could reduce the efficiency of the system overall and if that was a huge proportion of the population it could undermine the effectiveness of it. So the way it was designed would have to take that into account such that it was not like trying to get your tax credits and so on and so forth, which is quite an onerous process. You could even have systems which made the default that you did trade and you had to opt out proactively.

**Mr Roberts:** I think it is a very important point in terms of whether people would trade, you could try it not with a pilot but with voluntary games, if you like, or systems between groups perhaps within organisations—maybe Defra's own staff could participate in a scheme or something—where you actually set something up and see whether people do trade and, if so, on what basis and how regularly. A bit like the switching fuel suppliers, some people do it a lot and some people have never done it. If you look at the success of places like eBay people are getting quite used to the idea of buying and selling things that they own electronically. Obviously coming back to Martin's point earlier, there are issues about the capacity of everyone to do that and how you support those people who are not able, willing or set up to do it, and I think that is a key issue to be looked at: "What are the issues?" "How would trading take place?" "What kind of systems would be needed in order to make it as simple as possible?"

**Q25 Dr Turner:** How would you stop abuse of the system? How would you stop, if you like, a black market in quotas or in energy emerging?

**Mr Thumin:** Some of that is the same as the money system. You cannot completely eliminate it but the way we set up the infrastructure of the system can make it very difficult. So counterfeit bank notes are not that common—it does happen but it is not undermining the money system. Then other things would be around the rules of the game. You could in theory allow credit and lending and you could imagine a futures and derivatives market, betting on future values of carbon, and that is happening to some extent in the EUETS. Or you could not allow that.

**Q26 Dr Turner:** The Chairman has already referred to the question of whether you should take individual circumstances into account and you say that an equal allocation is morally egalitarian, but not everybody's circumstances are equal. What would you do with children, for instance? Would you give a one-year old the same allowance as a 12-year old and so on? And what account do you take of geographical location, whether people need to travel for their work because whichever way they travel they are going to use some carbon, so if they have a long commute to London they are already placed at a severe disadvantage. How do you propose dealing with this?

**Mr Roberts:** The first thing I would say is that they are also causing more carbon emissions.

**Q27 Dr Turner:** Of course they are, yes.

**Mr Roberts:** On that basis, if you are going to constrain carbon then they are going to be a target, whichever system you choose to do it, and I keep coming back to this point that what this policy tool does is make you have to think about exactly those kinds of issues. If you are trying to reduce carbon and you are trying to spread that burden reasonably fairly across society, what are the best ways to do it? I think there are definitely people who will be worse off under this system—not necessarily than anything else—but obviously people living in rural areas, off the gas grid with solid wall housing, with a need to drive and maybe some elderly relatives living in their home that needs a high temperature, will have higher carbon emissions, because of their circumstances, than the average. I think the question—and it is more of a policy question: do you try and fidget with the system—that particular tool—in order to make it cover all those eventualities? i.e. do you try and use PCAs to make the world fair or do you try and use it to make an efficient system for reducing carbon emissions and capping carbon emissions in the domestic sector and find other ways of creating more support for rural dwellers in solid wall housing off the gas grid, with elderly relatives living who need a high temperature, in the sense of how you might support them and help them cut their carbon emissions through programmes like Warm Front being more focused on solid wall dwellings, for example. I think there are other ways in which you can address those kinds of needs but when it comes down to it what you are effectively doing is taking a snapshot and saying, okay, people up to now have built the infrastructure and made the choices about what they have in their homes and where they live and where they work on the basis of carbon being completely free, they do not have to pay for it. But what we are talking about is starting to introduce a price for that and the way in which you allocate. That has some effect on how quickly you move people from a situation where they are effectively getting what they were and having to reduce it one by one—not that we actually know what people are using at the moment so we cannot really make that allocation—or whether you effectively say right from the start that we will allocate it fairly and let it all settle out, and because the cap will not be terribly tight—we are talking about dropping emissions from the domestic sector by 3% per year—that is not very difficult to do because most people can do an awful lot more than that just by behaving a bit better, but whether they choose to or not is a different point. That is not a huge issue. The question is whether the redistribution that goes on within that is too much to bear and whether you therefore try to taper it to a point where you are getting to an egalitarian kind of system. My preference, being an affirmed agnostic in relation to it, but if I had a preference in relation to it would be to introduce it as an equal allocation and let some of the other problems filter out because I do not think that the price of carbon is going to be quite so high in the first few years that it is not going to increase their cost of living that much because the amount you have to cut is relatively low cost.

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**Mr Thumin:** But if it did that would be precisely what the system was there to engineer, which is change the patterns of organisation in the economy towards lower carbon versions, and the question is how quickly do you allow that to happen, so is it a transition or a shock? You can imagine if you did it in too rapid and dramatic a way that could have undesirable social consequences. But in the long run you are looking, say, 25 years out, maybe commuting 150 miles a day by car does not actually have a place in the economy 25 years hence. And this tool has to get us there, so that is precisely the kind of effect we want it to have, which is, “This is actually hurting and I am going to have to relocate my work closer to home,” et cetera, et cetera.

**Q28 Dr Turner:** If you follow that to its logical conclusion you will abolish Parliament because some MPs have no choice but to travel hundreds of miles from their constituencies.

**Mr Roberts:** I suspect there are ways around that but I would not expect your personal carbon allowance to be used up in your official business. But it may be an interesting exercise looking 20 years hence as to how many times you do need to meet here as opposed to doing it virtually and all the rest of it, but that is a slightly different discussion. I think all of these things come back to if we are serious about constraining carbon emissions in the UK economy all of those things will come to a head. What this tool does is bring them to a head, crystallise them out rather more quickly and obviously than thinking that we can just regulate that a bit and maybe if we put a bit more money into public transport in rural areas and a bit of this and a bit of that. This one says that this is about designing a UK economy in which people can have low carbon lifestyles and that tends to mean that they will be living nearer to where they work, they will be living in lower carbon housing and they will be making choices about the equipment they put in the house, the holidays they have and the travel choices they make, which are lower carbon.

**Q29 Dr Turner:** How powerful an incentive do you think it would be to make people actively look for low carbon personal transport? Could it actually bring forward transport developments?

**Mr Roberts:** What it should do over time is create markets for low carbon services and technologies, and I think it could have an effect that the economists would not predict because they do not understand human psychology very well, where actually people think ahead of themselves in relation to this, so they start to think about those issues quite clearly. If you see the success of hybrid vehicles now it is quietly disproportionate to the benefit that they create and their high cost but they are still going forward, growing in the market quite significantly. So I think this would generate more demand for low carbon services and bring forward technologies. It creates markets for them in ways which are actually genuine markets rather than telling companies to go out and try and sell that to a public that is not yet

particularly interested. This at least starts to tackle the other side of that particular equation, which I think is an important element.

**Q30 Martin Horwood:** Accepting for a minute that if it stopped MPs flying so much it would be a result is there not a risk of a perverse effect at the other end of the scale where people are below average, where at the moment someone who is scared of flying, does not drive much, lives in a flat is trying as hard as everyone else to reduce their carbon emissions in other areas, but actually if you introduce the scheme and tell them that their tonnage per head is only three tonnes and everybody else’s is five that they relax and increase their carbon emissions.

**Mr Thumin:** That is fine as long as they stay within the cap.

**Q31 Martin Horwood:** No, but it is not because you have taken someone who is trying to reduce their carbon emissions and allowed them to increase.

**Mr Thumin:** If their carbon emissions are within the permit morality is not an issue because we have set the community wide cap.

**Mr Roberts:** I do not think he meant to say “That is fine”, I think what he meant is that that is not a problem from the point of view of reducing carbon and obviously you do not want to create that disincentive to people. I do not actually believe it would, I think most people who have made those kinds of decisions about carbon, trying to achieve low carbon lifestyles, will continue to take steps towards it.

**Q32 Martin Horwood:** But they may not have very consciously been pursuing it as a low carbon lifestyle, it may just happen to be the lifestyle they lead.

**Mr Roberts:** In which case they will simply have some emissions to trade because it is not that easy. If you have a house with equipment in it and a way of life in terms of how far you travel it is not that easy to suddenly increase your carbon emissions an awful lot. So if you are a three tonne household you are going to be a three tonne household unless you work quite hard at using up the rest of your allowance.

**Q33 Mr Chaytor:** Could the personal carbon card be integrated with the identity card?

**Mr Roberts:** Theoretically yes, but I think it might introduce a whole range of other public acceptability issues which you do not need to introduce to make personal carbon allowances work.

**Q34 Mr Chaytor:** In your written submission to the Committee you have not touched on civil liberties or data protection issues. Do you think there are serious questions there?

**Mr Roberts:** I actually think that if you look at the banking system, my bank has details about every financial transaction I have made and yet no one else has access to it unless they somehow manage to hack into the system. So I do not have any concerns about the transaction system and the accounts system being able to be managed in a confidential manner.

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**Q35 Mr Chaytor:** The technology can guarantee data protection?

**Mr Roberts:** Yes.

**Mr Thumin:** To the extent that we are used to living with already.

**Mr Roberts:** In that respect, in terms of the ID card, the issue there is not so much about whether you have it as a swipe card in some ways so that you can tell who it was exactly, but actually in terms of how you manage the allocation process and making sure that you are allocating the right amount to someone who is living and justifiably getting an allowance rather than someone who has managed to fill in ten national insurance number forms, or whatever it might be. So there is an issue in relation to that but, again, I do not think you need an ID system. It depends how much fraud you are prepared to tolerate, I suspect.

**Q36 Mr Chaytor:** Would it not be more efficient to do it through the national identity card given that there is huge pressure to ensure the integrity of the ID card to make it politically acceptable?

**Mr Roberts:** It is effectively a transaction system and you have a transaction system already; the ID card is not a transaction system, it is an identity system.

**Q37 Mr Chaytor:** It could be used as a transaction system.

**Mr Roberts:** It could be but my sense would be—and I do not want to go into a discussion around the issues in relation to the benefits or dis-benefits of an ID card—that the issue is if you associate personal carbon allowances and make it somehow dependent on one another then I think you are going to kill of personal carbon allowances because there will be a strong body of opinion, as you know already—you have an opinion about ID cards which in no way needs to be related to whether personal carbon allowance is an effective tool, where personal information can be protected, confidentiality can be protected and fraud prevention can be managed without the need for an ID card. So in theory you could link them together, of course you could, but they are actually performing completely different functions and the need for a personal carbon allowance is as much more about the transaction system than it is about the ability to prove who you are at any given point. I do not have to prove who I am in order to draw money out of my bank account, I have a card which by knowing the right pin number means that I must be that person somehow, but obviously there are other ways they can do it. I also do not think you should overstate the potential value of nicking somebody else's personal carbon allowance, I do not think there is going to be a huge amount of money involved in it for quite a long time because I do not think the price of carbon is going to be very high.

**Q38 Mr Chaytor:** To deal with data protection issues, is there a value in exploring an anonymous personal carbon trading system? Could that be possible?

**Mr Roberts:** If you have a banking based transaction system then that is effectively anonymous. I pay money across to my energy supplier, if someone else pays money for me the energy supplier is not actually that bothered; as long as the money goes in their credit system in the right place that is all they are really bothered about, and they do not have any access to the rest of my account details.

**Q39 Mr Chaytor:** So the logic of that then is could it be integrated with a travel card like the Oyster card, if that were to be extended to other conurbations in the UK? Could you see an integration there? One of the objections must be the multiplication of different cards that people carry—people are carrying bags' full of different kinds of ID cards and loyalty cards and points cards and so on. So I am looking to find a way in which it could be acceptable but also simpler. Could you link it in with the London Oyster card?

**Mr Roberts:** As I say, I keep coming back to the fact that that actually where you want it to be is with your accounting and transaction system, which is likely to be with the banks because it is principally a financial type of transaction and needs the same kinds of systems and safeguards in relation to it, and where it is going alongside a financial transaction every time you use it. On that basis I would stick it alongside a swipe card of some kind that is financial; or a separate one. I think that is one of those things you could find out from the public—would you rather have a card that was separate or rather integrated with another, and I suspect there would be a range of options available to people because it would depend, as we have at the moment, on what your bank, who is managing your carbon account for you, decided to do.

**Q40 Martin Horwood:** Your report states fairly categorically that a full pilot project of a personal carbon allowance system would be impractical and may even restrict progress. You have touched on this a little but could you elaborate a bit more on why you think that is the case?

**Mr Thumin:** I think the most important thing is the fact that the mandatory nature of the idea. Could you really have a mandatory pilot and could you actually police a mandatory pilot so that it felt like what the actual full-blown proposal would feel like? I think it would be difficult to do that and that would undermine the value of piloting it anyway. In addition to that, the investment in infrastructure in the system to run a personal carbon allowance scheme would not be likely to be made for the sake of creating a pilot when you might decide as a result of the pilot not to go ahead anyway. So, in summary, it would be very difficult to create a pilot that was actually a pilot of a full blown system in the sense that it created the conditions that were similar enough for you to learn lessons about the full-blown system from the pilot.

**Q41 Martin Horwood:** Do you think any of the existing experiments into any kind of carbon trading system would provide useful data of an individual?

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**Mr Roberts:** Can you give an example of one of the experiments?

**Q42 Martin Horwood:** I thought your evidence referred to things like the CarbonDAQ system proposed as part of RSA's CarbonLimited scheme.

**Mr Roberts:** We have just done a bit of work for Defra (and when it is in the public domain we will make sure it is forwarded on to the Committee as well), looking at the range of organisations which were apparently doing voluntary trading schemes and none of them really are; most of them are doing stuff which is effectively looking at helping people do their carbon footprint and then encourage them to think about how they might live within an allowance. But most of them are not particularly clear about how they might determine the allowance or whether they can pool it as a household, what the cap should be, what trajectory they should go on. So at the moment I would say that there are not systems out there that are actually testing it. But one of the points we have raised with Defra in relation to that bit of work is that a lot of them are thinking about going ahead and doing trialling. And from what we can tell at the moment, most of them are relatively ill-considered in terms of the way in which they might go about that in the absence of the transaction system.

**Q43 Martin Horwood:** But do you not see that if you have some kind of pilot that gathers some kind of data that might at least lessen the risk of what seems to be your big bang approach, simply introducing a national mandatory scheme overnight hoping that it works.

**Mr Roberts:** We have been trying some things out. When people say "pilot" to me you have the system and you are taking it to Manchester and making the whole of Manchester work within the system and you have this operational transaction system and it is going to feel very like it would at the end—a bit like introducing the congestion charge just in Kensington, for example. The decision about it being sub optimal in terms of the way the system would operate I think is really important. I do not think you can do that in a way which would be particularly useful because the system testing you can do in a big warehouse somewhere in the East End of London with a lot of people being clever about the way you test systems. In terms of the individual response to it there are so many factors that are conditioned by the fact that it is mandatory and everyone is involved, which makes it difficult for testing in the absence of doing that. What you can do is try out things—games, voluntary trading schemes, Web-based tools and all the rest of it—where you are looking at organisations, groups of individuals, community organisations, government department staff, business organisations (and a number of them are quite interested in trying to introduce this), to see how people respond to it and to see how easy people find it to live with and whether people do decide to trade and what decisions they make. If you have a group of people that has lower than average emissions at the moment and you give them a choice

to where they set the cap, do they set it at where they are at the moment or do they revert to an average for the UK and, as you were suggesting earlier, burn up the rest in the back garden by buying some coal from China or something? You can actually find out some interesting things from that. The real question with the pilot, what is it you are actually trying to find out and is doing a pilot with all its constraints and limitations going to tell you that as effectively as it can?

**Q44 Martin Horwood:** You seem to be giving some value to pilots in terms of the personal response at least and people's habits and finding out more about how people respond to different things. Could I summarise your position as saying that you are in favour of the right pilots but not the ones that are being carried out at the moment? Is that right?

**Mr Roberts:** No. What you have not got in any of them is a transaction system so that when you pay your energy bill you are giving up some energy credits. Because you have not got that in place—and that is the bit which is going to be suboptimal until you have got the full system—you are always going to have a situation where effectively you are relying on someone monitoring their electricity meter and gas meter and feeding those numbers in and coming up with how much carbon they have used. You will also have to have people registering the fact that they have run the car and calculating how much petrol they have used and what the costs of that would be. They will not be going into a petrol station, swiping a card and using up carbon credits. It will be a voluntary system in terms of people keeping track of those things. Until you have got a transaction system you are always going to have those limitations. The questions you can answer about the public's response to that are different from what you could answer if you could actually do the whole lot. Maybe someone will come up with something that is very simple and easy to use where you could go to Bristol and say we are going to run it on the whole of Bristol and the system would be so brilliant it would feel just like the real thing.

**Q45 Mr Caton:** Your report included a 'road map' showing how Government could carry forward the development and evaluation of personal carbon allowances as a policy idea. What progress has been made on that since publication?

**Mr Roberts:** I know that Defra has in effect accepted a lot of those recommendations in terms of the areas it feels are necessary to study. One of the areas it did not pick up on were the political acceptability and feasibility questions, which I thought was interesting bearing in mind it is really important to know what politicians would need to know in order to press the button on that because that helps to determine what research you need to do and what questions you need to answer in relation to that. There is a programme being developed within Defra to follow through the first step elements of the road map. There was a workshop a couple of weeks ago looking at detailing those in more detail. As we say in our evidence, there are some issues about whether

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it would be affordable to fund it and how it is going to be funded. There is a slight feeling in Defra that it would be really nice if someone else was doing it already but I do not see that happening. I do think it needs to be properly funded. It is not very expensive to do it relative to a lot of other things we are spending on to try and cut carbon, particularly technology-based solutions. I think the interest will be sustained by the new Secretary of State bearing in mind previous public statements he has made. And I think it is something where a programme of work has been developed. But I am not sure quite the funding is in place to follow that through. I think a key issue is how Government sets its priorities for funding.

**Q46 Mr Caton:** But you sense that there is adequate urgency and commitment in Government to take this forward, do you?

**Mr Roberts:** I think there is a level of interest and there is a programme being developed. Obviously there are a lot of other things the Government is trying to do which it feels it wants to give full headroom and let go first. I do not think this is seen as an instrument for the next three years and on that basis, while we have got a very limited research budget, maybe we ought to spend more of that on looking at understanding those things and making sure they work. This belongs more in the pot of the money that other government departments are spending on carbon capture and storage or fusion research which is being held up as the big white saviour of carbon emissions. PCAs is actually, in terms of carbon emissions reductions, possibly more significant, probably more useful to the UK economy in terms of sustaining a leading carbon emissions trading scheme and the value that gives and yet it is being treated as a policy instrument and scrabbling around for a few tens of thousands rather than being treated as an alternative to technology and the investment that goes into that. In terms of reducing carbon emissions, we need to be thinking not just about slotting it into different technologies and throwing money into each of those—and it is really quite significant sums, millions of pounds is spent on them—but rather here is a tool that may have some answers in relation to cutting carbon emissions and changing the way people live their lives, which is after all what we have got to do. We should be doing that rather than trying to bolt something on to the end of a power station and hoping.

**Q47 Mr Caton:** Is a personal carbon trading scheme completely compatible with what is in the draft Climate Change Bill?

**Mr Roberts:** I am not sufficiently familiar with either what legislation you need for a personal carbon trading system or the draft Climate Change Bill to say they are all linked, but my understanding is that Defra has worked quite hard to make sure that they have at least opened the doors and created a mechanism which could then be used. On the basis of the current level of understanding, I would be very pleasantly surprised if they have covered all the

bases that would need to be covered in order to create a legislative framework where you could just roll it out without any need for further legislation.

**Q48 Mr Caton:** Let us come back to the point you made earlier about the need for debate in the political subset of the population. One thing we know is that governments tend to be very nervous about introducing measures that require their electorate to change their behaviour substantially. In those circumstances does something as radical as this look likely ever to get off the ground?

**Mr Roberts:** That is probably the biggest issue on your side of the table, whether anyone is ever brave enough to decide to do it. If we cannot then we probably are not going to manage to curb carbon emissions more generally. If you want to cut carbon emissions you are going to have to address that precise question. If you are not going to do it through this you have got to find some other way to do it, most of which will stick in your throats and give you butterflies in your stomach as you stand up at the despatch box to announce it in terms of what effect it might have on the public. I have some direct experience of being involved in some deliberative focus groups that were not specifically about carbon emissions trading although it came up. People are much more ready to accept it when they have had it explained to them and they have thought about it a bit and had discussions with the people who understand it, but people are also quite angry that Government is not stopping them buying cars which are inefficient and not making sure that the only thing they can buy in a shop is something which has a low carbon footprint. They want Government to “edit their choices”, which is the latest version of “setting standards and banning things”. They do not believe they will ever have enough information and understanding themselves to make those choices, they would rather someone did it for them, like we do with health and safety. You cannot buy a television without a plug on it but you can buy one with a standby consumption that is still 60 watts. There is something very bizarre about a world in which you cannot expect people to wire their own plug but we will allow them to carry on causing a carbon footprint even when they are not getting any value from that particular appliance. I think there is much more public appetite for the Government intervening and stopping things happening that they have no control over because their choices are not having enough effect on the market for them to be braver about that. That is why I said the political subset should spend more time discussing how you overcome that. How do you take bold steps, in the absence of a direct feedback link from the public saying “this is fantastic, we’re all going to vote for you”, to do the things which are taking it a little bit more further forward and trying things, unlike things like road pricing where you say let us try it out and then get a million signatures and suddenly you never hear about it again? It is about being more sophisticated about how you think about it, more ready to test the public with the right questions

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about what they need, rather than just asking them “Would you like this?” without any alternative being presented about how else you are going to constrain carbon in the economy.

**Chairman:** On that note, can I just say that when this Committee issued a report last summer recommending quite vigorous action on things like

4x4s the e-mail protest response was said by the Clerk to be greater than that received by any other Select Committee in history. I am not sure every member of the public wants the Government to stop them doing the things they are doing. Thank you very much indeed. It has been a most interesting session. We are most grateful to you for coming in.

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**Memorandum submitted by Richard Starkey,  
The Tyndall Centre for Climate Change Research, University of Manchester**

#### INTRODUCTION

1. Since July 2003, Dr Kevin Anderson and I (both of the Tyndall Centre, University of Manchester) have been assessing the feasibility and appropriateness of implementing a Domestic Tradable Quotas (DTQs) scheme.

2. In December 2005, Dr Anderson and I published a detailed report on DTQs (Starkey and Anderson, 2005).<sup>3</sup> This report (henceforth “the Tyndall DTQs report”) has been submitted to the Committee in evidence.

3. This memorandum briefly describes the DTQs scheme and then discusses issues of equity not fully addressed in the Tyndall DTQs report but relevant to the public acceptability and therefore the viability of a DTQs scheme. It is submitted in a personal capacity.

#### BRIEF DESCRIPTION OF DTQs

4. DTQs were formulated by Dr David Fleming who first published the idea in 1996 (Fleming, 1996). Dr Fleming maintains a website<sup>4</sup> and his most recent publication is Fleming (2005).

5. DTQs are a “cap and trade” scheme for the reduction of greenhouse gas emissions from energy use under which emissions rights are allocated to and surrendered by all end-purchasers of fuel and electricity (both individuals and organizations). The DTQs scheme can be divided into three elements: (1) setting the carbon budget (2) the surrender of carbon units and (3) acquiring carbon units for surrender.

#### *Setting the carbon budget*

6. The carbon budget is the maximum quantity of greenhouse gases that may be emitted from energy use in a given year. Under DTQs, the carbon budget is reduced year on year in line with national and international emissions reduction targets. Fleming has proposed that, in any given year of the scheme, carbon budgets should be set 20 years ahead, so as to provide a long-term emissions reduction signal to society. He further proposes that carbon budgets are set by an expert independent Carbon Policy Committee, a proposal designed to de-politicize budget setting in same the way that the Bank of England’s Monetary Policy Committee is intended to depoliticize the setting of interest rates.

#### *Surrendering carbon units*

7. A carbon unit is an emissions right, specifically the right to emit 1 kg of carbon dioxide equivalent. All fuels and electricity are assigned a carbon rating based on the quantity of greenhouse gases (measured in carbon units) emitted by the combustion of a unit of each fuel and by the generation of a unit of electricity. Whenever individuals and organizations purchase fuel or electricity, they are required to surrender to the retailer carbon units to cover the quantity of fuel or electricity purchased. For accounting purposes, these units are surrendered up the supply chain and, on reaching the primary energy producer or the energy importer, are passed back to government.

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<sup>3</sup> Available at [www.tyndall.ac.uk/research/theme2/final\\_reports/t3\\_22.pdf](http://www.tyndall.ac.uk/research/theme2/final_reports/t3_22.pdf)

<sup>4</sup> [www.teqs.org](http://www.teqs.org)

*Acquiring units for surrender*

8. Each year a quantity of carbon units equivalent to that year's carbon budget are allocated by government to individuals and organizations. The proportion of total carbon units allocated to individuals is equal to the proportion of total energy emissions arising from individuals' purchase of fuel and electricity over a given period prior to the introduction of the DTQs scheme. (In the UK, the proportion is currently around 40%.) Carbon units are allocated to adult individuals free and on an equal per capita basis.

9. Whilst individuals receive their units for free, organizations must purchase the units they require on a national carbon market. Units enter onto the market from two sources. First, government auctions onto the market those units not allocated to individuals. Second, individuals who emit at a level below that permitted by their allocation, and who have, thus, not surrendered all their units, can sell their surplus units onto the market. Conversely individuals who wish to emit at a level above that permitted by their initial allocation ("above-allocation individuals") must buy additional units on the market. Visitors to the UK are not allocated units and so along with organizations and above-allocation individuals, must purchase them on the market.

## ASSESSING DTQs

10. In the course of our research we have encountered three main objections to DTQs.

- (i) Allocating emissions rights on an equal per capita basis is not equitable.
- (ii) Allocating emissions rights on an equal per capita basis is equitable and therefore 100% of emissions rights, rather than the approximately 40% under DTQs, should be allocated to individuals on an equal per capita basis.
- (iii) Allocating emissions rights on an equal per capita basis is equitable, but other instruments can achieve this allocation more cost-effectively than DTQs.

11. Objections (ii) and (iii) and responses to them are discussed at length in the Tyndall DTQs report and hence this memorandum focuses on objection (i).

## FAIRNESS OF AN EQUAL PER CAPITA ALLOCATION

12. In exploring the equity (or fairness) of an equal per capita allocation of emissions rights (henceforth "EPCA"), I put forward an argument for fairness that finds some support within the philosophical literature on distributive justice. I contrast this with the main argument for the fairness of EPCA found within what might be termed the "non philosophical" literature (ie writings that do not explicitly draw on the distributive justice literature). Though somewhat academic in parts, the discussion is relevant to the public acceptability and, thus, the viability of a DTQs scheme.<sup>5</sup>

13. Within the non-philosophical literature:

The central argument for equal per capita rights is that the atmosphere is a global commons, whose use and preservation are essential to human well being (Baer, 2002, p401).

14. Used in this sense, the term "commons" refers to something that has, since the beginning of humanity, been owned jointly and equally by humanity. And if the atmosphere is jointly and equally owned, it follows that all of humanity should have the right to emit equally into it.

15. However, within the philosophical literature, it is disputed that the atmosphere is a commons in this sense. It is held by a number of philosophers, both on the left and the right politically, that, in fact, nature was, in the beginning, unowned and that, over time, various parts of nature have been taken into ownership by individuals acting upon them in an appropriate manner. It is further held by some philosophers that the part of nature which is the atmosphere is incapable of being taken into ownership in the way that, for example, fossil fuel can be, and that the atmosphere is therefore not only unowned by unownable. For instance, Schmidt (1997, pp43–4) argues that there is:

no foreseeable prospect of being able to privatize the air . . . [as] it is difficult to parcel out . . .

16. Given that fossil fuel is something that can, uncontroversially, be owned, is it the case that, in a fair society, individuals would be entitled to equal quantities of fossil fuel, and thus emissions rights? If so, then we would have an argument for EPCA that did not require an endorsement of the (philosophically contested) claim that that the atmosphere is a commons.

17. Such an equal sharing out of fossil fuel would be an example of the norm of "equality of resources". However, this is not a norm that has been endorsed by most egalitarian liberal philosophers:<sup>6</sup>

The norm of equality of resources stipulates that to achieve equality . . . everybody [should receive] a share of goods that is exactly identical to everyone else's and that exhausts all available resources to be distributed. A straightforward objection to equality of resources so understood is that if

<sup>5</sup> This work is ongoing and is presented here in provisional form to provide the Committee with an illustration of the research conducted at Tyndall Manchester since the publication of the Tyndall DTQs report.

<sup>6</sup> The views of egalitarian liberals are important as they take a much more egalitarian approach to the distribution of resources than, for example, libertarian philosophers.

Smith and Jones have similar tastes and abilities except that Smith has a severe handicap remediable with the help of expensive crutches, then if the two are accorded equal resources, Smith must spend the bulk of his resources on crutches whereas Jones can use his resource share to fulfil his aims to a far greater extent. It seems forced to claim that any notion of equality of condition that is worth caring about prevails between Smith and Jones (Arneson, 1989, p77–8).

18. Most egalitarian liberals also reject the notion that “equality of condition” is achieved by equalizing welfare.

Equality of welfare is a poor ideal. Individuals can arrive at different welfare levels due to choices they make for which they alone should be held responsible. A simple example would be to imagine two persons of identical tastes and abilities who are assigned equal resources by an agency charged to maintain distributive equality. The two then engage in high-stakes gambling, from which one emerges rich (with high expectation of welfare) and the other poor (with low welfare expectation). In [this] example . . . it would be inappropriate to insist on equality of welfare when welfare inequality arises through voluntary choice of the person who gets less welfare (Arneson, 1989, p83–4).

19. In place of equalizing welfare, Arneson therefore suggests that what should be equalized is, in fact, “opportunity for welfare”.<sup>7</sup> (In his example in the previous paragraph, the two persons are provided with resources that give them equal opportunity for welfare. However, instead of realizing this opportunity by consuming these resources, they decide to gamble with them.)

20. Arneson argues that equalizing resources can lead to inequality in opportunity for welfare. Conversely, providing individuals with equal opportunity for welfare is likely to entail providing them with entitlements to unequal amounts of resources. For instance, people who live in colder regions may require more energy for heating. Or, as life in the countryside requires more travelling, people living there may require more energy for transport. (Indeed, one might even argue that people who feel the cold may require more energy for heating than people who generate lots of body heat!) And, if fossil fuel energy comprises the same proportion of each individual’s energy use, then an entitlement to differing quantities of energy translates into an entitlement to differing quantities of fossil fuel and, thus, emissions rights.

21. This sort of argument was been made in relation to the allocation of emissions rights between nations. For example, Raymond (2006, p656–7) takes the view that:

the more one considers the equal per capita argument, the harder it is to shake certain reservations about the idea. . . Does a poor writer living in a garret in St Petersburg, for example, have the same entitlement to the atmosphere as one living in San Diego, or do the cold Russian winters (heating being a major source of GHG emissions) merit additional consideration? What about the rancher living in eastern Montana, 40 miles from the nearest school or hospital, versus the resident of Tokyo? The problem is that once one begins unpacking the apparent equality of the per capita right, it becomes clear that it creates significant inequalities based on criteria—warm versus cold climate, rural versus urban dwelling—that look morally arbitrary. Tailoring the allocation principle to adjust for these various mitigating factors, however, again threatens to undermine its initial advantages of clarity and simplicity as a basic human right.

22. This sort of argument has also been made with regard to DTQs (a proposal for the allocation of emissions rights within nations). For example, commenting on a recent blog posted by the Secretary of State for Environment, Food and Rural Affairs on DTQs (Miliband, 2006), one respondent (Harry Manuel) argued (echoing Arneson) that those with a disability may require additional emissions rights:<sup>8</sup>

Will everyone get the same fixed amount, if so this is unfair on those with disability etc, who have a greater reliance on mechanical/electrical aids?<sup>9</sup>

23. Mrs Thatcher’s former Press Secretary, Bernard Ingham (2006), also responded to the Secretary of State in an article in his local paper, describing DTQs as:

A perfect wheeze for champagne socialists, but egalitarian, my foot. Nor is there anything fair about a single carbon allowance, bearing in mind the differing needs of the elderly, families with young children, the disabled and those who live in the country who simply have to have a vehicle.

24. Faced with the charge that equality of opportunity for welfare requires something other than the EPCA of DTQs, what defence can the supporter of DTQs mount? Of course, the supporter can reject egalitarian liberal arguments in favour of the commons argument. However, I think that the supporter of DTQs can, in fact, mount a defence that accords with the egalitarian liberal approach. And that defence is that an equal per capita allocation is fair if it is the closest affordable approximation to the allocation of emissions rights that would pertain under equal opportunity for welfare.

<sup>7</sup> Other egalitarian liberal philosophers have suggested alternative formulations of what should be equalized but this does not affect the basic argument set out below.

<sup>8</sup> This response (21 July) can be viewed on the webpage referenced in Miliband (2006).

<sup>9</sup> Of course, it may be that a person with a disability is not able to travel much and so has low transport emissions.



25. Imagine a society implementing equal opportunity for welfare with regard to energy use. Prior to implementation, everyone starts with an equal allocation of energy. It is then calculated what adjustments would need to be made to take account of the various factors affecting opportunity for welfare such as the temperature, whether people live in the town or in the country, the energy efficiency of dwellings, the extent to which people feel the cold and so forth. These adjustments result in individuals being allocated differing quantities of energy. And, as fossil fuel energy comprises the same proportion of each individual's energy use, individuals are therefore entitled to differing quantities of fossil fuel and, thus, emissions rights.

26. In this example, a fair allocation of emissions rights arises from the fair allocation of energy. By contrast, climate change policy, when considering issues of fairness, is concerned not to allocate energy fairly, but only emissions rights.<sup>10</sup> But, in a situation (like today) where energy is not allocated fairly, the fair allocation of emissions rights can be established only by determining the allocation that would arise if energy were to be allocated fairly.

27. This fair allocation of emissions rights can in theory be established by everyone starting with an equal allocation. The same adjustments (for temperature, town/country etc) would then be made to this allocation as would be made to the equal allocation of energy if one were setting out (as in the example in paragraph 25) to allocate energy so as to bring about equal opportunity for welfare.

28. However, in practice it may simply be too administratively burdensome and expensive to collect the information on individuals necessary to make such adjustments (see following examples). If so, the closest affordable approximation to a fair allocation of emissions rights (ie that which would pertain under equal opportunity for welfare) is to stick with the pre-adjusted, equal per capita allocation.

29. The following are two examples of the expense involved in collecting "adjustment information":

- (1) There would be a significant administrative burden and expense to classifying each dwelling according to average temperature and tracking individuals' moves between dwellings so as to accurately adjust their allocation of emissions rights.
- (2) Whilst it is probably feasible to assess how rural/urban each of a nation's dwellings is, this would not accurately reveal how much travel a person required to live their life. For whilst rural life might on average require more travel than urban living, some urban dwellers may have to travel significant distances (eg to work) putting them above the rural average. Hence, obtaining accurate data on the amount of travel required by each individual to live their lives would be extremely expensive.

30. In making the closest affordable approximation argument, the supporter of DTQs would be arguing not that EPCA is the fairest allocation in theory, but simply that it is the fairest allocation in practice. And making this argument may be significant if government is minded to implement a DTQs scheme. For to argue that EPCA is absolutely fair may well invite a cacophony of objections such as those described above and diminish the public acceptability of the scheme. However, if it was argued that the equal per capita allocation was simply the fairest in practice, then the government would create a space in which to recognize the concerns of specific groups and could leave open the possibility of taking actions to accommodate their concerns. For instance, government could ensure that DTQs was implemented as part of a portfolio of measure to make certain that those on low incomes were not disadvantaged by the scheme.<sup>11</sup> The adoption by government of this "fairest-in-practice" approach, may therefore promote a greater acceptability of DTQs amongst the public.

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<sup>10</sup> It might be argued that the aim of policy is to graft a fair allocation of emissions rights onto today's less-than-fair allocation of energy!

<sup>11</sup> See the Tyndall DTQs report, Section 3.4.

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**Further memorandum submitted by Richard Starkey**

**The Tyndall Centre for Climate Change Research, University of Manchester**

**PCT DEFINED**

1. PCT schemes generally deal with emissions from the combustion of fossil fuel and Figure 1 is a simplified schematic of emissions arising within a nation from fossil fuel combustion. These can be divided into direct and indirect emission. An individual or organization emits directly when they themselves combust fossil fuel and, in Figure 1, direct emissions by organizations are divided into those produced from the generation of electricity and those produced from other combustion activities. In the remainder of this section, the bracketed numbers refer to the box numbers in Figure 1.

2. As the following equation shows, total emissions with a nation are the sum of all direct emissions.

*Equation 1*

$$\begin{aligned}
 \text{Total emissions (1)} = & \text{Individual direct emissions (2)} \\
 & + \\
 & \text{Organizational direct emissions—electricity (3)} \\
 & + \\
 & \text{Organizational direct emissions—other (4)}
 \end{aligned}$$

3. An individual or organization emits indirectly, when they consume goods or services, the provision of which involved direct emissions by one or more (other) organizations. As can be seen in Figure 1, an electricity generator’s direct emissions (3) can also be regarded as the indirect emissions of its customers (5, 6). Hence, Equation 1 can be modified as follows.

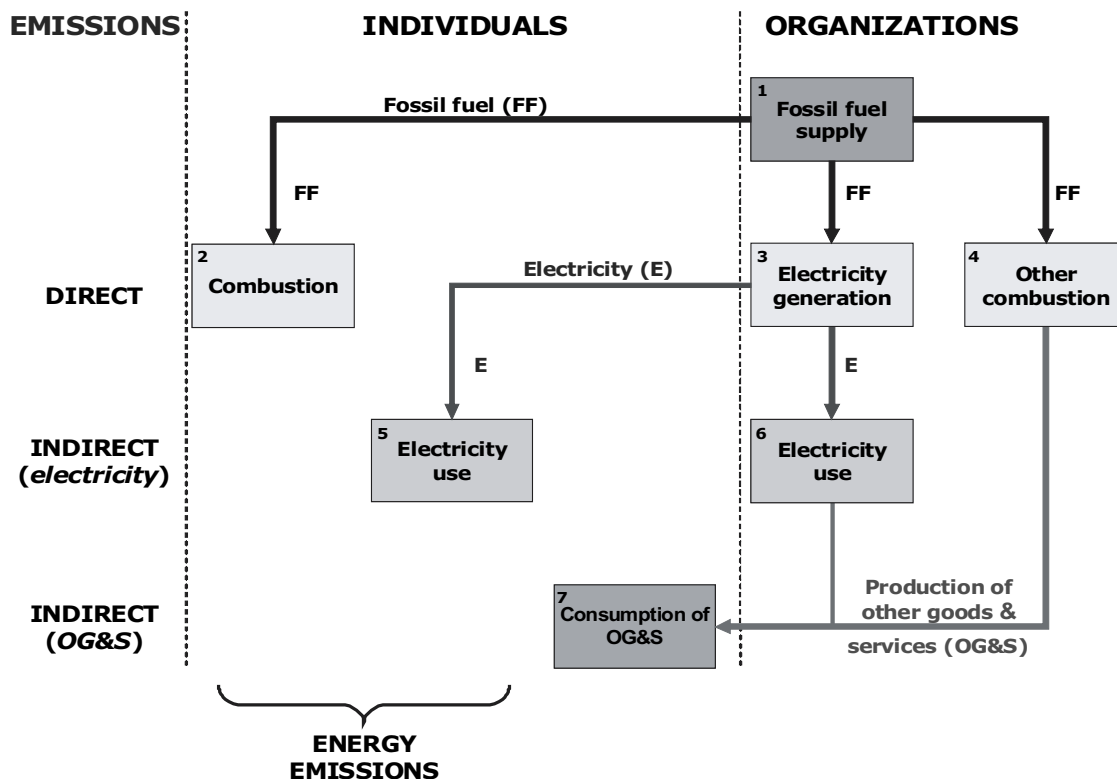


Figure 1: Emission arising from fossil fuel combustion.

*Equation 2*

$$\begin{array}{r} \text{Total emissions (1) =} \\ \text{Individual direct emissions (2)} \\ + \\ \text{Individual indirect emissions—electricity (5)} \\ + \\ \text{Organizational indirect emissions—electricity (6)} \\ + \\ \text{Organizational direct emissions—other (4)} \end{array}$$

4. It is customary for individuals and organizations to refer to their combustion of fossil fuel and use of electricity as “energy use”. Therefore the direct emissions of an individual or organization from their combustion of fossil fuel combined with their indirect emissions from electricity use are referred to as their energy emissions. Hence, Equation 2 it can be modified as follows.

*Equation 3*

$$\begin{array}{r} \text{Total emissions (1) =} \\ \text{Individual energy emissions (2 + 5)} \\ + \\ \text{Organizational energy emissions (6 + 4)} \end{array}$$

5. As Figure 1 shows, organizations use fossil fuel and electricity to produce consumer goods and services. Therefore, organizations’ indirect electricity emissions (6) and non-electrical direct emissions (4), ie their energy emissions (6 + 4), can be regarded as individuals’ indirect emissions arising from their consumption of goods other than fossil fuel and electricity and of services. These are referred to below as OG&S (other goods and services) emissions (7). Hence, Equation 3 can be modified as follows.

*Equation 4*

$$\begin{array}{r} \text{Total emissions (1) =} \\ \text{Individual energy emissions (2 + 5)} \\ + \\ \text{Individual OG\&S emissions (7)} \end{array}$$

6. I now describe a number of different emissions trading schemes which vary with regard to (a) the entities to which emissions rights are allocated and (b) the entities that surrender emissions rights.

7. The Sky Trust proposal (TR, Section 3.2) is an upstream scheme under which emissions rights are auctioned to fossil fuel suppliers who surrender them when they sell fuel to combusters. The auction revenue is allocated to individuals on an equal per capita basis.

8. Under DTQs and the scheme proposed by Robert Ayres (TR 3.2) emissions rights are surrendered by energy end-users ie individuals and organizations other than electricity generators whenever they purchase fuel or electricity. In other words, individuals and end-user organizations surrender emissions rights to cover their energy emissions (See Equation 3). Under DTQs, a proportion of emissions rights are allocated to individuals on an equal per capita basis and the remainder are auctioned onto a carbon market on which organizations must purchase the emissions rights they need and on which individuals may purchase emissions rights additional to their original allocation. In contrast, under the Ayres scheme, all emissions rights are allocated on an equal per capita basis to individuals, from whom organizations must purchase (via market makers) the emissions rights they require.

9. The RAPS scheme (TR 3.2) is one under which all emissions rights are allocated to and surrendered by individuals. Here, individuals surrender emissions rights whenever they buy energy and also other goods and services. In other words, they surrender emissions rights to cover not only their energy emissions but also their OG&S emissions (see Equation 4).

10. The Personal Carbon Allowances scheme (PCAs) proposed by Hillman (2004), under which individuals surrender rights covering emissions from their energy use and their use of public transport, is conceived of as a staging post on the road to a fully-fledged RAPS scheme (or, at least, to a scheme as close to RAPS as can practically be achieved).<sup>12</sup>

11. Under the cap and share (C&S) scheme proposed by the Irish NGO, Feasta (cap and share, 2007), emissions rights are allocated downstream to individuals, who then sell them upstream to energy suppliers. Energy suppliers then surrender these rights when they sell fossil fuel to combusters. Hence, under the cap and share scheme, individuals are initially allocated all of the emissions rights but do not surrender any, whilst energy suppliers surrender all of the rights but are not initially allocated any.

<sup>12</sup> Mayer Hillman, personal communication, 27 November 2006.

12. The term personal carbon trading can be used as an umbrella term for either (1) all emissions trading schemes under which individuals are allocated emissions rights or (2) all schemes under which individuals are allocated and surrender rights. Under the first usage, DTQs, the Ayres scheme, RAPS, PCAs and C&S are all PCT schemes whereas under the second, C&S is not. Below, I adopt this second usage, as proponents of C&S claim that an advantage of their proposal is that it avoids the technology, administration and costs associated with the surrender of emissions rights under the other schemes.

#### POLICY SPACE FOR PCT

13. Considerable attention has been devoted to assessing the appropriateness and feasibility of PCT. However, before looking at these issues, I discuss whether a policy space exists for PCT as this is a significant issue in the light of current and soon-to-be-implemented policy instruments.

14. It might be that, if one was implementing from scratch a policy regime to tackle climate change, one would favour the use of a PCT scheme as the central policy instrument for reducing fossil fuel emissions. However, this is not the situation that presently exists. Currently, EU ETS covers around 50% of the UK's CO<sub>2</sub> emissions (DTI, 2007). The proposed Carbon Reduction Commitment will cover slightly less than 10% of additional CO<sub>2</sub> emissions<sup>13</sup> and the proposed Supplier Obligation, which might take the form of a cap and trade scheme (Defra, 2007b), could cover around another 15% of CO<sub>2</sub> emissions.<sup>14</sup> The Commission has proposed the inclusion of aviation emissions within the EU ETS in Phase 3 and the UK government has proposed that emissions from surface transport also be included. Hence, it is possible that the majority of UK emissions will be captured under one or other cap and trade scheme by 2013.

15. Implementing a PCT scheme in parallel with these trading schemes would thus result in the majority of UK emissions being covered by PCT and another trading scheme. In other words there would be a very considerable degree of "double counting".<sup>15</sup>

16. Assuming the continued existence of EU ETS, then, in theory, the only way to implement PCT and avoid such double counting would be to modify the allocation rules of EU ETS so that it was permissible to allocate emissions rights to energy end-users.<sup>16</sup> (Currently, under EU ETS, emissions rights in the electricity sector must be allocated to generators and it is proposed that surface transport be incorporated into EU ETS by allocating emissions rights to fuel suppliers.) In this case, the Carbon Reduction Commitment and the Supplier Obligation could be removed, and their coverage being subsumed in an economy-wide PCT scheme, one part of which would constitute the UK's implementation of EU ETS.

17. There may be benefits (for instance, in terms of simplicity and efficiency) in having all fossil fuel emissions covered by a single instrument such as PCT rather than the proposed patchwork. If so, then there would be merit in taking steps to ensure that the implementation of PCT at a later date was not precluded.

#### TECHNICAL FEASIBILITY AND APPROPRIATENESS

18. The remainder of this memorandum assumes a policy space for PCT could be found and addresses issues of feasibility and appropriateness.

19. Certain recurring arguments regarding the feasibility and appropriateness of PCT are, in my view, unconvincing and these are set out in the next section. Equally, there are, in my view, some unconvincing arguments in favour of PCT which I set out in the following section. The final section of the memorandum discusses what I regard as the substantive debate around PCT.

#### UNCONVINCING ARGUMENTS AGAINST PCT

##### *The technology for PCT doesn't currently exist*

20. In a speech on 7 November 2006, Chris Huhne, the Liberal-Democrat Shadow Environment Secretary argued that:

the technology at present in my view is not available to make such a PCA scheme workable in the ten to fifteen years in which we need to act. So we must rely on existing technologies (Huhne, 2006).

In fact, PCT would rely on tried and tested existing credit card technologies and, thus, is currently technologically feasible.

<sup>13</sup> According to the government (Defra, 2007a), the 6000Kwh threshold with capture most of the emissions (15MtC) covered by the original 3000kwh threshold (Defra, 2006).

<sup>14</sup> Households account for around 25% of CO<sub>2</sub> emissions, around 35% of which are from electricity. These electricity emissions are already covered by EU ETS.

<sup>15</sup> For more on double counting see Sorrell and Sijm (2003).

<sup>16</sup> This would mean that emissions rights could be allocated to one entity (eg electricity generators) in one country and to another entity (eg electricity users) in another. I have not explored in any detail whether this is feasible. Alternatively, it could be required that all emissions rights under EU ETS to be allocated to energy end-users (though this is hardly likely politically).

*PCT gives the rich a licence to pollute*

21. The aim of cap and trade system is to reduce the cap to a level where it no longer pollution (in the sense of forcing further warming). Of course, within this cap, the rich can afford to buy additional emissions rights but under a carbon tax or upstream trading system, equally the wealthy can afford to pay and carry on emitting. The simple truth is that the additional spending powers of the rich means that they benefit under any scheme! And if this is a problem, it is not a problem that PCT should be expected to solve. (In the final analysis, the solution is, presumably, to put an end to richness!) At least, under an equal per capita emissions, the wealthy must pay for their above-allocation emissions rights and the less wealthy can make money from selling their surplus emissions rights.

*Some people just won't be able to understand PCT*

22. True, but not an argument against PCT. A person who doesn't understand the scheme can make an arrangement (or someone can make an arrangement on their behalf) to automatically sell their emissions rights to a market maker immediately they are allocated to them by government. The person then buys the rights they require at the point of sale. In this way, they would deal only in money and their experience of the scheme would be transformed into something akin to a carbon tax.

*PCT is like the poll tax*

23. PCT is similar to the poll tax in that both involve equal quantities. However, equal quantities are involved in diametrically opposed ways. Under a poll tax, everyone must give an equal quantity of money to the government. This makes a poll tax regressive. Under PCT everyone receives an equal quantity of emissions rights from the government. This makes PCT broadly progressive (but see paras 34–35).

*Carbon cards would be like ID cards*

24. Not even those groups most vehemently opposed to ID cards would seem to endorse this view. In her evidence to the Home Affairs Select Committee on ID cards, the Director of Liberty characterized ID cards as a “single identifier that is used for multi-purposes” (HAC, Ev 20). This she contrasted with “purpose specific identity material”. The carbon card would be an example of the latter, as it would be used to verify identity only for the specific purpose of surrendering and trading emissions rights. Whilst Liberty opposes to the use of single identifiers for multiple purposes, the Director noted that Liberty has:

no problem with purpose-specific identity material that is used for a specific purpose. We have for example NHS cards already and we have National Insurance cards (HAC, Ev 20).

25. However, it is important to address the issue of how much information is held on the central PCT database and who has access to that data. An expert seminar convened by the Royal Society of Arts concluded that it was possible to implement a “privacy-friendly” version of PCT.

*People could be cut off if they didn't have emissions rights to cover their utility bills*

26. Yes, some could be, but this does not constitute a departure from the situation that exists today. Under PCT, if a customer does not have emissions rights within their account to cover their utility bill, the utility purchases the relevant number of emissions rights on the national carbon market and add the cost to the customer's bill. If the customer is a non-vulnerable customer and does not pay their bill then, just as today, they could be cut off. However, if the customer is a vulnerable customer then just as today, their utility could not cut them off.

*The country could run out of emissions rights*

27. The whole point of a hard cap such as that under PCT is to limit the quantity of greenhouse gases emitted by a nation in a given period. If, under the cap, there was a high demand for fossil fuel there would also be a high demand for emissions rights which would result in an increased price. This price would incentivize investment in energy efficiency and conservation measures and low/zero carbon energy supply. The same would be true under a hard cap implemented upstream.

28. Under a hard cap government could play a role enabling the economy to flourish through taking measures to remove barriers to the take up of energy efficiency and conservation measures and to the provision of low-carbon supply. But clearly, there would need to be provision for expanding the cap in exceptional circumstances (for example, a very cold winter and wartime).

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 UNCONVINCING ARGUMENTS FOR PCT
*PCT is necessarily fairer than a carbon tax or other trading schemes*

29. The fairness of a carbon tax depends upon how the tax revenue is used. If the revenue is recycled to individuals on a lump-sum (equal per capita) basis then, arguably, it is equivalent to the equal per capita allocation of PCT. Likewise the revenue from an upstream cap and trade scheme under which rights are allocated by auction could be recycled to individuals on a lump-sum basis.

*The equal per capita allocation of PCT is obviously the fairest allocation*

30. A number of people have argued that an equal per capita allocation is not entirely fair, as those whose life circumstances require them to use more energy, for example, those who live in the countryside and those who live in colder parts of the country, should receive a greater quantity of emissions rights. I have forwarded a separate memorandum on this issue.<sup>17</sup>

*PCT benefits all those on low income*

31. Under DTQs, individuals are allocated emissions rights covering their energy emissions. Dresner and Ekins (2004) found that, if a DTQs scheme was implemented today, then, whilst the majority of households would be better off, around 30% of households in the lowest two income deciles would actually be made worse off due to having above-average energy emissions (mainly as a result of fuel poverty). Hence if DTQs were to be implemented in a way that did not disadvantage any low income households, fuel poverty issues would also need to be addressed (TR 3.4).

32. However, if a PCT scheme was implemented today under which emissions rights covering energy and OG&S emissions (ie total emissions—see Equation 4) were allocated to individuals on an equal per capita basis,<sup>18</sup> then it is not clear what percentage of low income households would be disadvantaged.<sup>19</sup> Research into this question would be very useful.

## SUBSTANTIVE DEBATE AROUND PCT

33. In para 32, I noted that the lump-sum recycling of revenue from a carbon tax or upstream auction is equivalent to an equal per capita allocation of emissions rights. It has been argued that a tax or upstream auction with lump sum recycling would be significantly cheaper than implementing a PCT scheme. For instance, Dresner (2005) writes:

An ecobonus is a payment of equal size given to each individual to redistribute the revenues from an ecotax (say, a carbon tax) and has the same distributional effect as a personal quota assigned equally, it's just that the individual is given money, rather than a personal quota they can trade. In the same way, the Sky Trust proposal to equally distribute the revenue from an upstream emissions auction . . . is distributionally equivalent to a personal quota.

However, there's a huge difference administratively. Now we have a largely integrated tax and benefits system, an ecobonus or the equivalent from an upstream emissions auction can be delivered just by increasing the personal tax allowance, benefits and tax credits by a certain amount. It could be made more explicit and popular by making it an additional item shown in everyone's benefits or a credit in the calculation of their tax. Either way, the marginal administrative costs are virtually zero because you're using systems that already exist. And because it's collected upstream, the administrative costs of tax collection or an upstream auction are very low, actually much less than those of the Climate Change Levy, which could be abolished.

34. And note in para 16, it is also argued that C&S would be cheaper to implement than PCT as it does not require the use of carbon accounts, carbon cards and carbon statements. The question thus arises, if the same degree of fairness can be achieved at lower cost by other instruments, why consider a PCT scheme? The answer, I think, is that one would consider a PCT scheme if it brought with it additional benefits that justified any additional costs.

35. Under a carbon tax or upstream auction, individuals are faced with a price signal whereas under PCT and C&S they hold an allowance emissions rights. The hypothesis regarding PCT and C&S is that actually holding emissions rights will increase individuals' "carbon consciousness", ie they will become more aware of their emissions and more engaged with and focused upon the task of emissions reduction than under other instruments. And if individuals spend more time and effort considering ways to manage and reduce their emissions, then emissions reduction may be more efficient than under other instruments. However, unlike C&S, PCT involves the surrender of emissions rights with (at least) each purchase of fuel or electricity. And

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<sup>17</sup> This was originally submitted to the Environment, Food and Rural Affairs Committee in September 2006.

<sup>18</sup> Lump-sum recycling the auction revenue under DTQs is equivalent to allocating OG&S emissions on an equal per capita basis.

<sup>19</sup> If low income households are spending a high proportion of income on fuel and electricity, they will have less to spend on other goods and services, their OG&S emissions will be lower and they will have a greater surplus to sell.

the hypothesis is that the physicality/visibility of this surrender process and the receipt of a regular carbon statement will give a more frequent reminder to individuals of their emissions and, thus, their carbon consciousness will be greater increased under PCT than under C&S.

36. However, it is important to distinguish between two types of surrender. The first is surrender from a carbon account either by direct debit when paying utility bills or carbon card when buying fuel at a petrol station. Surrender by direct debit is hardly a physical or visible process but will result in entries upon a carbon statement. By contrast, surrendering emissions rights by card is certainly a visible, physical process and one in which those who run a vehicle engage more frequently than the paying of utility bills (TR, 5.6).

37. The second type of surrender involves purchasing emissions rights at the point of sale which are then immediately surrendered. As noted in para 26, this second type of surrender is required to cater for those who do not understand PCT. And whilst, technically, emissions rights are purchased only to be immediately surrendered, from the customer's perspective, the entire transaction is cash-based, with the purchase of rights appearing as simply an item on the receipt (rather like VAT). Hence, this type of surrender of emissions rights is a largely invisible process which generates no entries on the individual's carbon statement (TR 5.6). And, of course, this is entirely appropriate from the perspective of those who don't understand the scheme.

38. However, it should be noted that this form of surrender is open not just to those who don't understand PCT, but to all. So it is, in theory, perfectly possible for all individuals to decide to sell their emissions rights immediately upon receipt and buy (and immediately surrender) all the emissions rights they require at the point of sale. Of course, as a result of the bid and offer spread, they would have to buy rights at a slightly higher price than that at which they sold them, but may decide that the convenience of purchase at the point of sale justifies this cost. And if everyone chooses to purchase at the point of sale, then, arguably the benefit of increased carbon consciousness is lost and PCT could be characterized a rather expensive way of implementing a carbon tax. Hence, an important piece of research is to assess the likely split between the two types of surrender.

39. Another proposed benefit of PCT is in relation to the public acceptability of large emissions cuts. In the Tyndall Report (TR, 7.1) we wrote:

Allocating [emissions rights] directly and on an equal per capita basis quite literally makes individuals equal environmental stakeholders by awarding them an equal stake or share of the atmospheric sink. Arguably, the lump-sum recycling of auction or tax revenue does not make it as explicit to individuals that they have these equal shares in the atmosphere. If awarding [emissions rights] directly to the public means that they more clearly perceive they have such equal shares, if the public perceives this equal share to be fair, and if fairness is a condition for public acceptability, then DTQs may promote greater public buy-in to the task of substantially reducing emissions.

40. However, as mentioned in para 33, not every one regards an equal per capita allocation as fair. Of course, PCT does not have to use an equal per capita allocation but the issue of how allocations should be adjusted to take account of individuals' varying situations may itself become a source of some contention.

41. No detailed research has yet been carried out into the cost of a PCT scheme. It is important to do this, to assess the extent of additional benefits that a PCT scheme might offer and compare this with the costs and benefits of other instruments/instrument mixes.

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July 2007

*Witness:* **Mr Richard Starkey**, Researcher, The Tyndall Centre for Climate Change Research, gave evidence.

**Q49 Chairman:** Good morning. I know the work you have been doing is particularly on DTQs. I wondered if you might just say why you think that particular model is best, if you think that particular model is the right one and whether there are any characteristics of DTQs which might differentiate it from other forms of personal carbon allowances.

**Mr Starkey:** Personal carbon trading is an umbrella term that encapsulates various versions of involving individuals in trading. The reason that we started looking at Domestic Tradable Quotas (DTQs) was that at the time, three or four years ago, it was by far the most well worked out system; we were not starting from base zero as it were. We built on the work that David Fleming, the originator of the DTQs idea, had done and our research at Tyndall has really been building on that work.

**Q50 Chairman:** Are there particular aspects of it which you think make it work well or does it just happen to be the one on which the most examination has currently taken place?

**Mr Starkey:** One of the aspects of the scheme that I think is quite attractive at least in theory, we can come to the practice later, is it is one scheme that encompasses the entire economy so it is simple and efficient. It is not just a scheme that involves individuals in trading carbon but it also involves organisations, firms, the public sector, the voluntary sector and so forth.

**Q51 Chairman:** Do you think it is going to be possible for a country like Britain to reach even the 60% target for cutting emissions? I know from earlier discussions with you and your colleagues at the Tyndall Centre that that is probably a much less ambitious target than what we are going to have to adopt fairly soon anyway. Even to achieve 60%, do you think it is going to be possible without a fairly radical system like DTQs being introduced?

**Mr Starkey:** Yes, I do think it is possible without a system like DTQs. Could you do it with a carbon tax? I think you could do it with a carbon tax. Could you do it with a different sort of trading scheme? Yes, you could do it with a different trading scheme. I am not a member of a group who says that this is the only possible way that you can reduce emissions substantially in the UK. I think the question is, if you can do it with various instruments, what is the preferred instrument to use and does a personal carbon trading scheme have additional benefits over and above those of other instruments? I think that is really what a lot of our research at Tyndall has centred on.

**Q52 Chairman:** Has it suggested it does have additional benefit?

**Mr Starkey:** It has suggested that it may do. I think the next stage of research really needs to dig deeper into whether there are additional benefits and those benefits are great enough to justify any additional costs that go with setting up this scheme as opposed to other schemes. You can start off saying the great thing about personal carbon trading is it is fair, it allocates emissions rights on a per capita basis, but the opponent of personal carbon trading can say two things at that point. One was the point raised by Dr Turner, that maybe an equal per capita allocation is not exactly fair because of variations in individuals' circumstances, but even if you put that to one side, the opponent to personal carbon trading will say that you can have an equal per capita allocation much more cheaply by having a carbon tax where you lump sum recycle the revenue; in other words you allocate the revenue from the carbon tax on an equal per capita basis, or you can do it more cheaply. Okay, but a carbon tax does not guarantee a cap. Well, you can have an upstream carbon trading system where you auction the emissions rights and you allocate the revenue on an equal per capita basis. That is equally fair, it guarantees the cap, but it is cheaper to implement perhaps than a personal carbon trading scheme. So the fairness argument does not win the day for personal carbon trading because the opponent will say there are other schemes that are equally fair but may be cheaper, at which point the proponent to personal carbon trading would have to say okay, other schemes may be cheaper, this may be more expensive to implement, but there may be additional benefits and those additional benefits will come from the increased visibility of carbon. Rather than confronting individuals with a price signal through a tax or through an upstream trading scheme you would give them this allowance in their hand so to speak. The currency of the instrument, emissions, is the same currency as that of the problem, too many emissions. Because they have got this visible allowance in their hand or in their electronic account carbon is much more visible and the awareness of carbon is higher and so their engagement with taking actions to reduce their emissions of carbon is higher and you get more efficient reductions within the economy. That is the hypothesised benefit of a personal carbon trading scheme, its visibility and its engagement. Some people describe it as raising carbon consciousness.

**Q53 Joan Walley:** Your report was published in 2005 and since then we have got the draft Climate Change Bill and we have a Committee of both



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10 July 2007 Mr Richard Starkey

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Houses looking at that. How do you feel that that is having a bearing on how you could put into effect personal carbon trading?

**Mr Starkey:** From my understanding of the Climate Change Bill and my conversations with people in Defra, a personal carbon trading scheme would not be precluded in any way by the provisions of the Climate Change Bill as it now stands. Enabling powers within the Bill would allow a personal carbon trading scheme to be implemented.

**Q54 Joan Walley:** It is interesting that they say that it would not be precluded. Would you not see it as a positive way of providing a constructive framework within which that could operate?

**Mr Starkey:** As I understood your question, it was simply whether the terms of the Climate Change Bill precluded a personal carbon trading scheme and they do not.

**Q55 Joan Walley:** I am asking whether or not it would provide a more constructive framework within which it could operate, and does there need to be more changes to it before it even gets to Second Reading and so on here in the House?

**Mr Starkey:** I am still not sure that I follow your question. Changes to the Climate Change Bill or changes to the configuration of a personal carbon trading scheme?

**Q56 Joan Walley:** Since your report was published we have had the draft Climate Change Bill, in fact it is currently under pre-legislative scrutiny. My question was whether or not the emergence of that Bill, with all that it will bring into operation when it is enacted, will make it much more easy for the aims and objectives of personal carbon trading which you are looking to bring about?

**Mr Starkey:** In the sense they would not preclude it. I think there are lots of other hurdles that need to be overcome and we can talk about those. As long as the Climate Change Bill does not put an insurmountable obstacle in the way of introducing a personal carbon trading scheme then it is one less obstacle to deal with, if that is the way politicians want to go.

**Q57 Mr Chaytor:** Can you describe the difference between a personal carbon trading scheme and the "cap and share" scheme? What do you think are the advantages and disadvantages of each?

**Mr Starkey:** Under personal carbon trading schemes emissions rights are not only allocated to individuals but they are surrendered by individuals. So under the Domestic Tradable Quota scheme, for example, individuals would receive their allowance of emissions rights and then whenever they bought fuel from the utilities or whenever they purchased petrol or diesel from the petrol station they would surrender their emissions rights either by card or by direct debit from their account or through the pay-as-you-go system, thereby buying emissions rights at the point of sale. So they are not just being allocated emissions rights, they are actually surrendering emissions rights as well. Under the cap and trade

proposal, which is put forward by the Irish NGO Feasta, individuals are allocated emissions rights but they do not surrender them. What happens in a cap and share is that the individual receives an annual certificate through the post and that certificate is their emissions rights for the year, so that is their allocation. They then take it to the post office and sell it, there is a national market in carbon and those emissions rights are purchased upstream by the fuel suppliers. It essentially becomes an upstream cap, but rather than allocating emissions rights directly to the fuel suppliers it goes to the fuel suppliers via individuals.

**Q58 Mr Chaytor:** What happens if people do not sell their rights to the fuel suppliers, if they just hang on to the certificate that comes through the post? Presumably the price of carbon increases dramatically.

**Mr Starkey:** The supply goes down so you would expect the price to go up. The same question could be asked of a personal carbon trading scheme, what happens if people do not surrender all the units in their account?

**Q59 Mr Chaytor:** In terms of the administrative aspects and the technical aspects, is that not simpler than a personal carbon trading scheme or a DTQ scheme? It cuts out the need for plastic cards and bank accounts. All that happens is that each household gets one certificate through the post each year and decides whether or not to sell it.

**Mr Starkey:** Yes. You could ask is it not simpler still to auction the emissions rights straight to fuel suppliers rather than having a complete database of where everybody lives, having to maintain that every year, posting it out and dealing with postal fraud. There are issues around cap and share that are not administratively simple, but I suppose the proponent of cap and share would say their scheme is more complex than an upstream auction but that the additional complexity is worthwhile because of the additional benefits. So the argument you have to make with personal carbon trading is that there may well be additional complexity in terms of cards, accounts and so forth, but that additional complexity is justified because of the increased benefits in terms of the visibility of carbon, the increased awareness and increased carbon consciousness. These are all hypotheses. I am not saying that would be the case, but that is the hypothesis that needs to be tested.

**Q60 Mr Chaytor:** What would be the benefits of cap and share as against a straightforward upstream auction?

**Mr Starkey:** I think the proponents of cap and share would say that it is important for people to be able to hold the certificate in their hand showing their share of the atmosphere, their emissions rights. There is something empowering about that. The atmosphere does not belong to organisations, it belongs to individuals, you have got your share in your hand and that sort of thing, but it happens just once a year. With personal carbon trading there is

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that reminder of your carbon emissions every time you buy petrol, every time you pay a utility bill and every time you buy gas and electricity. One might argue there is increased visibility and that increased visibility may justify the increased complexity and increased cost. In summary what I am saying is you are weighing up the costs and benefits all the time. It is not right just to look at costs; you need to look at the cost-benefit analysis.

**Q61 Martin Horwood:** Can I test you on the operational feasibility of this? You are very confident that the existing transactional technologies can cope with this system?

*Mr Starkey:* Yes.

**Q62 Martin Horwood:** What would be the equivalent of purchasing carbon credits in existing technologies?

*Mr Starkey:* What would be the equivalent?

**Q63 Martin Horwood:** Are you thinking of something where you would run up a carbon bill, do you have a top-up card or do you have to buy them online? How would you imagine that practical part of it working?

*Mr Starkey:* When you say run up a carbon bill, I do not think you would be allowed to go overdrawn on your allowance so in that sense it would be different from a bank account, if your bank allows you to go overdrawn.

**Q64 Martin Horwood:** So it would not be like a credit card?

*Mr Starkey:* No.

**Q65 Martin Horwood:** It would be more like a top-up scheme?

*Mr Starkey:* It is not the same as a top-up scheme. With a top-up scheme stuff is coming onto your card. In this system stuff is going out of your account. It is perhaps more like a debit card.

**Q66 Martin Horwood:** You talk in your report about individuals then purchasing units if they want to carry on emitting carbon. How would they do that in practice? Where is the existing analogy?

*Mr Starkey:* There are four routes. They could purchase them online with a credit or debit card. Just as you purchase a book from Amazon or eBay, you could purchase them online from your bank. You could go into your post office and buy them that way. You could easily do it over the telephone either by speaking to a real person or through an interactive voice recognition system. In the previous session you asked questions about what happens if people cannot cope with the scheme or are not able to understand it. People are able to set up an arrangement whereby they automatically sell their emissions rights as soon as they hit their account and then they buy them at the point of sale, but they do not know that they are buying them at the point of sale. They are simply paying an increased price. They are just transacting money. That is the fourth way of buying.

**Q67 Martin Horwood:** That sounds broadly like a top-up scheme, does it not? You have to go out and physically purchase it before you then carry on emitting. There is not a perfect analogy for this in any existing scheme or any existing technology. If everybody tries to do it the price will go up quite sharply. Somebody is suddenly going to find the holiday they were budgeting for is not something they can afford because it includes a long-haul flight.

*Mr Starkey:* That is the same under any cap and trade system. If you restrict the amount of carbon in the system then not everybody can burn all the carbon that they want to. The question is not how big the cake should be because every system restricts the size of the carbon cake but rather how that cake should be sliced up.

**Q68 Martin Horwood:** What I am trying to test is whether there really is any analogy in existing technologies or systems for this kind of scheme. There does not seem to me to be anything that would operate quite like this. Compared with the systems that you are hoping will cope, like credit card systems, actually this is going to operate quite differently, is it not?

*Mr Starkey:* When you buy petrol you simply put your card in the reader and money moves from your account into the account of the petrol station. The card allows the petrol station to export money from your bank account into their bank account. In the same way, if I am buying petrol under this scheme, I put my carbon card in the reader that already exists in the petrol station and that transaction allows the petrol station to take carbon emissions rights from my account into their account. If you get rid of the overdraft bit of it, it is analogous to using a debit card to move money from one account into another.

**Q69 Chairman:** There are some quite difficult practical questions here. What happens if you are an American, you just come in and you rent a car in London and you want to fill up with petrol?

*Mr Starkey:* You just use the pay-as-you-go option. You buy your emissions rights at the point of sale.

**Q70 Chairman:** If you are not a citizen you have not got an allowance, have you?

*Mr Starkey:* Which is why you buy them at the point of sale.

**Q71 Martin Horwood:** Then it is like a top-up system. You are allowing people to keep purchasing and push the price up quite sharply.

*Mr Starkey:* Are you talking about a reward card or a top-up system? In a top-up system, like with a mobile phone, I can buy an infinite amount of credit.

**Q72 Martin Horwood:** In systems terms there is quite a difference between something like an Oyster card where the allowance is on the card and something like a bank account where your account is with the main server of the organisation that has it. Operationally these are quite different systems.

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**Mr Starkey:** That is how your bank account works. Your money is held in electronic blips on a database somewhere.

**Q73 Martin Horwood:** No, because on a bank account you can run up endless bills if you are not responsible. You are saying that you would have a system that stopped you at some point.

**Mr Starkey:** I am saying, if you are looking for a perfect analogy, there is not a perfect analogy because it breaks down at the overdraft point. In terms of moving money from one electronic account to another using a card, then I think a bank account is an analogy that people will understand. With this you are getting stuff put into your account for free whereas you have to go out and earn your money to put into your bank account.

**Q74 Martin Horwood:** If you really do put a cap on it then that is not like a bank account because you very rarely reach the point where your card just stops working. What about the people who are not really capable of using a credit card at the moment or who struggle with things like tax credits, because you are moving from a voluntary system with credit cards or one that is, in the case of most bank cards, vetted by the institution that issues the card to make sure that people are credit worthy for instance? In this scheme you are issuing the Domestic Tradable Quota to everybody. Is there not a risk for the people at the margins who are not going to be able to participate properly in this scheme?

**Mr Starkey:** If you do not want to use a card you do not have to use a card. If you do not want to think about emissions rights you do not have to think about emissions rights. Just one thing has to happen. Your emissions rights are automatically placed into your electronic account, let us say, once a month. Either you yourself or, if you are not capable of doing that, someone on your behalf can set up an arrangement whereby those emissions rights are automatically sold to a bank as soon as they hit your account. You make that one arrangement and then for the next 15 or 20 years, however long you are alive, you do not have to think about it again. Then whenever you go to a petrol station to buy petrol or pay your electricity bill you simply just pay in money. The electricity company or the petrol station is adding on the cost of the emissions rights to your bill. You do not even have to think that they are doing that, that is what is happening in practice; you are just being faced with a financial quantity that you pay over. You can just transact completely in money if you want to.

**Q75 Martin Horwood:** That ends up being just like a carbon tax, does it not?

**Mr Starkey:** It does end up being just like a carbon tax if everybody chooses to do that. This is one of the criticisms that have been leveled at personal carbon trading and it is one of the points that I made in my written evidence, that if everybody chooses to sell their emissions rights immediately upon receipt and then just buy at the point of sale you could argue that it is just a very complex and sophisticated and

expensive way of implementing a carbon tax. There are a number of reasons why not everybody would do that. This is a very important area of research that needs to be done. One of the reasons given in the last session was that some people might enjoy fiddling around with their accounts and managing them and playing the market. I think another reason would be that it is a very convenient way of being able to work out how much you have emitted because just as you have a bank account and you get a bank statement, so if you have a carbon account you will get a carbon statement maybe once a month or once every three months, but on that carbon statement (or you could access it online) it will say that Martin Horwood over the last three months has bought this amount of petrol and has this amount of emissions relating to his petrol purchases, this amount of emissions relating to his gas purchases and this amount of emissions relating to electricity purchases. So on one piece of paper you can see whether you are above average, below average or at the average, whereas on all the other schemes, as far as I can see, you would just have to keep all your petrol receipts and go back to your electricity and gas bills and work it all out. There is some convenience in having an account and a statement as you can see very conveniently where you stand. If you are going to allocate emissions rights on an equal per capita basis some people may well be keen to know if they are above average, just below average or at the average. This is a very easy and convenient way of telling where you are at.

**Q76 Dr Turner:** The Tyndall Centre thinks it is very important to prevent fraud within the system. Given that initially carbon allowances would presumably be worth not very much, it is a bit like the first round of the European ETS, so there will not be much profit in committing fraud. Do you think fraud is really going to be a significant problem, and what sort of level of security do you think will be needed to prevent it?

**Mr Starkey:** The price of an emissions right depends upon the supply and the supply is the cap. The Chairman mentioned earlier about my colleagues who gave evidence to you earlier this year about the Climate Change Bill being consistent with a 4°C rise and if the Government is genuinely committed to 2°C we are talking about very deep cuts in emissions year-on-year, 6–9%. If you are constraining the supply of emissions rights that tightly it may well be that the price is considerably higher than it was at the beginning of the EU ETS where the cap, everybody acknowledges, was very loose. Who knows what prices you will see? It depends upon the stringency of the cap, but if the cap is as stringent as it needs to be consistent with a 2°C target you may see very high prices, which presumably increases the incentive to commit fraud. I think there are basically two types of fraud, there is identity fraud and card fraud. Identity fraud is where you fraudulently open multiple accounts. So whereas you would be entitled to one account, you may be able to fiddle it so you got four accounts and you would have a lot more emissions rights to sell. This is why it is important to have some

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sort of rigorous procedure for enrolling people into the scheme, ie you have to prove to me in some way who you are. There was a question in the earlier session as to whether you could do that through ID cards. If ID cards were in place it would be a convenient way of enrolling people into the system. We have worked quite hard to say this scheme is not dependent on ID cards. If ID cards were not implemented for some reason, there are plenty of other ways by which you can verify people's identity conveniently and to a high degree of assurance. Like them or not, if ID cards were in place that would be a convenient way of verifying someone's identity. That is the first type of fraud, identity fraud. The second type of fraud is card fraud. Well, chip and PIN would be the obvious way of dealing with that.

**Q77 Dr Turner:** You have got something that requires a secure system and it is mandatory. This inevitably makes people think of comparisons with an ID card system in any event. There is a certain amount of positive confusion there. Civil liberties groups tell us that they are not worried because it is purpose specific and used for a specific purpose and not a "single identifier that is used for multiple purposes". Do you think that public perceptions will be easily won over as far as this is concerned? Do you think you will have a problem with the public?

**Mr Starkey:** The public is not a homogenous lump. The blog that David Miliband wrote on personal carbon trading got by far the most responses to any of his blog entries. A large number of people said this was a great idea and there are a large number of people who said it is "Big Brother", it is the State interfering, the State is going to be able to track what I am spending on petrol, on electricity and so on and so forth. It will be very important to reassure the public that privacy issues have been taken very seriously. Clearly we have the Data Protection Act and there is the European Convention on Human Rights. It has to be made very clear that this is a privacy-friendly scheme. I have talked to someone at LSE who was instrumental in writing their very large report on ID card schemes who is interested in doing some work to look at this very aspect of privacy. I think it is a very important issue that you raise.

**Q78 Dr Turner:** Do you think anonymity could be guaranteed? How would you do that?

**Mr Starkey:** In what sense? When you use a credit card it has your name on it.

**Q79 Dr Turner:** Yes, but nobody else has access to your credit card account except you.

**Mr Starkey:** No. In the same way you would have to ensure that no one had access to your carbon account other than you except in very exceptional circumstances.

**Q80 Martin Horwood:** Surely if you are going to have a tradable price of carbon in the scheme the individual accounts have to be aggregated, do they not? So in fact you cannot have that firewall that you have with a bank account. Your use of money does not have much effect on the rest of the economy

except in the way you purchase, but with these Domestic Tradable Quotas you are going to have to take the information from individual accounts and aggregate it into a complete scheme in order to calculate the price of carbon. Information is going to have to pass from individual accounts to a central calculation.

**Mr Starkey:** Just as a bank is able to tell the total amount of money in the various accounts that it holds so it would be necessary to be able to tot up and follow the transactions.

**Q81 Martin Horwood:** But this scheme would have one operator, would it not? Surely it would have to have one operator in order to be able to calculate the amount of carbon that was still available in the system.

**Mr Starkey:** Simon Roberts talked in the previous session about banks hosting individuals' carbon accounts. If you had a system like that then carbon accounts would be dispersed over a wide number of databases and I am not sure how practical that would or would not be for auditing purposes. It may well be preferable to have a central database run by Government or subcontracted to some agency who runs it for Government. I have to say, I am not in any way an IT expert so I do not know the relative pros and cons of those two systems. There is some discussion to be had about what is the best way to do it.

**Q82 Chairman:** Public enthusiasm for schemes which involve very large government centralised databases I think is limited by experience, but people live in hope that they may get fed up running these sorts of things. Could you say how you think this would all fit in with the sort of carbon trading schemes that already exist, such as the EU ETS?

**Mr Starkey:** You touched on this in earlier sessions and the issue of double-counting was raised where you have two emission trading schemes essentially chasing the same emissions. I think it is not just EU ETS that you need to look at or EU ETS in its current form, which currently accounts for 50% of UK carbon emissions. We have the carbon reduction commitment coming online, that is another 10%, the supplier obligation, maybe a cap in trade scheme and it may cut another 15% of emissions. People are talking about expending the EU ETS. The Commission wants to bring in aviation. The UK Government is talking about bringing in gas suppliers and fuel suppliers. If all that happens, you will have a situation where the majority of UK emissions are already covered by a patchwork of carbon emissions trading schemes. If you were to implement personal carbon trading in parallel with those schemes then you would have a very, very considerable amount of double-counting. Most of the emissions would be covered by the two schemes, personal carbon trading and something else. At first glance that does not seem to be a particularly efficient way of going about things. One would need to look, if one thought that personal carbon trading was an idea worth exploring further, at being able to facilitate an evolution from that

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patchwork of schemes that will be in existence fairly soon to a personal carbon trading scheme, which goes back to your original question about the advantages of such a scheme. You would have one scheme in some ways much more straightforwardly covering the entire economy.

**Q83 Chairman:** What about the interaction with things like the Renewables Obligation and the Climate Change Levy? Are some of these other instruments eventually going to be redundant if you have got an effective all-embracing trading scheme?

**Mr Starkey:** I think some schemes are clearly substitutes to each other and some schemes are complements. You could have an all-encompassing emissions trading scheme and at the same time you could have product efficiency standards for instance for fridges and other white goods. Those two sorts of legislative instruments would not be incompatible because one would be facilitating an efficient use of energy within the cap provided by RoA.

**Q84 Chairman:** Given that the EU ETS even in Phase II is not without its problems and that is dealing with large fairly sophisticated organisations for the most part, does that not make you a bit daunted by the practicalities of trying to introduce an all-embracing scheme which will involve every citizen, many of whom do not have bank accounts and are not used to using cards in the way that other people are and so on?

**Mr Starkey:** I do not pretend it would be completely easy, but I am far less daunted by it than I was when I started my research. When we started our research at Tyndall there really had not been much work done on the technological feasibility and the administrative feasibility. It seems to me that technologically you are using a well-established tried and tested credit card system, all the readers are in petrol stations and you are using systems of direct debit which are very well understood. I would echo what Simon Roberts said in the previous session, that perhaps technology is not the biggest challenge, it is more the administrative challenges of enrolling 45 million people into a scheme, giving them a card, dealing with lost and stolen cards, closing people's accounts when they die or they emigrate, or if people are entitled to emissions when they are 18, making sure that when they hit the age of consent their account is open for them. There is vast experience in the private sector of issuing cards, running call centres, dealing with fraud issues and dealing with lost cards. There is a great body of experience that can be drawn on.

**Q85 Dr Turner:** You are concerned in your memorandum that a lot of groups would be disadvantaged by equal allocations of carbon units. At the same time you are adamant that an equal allocation of units is the only feasible option. If this is the case, how do you think that these inequalities should be addressed?

**Mr Starkey:** There is the issue of fuel poverty and that really arises because some households on low incomes have such inefficient houses that their use of

energy is above average. If everybody is getting the average under a personal carbon trading scheme and some people on low incomes are above average, they would have to go into the market and purchase additional emissions rights and so there they would be disadvantaged by the scheme if it was implemented tomorrow. The sensible way to deal with that is to tackle fuel poverty, which the Government is already doing through its various schemes, such as Warm Front and so on and so forth. If you can bring the emissions of fuel poor households back to below average then they would not be disadvantaged by the implementation of such a scheme. There is the specific issue of fuel poverty which is well recognised but again it is important to recognise that it is an issue under personal carbon trading and it would also be an issue under carbon tax and it would also be an issue under an upstream carbon emissions scheme. So if it is a problem, it is a problem that is not specific to this particular instrument. I think it is important to distinguish between problems specific to this particular instrument, for instance enrolling 45 million people under the scheme and problems that are generic to the whole gamut of instruments.

**Q86 Dr Turner:** A lot of people who have to commute to work or live in remote locations would be disadvantaged from a transport point of view because they would use up their carbon allowances in getting to work. How would you propose to deal with that?

**Mr Starkey:** I think the issue of equity is a really important one because if the Government were to stand up and say, "Listen here everybody, we're implementing a perfectly fair scheme," there would be a great outcry because people would say, "What about people who live in cold areas of the country? They need to use more energy. They should get more emissions rights. What about people who live in rural areas? They simply need to travel more in order to live their lives. What about people who have children?" Someone said to me, "What about people who live in London? They have such an incredible public transport system that they would be unfairly advantaged if they were given an equal amount like everybody else. They should be given less. What about people who work nightshifts? If they worked the dayshift they could get the bus to work, but because they are working a nightshift they actually have to drive their car rather than getting the bus." It really is not the case that it is done and dusted by saying it is completely fair for everybody getting the same amount of emissions rights. If you do not go down that route on the other hand you get into the whole knotty problem of how do we adjust everybody's equal share to take account of their particular circumstances and one can imagine getting bogged down in lots of disputes and lots of bureaucracy about that. If you had to put the worst possible spin on it then perhaps what you might say is there could be some opposition to the idea of an equal per capita allowance, but there could also be some disagreement about moving away from the per capita allowance and trying to adjust it to take

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account of various factors that influence people's lives. I think this is an issue that really needs to be thought about because it will impact on public acceptability. I am not sure I have an easy answer to that.

**Q87 Dr Turner:** It could be the barrier between making the scheme work and not work, could it not?  
**Mr Starkey:** It may be.

**Q88 Joan Walley:** However it is going to be done, if it is going to be done, it is going to be a daunting task. Clearly public acceptability is going to be key to it ever being done. You have just touched on the equity issue to some extent. You do not seem to mention in a great deal of detail in your report what the cost of a carbon allowance would be in monitoring terms.

**Mr Starkey:** The value of your allowance?

**Q89 Joan Walley:** Yes. If people are going to sign up to this, if they are going to willingly take part in it, assuming that all the barriers that you have just talked about could be overcome, you would have some kind of equitable system and people would need to understand what the costs of it would be. Have you any thoughts about what that might be?

**Mr Starkey:** If people's allowances under a personal carbon trading scheme were based on the UK's current emissions, and if we look at the Domestic Tradable Quota scheme where 40% of emissions rights are allocated to individuals to cover their energy use, the average individual emissions for energy use at the moment in the UK are about five tonnes of carbon dioxide, the value of that allowance simply depends upon the price of a tonne of carbon. If you have a very, very tight cap, if you are ratcheting emissions down 6–9% a year in order for your emissions reduction trajectory to be compatible with a 2° increase in temperature, then you could see a reasonably high price in carbon. If it was €100 a tonne then it would be €500 a year would be the value of the emissions rights that are allocated to cover your energy use. The other 60% of emissions rights, under Domestic Tradable Quotas, would be auctioned off and if that revenue was lump sum recycled then it would be one and a half times the value of your emissions rights holding, so that would be €1,250 if the price per tonne was €100. It is a very difficult question to answer because it just depends upon the cap. If you reduce supply drastically you would expect the price to go up quite considerably.

**Q90 Joan Walley:** I can see that a lot of it is inter-related.

**Mr Starkey:** The same question would arise, what price of carbon tax would you need to ratchet emissions down? It is not an instrument specific question.

**Q91 Martin Horwood:** If somebody who was very badly off was allocated a potentially quite valuable quota, what is to stop them from just trying to sell

most of it straightaway and then not being able to run their car or heat their house in three months' time?

**Mr Starkey:** If this person is a substantially below average emitter then they will have to buy back at the point of sale far fewer units than they sold, so in that sense they would not be worse off.

**Q92 Joan Walley:** That leads me to ask whether or not you would anticipate that people would be passively engaged in all of this or whether they would actively go out and trade. Are people going to be actively engaging with this whole process and buying and selling here, there and everywhere?

**Mr Starkey:** In the strangest way, even if you are not actively engaging in it, even if you are saying I do not want anything to do with this, you are buying and selling carbon units, you are selling them immediately they hit your account and then you are buying them at the point of sale. The trading is invisible, you are not consciously taking part in trading, but you are trading in the sense that you are buying and selling emissions rights. You could say there is something for everyone in this scheme. For people that really do not want anything to do with it, they sell automatically and buy at the point of sale without even realising they are doing that. For people who do want to manage their account more actively and have a record of their carbon emissions, they can involve themselves in trading. One downside of selling your emissions rights immediately they go into your account and buying at the point of sale is that your various emissions will not appear on your statement and so you will not have that easy reference point.

**Q93 Joan Walley:** We heard from the previous witnesses about the need for bold steps. In your view of the British general public and where we are in this debate at this stage in 2007, is this going to be something that is just a step too far, that is just much too bold? Are people going to feel that it is restrictive and discriminatory or are they going to seize it with open arms, given the problems we have just been experiencing with flooding?

**Mr Starkey:** A very valuable point was made in the last session and that is that one has to distinguish between the instrument and the target. The most important question in terms of climate change policy in the UK is what is our emissions reduction target trajectory? Are we serious about 2°C or are we talking about a 3°C or a 4°C temperature rise? That is the fundamental question. What quantity of emissions are we going to shed into the atmosphere? Once you get a definite target you can then have a discussion about what is the right instrument to use or the right instrument mix in order to meet that target. There may be difficulties with personal carbon trading, but there are going to be difficulties with all instruments. The choice for the public is not personal carbon trading or nothing, it is personal carbon trading or something else that is more desirable. Is a higher carbon tax more desirable? Is a

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price signal more desirable? You have got to shrink the size of the cake whatever happens. Is personal carbon trading the fairest way to cut up that cake?

**Q94 Joan Walley:** Is that not one of the issues, that people are not yet engaged? Doing nothing is not an option and, therefore, they will see it as do we have personal carbon trading or do we have nothing as opposed to putting it into that wider picture where doing nothing is not an option. What are the options? It is really about how we progress in terms of a general debate onto that level of understanding where doing something is something that we have to do. It is a question of the devil in the detail and how we do it.

**Mr Starkey:** I agree with you that the debate needs to be moved forward in this country in terms of getting the message across very clearly that even though we are doing quite a bit in this country we need to be doing more.

**Q95 Joan Walley:** A lot of times people just do not see the need for change and so the whole debate is not couched in understanding that need for change. How do we get to that position?

**Mr Starkey:** I suppose that raises bigger questions, such as to what extent do you need to wait for every member of the general public to be well-informed about climate change before politicians move forward? Do you wait for that situation or do you say this is too urgent, we are just going to have to move forward and try and carry the public with us? The Congestion charge is the example that everybody quotes about leadership. Not everybody was signed up to it, but there was one particular politician who said, "This is what we're going to do. Let's crack on."

**Q96 Martin Horwood:** Surely the difference with that kind of Green taxation is that it is going into a central pot that you can then choose to offset people's disadvantages with. You could spend it on public transport so that the people who are priced out of their cars at least have a more affordable public transport option or you could offset Green taxes against income tax or something like that. Those escape routes for both the politicians and the public are not really there with a DTQ system, are they?

**Mr Starkey:** I think they are. You are saying to people that if they are a below average emitter they will have these surplus emissions rights that will have a value and they will be better off than they were prior to the implementation of this scheme. If their emissions are half the average they are going to have a fairly hefty whack of emissions rights that they can get rid of and make themselves a tidy sum.

**Q97 Chairman:** That will depend on the price. One of the advantages of a scheme like this is that it does engage people in thinking about their emissions more than they otherwise might. You did suggest that some people might simply choose to bank their allowances right upfront and then buy as they go. Clearly that sort of person will not be engaged in

quite the same way. If a lot of people chose that option it would somewhat dilute the advantage of getting everyone thinking about it all.

**Mr Starkey:** I agree. In terms of personal carbon trading, this is one of the issues that needs to be looked at further. If nobody chose the bank and everybody chose to manage their account carbon consciousness would go through the roof perhaps.

**Q98 Chairman:** That is an unlikely outcome.

**Mr Starkey:** Yes, but if everybody chose to sell immediately these emissions rights hit their account then the effect is somewhat lessened. I would reiterate the point I made earlier, that by actually surrendering from your account rather than buying at the point of sale you are able to track your emissions through a carbon statement, which gives you this nice convenient summary of your emissions over a particular period and you will be able to play the game, ie am I above average, below average or at the average. I think that is an important question. One can hypothesise that lots of people will buy at the point of sale or not many people will. I think we need to try and test this out somehow.

**Q99 Chairman:** That is interesting because in a previous session the witnesses were pretty dismissive of the idea of pilot schemes for various reasons, some of which may be quite valid. The only way to test things out is normally by a pilot scheme. Do you share the concern that pilot schemes are likely to "contaminate", I think that was the word used, the public's view of the whole concept or do you think it might actually be a way of helping people to understand what it is and they would not be quite as fearful of it as they might otherwise be?

**Mr Starkey:** I think there are problems with pilots and I also think there are lots of things you can do other than pilots. If by a pilot you mean a scheme that is identical to the real thing in every way other than size then I think there are problems, which the previous witnesses highlighted, ie there are boundary issues and there is the fact that maybe you are not going to rig up petrol stations in the way that they will be rigged up under the real scheme. It would be much more difficult to have a functioning market with various banks and the market makers taking part if it was just a couple of thousand people in the pilots as opposed to a market of 45/50 million individuals and several million organisations in the real thing. If you are trying to replicate the real thing on a smaller scale then I think there are big barriers, but I think there are lots of things you can do. I am not thereby ruling out a pilot, I am just saying it is important to be cognisant of the limitations. The previous witnesses talked about setting up websites to inform people. I think it is important to do some in-depth focus group work with members of the public. It has been my experience that people's hostility to a personal carbon trading scheme is inversely proportional to the amount of detail they have about it. When they first hear about the idea and they do not hear very much they think it could never work, the technology will not work or it is unfair on the poor, these various objections come

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up. When you give people answers to these sorts of questions and give them more detail, they do not necessarily become supporters of the idea but they at least see that the idea is not completely off the wall, it is not completely preposterous and the idea moves from the realm of the preposterous into the realm of the vaguely reasonable. If you explored with members of the public through ongoing focus groups how they felt about this particular option to reduce emissions as opposed to other particular options you could learn quite an amount about public attitudes. The technology can be tested quite robustly without necessarily having to run pilots. There may well be value further down the line in pilots but it is by no means the only thing that you can do.

**Q100 Chairman:** Given that this is an interesting topic and it is one that is going to go on provoking quite lively debate, what should the Government be doing to take the whole discussion forward?

**Mr Starkey:** I think it needs to be trying to get a better handle on the specifics of cost and benefit. I think it is important, as the previous witnesses said, to try and put some hard numbers on what it would cost to set up such a scheme and to administrate such

a scheme. How much would it cost to post out carbon statements to everybody? How often would they need to be posted out? What percentage of cards would be lost or stolen? I would imagine there is a wealth of data out there in the public and private sector that could be drawn on to try and get a handle on what the costs are. Once you have got a better idea of costs we need to try and understand in more depth what the benefits are. Is there this carbon consciousness raising effect that people think there may be? Some people say a personal carbon trading scheme would generate this sense of common purpose, we are all in this together and we are all being allocated our fair share of emissions rights. Would that happen? What benefit would it have other than a feel good factor? Would it result in more efficient fuel reductions? These issues are quite difficult to eek out, but to the best of our ability we need to try and find some answers to these questions. The fundamental question is if there are additional costs to setting up such a scheme as compared to other instruments, are there additional benefits which justify those additional costs?

**Chairman:** Thank you very much. It has been another interesting session. Thank you for coming in.



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**Tuesday 17 July 2007**

Members present

Mr Tim Yeo, in the Chair

Colin Challen  
Mr David Chaytor

Martin Horwood

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**Memorandum submitted by the Energy Saving Trust**

**INQUIRY INTO PERSONAL CARBON ALLOWANCES**

The Energy Saving Trust is pleased to respond to the Environmental Audit Committee's Inquiry into personal carbon allowances and the feasibility of implementing a carbon trading scheme between individuals. The Energy Saving Trust was established as part of the Government's action plan in response to the 1992 Earth Summit in Rio de Janeiro, which addressed worldwide concerns on sustainable development issues. We are the UK's leading organisation working through partnerships towards the sustainable and efficient use of energy by households, communities and the road transport sector and one of the key delivery agents of the Government's climate change objectives. Our response focuses on the key areas of the Energy Saving Trust's activities and related issues that are relevant to the inquiry including those specifically identified by the Committee. Please note that this response should not be taken as representing the views of individual Energy Saving Trust members.

**ENVIRONMENTAL AUDIT COMMITTEE'S INQUIRY INTO PERSONAL CARBON ALLOWANCES AND THE FEASIBILITY OF IMPLEMENTING A CARBON TRADING SCHEME BETWEEN INDIVIDUALS**

1. Our response focuses on the Committee's two principal lines of inquiry and its more specific points of interest. By personal carbon allowances (PCAs), our responses assumes that such a scheme covers individual's carbon dioxide emissions only, including aviation, and that allocation is made free of charge on a per capita basis<sup>1</sup> with coverage including electricity, gas, coal, oil and transport fuels.

*Is a scheme of personal carbon allowances desirable, and could such a scheme be practical?*

2. We believe that in principle a personal carbon allowances scheme is desirable for a number of reasons, most notably:

- A cap on household emissions is wholly consistent with the proposed Climate Change Bill to cap UK emissions.
- It will provide a clear message that individual action is required to help tackle climate change.
- It will help ensure that individuals take personal responsibility for reducing their own emissions.
- Such a scheme could be both fiscally progressive<sup>2</sup> and economically efficient.

However, whilst a PCA scheme is likely to be better for behaviour change measures, a measures based approach is likely to be more effective for energy efficiency investments. In our view the priority is to deliver reasonable levels of behavioural change.

3. We agree with the views of the Tyndall Centre in its report "Domestic Tradable Quotas: A policy instrument for reducing greenhouse gas emissions from energy use" that "it is technically feasible to build a Domestic Tradable Quotas (DTQs) scheme<sup>3</sup> around the existing infrastructure for credit and debit cards". Implicitly this implies that a PCA scheme should also be feasible.

The likely impact of a personal carbon trading scheme. The Committee would like to investigate the likely impact of a scheme of this nature, not only on carbon emissions, but also on the economy, different markets, existing "green" policies, and the public themselves. The Committee would also welcome opinions on whether favourable conditions currently exist for the introduction of such a scheme and, if not, what conditions would be required for such a scheme to be feasible, desirable, and palatable to the public and business community. In particular the Committee would be interested to identify any areas where further research and consideration would be required in order to fully assess the impact and feasibility of a personal carbon trading scheme.

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<sup>1</sup> Consideration of the percentage allowance for children is required.

<sup>2</sup> Assuming that allowances are allocated on a per capita basis as the better-off tend to emit more carbon than the less well-off.

<sup>3</sup> DTQs include non-domestic sectors.

4. Further work is required to assess the likely impacts of a PCA scheme, which will inevitably vary depending on the specific nature of any such scheme. It is too early to hypothesise what these might be. However, depending on the implementation of a buy-out, such a scheme should cap the emissions covered and reduce them over time whilst ensuring that individuals take personal responsibility for their carbon-emitting actions. Both of which are clearly desirable outcomes.

5. In addition to issues relating to the detailed design of the scheme design, research is required to investigate several key issues that will need to be resolved prior to the implementation of any scheme including:

- Assessment of the cost-effectiveness of PCAs when compared to alternative emission reduction measures.
- Potential fit with other policies such as the EU Emissions Trading Scheme and the proposed Suppliers Obligation including double-counting issues and the identification of the supporting policy measures, such as the provision of information/advice and product standards etc, which would still be required.
- The degree of public understanding and acceptability.
- The required market structures and ease of use.
- Addressing social equity and protection of priority groups.
- Likely carbon price and potential impact on the UK economy.
- Development and testing of the required IT infrastructure.
- Resolution of carbon ownership and who profits from the monetary value of carbon savings.

Currently there is insufficient data and evidence to make fully informed judgements on these issues.

6. We therefore welcome Government proposals to explore the potential for such a scheme in the future to improve the evidence base prior to any Call for Evidence, or subsequent consultation, and believe that this is appropriate use of Government funds. We support the cross-Government approach that is being taken by Defra, as project manager, and the proposed focus on four initial workstreams that will consider:

- Strategic fit including cost effectiveness and additional value compared to other policies.
- Equity and distributional impacts.
- Public acceptability.
- Technical and cost issues.

In our view, at this stage the main focus should be on exploring the first of these.

7. However, it is important to recognise that PCAs will not help reduce carbon emissions in the short term and that the priority should be to robustly implement existing and proposed policies whilst increasing public acceptance of the need to take individual action to reduce emissions. This would facilitate the potential implementation of PCAs in the future. We therefore urge that Defra is provided with sufficient resources to develop both Supplier Obligation and PCA proposals without constraining its shorter-term priorities.

8. We do not believe that the right conditions currently exist for the introduction of PCAs in respect of the necessary public acceptance. Our behavioural change model (Appendix 1), combined with our market research based on our customer segmentation model<sup>4</sup> identifies where people are on the path to overall behaviour change and the key attitude changes driving that. In order to gain sufficient public acceptance to implement PCAs, we need to move towards a position where the public majority is at least beginning to take personal responsibility.

9. The Energy Saving Trust's Green Barometer research seeks to measure environmental attitudes and has found that 42% of the UK public would "definitely not commit to a carbon card" and that "28% would probably not". Research recently undertaken for Defra also finds that PCAs are overwhelmingly unpopular. However, our research also indicates that over 80% of people believe that climate change is having an impact on the UK but with few actually making the necessary lifestyle changes and with 40% doing nothing at all. With the right policies, it is possible to transform attitudes that will increase acceptance of PCAs to the extent that would allow politicians to implement a PCA scheme if evidence demonstrated that it would be advantageous to do so. Ongoing market research of attitudes, behaviours and potential acceptability of PCA schemes will help inform analysis of the options.

10. Research carried out by Linguistic Landscapes early in 2006<sup>5</sup> identified that if climate-friendly behaviour is to be encouraged then new ways of engaging the public will have to be found. A follow-up report, commissioned by the Energy Saving Trust in conjunction with ippr, will explore the evolving discourse of climate change in the UK. This is due to be released in September and will make further recommendations on how best to engage with individuals. We would be pleased to share this with the Committee when available.

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<sup>4</sup> Utilises 61 Mosaic UK types to develop ten "whole-life" segments based on attitudes towards the environment, estimated household and vehicle CO<sub>2</sub> emissions

<sup>5</sup> Warm Words: How are we telling the climate-change story and can we tell it better? ([www.ippr.org.uk](http://www.ippr.org.uk)).

11. Clearly other public acceptance issues will also need to be resolved including concerns over rationing, social equity and data protection/“big brother” issues. This will be easier to do if there is public consensus on the need to take personal responsibility for carbon reduction. Further effort is required to progress this regardless of the PCA debate.

12. In this respect, we agree with the conclusions of the recent ippr Positive Energy report that before “more radical (and possibly more costly) policy options . . . . such as carbon rationing for individuals is imposed, people deserve the right to be given the possibility to change” and that “approaches to enable people to adopt alternative forms of behavioural, by making them cheaper, more visible and more attractive, are now urgently needed”. Our Action for a Low Carbon Society report outlines how this might be achieved.

Operational feasibility. The Committee would also like to investigate the operational feasibility of a personal carbon trading scheme, notably whether the institutional and operational systems to implement the scheme currently exist and, if not, what degree of system and institutional development would be required for the programme to operate effectively. The Committee also welcomes opinions on how the administration of a scheme should operate, and who should have responsibility for managing the scheme, setting the emissions caps and deciding the allocation of credits. The Committee is also interested in the likely cost of implementing and operating the system, and the feasibility of running an effective pilot scheme.

13. We believe that the implementation of a PCA scheme would be wholly consistent with the Climate Change Bill proposals to implement a carbon budget by capping the UK’s CO<sub>2</sub> emissions. In our previous evidence to the EAC Inquiry on the Climate Change Bill, we proposed a series of rolling five-year average targets set every year, from now to 2050, on the basis of an equal percentage reduction each year towards the 60% goal.<sup>6</sup> In our view, this would provide the necessary long-term emissions reduction signal to business and individuals and should therefore be consistent with any PCA allocation. It would seem logical that the setting of PCA carbon caps, allocations and related activity should be based on recommendations of the Committee on Climate Change provided it has sufficient downstream and behavioural expertise amongst its members; initial proposals for the Committee make-up suggest that this may not be the case. We would also advocate that the private sector is better placed than Government to design, build and operate the required supporting infrastructure but this would require cross-party support.

14. Operation of such systems is not an area of our expertise, although it is clear that further research is again required to explore operational feasibility of a PCA scheme. However, given the parallels with banking and billing systems, electronic point of sale systems, loyalty cards, Oyster card etc we would expect that workable solutions could be developed. In particular, we note the widespread use and popularity of loyalty cards, the considerable data volumes that this entails, the ease of consumer use at the point of transaction and the ease of communications from the operators. However, in order to provide sufficiently accurate household consumption data we believe that a national smart metering system is likely to prove necessary for households.

15. How best to enforce compliance is a key issue, ie what happens when someone uses up all their allowances, that needs to be resolved in respect of operational feasibility. The implementation of a buy-out option, as under the Renewables Obligation, might allow a tighter target to be set but would not ensure delivery. A “cut-out” option once allowances have been used up may not be acceptable on political and social grounds.

16. A PCA scheme is likely to have greater set-up and running costs than other policy instruments for emission reduction and it is not yet clear whether these additional costs may be justified by the potential additional benefits.

17. In our opinion, the initial priority should be to undertake research to allow informed decisions to be taken. However, we believe that ultimately a running a well-designed pilot scheme with clear objectives and implemented on a mandatory basis, could be advantageous in assessing the effectiveness of PCAs and gauging public opinion. However, this may not be straightforward and selection of the pilot area is likely to prove contentious. There may also be greater complexities if transport were to be included in any such trail due to the many potential points of purchase. It might therefore be simpler to focus a trail on household energy consumption to understand how individuals might respond and to assess public acceptance. We also note that a voluntary pilot scheme would not fully examine the issues related to a mandatory scheme and therefore is unlikely to be of much benefit as a pilot to test public reaction etc as opposed to technical systems.

Variations between different proposed models. The Committee is interested in the various different proposals for personal carbon trading schemes, and would like to investigate the distinctions between these ideas, such as:

who should participate in such a scheme?

how should permits be allocated?

which carbon emissions should be included under the scheme?

<sup>6</sup> So, while there would be a nominal target for each year between now and 2050, actual targets would be set for the end of each rolling five-year period. The target would be the average of the five nominal annual targets up to and including the given year.

The Committee would also welcome any opinions on alternatives to a compulsory system of personal carbon trading, such as a household-based system, a voluntary scheme, or a rewards-based system for saving carbon credits.

18. Without further research it is difficult to give informed views on the different options. However, it is possible to form views on some high level principles:

- Initially a PCA scheme should cover individual's carbon dioxide emissions only, including aviation.
- The scheme should be mandatory to ensure all individuals have to assume personal responsibility and to prevent free-riders.
- Allocation is made free of charge on a per capita basis although further consideration of the percentage allowances allocated to children will be required.
- Coverage should include electricity, gas, coal, oil and transport fuels, although further consideration of the potential inclusion of public transport is required.

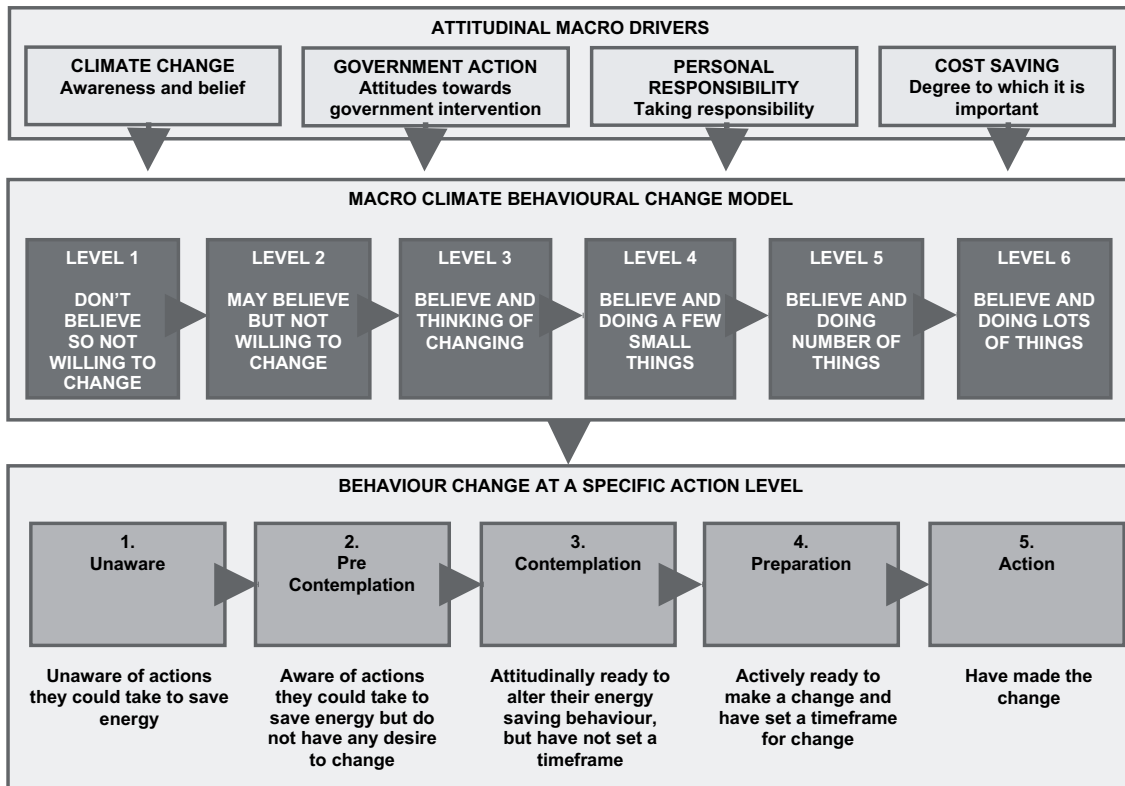
Public acceptability and involvement. Given that a personal carbon trading scheme requires the cooperation and engagement of the public, the Committee would welcome views on the likely response of the public to such a scheme, not only on the extent to which such a scheme would be acceptable, but also on the capacity of the public to adopt and benefit from the scheme, and the likely trading habits that would develop. The Committee would also like to examine the extent to which such a scheme would be just and equitable, and what possible measures would be required to ensure no groups were unfairly disadvantaged.

19. Please see our earlier comments on public acceptability. There is insufficient evidence to illustrate how the public might respond although there is some similarity with standard market transformation curves. Inevitably some people would embrace the trading aspects as with on-line gambling, financial trading and product trading (eg through EBay), whilst others may prefer third parties to manage their requirements. Some will also inevitably struggle with the concept and will require assistance.

20. Clearly multiple compliance options eg over-the counter "trading" through banks, post offices, supermarkets etc will be required to make it as simple and easy as possible for individuals to participate. Evidence from personal finance management demonstrates that over 80% of people manage their finances well and it would be logical to assume that similar levels might apply to carbon allowances. Specific consideration for pre-payment customers and those without bank accounts (who may be less well-placed to manage carbon accounts) may be required.

21. As previously mentioned PCAs are likely to favour the less well-off who generally tend to emit less carbon and would be able to sell surplus allowances to the better-off who generally emit more carbon. Clearly further research is required in this area, which could include the development of standard profiles and assessment of the potential impacts. We note that there may also be differences between rural and urban areas and regional variations eg northern Scotland and southern England.

## Annex 1—Energy Saving Trust Behavioural Change Model



July 2007

*Witnesses:* **Dr Nick Eyre**, Director of Strategy, and **Mr Brian Samuel**, Head of Policy Research, The Energy Saving Trust, gave evidence.

**Q101 Chairman:** Good morning and welcome back. You became familiar to us with the Energy Saving Trust (EST). As you know, I have had a particular interest in the EST right from the start. Would you like to say what progress you think you have made over the last 14 years in improving domestic energy efficiency and making the public more conscious of their own carbon footprints?

**Dr Eyre:** I think we have made progress and, more broadly, a lot of progress has been made on household energy efficiency. We see the rates of some of the key investments—loft insulation, cavity wall insulation—increasing. We have obviously seen a huge switch in the boiler market from traditional boilers to condensing boilers. We have seen a very rapid growth in the use of A-rated appliances. It is often difficult for us to unpick exactly what our role has been in that in terms of providing information and advice from the other key measures, the changes to building regulations and the changes to appliance labelling and standards, the Energy Efficiency Commitment. I think we are confident that we need action on both the supply side and we need the products and investments to be there. Those are the sorts of things that EEC generates, but we also need to generate the customer and citizen interest in the agenda, which we see as our role. Have we done that sufficiently? No, we have not. Currently, we talk to just over one million people a year, but that

is not sufficient. We would like to be talking to more people than that and getting an even more serious engagement, given the seriousness of the climate change problem that we now face, and we are talking to government departments about how we might do that.

**Q102 Chairman:** Where there has been reluctance on the part of people to respond, do you think that is because they do not want to or because it is practically difficult for them to do so?

**Mr Samuel:** I think it is a combination of reasons. Certainly with some people there is a lack of willingness to embrace the issue. We know now that 80% of the public recognise the threat of climate change, but out of those, 40% are not taking any actions. There are a number of reasons and barriers for them to take action. The first is probably a lack of awareness of what actually to do, where to go for that advice and information and signposting to the most efficient products to buy. We are looking to change routine and purchasing behaviour. On routine behaviour, we know that people do turn off lights. However, they do not necessarily use public transport. With purchasing behaviour it is about signposting people to the right information but some people do not have the necessary finance to invest in the most efficient energy-saving products, and so there is a fiscal barrier. There is also a lack of trust as well

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in the energy suppliers, for example, so that on the energy efficiency commitment, whilst it has been successful, the people still do not understand why energy suppliers would be selling energy saving to them. There is a whole raft of reasons why people do not actually take action. They do need support from a variety of sources through fiscal incentives, through regulatory instruments and through the provision of information and advice.

**Dr Eyre:** I think most people see the sense in energy saving in the way that the EST used to sell energy savings, and still largely does sell energy saving, that it is good for your pocket. In terms of the climate agenda, as Brian Samuel has said, most people accept that there is a problem but many people are not in their own lives doing anything significant about it. There is a big group of people in the middle who are now convincible to take action but not taking it. They conceptualise the problem as your problem. They see it as an issue for government, perhaps politicians, perhaps for big business. I do not think we have yet won the argument with the majority of the British public that it is also an issue for them,

**Q103 Chairman:** In a sense, the easy bit was getting people to do more energy efficiency at home but that does not involve a great lifestyle change. In your memorandum to us, you identified behavioural change now as a priority. That is likely to be more difficult. How much behavioural change is going to be needed if you are going to get anywhere near the target for cutting carbon emissions by 60%?

**Dr Eyre:** I do not like to unpick the question but I will. It depends what you mean by 'behavioural change'. In a sense, buying an A-rated fridge rather than a C-rated fridge is a behavioural change, but it is rather an easy one and that is where we have done rather well. The behavioural changes of getting on the bus rather than going in the car or the behavioural change of not going abroad by plane for your holidays are more significant and it will take longer; it will take more effort. It needs a sustained effort across parties but also between government, business and organisations like ours. We are seeing some slight changes in those behaviours, but not very much at the moment.

**Q104 Colin Challen:** We do seem to be inching along towards behavioural change on the current policy of voluntary efforts and some forms of taxation. Do you think perhaps that what we really need might be the big bang approach of personal carbon allowances to actually get to the point where we are seeing real, large reductions in domestic energy use?

**Dr Eyre:** It is a good question but it is a very difficult one. Our view is that more research needs to be done before we would be willing to put our hands on our hearts and say that is definitely the right way forward, but it is certainly an area that we think is promising because it is, as you say, potentially a driver of behavioural change by

forcing a recognition that personal action is part of the problem and part of the solution. There is the potential for triumph in that policy. There is also the potential for disaster as well because, in the current state of commitment to personal action, I do not think that it would work. That does not mean that public opinion will not have changed sufficiently by the time we could implement the policy of personal carbon allowances, but if 80% of the people are not going to change their behaviour and buy more allowances, it would not have a great deal of effect. Any market needs people to understand it and respond to the pricing. What we are saying is that at the moment public understanding is not at that level.

**Q105 Colin Challen:** Do you think that such of scheme would add anything more than simply sending out a price signal, which people may reject or just ignore, as they have, if you like, the price signals of energy going up in cost over recent years? That really has not changed a lot of people's view about energy efficiency in their homes.

**Dr Eyre:** That is the question. If the effect is purely as an economic instrument at the sort of price that any government is likely to allow, then the effect will be relatively small. It only becomes an effective instrument if it has a non-price effect and people recognise that the quantity restriction is telling them something about the way that we all individually need to behave. The answer to 'will that happen?' has to be: we do not know until we try it. We cannot know, but we can work in that direction. We can get people to know what their carbon footprint is, for example. If people do not know what their carbon footprint is, they do not know whether they would be a buyer or seller within a trading scheme. That is a pretty fundamental thing that they need to understand before they can engage with the system.

**Q106 Colin Challen:** The EST, in previous evidence to us, was very keen on schemes like Centrica's incentives for people to get council tax rebates if they installed insulation and things of that sort. That has apparently led to some quite big conversions. Even if the financial incentive was not all that great, I suppose people hate their council tax so much, that anything off it seems disproportionately large. Would the EST prefer more of those sorts of things rather than a big single policy solution? Do you think that you could tackle the problem effectively with a multitude of those sorts of approaches rather than a single solution?

**Mr Samuel:** I do not think personal carbon allowances would be a single solution. You would still need other mechanisms and other measures in place to support consumers and help them take the actions that their personal responsibilities through a PCA scheme would demand. In relation to the example of the council tax rebates, those would be fine for hard measures, measures that require investment in energy efficiency or in micro generation, although the council discounts for

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micro generation would either possibly be too small or would not be large enough in comparison with the actual costs. Personal carbon allowances are much more focused on behavioural change. Council tax incentives, for example, would not address behavioural change, although they are efficient in encouraging energy efficiency investment. It would be helpful to have a mechanism, or a combination of mechanisms, that allows you to tackle both behavioural change and the investments in energy efficiency or micro generation. Whether that is by council tax or in some other form, perhaps a continuation of CERT, remains to be seen but we do not yet know how the different policies will interact. That is another area of further research that will be required.

**Q107 Colin Challen:** As I described it, if you do have the big bang approach of personal carbon allowances, which is so universal in its application, you may have to start saying that that duplicates another effort which then can be abolished. At the stage when you get to that point, how you decide when is the right time to do that? Do you think that might be a problem?

**Mr Samuel:** Inevitably, you will never actually get the precise right time. Personal carbon allowances will always create winners and losers. Some people, those who have taken action earlier, might benefit more than those who have not taken action, but we do not yet know. We need to identify who would be the winners and losers under such a scheme and what measures they might be able to take and when those measures are likely to be taken. There is also the need to identify crunch points, if there are any, whereby certain families, depending on where they live, cannot actually do anything else to their homes. To come back to your original question, everything is interrelated and it is complicated. Inevitably, whatever decisions will be taken will have consequences.

**Dr Eyre:** Personal carbon allowances would set an overarching instrument for individuals and carbon but that would not itself address every barrier to behavioural change and investment that Brian mentioned earlier. There would still be a need for specific interventions. Better metering is a good example. It is very difficult for people to interact sensibly with the market when they do not actually know what they are using. There would be a range of other interventions that would still be needed.

**Q108 Mr Chaytor:** What is the role of energy suppliers in this? Do you think that any of the major energy suppliers have given serious consideration to this concept?

**Mr Samuel:** The best people to answer that are probably the energy suppliers. There will certainly be a difference between those energy suppliers for gas and electricity who operate in the energy efficiency commitment or CERT market and those suppliers of fuels outside that. One of the advantages of personal carbon allowance schemes is that they will capture transport. I do not know what the suppliers' views are. I suspect that as

CERT becomes harder for them to meet, then they will want to look for alternative mechanisms. One of the advantages of a personal carbon allowance scheme is that it creates the consumer pull, which you do not have under CERT at the moment. Certainly having some form of PCA scheme would help suppliers meet whatever targets or obligations they would have.

**Q109 Mr Chaytor:** At the moment, from the public's point of view, the message from suppliers is that the price is the key difference between companies supplying. Since the fall in wholesale gas prices over the last few months, there is a big focus on marketing. Is there some way in which you and other agencies could have a role in persuading suppliers that, as long as they focus on cheap energy, this is a positive disincentive to households and businesses from taking energy efficiency measures seriously?

**Dr Eyre:** We have tried to do that over most of the 14 years that we have been in existence. I would say that it is one of our failings, and indeed the suppliers' failings, that no-one has made energy services to households work outside some particular niche markets. I would add to that: it is always going to be difficult for suppliers to make that work whilst they are regulated in a way that means that they make bigger profits by selling more. Regulating them in such a way that they make big profits to sell less is quite a regulatory challenge, and I do not know anywhere in the world that has succeeded in doing that in a fully liberalised market. I think that is the challenge if we want the energy suppliers to make energy services work for us because it is not reasonable to expect them to change their business model to one with a lower profit margin.

**Q110 Mr Chaytor:** So Ofgem is at the heart of the framework which Ofgem offers in this?

**Dr Eyre:** It is not just Ofgem but the way that most commodity markets work, whether they are regulated or not; people make more money by selling more.

**Q111 Mr Chaytor:** What do you think about the suggestion that has been put forward by the Environmental Change Institute that there should be an obligation on suppliers to reduce average household carbon emissions year on year, a kind of parallel instrument to the energy efficiency commitment?

**Mr Samuel:** There are two leading models for the suppliers' obligation: one is the cap and trade approach where the suppliers are capped and then take ultimate responsibility for reducing consumer demand. There are concerns about that because of the events that are outside the control of suppliers; for instance, weather, consumer trends, et cetera, that would probably make it difficult. The other leading model for a suppliers' obligation is one of a more market-based CERT; and by that I mean a measures based approach similar to the existing CERT but with the ability for third parties to

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participate directly in that; i.e. some form of white certificate trading scheme. We certainly feel that the white certificate trading model is worthy of further investigation. Whether the suppliers' obligation could operate in parallel with a PCA approach would perhaps be difficult because you would have issues around the ownership of carbon that would certainly need to be resolved. Is it the suppliers who own the carbon or the individual members of the public who own the carbon? We have not mentioned the European Emissions Trading Scheme but you do have potentially a third scheme. Whereas we can see an upstream and a downstream approach working together where the upstream approach tackles the carbonising of the grid, it would be very difficult to have upstream, downstream and midstream schemes.

**Q112 Mr Chaytor:** I think I understand that. Still on the role of suppliers, is the issue of the structure of tariffs almost another way of implementing what a personal carbon allowance scheme is designed to do? Some suppliers, for example, have recently restructured their tariffs so that the greater the household consumption, the more expensive the unit of electricity or gas consumed. As I understand it, the majority of suppliers still operate exactly the other way round?

**Mr Samuel:** There is clearly a role for more innovative supplier action in the design of tariffs. Again, it is different between electricity and gas because gas is settled on a daily basis, so there is less incentive. Electricity is settled on a half-hourly basis, so there is a far greater incentive to do something on the tariffs, but you need the tools to do that. We come back to the argument about whether you actually need smart metering or not. If you have smart metering, you can have more innovative tariff options. To me, that is a real driver for smart metering. There is certainly greater potential in electricity than gas, but there is potential in both.

**Q113 Mr Chaytor:** Coming back to the question of upstream and downstream and midstream, if a personal carbon allowance scheme was introduced, how would that work? You mentioned problems of running in parallel with the EU ETS. What about other policy measures, such as the energy efficiency commitment to the renewables obligation? Is the field too crowded or would it be necessary to start from scratch really if a PCA were introduced?

**Mr Samuel:** One of the starting points for analysis of the potential for PCAs would be to investigate the strategic fit with existing policies. We cannot answer that now but, yes, it would be crowded but some policy measures would still be required, for instance, the provision of information advice, whereas others may not be, and a renewables obligation could be one of those, particularly given the EU ETS.

**Q114 Mr Chaytor:** Finally, in terms of importance of smart metering, as you mentioned, would any other and specific support measures for households be needed if a PCA scheme was introduced?

**Dr Eyre:** I would say this, would I not, but I think the Energy Saving Trust programmes, which advise people on what their energy use is, what their carbon footprint is, and, more importantly, how it can be changed, provides the key piece of information that any individual needs to participate effectively in a personal carbon allowance market. Until we have that sort of information, the market will not work because it is a fundamental principle of markets that they only work properly when people are informed.

**Mr Samuel:** At the moment, people do not have the means to get advice on eco driving and modal shift. With transport being included in the PCA scheme, then further support measures will be required.

**Q115 Martin Horwood:** Could I ask one more question at the end of that? Do you feel that you have really embraced all the technologies required to make popular the whole concept of people measuring their own carbon footprint? There are lots of new websites and NGOs coming up with ways of measuring carbon footprints. If it is such a crucial part of your mission to communicate that, do you feel you have really done a good job in terms of communicating to the mass of the population and making that available to the population in an attractive and engaging way?

**Dr Eyre:** I think we probably have not gone far enough yet. We have been working with Defra on the carbon calculator that is now available on their website, which we think contains the most reliable assessment of a personal carbon footprint that you can get. I am not sure that a multiplicity of different carbon calculators always give people different answers is all that helpful in communicating with people. In a sense, we are transitioning from a world in which the best way to get people to reduce carbon emissions was to tell them it would save them money to a world we hope we will begin when people fully understand the effects of climate change and take action for that reason. Primarily with most people we are still in the former world, and for our communications to be effective, they have to recognise that for most people it is still going to be more effective in the short term to tell them: save energy because it saves you money. We also have to look to the future and develop new tools to address the new world we want to move into. That is the balance that we are trying to get right.

**Q116 Martin Horwood:** That links to my next question. You said in your memorandum to us that according to opinion polls, the idea of a personal carbon trading is "overwhelmingly unpopular". That was the phrase you used, but you said that "with the right policies, it is possible to transform attitudes that will increase the acceptance of PCAs to the extent that would allow politicians to



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implement a PCA scheme". What do you think those policies would be that would achieve this transformation?

**Mr Samuel:** I know at the moment we are at a point where people do accept that climate change exists, or the majority, over 80%, and some 68% of people actually believe that it will impact on them specifically within the next ten years. We have the basis on which to work with people so that they do start taking action. We are seeing a very gradual shift towards the number of people who (a) are starting to take small actions, and (b) starting to take larger actions although there are only 4% of people who in their everyday lives are taking major actions. We need to start shifting people to the right of that spread. We can do that in a number of ways. One of the best is by using real examples within the local community as to how people can make a difference.

**Q117 Martin Horwood:** I am well aware of the general need to do that, but we are focusing specifically on personal carbon allowances, which you said at the moment is an unpopular part of that mix. You could not have more media and public awareness of the issue generally, yet that remains an unpopular solution. What would change that?

**Mr Samuel:** What we need to do is to explain what personal carbon allowances actually are—people do not really understand that—and what it might mean to them and what the alternatives are if we do not do something, but also to look at the alternative policy measures as well. You may have a cap on the one hand or you may have localised flooding on a regular basis on another hand. It is about bringing the issues to a local meaningful level to the individuals so that they can see it will impact on them if they do not do something and to help to inform them that they can do something positive.

**Dr Eyre:** It does come down to people's understanding of what it means for them and at the moment a lack of understanding of it. If people conceptualise personal carbon allowances as something like rationing plus identity cards, which is the way they could contextualise it, then we are going to have a problem selling that to them. If they conceptualise it as a fair way of cutting a limited carbon cake between different people and then a relatively efficient way of dealing with that, that is more saleable. We just have not done that sales job yet.

**Q118 Martin Horwood:** You said in your last reply that in the end you have to relate this to the bottom line for people.

**Dr Eyre:** At the moment, that is what people tell us: we are more interested in the bottom line. That is only saying what the state of public understanding about climate change is at the moment. That is moving. I am confident that will continue to move and therefore we need to think through the policy instruments that will work with a different set of public understanding.

**Q119 Martin Horwood:** If the idea of personal carbon allowance as currently indicated is overwhelmingly unpopular, where is the tipping point in terms of popularity that will enable people like us to push ahead and implement something like this at government level? Should we aim for 50% acceptance and then try to grit our teeth and tough it out with the other 50%, or do you want it to be overwhelmingly popular before we could try to implement it?

**Dr Eyre:** Personally, I think it would need majority support before it would work because we know of changes in public policy that have been pushed through without public support that have failed. The poll tax springs to mind, for instance.

**Mr Samuel:** If it is identified as the most cost-effective option, then the support levels that would be required would be lower than for other options that may be more cost-effective. You need to look at it in the context of what else can be done at that particular time. Ultimately, I do believe personal caps will be required, but it is a question of when and how you get there, and your question alludes to that. It does not necessarily have to be 50%, but you do need that groundswell of opinion.

**Dr Eyre:** People will need to believe that if it comes, it is coming to stay. I think that does mean that it needs some level of political consensus as well if it is going to be established effectively.

**Q120 Martin Horwood:** Can I ask you about some of the people who may be suffering perhaps from fuel poverty at the moment, people in the more marginal situations? On the face of it, they should gain from a scheme like this. They are more likely to have a low carbon footprint at the moment and therefore be in credit in terms of their *per capita* allowance. Say, they cash that in, as would be the obvious temptation, at the beginning of the year and then find themselves in exactly the same kind of budgeting problems that they had with their financial situation. Do you think that is going to be a problem? Do you think there is a marginal population that is going to find this rather an onerous system and psychologically perhaps a financially difficult one?

**Dr Eyre:** The system will only work if it is made easy to work and if there are easy ways to trade, easy ways to buy. We would expect that most of the energy suppliers in both the gas and electricity markets and the petrol/diesel market would want to offer an option whereby they sell you the credit as they sold you the fuel essentially.

**Q121 Martin Horwood:** If you make it easy to trade, surely you will make it easy for someone who is hard up and struggling to make ends meet to cash it in at the beginning, are you not?

**Dr Eyre:** Yes, you are.

**Q122 Martin Horwood:** Are they not then going to get into the same problems they get into with credit and debit on the financial side?

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*Dr Eyre:* That is possible. Of course, it depends fundamentally on what price is generated in this market. That has been the subject of relatively little research and discussion, which is quite surprising because if the price is, say, £10 per tonne of carbon, this is all trivial to anybody's budgeting problem. If the price is £1000, then it is beginning to dwarf the price of energy. That research needs to be done. People are making hugely different assumptions. The piece of work that CSE did for Defra mentioned the price of I think £10 per tonne of carbon but did not have any evidence on which to base that.

**Q123 Martin Horwood:** Without making assumptions about a particular price, there are going to be some people who are going to suffer under this scheme who are going to be relatively poor. The classic one would be a pensioner with a three-bar fire who is using quite a lot of energy and does not have an easy way of escaping from that carbon footprint. Would you like a carbon tax credit system to be introduced to compensate for the unfairnesses of the system?

*Mr Samuel:* There are always going to be winners and losers. We need to identify who those winners and losers are going to be. I suspect the people living in rural areas, in sole occupancy, in stone buildings will probably be losers. You then need to put the appropriate policies in place to provide the support to those people who most need it. That will be as with any other social policy.

**Q124 Martin Horwood:** Is there not a contradiction there? Surely the whole basis of the system is to try to take those people who have a high carbon footprint and reduce that. Now you are saying that if you have a high carbon footprint—

*Dr Eyre:* We agree with your starting assumption, which is that broadly speaking this will be progressive. Broadly speaking, people on lower incomes will benefit and people on higher incomes will not benefit, at least in the direct financial sense. You are absolutely right that society is more diverse than that and a single pensioner who has to drive five miles to shop and lives off the gas grid in a very inefficient home is probably going to be a loser. Then it is an issue for social policy as to how we deal with that. It is not really an area of our expertise but we recognise that research needs to be done to identify who these groups are and what social measures need to be put in place to deal with that.

**Q125 Martin Horwood:** Can I ask about one final group which might suffer in this scheme, and I speak as a parent here. I have two kids; they seem to use quite a lot of energy in various different ways. Should they have a carbon allowance—and that would help me enormously as a parent—or do you think that would then sharply diminish the amount of individual carbon allowance available to every person if all children had a carbon allowance as well. How do you think we should approach that?

*Dr Eyre:* That is another equity issues which you can resolve in a number of different ways, depending whether you want to benefit people with children or benefit people without children, roughly speaking. We do not have the research to tell you what the marginal energy and carbon impact of having children is. Clearly, there is a positive one. Households with children use more energy and carbon than similar households without children, but we do not know by how much. I guess, if you wanted to be fair, that is the sort of information you would have and then give children perhaps a lower carbon allowance, but essentially these are just choices that have to be made which have distributional effects but very little effect on whether the scheme would be effective or not.

**Q126 Chairman:** Can I ask you about pilot schemes in that case? We have had some mixed views about the value of pilots. One of the witnesses we had last week said that if there was a pilot, it might fail for reasons unconnected with the potential effectiveness or acceptability of the scheme. What is your instinct? Your own memo is a bit cautious about it. What do you feel about that?

*Mr Samuel:* It depends what you want a pilot scheme to test. If you want a pilot scheme to test the hardware, then that is completely different from having a pilot scheme to test how people will be able to respond. The problem with having a pilot is that in order to test reactions, then you have to have a mandatory pilot. A voluntary pilot will not attract those people who are least likely to take action, and so it would be difficult to come up with any robust conclusions. If you have a mandatory pilot, then it would be difficult to include transport within that because of the multi-point purchase opportunities, the number of petrol stations, et cetera, that you would have. Therefore, a pilot to test personal responsibility and how people would respond to their home energy usage only might provide some useful information. However, you then have the issue: what is the area that is going to have this mandatory pilot scheme imposed upon it? That is probably the most difficult question.

**Q127 Chairman:** Even if it was a virtual pilot and not actually financial?

*Mr Samuel:* If it is a virtual pilot, then you are not necessarily going to get the best results out of that. In order to get the most accurate, robust results, you need to have some form of mandatory scheme with penalties and compliance associated with that.

**Q128 Chairman:** Is that true in every respect? I can see in terms of greater changes of behaviour, of course that is true. If you want to test the acceptability and the workability of the actual technology, a virtual pilot would do that all right, would it not?

*Mr Samuel:* You can certainly test the technology without having a mandatory scheme. How you test public reaction without a mandatory scheme, I think would be difficult.

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**Q129 Chairman:** This is a pretty radical idea and obviously it will generate lots of controversy. How do you think the Government should proceed now if it wants to try to gain public support for it?

**Mr Samuel:** Really, the Government needs, and has already through Defra, to initiate a detailed research programme. You need to test the wider strategic fit. You need: to test the equity and distributional issues and how people, as we have just mentioned, will respond; the degree of public understanding now; the degree of public understanding that will be needed to implement the scheme; to look at the technical and cost issues; and of course the actual detail of the scheme, the allocation, the identity of those people who will be participating in the scheme, et cetera. The only way to progress is through a comprehensive research programme. Of course (a) that will take time and (b) will take resources.

**Dr Eyre:** Politics matters as well. The idea is not all that new. It has been on the agenda since David Fleming's work many years ago. It was put on the political agenda by the last Secretary of State for the Environment and I think he is to be congratulated for doing that. I hope his successor

will keep it on and I hope that leading politicians in other parties support that as well. That is the sort of sense that, yes, this is the direction we are moving; we may not know when we get there or in detail how we will get there yet, but unless leading influential people in and outside government say this is the sort of direction in which we need to go, it will not happen.

**Q130 Chairman:** Part of the purpose of this inquiry is for the committee to help keep it on the agenda and we think it is a positive thing to do. This is the final question. It is a slightly controversial proposal. Do you think it has the remotest chance of being implemented, given that at present we seem to be nervous of saying we cannot fly to Barcelona for £3? This seems quite a big step further from one we are not even prepared to take.

**Dr Eyre:** I will answer the question the other way round. We should be telling people they are not going to fly to Barcelona for £3 now and, unless we are prepared to do that, I agree that we will not get into a position where this will ever be workable.

**Chairman:** Thank you very much indeed. That has been very helpful.

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**Memorandum submitted by Public Interest Research Centre (PIRC), Centre for Alternative Technology (CAT) and The Lean Economy Connection**

1. *Is a scheme of personal carbon allowances desirable, and could such a scheme be practical?*

DESIRABLE

1.1 A scheme of personal carbon allowances is desirable, for many reasons. Here are two:

1.2 (a) Citizens are ultimately (either directly or indirectly) responsible for the entire flow of carbon emissions into the atmosphere. There will be no possibility of reducing that flow on the scale required unless individuals are themselves involved in the scheme. Equally, there will be no possibility of reducing individuals' contribution to that flow unless they are able to work in real practical partnership with all other energy users—companies, public services and local and the government itself.

1.3 (b) The nation needs to have an efficient electronic system in place in order to support an energy rationing scheme in the increasingly probable event of shortages in the supply of oil and gas. At the very least, this is a necessary precaution; a rationing facility needs to be in place. In fact, the case is stronger than that, because oil and gas outages are to be expected from the early years of the decade beginning 2010.

1.4 A key criterion for the design of a personal allowance system is that it should be equally applicable both in the context of rationing to reduction of carbon emissions and in the context of rationing to reducing the consumption of particular fuels, (at short notice). Tradable Energy Quotas (TEQs) have this facility.

PRACTICAL

1.5 The system is entirely practical if it is "hands-free"—that is, it must not require participants, especially households, to be distracted by calculations of carbon emission and administration of their unit (credit) accounts. The way to achieve the needed simplicity is to base the scheme, not on carbon emission themselves, but on fuel. The fuel is rated for the carbon emissions associated with it, and consumers will simply surrender their units when they buy fuel, in exactly the same way is done for their monetary payments. Virtually the whole scheme can in this way be handled by credit card and direct debit arrangements, enabling participants to focus attention on the real problem—the practical task of achieving a steep, demanding reduction in their fossil energy use/carbon emissions, and sustaining this effort over at least a 20-year time-scale.

1.6 “Practical” also means (amongst other things) “effective”. Tradable Energy Quotas (TEQs) are highly effective in that (a) they guarantee that the reductions set by the Carbon Budget will actually be achieved, and (b) they focus attention on ways to sustain steep reductions in fuel-dependency. By directly involving citizens, they recruit the intelligence of the whole population to the task of achieving the energy descent. Without the full involvement of citizens, it cannot be done.

2.0 The likely impact of a personal carbon trading scheme. The Committee would like to investigate the likely impact of a scheme of this nature, not only on carbon emissions, but also on the economy, different markets, existing “green” policies, and the public themselves.

The Committee would also welcome opinions on whether favourable conditions currently exist for the introduction of such a scheme and, if not, what conditions would be required for such a scheme to be feasible, desirable, and palatable to the public and business community. In particular the Committee would be interested to identify any areas where further research and consideration would be required in order to fully assess the impact and feasibility of a personal carbon trading scheme.

2.1 In compiling the report *Zero Carbon Britain*, we explored the concept from first principles as well as evaluating various existing proposals for Personal Carbon Allowances. We found that the most robust and comprehensively thought-through policy was that of Tradable Energy Quotas or TEQs which explicitly includes personal carbon allowances and crucially, does so within a single carbon market used by business, industry, government and individuals.

3. Operational feasibility. The Committee would also like to investigate the operational feasibility of a personal carbon trading scheme, notably whether the institutional and operational systems to implement the scheme currently exist and, if not, what degree of system and institutional development would be required for the programme to operate effectively.

3.1 We found that TEQs are feasible, the components that have been drawn together in the design of the scheme are all tried and tested. The innovation is simply the linking of the various components in its application to carbon.

- Ration schemes have been relied upon in the past.
- Today’s “Oyster Cards” demonstrates that the technology to underpin the system is feasible.
- The financial industry in which Britain excels in will provide the backbone for the delivery of such a system.

3.2 By integrating personal and business choices, TEQs provides a system that genuinely harnesses the power of the free market within a climate safe<sup>7</sup> and energy secure framework.

4. The Committee also welcomes opinions on how the administration of a scheme should operate, and who should have responsibility for managing the scheme, setting the emissions caps and deciding the allocation of credits. The Committee is also interested in the likely cost of implementing and operating the system, and the feasibility of running an effective pilot scheme.

4.1 It will be essential to maintain independence between the elected government of the day and the administrative body that manages the carbon budget. It will also be highly desirable for Government, business and civil society to work in cooperation under the same constraints set by an independent external body.

4.2 Our most effective model in Britain is that of the Monetary Policy Committee. A Carbon Policy Committee should be established with at least as much independence and integrity of structure. The economy has been recognised as a subset of the Environment, so economic considerations should be framed by the considerations of the Carbon Policy Committee.

The existence of the Carbon Policy Committee is also critical to the effectiveness of the scheme because of its value in freeing the Government to concentrate on enabling and encouraging the nation as a whole to achieve the demanding energy descent set by the Carbon Budget. The practical difficulties of achieving this descent tend to be underestimated (owing perhaps to the interest aroused by the scheme itself). It will require changes in transport patterns, in land use, and in work patterns, as well as the more straightforward tasks of energy conservation and renewables. The *zero carbon Britain* report demonstrates that this transition is technologically achievable.

4.3 However there is no possibility of achieving a transformation on this scale unless the Government is deeply committed to supporting it and helping all energy-users to achieve it. The government’s ability to do this will in the end depend on it being in the same situation—in the “same boat”—as everybody else. If the Government can say, “We too, are bound by the requirements of the Carbon Policy Committee, we deal in the same market, and are subject to the same challenges as everyone else”, it will earn the trust and credibility it needs. That sense of working together will require the Budget to be set by an independent body, not by the Government.

<sup>7</sup> The level of climate safety is contingent on the size of the global carbon budget. Furthermore it must be recognised carbon emissions management is only part of a comprehensive global strategy towards a safe climate.

5. Variations between different proposed models. The Committee is interested in the various different proposals for personal carbon trading schemes, and would like to investigate the distinctions between these ideas, such as:

Who should participate in such a scheme?

5.1 All energy users: Individuals, Business and Industry, the Government.

How should permits be allocated?

5.2 Issued by entitlement to individuals, auctioned (by weekly Tender) to business and industry on the model of the existing system of Tender for government debt (Treasury Bills).

Which carbon emissions should be included under the scheme?

5.3 All greenhouse gases associated with the provision and use of energy, including the extremely climate-potent solvents used in the nuclear industry, such as the halogenated compounds whose impact ranges up to 10,000 times that of carbon dioxide.

6. The Committee would also welcome any opinions on alternatives to a compulsory system of personal carbon trading, such as a household-based system, a voluntary scheme, or a rewards-based system for saving carbon credits.

6.1 It is helpful to be aware of key criteria to be fulfilled in the choice and design of a scheme to reduce carbon emissions quickly and/or to sustain an energy rationing scheme. Here are nine criteria for a successful scheme:

1. Is there a guarantee that the budgeted energy descent will be achieved?
2. Is there an assured ration of energy for individuals at a time of scarcity?
3. Is there a long term budget, which gives time to plan ahead.
4. Is the scheme specified in terms of energy (not money), so that it involves everyone in energy-planning, not in calculating financial opportunities?
5. Is the scheme equally suited and designed as a response both to climate change and to energy depletion.
6. Is the scheme hands-free?
7. Is the scheme denominated in units other than money, making it resilient to the deep economic changes and possible recession which could emerge over the period of the scheme?
8. Is the system based on “pull”? That is, does it avoid paternalistic intervention and, instead, recruit individuals and localities to the task—inviting them to apply their intelligence and talent to the invention and development of solutions?
9. Does it inspire a “common purpose” between all participants—individuals, industry, the Government?

The Committee may wish to consider whether the alternative schemes indicated under this heading fulfil these criteria.

10. Public acceptability and involvement. Given that a personal carbon trading scheme requires the cooperation and engagement of the public, the Committee would welcome views on the likely response of the public to such a scheme, not only on the extent to which such a scheme would be acceptable, but also on the capacity of the public to adopt and benefit from the scheme, and the likely trading habits that would develop.

10.1 Once a sufficient portion of society are aware of both our necessary cuts in carbon for climate change and the imminent constraints in global oil and gas supply it will become incumbent on Government to act. When presented with the available options, TEQs will be the preferred option of the public as they are transparent and provide fair access to energy for all. Business will champion the system as the preferred option as TEQs provide a level playing field, rewards carbon-free innovations and provides long term certainty with which to plan.

10.2 Introducing such a system will change all of lives more profoundly than any single policy ever has.

10.3 The system will necessarily demand clear and strong leadership. The introduction of such a scheme will be greatly aided by widespread public understanding and deep concern of the seriousness and urgency of climate change—specifically runaway feedbacks. We should recognise that we have now entered the slow unfolding of a climate emergency.

11. The Committee would also like to examine the extent to which such a scheme would be just and equitable, and what possible measures would be required to ensure no groups were unfairly disadvantaged.

11.1 There is clear and direct equity in the equal per capita adult entitlement. There would be flexibility (eg by child allowances and local social services) to provide households in particular difficulties with financial support. However there is a danger in building too much flexibility into the scheme. The reality is that the energy available to us all, and the carbon emission permissible from us all, will fall rapidly, and without regard to equity. The big impacts are beyond our control, however committed we may be to equity. It is fundamental that we learn to adjust to the imposed rate of decline. It would be profoundly inequitable

if the scheme were so moderated by adjustments in the interests of equity that it failed to achieve the reductions that are needed. Evidence of special cases with very high energy dependency should not be signals for compensation, but clear challenges for energy reform achieved with all speed.

11.2 Nonetheless, measures to sustain high levels of equity, consistent with also sustaining the effectiveness of the scheme, will need to be included among the available policy instruments. The TEQs system is flexible, allowing arrangements to be made to meet circumstances and needs, according to the best judgment of circumstance and time. Two key constraints exist for many of the poorest households under a personal carbon allowance scheme.

- Firstly, poor households will not have the disposable income to cover the capital expenses of energy saving measures such as insulation, low energy appliances and efficient cars. In the absence of secondary legislative support, a steadily reducing personal allowance will cause energy poverty for these households.
- Very poor households may find themselves compelled to sell their personal carbon allowance for short term financial gain at the expense of their longer term or mid term energy needs.

11.3 Both of these problems are real and need to be carefully addressed in any carbon permit scheme. Under the TEQs scheme, a portion of the revenue from sale of TEQs to Industry and business must be hypothecated to support these low income households.

11.4 These issues do not undermine the central reason for choosing a personal carbon scheme; that it provides the core driver for a race out of carbon.

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*Witnesses:* **Mr Tim Helweg-Larsen**, Project Leader for *zerocarbonbritain* and Director, Public Interest Research Centre; **Mr Paul Allen**, Project Director for *zerocarbonbritain*, and Development Director, Centre for Alternative Technology; and **Dr David Fleming**, Director of The Lean Economy Connection, gave evidence.

**Q131 Chairman:** Good morning and welcome. I think you have all heard the previous exchanges. Can I personally welcome you, David. I think you and I first discussed this idea at least ten years ago and possibly longer. I am delighted to welcome you to the committee to discuss this again. The *zerocarbonbritain* report<sup>1</sup> is, by its own declaration, a very ambitious one. I want you to say a word to the committee about the project, the thrust of it, and in particular how personal carbon trading fits into your ideas?

**Mr Helweg-Larsen:** The name *zerocarbonbritain* came out a few weeks before publication. Our initial objective was to explore a set of policies and a scenario for Britain—a set of policies to be able to deliver the maximum energy savings and also incentivise the maximum amount of renewable energy update. We then explored a scenario of what we saw as potentially one of the most constrained possible scenarios that we could to explore an island Britain, one which had no flows of energy and fuel in or out. Could Britain feed and power itself within its own borders and coastal waters? What we found was that the answer is: yes, we do have the ability not only to provide the energy that can deliver our current levels of wellbeing, albeit in a different way, but we can also match a variable supply of renewables to a variable demand. In terms of how we achieve that, we explored—and by “we” I refer to Paul Allen and the Centre for Alternative Technology here—the various policy options out there. We found that we would definitely be needing what amounts to a cap and trade scheme. Our reading of the climate science is that this is an emergency situation. It is within that emergency

context that we framed our scenario. So we were asking ourselves: how fast, under emergency conditions, can we move to zero carbon? We figured that two decades would not be unreasonable under emergency conditions. We then had to consider that that could be done by diktat but what would smooth the process most effectively? We have explored personal carbon allowance schemes. We found that the tradable energy quota scheme that David Fleming compiled has most comprehensively explored the issues and problems associated with a personal allowance scheme and then, not only explored them but sought to answer them, always through proven mechanisms, such as, and I dare to use the word, rationing and what we can see with the success for instance of Oyster cards, that the technologies and approaches that are incorporated in the system are all ones with which we are familiar.

**Mr Allen:** The project started really with the reading of the most current science. We have met up with Sir John Houghton, James Lovelock, we visited the Hadley Centre and talked Cox and Betts there, and we are mapping what seems to be unthinkable because the evidence compels us to do so. Rather than being bounded by forecasting from existing attitudes within the existing parallel, what we attempted to do was to back cast, to go to where the science tells us to be, and then evaluate policies and technologies that could build a bridge with where we are now, although we see the primary driver of this transformation as the market, setting up the right drivers in the market, to set us on a race out of carbon rather than a race into carbon. We have identified particular government interventions that will be vital catalysts and particularly to increase climate research and petrochemical depletion research, a vastly accelerated technology and R&D

<sup>1</sup> [www.zerocarbonbritain.com/images/zerocarbonbritain.pdf](http://www.zerocarbonbritain.com/images/zerocarbonbritain.pdf)

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programme to get these technologies started now as we have a closing window of opportunity, but particular strong investment in new skills and training. When we talked to the Sector Skills Council, we did not find anywhere near the degree of urgency that we feel in those areas, so CAT is launching a major initiative to begin upskilling to give us the professionals that we need to transform plumbers and electricians to be skilled and ticketed ready for a roll-out of these technologies. The core of it is a national public awareness programme of what is needed going beyond what we do now. Transforming behaviour means getting the information you need, making sure that information is in the public domain and that the public trust it, and then transforming attitudes. There is an attitude that is comprised of the consequences of behaviour and we need more to directly link current behaviour to the consequences of that behaviour. When we can shift attitudes, then we can begin to shift behaviour. The change in our attitudes to smoking was essential to the change in the behaviour of smokers.

**Q132 Chairman:** Do you think that shift in attitudes can only be achieved by some sort of trading scheme?

**Mr Allen:** I think the shift in attitude needs to come ahead of a trading scheme. Once we have achieved the information we need and it is in the public domain and the shift in attitudes through the connections of the consequences of behaviour, then we are ready for the public to look at what sort of scheme will help us deliver that. When people are ready and understand the serious situation that we are in perhaps, bringing everybody up to speed is a bit much to expect but certainly a high proportion of the movers and shakers within society thoroughly understand that position, then carbon allowances would be seen as a leading contender in meeting that challenge.

**Q133 Chairman:** What led you to choose what you describe as tradable energy quotas as a variant? Perhaps I could ask David first what he thinks about it. What led you to pick on that particular model?

**Mr Helweg-Larsen:** We have looked at a focus from first principles at what the scheme needed to achieve as well as exploring some different options that had been spelt out, David's being one of them. I think we wanted to achieve a very rapid reduction in carbon and so we needed to have a government-implemented cap. We find that element of it. We needed to have a system that would be as efficient as possible and to look to something that was going to be an electronic mechanism. We needed a scheme that was going to engage all members of society—individuals, business and government—so that they are all focused on achieving the objective of moving beyond carbon. To do that, all of these groups need to have feedback: personal feedback, feedback from business and feedback from government. We currently do have a very powerful feedback mechanism in terms of how we use cash, but we need

an equally powerful one in our use of carbon. Those are probably some of the central tenets to looking at tradable energy quotas.

**Q134 Chairman:** David, do you want to comment on that?

**Dr Fleming:** Yes. There are lots of different interpretations of what a personal carbon allowance may mean, and tradable energy quotas are distinctive in two fundamental senses. The first sense is that it is actually not based on carbon allowances. Personal carbon allowances are not a very good name for them. They are based on energy. The carbon involved in their combustion is mapped on to energy. What you do is you buy energy; you buy petrol; you buy electricity, in exactly the same way as you do at the moment. As a result, you do not need to know what your carbon footprint is; there is no need for smart metering. This is of the most fundamental significance because Chris Huhne and the Liberal Democrats, amongst others, have said, quite rightly, that it would take 15 years to set up the technology to measure carbon emissions and to measure carbon footprints. Indeed it would; it might even take longer. I doubt if it is feasible at all. You do not need to do that in the case of tradable energy quotas or TEQs because you just surrender units when you buy a gallon of petrol or when you buy some fuel. It is immensely simple. That is the first point.

**Q135 Martin Horwood:** Surely, the tradable energy quotas have to distinguish between renewable energy, energy with a very low carbon content and other forms of energy, so in effect, you do have to do the calculation behind it somewhere, do you not?

**Dr Fleming:** Yes. That is very easy. You do the calculation upstream. You do not do it downstream. That is the point. The downstream calculations of carbon emissions are enormously expensive and appear to require a civilisation changing effort. It is very easy and lots of people have done it—EPSU before they were abolished were doing it ten years ago. I have lots of numbers of those. We know what the carbon emissions of different sorts of petrol are. We know what the carbon emissions of the different sorts of electricity are, depending on where they come from, whether they come from renewables or gas or coal or oil, whatever it may be. In fact, those numbers are done very simply by a few high level calculations. Everything else is done on the basis of bottom-up. In fact, there is no problem. Carbon footprints are not a concept of which people are going to have to be aware. They are entirely concerned with the energy they buy and rated, as I said.

**Q136 Martin Horwood:** They are not really energy quotas, are they, because you would not need them to buy some kinds of energy?

**Dr Fleming:** I think energy quotas is the best name for them. The whole thing is based on energy. The whole thing is concerned with energy use, so we are not just concerned with encouraging people to buy energy with a low carbon rating, which indeed we

would do, but actually we are also encouraging people to do the fundamental thing which a lot of this tends to forget and that is achieving an absolute transformation in the whole of the energy use of our civilisation. Civilisations in the past have not succeeded in such a transformation. The scale of this change and the scale of the way we change it in the use of transport and the way we grow food and the way we organise our economy is quite spectacular and is going to have to be done very fast indeed. That is the energy shift. Moreover, we need to bear in mind, and this is the second point I was going to make, that we are not just looking at climate change. It is becoming very clear now that we also have to set up a system which can accommodate itself to energy depletion. It is looking highly probable that the energy market will be breaking down in the next few years. I would argue quite strongly that any responsible government would right now be saying, even if they had never heard of climate change: we need to have a contingency plan to organise energy rationing schemes when oil and gas depletion kicks in, which is going to happen very soon. Even if they were not going to be used, the government would need inevitably to set up an electronic rationing scheme. There are two sorts of electronic rationing schemes. One is a paper rationing scheme with which we were familiar during the War; the other is an electronic rationing scheme. If it is an electronic rationing scheme, it more or less has to be tradable energy quotas. Tradable energy quotas are not my idea; it is a generic way of doing rationing if one is going to use the modern technology. We definitely do need a rationing scheme to be set up. In fact, the core of this is energy. If you design a system properly, then you get to the point of leverage so that if you just pull one string, everything else comes together. If we concentrate on our use of energy, then lots of other things will come into play. We will be addressing carbon in a very effective way. We will be addressing climate change. We will be addressing the whole question of developing renewable forms of energy with a low carbon footprint. All those things do come together, but they only come together if you focus on just one thing right at the start.

**Q137 Mr Chaytor:** Your *zerocarbonbritain* report refers to redirecting Adam Smith's invisible hand. My recollection is that Professor Stern said in his report<sup>2</sup> that it was Adam Smith's invisible hand that led to the biggest market failure in the history of civilisation, climate change. My question is: are you sure that the pure market mechanism of tradable energy quotas by themselves will actually bring about the changes that you wish to see?

**Dr Fleming:** I am, yes, and the reason for that is that I think we need to understand Adam Smith and his invisible hand. There are various ways in which the invisible hand can work. Adam Smith, writing at the end of the eighteenth century, was thinking in terms of the market and in terms of money, which is very well recognised. What he is actually talking about is

the common purpose. The common purpose is a system for bringing together individual aims with collective aims. There has to be a way of achieving a common purpose if a society is to hold together at all. There were previous ways in which the invisible hand would work. In the medieval period, there was a cultural way. The culture was the invisible hand. Tradable energy quotas are the invisible hand, I would argue, that we need for the common purpose exercise, the common purpose challenge, of transforming our use of energy. The invisible hand is right there; it is just wearing a different glove.

**Q138 Mr Chaytor:** What is the relationship between the downstream measures of tradable energy quotas and the upstream measures? Earlier you said that the issue of carbon content of energy was to be dealt with upstream. Your report does not say anything about the EU Emissions Trading Scheme, so how do you see the relationship, for example, between tradable energy quotas and the EU Emissions Trading Scheme or the other midstream measures of the energy efficiency commitment to the renewables obligation? Do they need to be all swept away?

**Mr Helweg-Larsen:** It is probably worth just making a distinction. David was not an author of our *zerocarbonbritain* report. We have certainly drawn on his work for it. David may still want to answer the question

**Dr Fleming:** Yes. The point is that the only way we are going to achieve this transformation is by recruiting the biggest energy resource we have, which is the intelligence of the people. Not only do we need to involve them but we need to make them want to achieve results. There are two ways of getting people to achieve results, which are very well understood in industry. This has been the biggest debate in industry over the last 60 years. One is telling them what to do and saying, "If you do not do this, it is going to cost you and this is the regulation we are approving and these are the instructions". That is yesterday's way of doing it. Unfortunately, in terms of public policy, our public policy does not seem to have caught up with lean thinking, which is now becoming very well established in industry and we are absolutely achieving transformation in consequence in terms of quality. Therefore, that is what TEQs (tradable energy quotas) are designed for, to say, "Sir, that is the energy budget you have got. The onus is on you to work within that energy budget. You have to recognise that the energy available to you in 20 years time is going to be *this*. You are right down to *there*. So you, sir, will need to get together with your family, your community and your employers to work and develop a common purpose so that you are the centre of a network of collective motivation. If you do that, and only if you do that, will you actually achieve serious results.

**Q139 Mr Chaytor:** I understand how the TEQs can reduce personal energy consumption. I do not understand how the TEQs alone, as you describe them, can result in a continuous reduction in CO<sub>2</sub> emissions.

<sup>2</sup> [www.hm-treasury.gov.uk/independent—reviews/stern—review—economics—climate—change/sternreview—index.cfm](http://www.hm-treasury.gov.uk/independent—reviews/stern—review—economics—climate—change/sternreview—index.cfm)



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**Dr Fleming:** I am glad you have asked that because here is the picture in my reply. The whole thing is based on the carbon budget. A carbon budget is set 20 years ahead.

**Q140 Mr Chaytor:** So you are saying that you need other measures in addition to the tradable energy quotas?

**Dr Fleming:** No, that is intrinsic to it.

**Q141 Mr Chaytor:** You have referred to the carbon budget.

**Mr Helweg-Larsen:** If I might take up that point, we started off by saying, "What is the carbon budget for Britain?" That carbon budget is a budget over time but it has a budget every year and within that right down to the week. Those weekly budgets are going to be distributed under the TEQs scheme; 40 per cent is going to the domestic sectors and 60 per cent is auctioned to business and industry. That budget, on a weekly basis, is contracting week by week and business and individuals will have great confidence in the profile of that reduction because it will be defined by a carbon policy, much like the Monetary Policy Committee. We would know that right from the outset. There is the possibility to adjust that budget, maybe on an annual or five-yearly basis, in the light of changing climate science and what have you. In terms of how you achieve the reduction, you achieve the reduction because you decide what reduction to achieve at the outset.

**Q142 Mr Chaytor:** I am still unclear how the TEQs themselves will result in . . .

**Mr Helweg-Larsen:** We have a budget each week—

**Q143 Mr Chaytor:** Yes. It may be somebody else needs to pursue this line of questioning. Can I move on to the question of technology. Earlier you drew the analogy with the Oyster card, for example. Accepting the Oyster card works pretty efficiently in my experience but the difference is surely that the Oyster card is voluntary, that not everybody who travels on the London transport system has to have an Oyster card, whereas for a successful tradable energy quota system, everyone would have to be part of it.

**Mr Helweg-Larsen:** The underlying question is how do you "force" my gran to take on a carbon Oyster card when she might have no interest or what-have-you?

**Q144 Mr Chaytor:** It is a question of the scale of it also, is it not? We are talking about 60 million plastic cards as against 500,000 or so.

**Mr Helweg-Larsen:** Indeed. A carbon Oyster card is visually quite an easy way to grasp the TEQs concept but in practice you might find that it is far more seamless than that. It does not need to be so obvious. It could very well be—I think you would back me up, David—that if you have an existing credit card or debit card, your bank might be very keen to provide you an extra service and have the carbon data kept on that very same card. If you choose not to engage in any of this carbon trading at all, you could elect

to have your tradable energy quotas cashed in the moment they reach you and so you just operate in a cash economy and the vendor of fossil fuels would charge you extra for the TEQs that they have to purchase.

**Q145 Mr Chaytor:** On the question of the role of the banks or suppliers of the card, you referred to a carbon card, not an energy card. What other infrastructure would be required to enable the banks to be able to offer that service?

**Dr Fleming:** The infrastructure is minor, in my view, in that the cards would not actually have to have anything except your account number, which would plug into the registrar. This is designed based on a system that has existed for many years of unit trusts. When you buy a unit trust, your holding is held in a central registry in an electronic way in exactly the same way—I used to work in the unit trust industry—and exactly the same system is used for this. All you do when you have a credit card, you access your account on the registrar and it is transferred. That is really very simple. It may very well be that the banks want to provide some ancillary services and indeed, there would be some services they would provide. For example, the tender, which of course is very well established for the issue of Treasury bills, as you know, would in exactly the same way as is used for Treasury bills, trickle-down purchases made by the bank on behalf of their customers into customers' bank accounts. Those accounts would have to be set up but that is very standard in accounting systems, so setting up another account for people is just like setting up a savings account. So in fact, the technology is really very straightforward.

**Q146 Martin Horwood:** If you have this account running, what happens when you have used up your quota?

**Dr Fleming:** The thing is that one needs to be aware, even though Tim quite rightly said that it is issued week by week, actually, on the very first day one year's supply of carbon release is issued, so in fact there is constantly a one-year supply in the market as a float, so it is extremely unlikely that anybody would actually run out, but they may run out and, if they do run out, it is like going to a petrol station to buy your petrol. You have to surrender a certain number of units if you have run out of units or you have forgotten your card.

**Q147 Martin Horwood:** If it is likely to run out, how is it going to change behaviour?

**Dr Fleming:** What they do is they buy units on the market on your behalf and so you surrender units. The answer to your question now is in a way, there is a misconception unfortunately which Nick Eyre rather produced, i.e. when you run out, you go into the market and buy some more. That is absolutely right but the point, the crucial point is that the market is subject to that quantity constraint, is subject to the budget, so collectively, the economy as a whole cannot possibly go beyond the budget, and

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one needs to recognize that this is a guaranteed scheme; it is impossible for the economy to use more units.

**Q148 Chairman:** As you will know with your experience in the investment world, if someone has sold short, you get the most enormous price spike. If there is a quantified total available and someone is short, they have to get their pregnant wife to hospital by filling up the car with petrol, the price could be infinite because there is no supply in the market. I do not want to get too bogged down in details but your answer there, I do not think, really stands up to scrutiny.

**Dr Fleming:** Not at all, sir. The price of units is posted on petrol stations in the same way as the price of petrol and if for some reason they were to charge a lot for their units, the price would be on display, and you could just go round to the nearest hole in the wall and pick them up there. One needs not to imagine that the world is full of wicked monopolists.

**Chairman:** It sounds like the former Prime Minister saying, "We will march the offenders to the nearest cash point."

**Q149 Colin Challen:** The popularity of the proposal is in some doubt because Defra apparently has produced opinion research which suggests that 70 per cent of the population are either not very keen on it at all or may not be terribly interested and if you look at David Miliband's blog, you will see there is a great deal of hostility in many of the comments that are posted. Given that it can be quite difficult to have a pilot scheme some other kind of evidential base up front to demonstrate it is quite a good idea, how can you get round the public scepticism about this proposal in practical ways?

**Mr Allen:** The fundamental thing is to get across that the lifestyle changes that people will have to explore are really related to our bad attitude to energy over the past 30 years and the failure of markets and governments to foresee what the consequences of climate change would be. That is going to cause lifestyle change, not tradable quotas, and you have to get that shift in. There is going to be some unpleasant medicine regardless of which type of medicine we take and the displeasure at the taste should not be related to the medicine that is chosen but to the illness. Once that is instilled in society, the question of what techniques can be used to resolve this situation most equitably would produce a different response.

**Q150 Colin Challen:** It is a challenge for the government to try and prevent the unpleasantness from happening by introducing far-sighted, radical policies such as this perhaps to head off a crisis but until we have the crisis, as you say, perhaps people will not be so keen to engage with the policy. That is the conundrum that we have to resolve.

**Mr Allen:** The first scientific musings about carbon emissions were 100 years ago and if we had had the foresight in the 1950s and developed along a

different technology line, we perhaps would not be in this situation now. It is essential to separate the actual tradable quotas from the bigger problem.

**Q151 Colin Challen:** How do you sell the policy as a positive product to peoples whose backs are against the wall?

**Mr Allen:** We also have to look at what other changes we need to make in society. We need to change people's health, we need to change people's diet, we need to change people's levels of fitness, we need to improve levels of social cohesion and community purpose. There is also a big need to deal with personal debt. If some of those can be instilled as additional benefits of re-thinking our attitude to energy, there are additional benefits we can explore.

**Dr Fleming:** May I pick up your point about motivation? I have five points and they may all be significant. Number one is a piece of research on motivation in Canada, particularly with old people and they are now extending it to the population as a whole, which shows a bimodal result. When they say, "What you think about the idea tradable energy quotas or personal carbon allowances?" they say, "No, not on your life. What a terrible idea." Then they have a discussion and talk about why they may seriously be needed and why they are the best solution, and the reaction changes completely: "This is absolutely right, and not only that, we will show other people how to do it." If it is well expressed, there is a complete flip in opinion. That is the first point. The second point is that we do need to recognize that there are these energy problems and if we are—and I think it is a matter of when we are—in an energy crisis, people will be on their knees for a rationing scheme. They may call it an entitlement scheme or whatever but if you have a rationing scheme, you can guarantee that when you want to buy your petrol, it will be there for you and it has your name on it. Without a rationing scheme people will be in trouble. The third point is when people say, "What would the effect of this scheme be? What will people think about it?" one absolutely has to say it depends on how steep the carbon budget is. If the carbon budget was hardly doing anything at all, it would actually have no effect on our lives whatsoever. So the whole effectiveness of it, the whole reaction of it, depends on the steepness of that and there will need to be a clear communication and interaction between the Carbon Policy Committee and the economy and people as a whole, working out how steep they can make it. There is no sensible answer to motivation and what people's reaction will be unless one specified the budget. The fourth brief point is that this will be a wonderful opportunity for the government really to do a useful job and to be on our side, because the Energy Policy Committee are the nasty guys but the government becomes the nice guy because the government is also part of the scheme; they too have to buy their units and therefore the government is not say "We are going to impose this taxation, this regulation, and if it is not hurting, it is not working." They are going to say, "We are all in this together and we are going to work with you on enabling you to actually achieve

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this.” If someone is in trouble because they only have a three-bar electric fire for an enormous stone-built house, okay, we are going to help you in whatever ways come to mind, with money, with technology, with help and advice, in whatever ways come to mind so that the government is part of the scheme so that actually means there is a sense of common purpose. Finally, it is a sense of at last there is something to do; we can do something about it. I think one of the reasons why there is a reluctance to accept the climate change problem and the energy problem is that people do not know what to do about it. There is the law of reverse risk assessment: it is much easier to recognize a problem if you think there is a solution and if people say, “Yes, not only do we have this problem but we also have this solution” that could be fantastically popular and, as Tim said in his excellent report, it could even be a vote winner.

**Q152 Colin Challen:** The *zerocarbonbritain* report does foresee this scenario of a steep reduction in carbon emissions, which obviously affects our habits in relation to the use of energy but how steep can it be to be publicly acceptable? If you have a very steep curve downwards and that means the price of carbon rises very quickly, I would assume, people might be tempted to say, “Great! We have a windfall. We will go out and sell our units straight away,” and obviously they may then learn there is a price to pay later on. If we did not have a steep curve, that might have greater public acceptability because, as you were saying, you could start off flat and it would not have much of an impact until you get the system embedded. What is the optimum curve to introducing this?

**Mr Helweg-Larsen:** I think the first thing to say is let us look at this as an emergency and, if this is an emergency, the public needs to understand this issue as an emergency and then our actions can be framed by that context. One of the things that I found quite invigorating and uplifting as we came to the conclusions of the report was that we did not when we set out know what carbon reduction we were going to be arriving at. We had not done all of our reading on the climate science at that point but as we worked on through it—and I am going to digress briefly into climate science—two key things came out. One is that we now understand from the contributing authors of the IPCC that there are numerous and very powerful feedback mechanisms in climate change and that this is leading us to an understanding of climate change. If we look at it as an explosion or as a bomb, the carbon emissions and our greenhouse gas emissions are much more of a detonator. The feedbacks represent far more the main charge, so there is this new perspective that we are just on the trigger really of this bomb. The second is that, because the atmosphere is cumulative in its concentrations of carbon dioxide and greenhouse gases, and because we are starting to realise that there may be significant sink failures to pulling those emissions back out and that the sinks do not grow at the same rate as our own emissions, it may be that we cannot add any more to the

cumulative concentration of atmospheric greenhouse gases. It may be that we absolutely cannot add to that, and that means not emitting; that means zero carbon emissions, so it is zero carbon emissions probably yesterday. How fast? It is what I was touching on at the beginning; we need to frame it in that context and then, if we see that we are going to zero emissions, it puts a very different perspective on it than thinking about a 60 per cent cut or an 80 per cent cut or a 90 per cent cut, which just seems more and more constrained and impossible and you get to a 100 per cent cut and you say, “Am I dead yet?” The answer is no, there is life beyond carbon and it is quite refreshing to start exploring just what we can do.

**Q153 Colin Challen:** That makes very clear the nature of the emergency, which I think most of us in this room would agree with, but most of the people out there have a different idea, as perhaps evidenced by the polls that you referred to. A radical measure would not be welcome so the question remains politically how do you get from A to B and how do you sell the idea as a positive, good thing for people to engage with?

**Mr Allen:** I think Britain has a network of museums, galleries, science and discovery centres which are not engaging with this issue at all, and we have a National Curriculum which touches on it but does not really get to the core of what Tim has just said. If we can get the attitudes to the problem out there to be the same as the attitudes to the problem in here, then we have a fertile ground for introducing some sort of equitable system for dealing with it. The optimum carbon descent steepness curve is the one that begins immediately. The longer we leave it, we are moving away from the optimum because we are making the descent steeper and steeper, and therefore the social transition harder.

**Q154 Colin Challen:** Your memo has suggested that there should be an independent body created called the Carbon Policy Committee. I wonder if you could just say what differences that might have in comparison with the Government’s proposal in the Climate Change Bill for a Carbon Committee.

**Mr Helweg-Larsen:** I think under the draft Climate Change Bill the committee that is envisaged is similar in name, but very weak in structure. It is nothing like as rigorous or as independent or as powerful, I suppose, as the Monetary Policy Committee that we have today or the Carbon Policy Committee that is envisaged.

**Dr Fleming:** Is it permissible to answer your previous question?

**Q155 Colin Challen:** Sure, with the permission of the Chairman.

**Dr Fleming:** The question was what would happen if the budget went down so steeply that the price rose and that would encourage people to sell, and there are three brief answers to that. The first thing is that the price absolutely does not matter. One of the fundamental rules of system design is that if there are two variables, one only has one degree of freedom.

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That is to say, if we have two variables, one is quantity and one is price, but it is only quantity that matters. Price can be flexible and it is because of that flexibility that the system works. It applies to any system. Lots of people do think, “Oh dear, supposing the price fell very low, the government would have to intervene.” The price is completely irrelevant. It is entirely the quantity that matters. Because of that, the system provides a guarantee. The second point that is relevant is that we may well under-estimate the extent to which the political economy is able to reduce our carbon emissions. Terry Barker at Cambridge has done some interesting work on that and described something called “the announcement effect”. The government does not even need to impose an instrument; all it has to do at the very start—I am not saying it is a substitute—is just to announce it and immediately there is clear evidence that people are reducing their energy demand. So in fact there is a substantial degree of softness in the economy and I think we would be surprised, certainly in the early years, how much the economy could actually respond when the energy availability goes down. The third point is that a steep carbon budget would have lots of very clear benefits. One clear benefit is that it would enormously improve our security because, as energy gets scarcer and as the agenda for climate change becomes more severe, any economy which is already a long way down in terms of their energy consumption will have an advantage. They will be more secure, they will have a competitive advantage, they will be less liable to disruptions. Clearly, all the motivation is towards a steep carbon budget.

**Q156 Martin Horwood:** If that steep carbon budget happens, is there not a risk? You say quantity is the thing that matters and price is irrelevant but price will have a huge impact on individuals. You can imagine a scenario in which rich people see the way this is panning out, fork out on all the photovoltaics, put ground source heat pumps in their swimming pools, they buy a brand new car which has a zero carbon footprint, and they use what of their quota they do not want to sell to pay for their holiday because that is the only way you will be able to afford it under this steep carbon budget. Poor people find themselves with a bit of cash if they have a relatively low carbon footprint are actually also trapped in houses and with cars and lifestyles that they cannot change because of that need for capital expenditure. So they end up perhaps with a bit of cash but unable to travel in the way that they could, probably unable to afford a holiday because the TEQs required will be beyond their means. This could be a very unequal system in the way it actually pans out.

**Dr Fleming:** I do not think I can really bear out that argument, for two reasons. One is that the higher the price, the greater the motivation there is for the poor to in fact reduce their carbon emissions and the more money they will get in when they can sell their surplus rations. One of the things which will be intrinsic with this will be that the government, which, as I said earlier, will be the good guys, would enable the poor—it would be an absolute priority—

to reduce their carbon emissions and it will have enormous effects such as location of shops and location of jobs versus living.

**Q157 Martin Horwood:** I am sorry to interrupt you but that is new development. Most people have to exist in the world that exists now, where their shops are now and the way the housing estates are designed now. I can afford to put solar thermal panels on my house to reduce my carbon footprint but most of my constituents are not going to be able to afford that.

**Dr Fleming:** That is music to my ears, Mr Horwood. You are completely right. I am talking about transition here. The carbon budget goes down steeply but gradually, that is to say, there is a transition. It is hard to define in terms of words what it is. If one immediately has a one-step crash in the carbon budget down to nothing, which could indeed happen from the point of view of the energy market, but leaving that, if there were a one-step crash, then indeed there will be a one-step crash in poor people’s behaviour but, as well as talking about a transition and as well as talking about this common purpose and this collective motivation, the thing does become really a matter of working together, and far more likely than your appalling scenario of the rich people getting into their Jaguars and driving to Spain or whatever it was, it is much more likely that there will be some communication between the rich and the poor.

**Q158 Martin Horwood:** My point was that rich people can afford to buy their way into a low-carbon lifestyle in a way that poor people cannot because their lifestyle choices are much more constrained. They might end up being the losers. Although they are relatively low now, they might end up relatively high.

**Mr Helweg-Larsen:** Perhaps I can respond on this. You are pointing out that there are going to be households who do not have the disposable income to switch to energy-saving appliances, that do not have the disposable income for insulating their lofts and, as the carbon budget shrinks week on week, they are going to find themselves in the position where they actually have to purchase extra TEQs on the market. Yes, absolutely. The scheme provides us with a core driver out of carbon in a race out of carbon. It does not fill every last nook and cranny. Not wanting to be derogatory, it does not solve all the world’s problems but built into the scheme, given that 60 per cent is being auctioned to business and industry, if the price were to go high, to the extent there is value to these tradable energy quotas, there is a significant income to government to work with those groups which would be most disadvantaged and so there is going to be significant funds. There is also going to be an obligation on government to provide secondary legislation and to find all sorts of interesting ways to back that up. We have to prioritise the primary problems of climate change and access to fuel at all, and recognize that there is going to be no equity in a climate change disaster and there is no equity in a situation where fuel is completely unavailable to anybody.

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**Q159 Martin Horwood:** Two final questions. Why are children not included and why weekly allowances?

**Dr Fleming:** Everybody is included, including children. Children are just included in a different way, that is to say, there could be changes to the family allowance and such things. The idea of someone as soon as they are born qualifying for a full adult version of the TEQs ration seems to me bizarre. The point is the scheme has a core. One can talk about the hard core and the periphery. That is peripheral. At the moment it is designed so that children are included through family allowances and then they get their adult ration at the age of 18.

**Q160 Martin Horwood:** Why weekly allowances?

**Dr Fleming:** Weekly works with the existing tender system and it seems to me that the smoother one can make it, the better. If one had monthly, there would be a certain ten per cent or more than ten per cent adjustment in the total float or variation in the total float because one year's supply of units put on the market on day one of the scheme, and then at the end

of one month there will be only 11 months' supply, which will begin to affect the price a little bit, whereas if you have it weekly, the increment will have no effect on the market. It is just the smoothest way of doing it. One advantage of it being weekly is that the scheme is hands-free. People think, "Oh gosh, people are going to have their carbon calculations and their card." Actually, most people will not even notice the scheme exists from the point of view of messing around with cards and bits of paper. It is all done with direct debit and direct credit and things like that. There has been a lot of excitement about the paperwork and the decision making. With a hands-free scheme like this, everybody, no matter what condition, they may have Alzheimer's or be in a long-term care home, it actually works for everybody without condition and, under those circumstances, the weekly issue is no hassle at all.

**Chairman:** Thank you very much. I am sure we could spend the whole day discussing this extremely interesting subject. We are very grateful to you for coming in and shedding a little more light on your own ideas.

**Tuesday 24 July 2007**

Members present

Mr Tim Yeo, in the Chair

Mr Mark Caton  
Colin Challen  
Mark Lazarowicz

Jo Swinson  
Joan Walley

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**Memorandum submitted by RSA CarbonLimited**

**EXECUTIVE SUMMARY**

RSA CarbonLimited does not believe that personal carbon trading (PCT) needs to be described as part of a whole-economy system, but should be seen as an instrument for individuals to share responsibility for greenhouse gas emissions with government and industry. PCT is the idea that individuals would be in receipt of a personal carbon allowance (PCA) and that this would be tradable, subject to a cap. This is one of a series of measures that could be employed to deliver emissions reductions at the level of the citizen, one which would by its nature be engaging and, arguably, empowering as citizens hold for themselves their right to pollute.

**RSA CARBONLIMITED**

Initially a three year project running between January 2006 and December 2008 to explore the feasibility of a system of personal carbon trading. The project has a core staff of three; a director, Matt Prescott; co-ordinator, Lucy Stone and researcher, Ben Castle, supported by other RSA staff and a number of strategic external relationships with organisations able to provide relevant necessary expertise. These include CarbonSim, Atos Origin, Morgan Cole and Moneyswap, amongst others.

**AREAS UNDER INVESTIGATION BY RSA CARBONLIMITED**

Current areas of focus include:

1. Economic impact analysis focussing on the nature of the market place required to support a PCT scheme, including market design and regulation, the likely economic efficiency of PCT in emissions reduction and the interaction and strategic fit of PCT with other trading schemes, proposed and current. This work consists of stakeholder workshops, expert interviews and economic modelling. The team of researchers is advised by a steering group of: Michael Roberts, CBI; David Green, BCSE; Ed Mayo, National Consumer Council; James Cameron, Climate Change Capital and Kevin Anderson, Tyndall Centre.
2. An exploration of the technology requirements and privacy impacts, including consultation with IT providers and technology experts through expert workshops and interviews with a resulting working paper<sup>i</sup>. We are currently examining some of the design proposals with Atos Origin to understand the costs and feasibility of re-using existing technology infrastructure.
3. Examining likely impact on households and options for personal/household/community carbon management. Initially focussed on Cardiff, as a case study, this strand of work is analysing the potential impact of personal carbon allowances on different housing types, community groups and demographic groups. It will be assessing the potential for public agencies, housing associations or local authorities, for example, to manage carbon allowances on behalf of citizens and communities.
4. Exploring the impact of a PCT scheme on the transport sector. Through a steering group chaired by transport expert David Quarmby OBE, we are looking at the practicalities of the inclusion of aviation and public transport in a PCT scheme and modelling carbon emissions reduction through behaviour change across transport modes.
5. The likely public acceptability of a system of PCT is being explored through a series of deliberated citizens forums, CarbonLimited Cities, which may include a number of non-UK cities to enable the project to explore public acceptability both within and beyond the UK.
6. The international context is also being explored in the US, with a US advisory group set up chaired by Branko Terzic and a US project launch scheduled for November 2007. The programme of work will look to mirror exploration of the key questions in a US context, as well as provide learning through practical initiatives.

The following section responds to the keys areas of interest set out by the Environmental Audit Committee.

## ECONOMIC IMPACTS

This is under investigation in a joint project with Green Alliance, due to be published in October 2007. (See number 1 in “Areas under investigation” above for details). The likely relationship with and impact on other carbon markets will be explored as part of this work. However, there is no assumption that a relationship need exist with other carbon markets, save to provide a “safety valve” for the scheme’s ultimate sponsor, presumably the government, given a shortfall of PCAs. Approximate scheme costs will also be considered as part of this work. Investigation to date suggests that the potential nature of the role for aggregators and market makers could mean they could carry some or all of the operational costs associated with the scheme, voluntary or mandatory.

## IMPACT ON THE PUBLIC AND PUBLIC ACCEPTABILITY

There is received wisdom and some research to show that carbon emissions and socioeconomic status have a positive correlation—those on higher incomes and in more stable social conditions are responsible for higher carbon emissions. They are more likely to live in a larger house, have more than one car and travel frequently by air. Those in lower socioeconomic groups use less carbon. This is one of the attractive elements of the scheme—it is progressive and largely redistributive. It would be socially fairer than a flat tax on carbon, which would penalise those causing fewer emissions in the same way as those causing high levels.

However, there are some who are the exception to the rule, and it is important to distinguish between those who choose to use more carbon, due to lifestyle choices, status and luxury, and those who have few or no relevant choices to make due to housing condition or lack of public transport. There would need to be either a subsidy for these individuals, in the form of additional carbon allowances, or supporting benefits, or exemption, with the cap adjusted accordingly. The infrastructure required to support citizens in living low carbon lifestyles is a pressing issue that will have to be tackled with or without a PCT scheme in order to meet the UK’s target for emissions reduction. The design of a PCT scheme which begins with a generous allowance and is slowly reduced to meet targets, would provide the long term signal and security for product and service providers to invest in and deliver this infrastructure.

Even if designed as a fair and equitable solution, there may remain the perception that it is unacceptable. This will depend to a large extent on media responses and their ability to communicate the concept. PCT should therefore not be presented as a fully worked up solution, leaving the public with only the option to protest (as with the Road User Charging proposals). Genuine and open public dialogue and discussion at these early stages that allow the public to feed into the design as well as the debate will be critical. And this must be conducted by a non-government or bias organisation. This is one of the reasons that CarbonLimited is conducting citizen forums, online trialling (the next version of CarbonDAQ) and open debate.

## PRECONDITIONS FOR A PCT SCHEME TO BE FEASIBLE, DESIRABLE, AND PALATABLE TO

### (a) *the public*

Existing loyalty, pre-pay, credit and store cards have enormous penetration into the UK public and the feasibility of their operation for the handling of personal carbon accounts looks good and is currently under investigation and testing by CarbonLimited working with Atos Origin. A voluntary scheme targeted at a wide demographic of citizens, as a “warm up” and with the potential to deliver reductions in emissions, will, in the view of the project team, be a vital precursor to a mandatory scheme in the absence of an environmental catastrophe (as defined by the popular media). Such a voluntary scheme will work only if there is an attractive incentive built into it. Only at the point when the public has sufficient understanding of a comparable scheme and with strong political leadership, could it be made mandatory.

### (b) *business community*

We would advocate that the personal carbon market is structured in such a way as to avoid the direct involvement of business and industry in the buying and selling of credits for their own compliance needs. We do, however, envisage a major role for business in organising and facilitating the personal carbon market. The opportunities associated with this would be dictated by its governance, but must exist in order to provide an incentive for businesses to seek to play a role in the operation of the scheme. Given the likely role of existing banking and IT infrastructure, a range of organisations would be in a strong position to play a role.

## PRACTICALITIES AND OPERATIONAL ISSUES

There is a strong case to be made for banks and credit card companies to handle the PCAs. Banks have the system and knowledge in place. Accounts currently handle different currencies, so they could easily deal with a PCA. Likewise, individuals’ ownership of multiple accounts and the facility to transfer between accounts is commonplace. Chip and pin is currently run by banks, with one card carrying two technologies, and it is also true that multiple cards for a single account also already exist.

PCT could use a single, centrally-controlled or dispersed database. The database could be run by the government or privately. This would present options for government to contract it out to the private sector to operate single database, or for the banks to privately run dispersed database systems. There are various problems associated with banks running dispersed databases; such as the policing of participation in the scheme, and so further research and consultation is needed on this issue. A Public-private partnership model may also be tenable. This also removes the necessity for a large central database, reducing both cost and privacy concerns.

Government would need to be involved at the outset in the allocation of credits and in overseeing identity protection. Many commentators feel that the system could then be handed over to the private sector for operation. This was a widely held view in an expert seminar run at the RSA. The London congestion charge was raised as a good example of private sector operation of a scheme with multiple methods for making transactions. Much like the foreign exchange market, a charge could be levied for managing transactions that fall outside of the personal carbon market, thus encouraging take up. Pricing transparency in this regards would be vital.

#### EQUITY ISSUES AND AVOIDANCE OF DISADVANTAGE

In their 2005 report<sup>ii</sup>, the Tyndall Centre advocate an equal per capita allocation as the most appropriate way to ensure fairness. After all, if everyone has an equal share, it is a good basis on which to argue the equity of the scheme. However, as Richard Starkey of the Tyndall Centre and ourselves have experienced at public events, this does generate strong debate amongst the public, mostly around higher carbon footprints associated with living in remote areas, having children, or even living in colder parts of the country.

There is an important debate around the potentially redistributive nature of the instrument. It is often stated by commentators and members of the public alike, that “the rich can just buy their way out of it”. While it is true that it would be possible to buy extra PCAs to cover excess emissions, money can buy most things, as well as pay carbon taxes or higher prices for carbon intensive goods, so no matter what mechanisms are used to control personal emissions, the wealthy are in a stronger position to cope. PCT is an instrument which would recycle that extra payment to those with below-allowance emissions in the form of an incentive or reward.

In order for a system of personal carbon trading to deliver the level of required behaviour changes in favour of lower personal carbon footprints, individuals must have responsibility for their carbon allowance. However, lifestyles differ from person to person and the ability to reduce emissions differs between households. It is on this basis that much of the discussion about the equity of such a scheme rests.

It is conceivable that other organisations would want to, or have a strong reason to offer personal carbon account management services to individuals. As an interesting example, a housing association might offer to take responsibility for part of an individual or household’s carbon allowance. This would represent a logical move given the limitations to household energy efficiency options open to those in multi-occupancy dwellings, whether in social or private rented accommodation. In such circumstances, householders either do not have control of key energy related choices, or have no existing financial incentive to make them, for example where they pay a communal heating bill. Yet this is counter-intuitive, as measures such as communal heating can represent the cheapest and lowest carbon options.

A social landlord such as a housing association or local authority would have an additional incentive to deliver cheaper and lower carbon energy to householders given the management of its residents carbon allowances—the better its achievements, the lower its costs or the more it could earn through the personal carbon trading market. Equally, in delivering this outcome, it will seek incentives for its residents to reduce their carbon footprints, and as the landlord, will have a strong appreciation of the ways that this can be achieved and, to some extent, the capacity of its residents to deliver reductions. The housing association or landlord is therefore in a strong position to design incentive schemes for its residents that they can understand and that have resonance with them. This is under investigation as part of our work in Cardiff<sup>iii</sup> (See number 3 in “Areas under investigation” above).

#### PILOTING

Full piloting of a personal carbon trading scheme is a difficult undertaking, but it is possible to pilot aspects of a given proposed scheme and to assemble the evidence that these exercises would reveal. CarbonLimited is currently working with Atos Origin to pilot a “carbon credit card” with an initially small user group, with this group building over time. The aims of this piece of work are to establish which IT infrastructures could be employed to carry out the necessary functions of a PCA and gather initial user feedback regarding the experience and interface of the personal carbon account which will support it.

It is also possible to pilot the trading of PCAs, which is the intention for the next version of the RSA’s “CarbonDAQ”<sup>iv</sup>, due to launch later in 2007. Currently in development, CarbonDAQ will enable individuals and groups to set parameters and trade PCAs. CarbonLimited will analyse the data to support recommendations regarding both voluntary and mandatory versions of a personal carbon trading scheme. Once combined with the automatic collection of data via a “personal carbon credit card”, or other interface, CarbonLimited will be in the position to fully pilot a voluntary PCT scheme.



## THE INTRODUCTION OF A VOLUNTARY SCHEME

The scheme should be offered at the point that we can, with reasonable certainty, measure the relevant carbon emissions of an individual in real time, without the need for them to input data. An allowance can be issued and incentives put in place to stay within that allowance. The incentives might be funded by grants, corporate sponsors, or individuals prepared to be penalised for exceeding their allocation. The version of RSA CarbonDAQ under construction will provide one possible basis for operating a basic trial scheme according to these principles. Lessons learned will inform the next steps in the scheme design.

## AN EVOLUTION TOWARDS A MANDATORY SCHEME

Ultimately, according to emissions reductions being achieved elsewhere in the economy, voluntary incentives may not be adequate. To make the right choices, people will need clear boundaries and price signals, just as industry, but with room for individual lifestyles within. The role of government in such a system will be twofold: to ensure compliance, or to appoint a body to do so, “OfCarb” for example, and to provide the full infrastructure to enable everyone to live within allowance with minimal, if any, pain. This will necessarily involve investment and support for emerging low carbon products and services.

## IS A SCHEME OF PERSONAL CARBON TRADING DESIRABLE?

CarbonLimited aims to answer this question fully by the end of 2008. Interim findings due to be launched at the end of July 2007 suggest that such a scheme would be technically feasible and economically acceptable. The main thrust of the project now is to examine public acceptability and potential for behaviour change across a representative demographic sample of the UK and US populations.

## REFERENCE

- i <http://www.rsacarbonlimited.org/viewarticle.aspx?pageid=667&nodeid=55>
- ii [www.tyndall.ac.uk/research/theme2/summary\\_t3\\_22.shtml](http://www.tyndall.ac.uk/research/theme2/summary_t3_22.shtml)
- iii [www.rsacarbonlimited.org/uploads/documents/RSA\\_PersonalCarbonTrading-ACommunityPerspective\\_25.pdf](http://www.rsacarbonlimited.org/uploads/documents/RSA_PersonalCarbonTrading-ACommunityPerspective_25.pdf)
- iv [www.theRSA.org/carbondaq](http://www.theRSA.org/carbondaq)

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*Witness: Mr Matt Prescott, Project Director, RSA CarbonLimited, gave evidence.*

**Q161 Chairman:** Good morning. Thank you for coming in. I understand you have just published your interim report for the CarbonLimited project.<sup>1</sup> Would you like to say a little bit more about what the project involves and what your findings have been so far?

**Mr Prescott:** We have not quite published our interim report. It is due at the end of the month, but obviously much of that information is now pretty much prepared. The project has been running for 18 months and will run for another 18 months, specifically looking at personal carbon trading. During that first 18-month period we have focused on a number of the big academic questions behind the idea. We have focused on issues to do with economic efficiency and impact, et cetera. We have done some initial work on the technological infrastructure and some of the IT systems that we could use. We have looked at some of the privacy issues that have been popular in discussions. We have also had a preliminary set of conversations with a number of publics, moving forward with switching into more of a conversational mode with the population, to start to tease out some of the public acceptability issues in more detail, and also moving

into a more practical phase where we are testing some of our ideas on the ground and visiting communities to explore how some of these can manifest themselves.

**Q162 Mr Caton:** Thank you, Chairman. In your submission, you are particularly enthusiastic about the role the private sector can play, both in administering the system and providing the impetus for keeping it running at a useful pace. What exactly do you envisage the private sector undertaking in a personal carbon trading scheme and why are they better suited to do it?

**Mr Prescott:** We are quite salient about which parts of the economy kick into action in order to support such a scheme and the private sector is one which has a lot of the existing infrastructures that one might need to support the kind of user interfaces that we would envisage. For example, if we were looking at the idea of carrying around a personal carbon credit card, then naturally some of the banks already have existing credit card infrastructure and local knowledge about how those could work and be set up and are very experienced at dealing with some of the issues around fraud and gaming of market-places. Certainly, if one were to take the banking sector as an example, there is a lot that is already in place that they might be able to do but the issue for

<sup>1</sup> [www.rsacarbonlimited.org/uploads/documents/CarbonLimited\\_InterimRecommendations\\_37.pdf](http://www.rsacarbonlimited.org/uploads/documents/CarbonLimited_InterimRecommendations_37.pdf)

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us is to take a step back and look at what is required. For many people in the UK a bank style approach to a personal carbon trading scheme might not be all that appropriate, so we are also looking at what the public sector could do to support such a system as well. We very much see a mixed portfolio of options and we very much want to explore each of those. As I have mentioned, one of the things we have already done is that we have looked at the IT infrastructure which naturally does lead us into some of the banking sector organisations particularly.

**Q163 Mr Caton:** Could you expand a little bit on the balance between the role of the Government and the private sector? In doing so, do you think there could be a problem of credibility with the public if they felt that the scheme was actually owned by the private sector?

**Mr Prescott:** The most important message that we would wish to communicate about the idea of a personal carbon allocation and a tradeable one is that the ownership rests with the individual. That is the most important point about the whole idea because, with an ownership at the level of the individual, you are, if you like, reversing the hierarchy of responsibility. By taking responsibility for a share of the UK's emissions reduction target and having those emissions rights in their hand, the people of the UK could then choose how to move forward with those and appoint those credits to any of the systems that might be on offer, any of the traders or any of the organisations offering to operate the scheme or whatever. The first and most important thing is that it is owned by the individual. The second thing is that the types of organisations that would operate the scheme would be those best suited to do so, subject to the government guidelines, but the government guidelines we feel should be as light as possible so that the system is not seen as a government one but as a shared ownership scheme, if you like, between civil society, business and government. Therefore, as I mentioned, the types of organisations that might choose to act to offer services to individuals to operate their accounts could be in the private sector, such as banks, but they could also be in the public sector, such as, for example, a housing association, which might choose to gather credits together on behalf of their residents in order to invest those in longer term energy security gains, such as local renewable energy schemes, for example, which the residents would choose to sign up to in order to give them a longer term energy security signal, and then the marketplace itself would be interacted with via the housing association rather than by the individuals, but at the choice of those individuals, who may, for obvious reasons, in many cases not necessarily have strong financial skills or a strong interest in playing into the market-based environment. The interface with the individual would be one of choice but the ownership would very much rest with themselves.

**Q164 Colin Challen:** I should start my questions by mentioning that I am a member of the RSA and have been slightly involved in the project, in its early days.

You have touched on the technology side. Of course there has been the debate about whether or not everybody should be issued with a card. Some see that as the introduction of some sort of ID card, with civil liberty problems attached to it. Do you think it would be necessary for everybody to have a card, like an Oyster card, or could you manage the system and the transactions on the system without necessarily having to have a card of the credit card type?

**Mr Prescott:** I think the interface is very important. The ultimate purpose of the scheme is to bring about behavioural changes at individual and community scale, I think it would be fair to say, and, therefore, the visibility of the scheme needs to be high—and necessarily so, because, as we see it, we have upstream carbon instruments in play of which the public are not especially aware and which do view more as a tax, in feel. The purpose of the scheme is very much to give ownership down to the level of the individual and the community and enable them to control it, hence the interface would need to be something that was comprehensive for the scheme but also comprehensible from the point of view of individuals. The original suggestion of a stand-alone credit card, of sorts, which has been talked about for probably the last 12 months would give you that “in the wallet” visibility that you are involved in a scheme. However, we have looked into that particular approach and the retailers to whom we have spoken are not particularly keen, due to extra time at checkouts, extra staffing and educational requirements, and potential revenue lost under a voluntary scheme rather than a mandatory scheme. The alternative would be to piggyback on existing card technologies, if one were to follow that route. The main options that stand up for us are the loyalty cards and the pre-paid cards that are starting to emerge. It would be possible, depending on the coverage of the transactions, to gather much of the data that you need from one of those existing infrastructures, and those are popular with the retailers when one talks about this idea with them but also would mean there would be very little in the way of additional infrastructure cost to set up the scheme. It would be entirely done at the back end, behind the scenes, and nothing to do with point of sale, software changes, et cetera. That is the more popular route. Many people do have loyalty cards and the coverage of those is quite broad and the understanding of those is quite high. However, it is obvious to see that domestic household utility bills are not often paid using one of the existing card systems but more often either through a prepaid meter or direct debit and hence we would be looking at a mixture (a) of technologies; and (b) of interfaces, that we would want to tie in in an understandable way, such that the scheme looked neat and tidy to the public but actually properly did dovetail a number of different infrastructures in order to deliver that.

**Q165 Colin Challen:** Have you had discussions with credit card companies and are they in any way enthusiastic about it or do they have any objections to it?

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**Mr Prescott:** Yes, we are talking to a range of organisations about operating the system. They are generally reticent to talk about introducing new technologies which will cost time at the point of sale but they are generally very positive about reusing their existing infrastructure to support such a scheme because they can see that, once introduced. If introduced, there could be some business opportunities for them and some alternative uses for networks into which they have already put time and effort.

**Q166 Jo Swinson:** I should start off by saying I am signed up to the RSA website that tells you how much carbon you have been using. I heard about the project and thought it was quite interesting. It sends me an email every so often with what today's carbon price would be. It is a very interesting project you are involved in. I was interested to look at the variety of methods you have to try to assess the public acceptability of the scheme. In your memorandum, you mention citizens' forums, Carbon Limited Cities, and so on. What are the results so far of what you think the public reaction would be to personal carbon trading and where do you think more work is needed?

**Mr Prescott:** The citizens' forums which we are calling Carbon Limited Cities have not actually been launched yet, unfortunately. That will kick off around September of this year and run for a while. We will be using market segmentation approaches to test quite accurately—this is probably the Energy Saving Trust's market segmentation that we use—and to look at some of the key questions about this idea in detail with the public and be able to put some very solid research forward with respect to public attitudes. For the moment, as I mention in my introduction, it is quite anecdotal the evidence that we would have because it is not based on any particular segmentation. We do find that people will naturally take the core idea for the personal carbon trading scheme (that you receive a personal carbon allocation that is tradeable, et cetera) and will apply it to themselves and will immediately respond if they feel they might be on the losing side, if you like. The issues that tend to get raised repeatedly are to do with the availability of public transport (which is generally a rural/urban issue, to put it crudely); to do with local climate (some people feel that parts of the UK, if one were to apply a UK-wide scheme, might be requiring additional units, carbon credits); and the other main area of interest is around children. All of these touch on the vital question of the equity or the perceived equity of the scheme. In their *Domestic Tradeable Quota* paper, the Tyndall Centre talks about an equal per capita allocation. Many people feel that is inherently fair and many others feel that is inherently unfair because of their circumstances. We feel it is very important indeed to separate between people who are able to make choices to reduce their carbon emissions from their lifestyle and those who are not. An obvious and good example of somebody with a lower carbon footprint would be somebody in a multi-occupancy household with a general low carbon lifestyle versus

somebody in a single occupancy household, but the single occupancy household might be an individual who has chosen to live on their own and is able and has the means to, or it might be somebody who through no fault of their own finds themselves living alone, and we do feel it would be important to be able to distinguish between those two groups. That same example can ratchet out around other sections of society and hence we are doing work to look at specific case studies and to look at what kind of mechanisms you might need to use to support people who are disadvantaged by the scheme in such a way. The fuel poverty question, if I might touch on this, is a big one in this respect, in that those people who are fuel poor generally have high carbon emissions from their households. Obviously that is not a showstopper because, in essence, the scheme is redistributive. However, it does mean that we need to make a choice about which way to avoid that disadvantage. For us, there are three ways which we go into in more detail. One is to increase the allocations to those households, which would then mean we were moving away from the per capita allocation. Another would be to adjust other benefits to that household, perhaps through the social services network or wherever, in order to avoid the disadvantage using related schemes targeting household energy efficiency, like Warm Front. Thirdly, one could exempt those households from the scheme and adjust the cap accordingly. Once we look into the case studies of individuals under the scheme, we will find those at a disadvantage through no fault of their own, and we just need to explore how we can avoid that disadvantage.

**Q167 Jo Swinson:** As well as creating a complex scheme that might be fair, it is also about it being perceived to be fair.

**Mr Prescott:** That is right.

**Q168 Jo Swinson:** This is surely where the whole thing can fall apart, if the public do not accept it. I am thinking of recent public reaction to alternate weekly collections or to road user charging. When radical changes are perceived to affect people, even if it is for the environmental good, very often there is not the support out there. The people who have been engaged in this so far have tended to be people who are quite interested in the issue, environmentally conscious people. How do we make it work for the vast majority of people out there? Some of the opposition will come from people who will lose out, disadvantaged groups, but some of the opposition will surely come from people who just want to keep a high carbon lifestyle and do not like the thought of being asked to change or pay for it. How would you propose that we can increase our public acceptability?

**Mr Prescott:** There are a number of issues in that question and it touches on different sections of society as well. Firstly, our philosophy in running this project is very much one of co-production—and I hesitate to use that word—in so far as we want to work with the population to explore the detailed

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issues and describe an instrument that will work for the maximum number of people, with public buy-in through that process so that we can demonstrate that we have consulted very much during design phase rather than at the end of the design phase. That is important for us in the way we are approaching the project. It is quite right to say that interested groups will always take part in a voluntary scheme first. We accept that. The introduction of the voluntary scheme which we are planning to bring about during the course of this project will naturally attract these types of groups initially, but we can nonetheless still achieve a certain level of learning from that, certainly in terms of infrastructure provision in ease of use and generating a big debate. That is a useful step. The next step beyond the voluntary scheme for us is what one might call an “incentivised voluntary scheme”. This touches back on parts of the role of the private sector where one could imagine, for example through a CSR budget or through some other identified funds, that a private sector organisation wishing to operate the scheme could offer an incentive to voluntary participants in the form of financial reward or some other reward in kind, and hence you would then start to attract a slightly wider demographic of people. The private sector have shown an appetite for marketing environmental issues so far. If we can harness that appetite to market a cap and trade scheme, then one could see development of some very interesting proposals from the private sector to individuals, with incentives, which might well attract a far greater body of the population. It is from that point that then the conversation about its acceptability at the mandatory stage could take place. There were more questions in there which I do not think I quite got to.

**Q169 Jo Swinson:** There is the issue of disadvantage, because they live in a cold climate or far away from public transport, which will create opposition. But, in relation to opposition from people who are just resistant to change in their lifestyle or paying more for their current lifestyle, how do we go about getting them aboard schemes like this?

**Mr Prescott:** Firstly, this debate is premised on the need to cut emissions rapidly, hence it is more a question of which tool or which mixture of tools we employ. Under a personal carbon trading scheme, if one were in receipt of one’s personal carbon allocation but chose not to participate in the scheme, then, at the point at which they made the purchases relevant to the personal carbon allocation, they would be paying some form of surcharge in order to obtain those credits from the market and hence it would feel like a tax. That is the straight choice. You either take control of your personal carbon allocations and either employ somebody or choose to operate in the market yourself and use that process to enable you to make the relevant choices for you about how to live a lower carbon lifestyle or you accept that you will be taxed. I think it would not be a problem once there is a strong enough

conversation and a strong enough participation to incentivise a voluntary scheme for that debate to be had in public.

**Q170 Chairman:** What makes you think that personal carbon trading will result in community action?

**Mr Prescott:** We do not assume that it will but we are looking at how it could. We have a particular programme of work that is initially taking the Cardiff South and Penarth constituency as a case study. We are looking at a variety of housing types and a variety of demographic groups within that constituency, first of all to explore what would be the most efficient carbon reductions at either household or community scale, and, secondly, what community based groups or community based organisations—and I mentioned housing associations but it could be the local government even—chooses or would be able to offer support to those households that wanted to do something on a larger scale and a community scale for reasons of common sense; that is, a greater carbon reduction can be achieved at the community scale, for example. That may be true in many cases, hence that population choose to invest in their carbon credits in that way to bring about, as I said, a longer term energy security gain for themselves. We do not know that is how people will behave but we want to establish what the options could be for individuals and play those out in communities around the UK to put some evidence on the back of that question which is whether or not people would choose to behave like that.

**Q171 Chairman:** Would you envisage people pooling their allowances if they were living in a block of flats?

**Mr Prescott:** It may very well be the best choice, if the household were paying a communal energy bill. I have worked on a housing estate where people, because they paid a flat communal energy tariff, chose to have both the heating turned up full and their windows open, because that was the atmosphere they most enjoyed in their flat. There was not any economically rational reason why they should not do that but also, because the flat was not one that they owned, they did not necessarily have any incentive, for example, to install insulation or whatever. One would extend that also to private sector managed accommodation. Again, any investment on the part of the tenant, the gains from that would not be felt by the tenant but by the landlords. There are some particular issues around housing that need to be explored and the idea of pooling credits or personal carbon allowances to act at community scale might very well be, by some distance, the most obvious choice for somebody in that kind of accommodation.

**Q172 Chairman:** How big could the unit be for people working together? Have you thought about that?

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**Mr Prescott:** It is a good question that we will explore in Cardiff. For argument's sake, a particular block of flats could be a community or a housing estate could be represented as a community. I would suspect that smaller sizes might work better—up to two or three houses in a street or of that kind of scale—but we shall see the output of our work in Cardiff.

**Q173 Mr Caton:** Your technical requirements working paper mentioned the possibility of including an expiry date for credits. Why would this be necessary? What sort of eligibility period are we talking about?

**Mr Prescott:** That paper was exploring some of the market based issues as well as those associated with the technical infrastructure. This suggestion came from one of our expert workshops. When we were discussing the Oyster card scheme as an analogy, we were concerned that if people felt that the value of carbon would rise rapidly over time then as carbon becomes scarcer they might choose to hoard their carbon credits, hold on to them, and hence you might see a market failure in respect of trading early on. That was where the suggestion for a time expiry came from. However, our thinking has probably moved a little bit further. We now see perhaps the regularity of the allocation as being the most important thing and with respect to the question of maintaining a fluid market-place. So we would be thinking more on a monthly basis for an allocation, which would chime with many people's monthly income. Many people budget over a monthly period of time financially, and hence budgeting over a monthly period in terms of the carbon would also be a logical time frame and may provide the fluidity required without the need for a time expiry. But if we look at a cap and trade market such as the EUTS, there are some interesting relationships between EUA credits, between years and tradeability. All of these issues would need to be set out, and we will do so in an interim report, in order to explore how best to maintain the fluid market. It would also be important not to allow the prices to vary, to fluctuate too rapidly, because I think that would cause people a lot of problems.

**Q174 Mr Caton:** I hear what you say about the danger of hoarding, and that being important, the expiry date, but I guess the counter danger is that if you have an expiry date people spend and therefore emit more just because they know that is going to happen. Is that part of your reason for moving to monthly accounting periods rather than an expiry date?

**Mr Prescott:** Possibly yes. The predicted price of carbon—and this is something again that we are exploring but unfortunately at the present time I cannot report it—would really determine whether that kind of behaviour would be likely. I certainly know of people—and I shall not name names—who are taking long-haul flights this year for summer holidays because they perceive that some kind of carbon reduction scheme is on the horizon and they want to get it in while they can. Yes, I am sure that

kind of behaviour would be possible, and, again, it is all to do with detailed scheme design to avoid any unwanted repercussions of such a detail.

**Q175 Jo Swinson:** I wanted to ask how you see the personal carbon allowances fitting in with the rest of the equality tools that we have in this area, including the emissions trading scheme. Do you think they would interact well or would we have to start with a clean slate to introduce personal carbon trading?

**Mr Prescott:** It would be unfeasible to start with a clean slate because we do not have one: we have the Kyoto mechanism, the EUTS, the Renewables Obligation, Climate Change Agreement, etc. But we do see multiple carbon instruments on the same energy chain, so it is possible to suggest that it is not a problem at all for the idea of personal carbon trading that a number of these instruments exist and that they can overlap. Indeed, with the EEC 3 moving into a slightly more visible location, if you like, I think there is a certain level of recognition that upstream instruments are not able to bring about the climate behaviour changes downstream that are necessary and so a multiple number of instruments on that line would be entirely possible. Also, as I mentioned, the nature of the personal carbon allocation being something which is very much yours to own as an individual, it will feel different from a number of those other instruments that I mentioned which do come through in perceived terms as taxation. That would be my first point. The second would be that, so long as the carbon market that was set up to support a personal carbon trading scheme was a separate currency from the EUAs of the ETS and the EUTS, then the two schemes would be able to operate side by side. They may want to be connected but we would suggest that a personal carbon trading scheme should only apply to individuals in the population. It would need some kind of safety valve but it should not be able to be gamed by other organisations, who would behave in different ways from individuals, and hence we very much see personal carbon trading as the personal element of what the Tyndall Centre described as the “domestic tradeable quota” and, indeed, it need not be part of a domestic tradeable quota. In fact, a domestic tradeable quota would imply a clean slate, but, because that is not possible, we have reached the conclusion that a domestic tradeable quota also is not possible. Therefore, from the personal carbon trading scheme we are looking at a percentage of the emissions reductions required by a nation being allocated to the individuals and those then forming, if you like, a shared responsibility with government and business for achieving the reduction. It would be possible to put that in place initially as an initiative (that is, as a voluntary scheme) and later as a mandatory market-place without running into problems with the other instruments that currently exist.

**Q176 Mr Caton:** In this inquiry so far we have heard strong varying opinions on the value of pilot schemes. What sort of pilots are going to be part of the carbon energy programme and what information are you going to get from them?

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**Mr Prescott:** Primarily, two. The first is one on which we are currently working with a private sector organisation called ATOS Origin who are helping us to look at each of the infrastructural options for operating the scheme and to start testing those out. In terms of piloting the technology, if you like, that is entirely possible and we will initially be doing that with an unrepresentative sample, just to look at ironing out some of the details of what would most likely be a card, and then looking at getting a representative sample of the population to take part in that pilot scheme. That is a technology pilot that is entirely possible to do. However, that will not give firm evidence regarding the behavioural response in the round, and hence our programme for Carbon Limited Cities, using delivery to fora to look at behavioural response. Secondly, the development of our online tool, *CarbonDAQ*, which we are currently revamping quite drastically to include a trading platform, possibly multiple trading platforms, would be set up both as a public engagement tool to come and learn about the idea but also as a research tool for us, and we will be using, again, segmentation techniques. We will enable people to set their own allocations and chose to trade in their own ways and form their own groups, et cetera, et cetera. There will be a lot of functionality but from that functionality we will be able to see which are the most popular methods that people are using and the kinds of behaviours different groups are displaying. In an online environment, even though some of those groups may well be geographically located in the UK and, indeed, overseas, as this will be an international tool, we will be able to learn a lot about behaviour in an online environment through that. Between the technical front end, if you like and the online back end, we will learn a lot, and then those two being linked together so that the CarbonDaQ becomes the personal carbon account that supports the card that they have for part of the pilot scheme. It is that that will evolve into the voluntary scheme, so that we see a number of the elements coming together that enable a robust analysis of people's behaviour.

**Q177 Mr Caton:** You seem to agree with many of our other witnesses that the big question is attitudes and behaviour, and you are attempting to address that. However, it has led some of them to say that you cannot have a pilot project based on voluntary action in order to try to work out the details of a mandatory scheme, just because, as has already been mentioned, the people who get involved are already interested, whereas the majority of the public, sadly, at the moment perhaps are not. How do you respond to that?

**Mr Prescott:** Firstly, to reference my timeframe of moving from voluntary to incentivised voluntary to mandatory, this piloting work should at some point in the not too distant future contain an incentive part, and hence we move away from the usual suspects. However, there is a big danger that one could try to pilot something and never really uncover the key issues, which is why we are

covering our bases and also doing some modelling work to support the deliberative fora. The main concern that was raised was really to do with piloting domestic tradable quotas and I think this is where the confusion arises. We are talking about a system of personal carbon allocations that go to the population and those are tradable. The environment in which those are tradable is not a whole economy scheme, because the personal tradable units are not tradable with business or industry. Indeed, that unit of currency is not necessarily also traded by business and industry; that is where EEC and the EUTS is operating. So we are talking about a separate scheme that is focused on the individual. That, for us, is what personal carbon trading is. The main problem with piloting the DTQ is that it would be impossible to set up a whole economy trading scheme in a microcosm but, if you forget about the rest of the economy and focus on the behaviour of individuals and communities, I think we can get a lot closer to an accurate piloting system than we would if we were talking about domestic tradable quota. That is the important distinction for us.

**Q178 Colin Challen:** Leaving aside the question of public acceptability for a moment, do you think that by the time of the next election, say in two years time, we would have enough information of a technical nature and practical nature to support the introduction of such a scheme? Do you think that by then we may have ironed out any of the practical questions which may be raised as objections?

**Mr Prescott:** There are the practicalities of operating the scheme. I believe we will, by the end of 2008, be able to report fully on the practicalities of operating the scheme. This is quite a pressing issue and we are looking also to minimise risk, hence looking at reusing existing infrastructure. My feeling is that it is very much in place. We are not talking about an ID card at all. The amount of information we would need is far less than that and so the existing infrastructure networks we have will be able to support the kind of scheme we are describing here. The outstanding questions, I suppose, are around political acceptability, which to some extent I believe we have just touched on by talking about the various instruments in play, and I think unnecessary concern about double counting. If we are talking about different currency, there cannot be double counting. So political acceptability, in terms of policies, I think will be there. It is the public acceptability which is really the outstanding one and that is why we want to put into play an incentivised voluntary scheme so that there is a strong enough conversation about the idea that, at the very least, people will have heard what it is and have a good idea of what it is and many of the public should have taken part in exploring it. I do not know if that answers your question.

**Q179 Colin Challen:** Do you think an incentivised voluntary scheme could be put in place at the next election.

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**Mr Prescott:** Yes.

**Q180 Colin Challen:** If it is publicly acceptable it does address the question of public acceptability. Obviously, if people want to volunteer, that is a self-defining group, but what then happens? What is the process after that? Do you have to wait for another generation, five years time, before you can roll it out across the nation, so to speak?

**Mr Prescott:** I do not think we need to worry about the political cycle to introduce an incentivised voluntary scheme. That can be done in the institutional sector, such as by ourselves. The rules governing that scheme would emerge in time. If we are talking about making a mandatory scheme, if we are talking about when we get to that point, then I very much feel that the Carbon Committee that has been identified in the Climate Change Bill would be the group to create the rule book, if you like, that governs the operation of the mandatory scheme. The mandatory scheme could still be operated by public or private sector organisations—and that is when I

talked about a very thin rule book to guide it—but we would need something like OfCarb or the Bank of England to control the price of carbon in the market but it could possibly be done through secondary legislation in the first instance. I am not sure that we are necessarily overly concerned about the political cycle. We would be if we were talking about a domestic tradable quota because we would need to clear away some of these instruments.

**Q181 Colin Challen:** Once again on public acceptability. Has any of your research shown whether the general public, accepting that there is an environmental challenge, would be happier to do this or to prefer environmental taxation or regulation or do they have that opinion in your assessment?

**Mr Prescott:** I believe there is evidence emerging on that issue, but not from ourselves at the current time. That is something we will be addressing through Carbon Limited Cities over the coming months.

**Chairman:** Thank you very much indeed. A very helpful session.

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**Memorandum submitted by Dr Tina Fawcett, Environmental Change Institute,  
University of Oxford and UK Energy Research Centre**

**EXECUTIVE SUMMARY**

PCA is a promising policy option which could deliver carbon savings in an effective, equitable and certain manner. However, at present there remain many unanswered questions about the practicalities, consequences and social acceptability of the policy. This evidence summarises recent PCA findings by UKERC and others, and identifies key research gaps.

**AUTHOR DETAILS**

Dr Tina Fawcett is a Senior Researcher at the Environmental Change Institute, University of Oxford and UK Energy Research Centre (UKERC), and has been researching personal carbon allowances (PCA) for the past five years. As part of the “Demand Reduction” team at UKERC, she has run a number of PCA research workshops, published academic and popular articles, and is involved in ongoing team research on PCA. She is co-author with Mayer Hillman of *How we can save the planet*, a book which brought PCA to a wider audience. This book has been adapted for a US readership and was recently published as *The suicidal planet: how to prevent global climate catastrophe*.

**THE LIKELY IMPACT OF A PERSONAL CARBON TRADING SCHEME**

1. Despite the increasing public and political interest in personal carbon allowances/trading, it is a subject which is currently very much under-researched, with few active individual researchers or groups. In 2006, UKERC held a workshop with researchers and government civil servants from a variety of departments in order to identify research priorities for PCA and other “competitor” policy instruments (such as carbon taxation) (Bottrill 2006a). A long list of research questions was generated. Included amongst the key research tasks were:

- Assessing the relative benefits of different policy instruments.
- Investigating the public acceptability of different options.
- Gathering better data on personal carbon profiles.
- Researching the wider strategic policy fit of PCA.
- Understanding the economic rationale for different options.

Since this time, the Centre for Sustainable Energy (CSE) have published a “road map” for research into personal carbon trading (Roberts and Thumim 2006) and DEFRA is currently finalising its own research programme. The overall message is clear: far more research is required into all aspects of PCA. Without this, the policy cannot be properly assessed and many of the key questions about public acceptability, practicality and likely social and economic outcomes cannot be answered.

2. There has been some partial research on the variations of carbon emissions within the UK population. A key study demonstrated that emissions rise with income, but that there is also huge variation of emissions within each income decile (Ekins and Dresner 2004). They also looked at the distributional impacts of PCA compared with various carbon taxation proposals, and demonstrated that PCA would be more progressive than taxation, ie fewer people in the lowest income groups would be worse off. However, this analysis did not include people’s carbon emissions from aviation, and of necessity used proxy expenditure data to estimate carbon emissions in different income deciles. Recent work carried out by a UKERC researcher, calculated the carbon emissions from all personal travel of several hundred Oxfordshire households (Brand 2006), including travel by private vehicles, public transport and domestic/international air. Emissions from household energy use were not included in this study. Two key results stood out, the first was that air travel dominated emissions at 70% of the average individual’s travel emissions. This is considerably higher than shown in national statistics, and may be explained by a combination of factors including accounting methods, calculation methodologies, and the easy access of Oxfordshire residents to international airports. Secondly, the data showed huge variations in personal emissions. The top tenth of emitters were responsible for 43% of total sample emissions, while the lowest tenth were responsible for just 1%. The highest 10% of emitters were flying five times more than the average person in the sample. There was also a significant link of CO<sub>2</sub> emissions levels with income, in particular for travel by car, air and rail. Other significant factors included age (or position in the family lifecycle), economic activity, car availability and household size and structure (Brand, 2007). This indicates that PCA will have very different effects on different people, depending on their current carbon emissions, and of course their willingness and capacity to change. While both these sets of research are very valuable, until a large-scale, representative carbon audit of individuals, covering household energy use, personal transport and aviation, has been undertaken in the UK, many questions about who would be affected by PCA are unanswerable.

3. If PCA were to be introduced, it would not be a stand-alone policy. It would simply form the umbrella mechanism within which a wide range of other policies would operate (Hillman and Fawcett 2004). Product policy using the full range of market transformation tools (regulations, incentives, information, voluntary agreements etc.) would still be needed to encourage more efficient lights and appliances into the market. New and existing housing energy efficiency and carbon emissions standards would continue to be tightened. Greater take-up of household-level renewable technologies would be supported. Transport and planning policy would need to find more effective ways of encouraging the use of lower carbon modes and, eventually, lower mobility lifestyles. Not only would these policies enable and encourage people to live lower carbon lives, they could also be used more comprehensively in advance of PCA to broaden the low carbon options available.

4. It is hard to know what circumstances would make the introduction of PCA politically and socially possible. They are likely to include the following: convincing evidence on how PCA would work, who would be affected, what it would cost; demonstrations that people can adapt to and live well under a PCA scheme, via voluntary and research trials; understanding of the benefits of PCA compared with the alternatives (eg taxation); identification of the many “winners” under PCA (of which there are certain to be more of than “losers”); even greater public and political concern for and action on climate change.

#### OPERATIONAL FEASIBILITY

5. The most detailed research on institutional and operational systems, administration and the likely cost of personal carbon trading schemes has been carried out by David Fleming and the Tyndall Centre researchers (eg Anderson and Starkey 2004). UKERC researchers have not done substantial work on these topics.

6. We are currently completing a study into the feasibility of carrying out a PCA pilot—funded by the Esmée Fairbairn Trust and UKERC. The study has sought to incorporate a wide range of expert opinion, by having an advisory group which includes members from the Tyndall Centre, CSE, DEFRA and two environmental consultancies, running two consultative workshops and undertaking individual meetings with many academics and other experts. The final report is due to be published by the end of the summer. During the course of the study we have identified difficulties in replicating a real PCA scheme within a pilot. For example, inclusion within a pilot could not be made mandatory for participants and the infrastructure, information and trading systems that would be in place in a real PCA would not be present in a pilot. For these sorts of reasons, our research is now focussing on designing PCA “trials”, rather than a pilot, where as many key aspects of PCA as possible are tested with participants over the course of a year. There is no doubt that running worthwhile trials of PCA is a complex and demanding research task. Nevertheless, we believe well-designed trials can offer unique qualitative and quantitative data on: social acceptability of PCA (based on peoples’ experience of living with the concept for a year); the effectiveness of PCA in motivating attitudinal and behavioural change; testing the detailed rules of PCA; discovering unexpected reactions to



PCA, and; better understanding the complex consequences of this policy change. The final report will make the case for PCA trials in detail and will provide guidance on how trials should be designed and managed, and what they might cost.

#### VARIATIONS BETWEEN DIFFERENT PROPOSED MODELS

7. UKERC is researching a model of PCA which would cover all the direct energy used by individuals within their household and for personal travel. This would account for around half of the carbon emissions from energy use in the UK (where international air travel is included, and a multiplying factor used to calculate carbon equivalent emissions). Every time a person paid an energy bill, filled up the car with petrol or bought a flight, they would have to surrender carbon “credits” from their account, or pay the additional cost of buying carbon credits at the market price. The PCA scheme does not include the other half of emissions within the economy, which are generated by organisations. Clearly there would need to be a parallel carbon capping and reduction system for the other half of the economy.

8. PCA includes more emissions in the personal allowance than DTQ (domestic tradable quotas, the other major variation on personal carbon trading). In particular DTQ does not propose to include air travel or public transport. Apart from this difference in boundaries, the two schemes are very similar in their principles and details of how individuals would be involved. Air travel is included in PCA for the same reason as other personal travel: individuals can choose whether, how often and how far they fly, and they should bear the carbon responsibility of their choices. In practice, because air travel is predominantly used by richer people, including air travel within a PCA adds makes the policy more progressive. By counting air travel, there is a greater difference between poorer groups, with on average lower emissions, and richer groups, with higher emissions (Fawcett 2005).

9. Although in principle PCA would include emissions from public transport, there are practical reasons for excluding public transport from the scheme, at least in the early years of introduction. The key arguments for not including public transport initially are:

- surface public transport comprises only a small percentage of individuals’ total emissions;
- inclusion of public transport could easily double or treble the total number of carbon credit transactions per year, while only affecting a small proportion of personal emissions;
- it reduces the need for costly infrastructure on public transport;
- it would provide additional motivation for individuals to switch away from private to public transport;
- it could put more onus on transport operators to reduce their fleet emissions (as the organisations would be responsible for all their operational emissions); and
- it is difficult to accurately calculate the emissions associated with an individual’s travel on different public transport modes due to fuel choices, occupancy and distance travelled (Bottrill 2006b).

10. The PCA scheme is based on the principle that all adults get an equal allowance of carbon. But what about children? There are essentially three options: children get no allowance, children get a partial allowance, or children get a full allowance. While there may be some arguments in principle about the rights of children, most of the concerns about children’s allowances are focussed on the social and distributional effects of allowance allocation. Preliminary research by UKERC, which has included a number of workshops with teenagers, suggests that a partial allowance for children, which is allocated to their parents (as in the case of child benefit), would be the most socially acceptable option. However, much more research remains to be done on this topic. Further research is planned later in 2007.

11. The key characteristic of PCA is that it is a carbon capping and reduction policy mechanism which offers equity and certainty. It enforces a carbon cap and reduces it year-on-year. Voluntary initiatives would not do this and are not comparable with PCA. The policy which is usually suggested as an alternative to PCA would be increased carbon taxation on household and transport fuels. This takes the alternative approach of regulating by price instead of by quantity. UKERC has held a major debate about taxation versus capping and trading systems, both upstream and downstream (Keay-Bright and Fawcett 2005). Without re-running all the arguments for different policy options, the key arguments in favour of PCA include its effectiveness, equity, distributional impacts and certainty of delivering savings. An alternative cap and trading policy covering household energy use would be a carbon cap at energy supplier level, based on their number of customers. This is being discussed as the possible successor to the current Energy Efficiency Commitment. Indeed, this idea was proposed by the Environmental Change Institute several years ago under the title “AUCH”—average utility carbon per household (Fawcett, Lane et al 2000).

#### PUBLIC ACCEPTABILITY AND INVOLVEMENT

12. There has been little research into the public acceptability of PCA. A small number of focus groups was run in 2005 in order to explore people’s reactions to PCA in comparison with carbon taxation (Low 2005). The aim was to begin to determine whether, and in what circumstances, individual members of the public find the proposal acceptable. The three broad attitudes to PCA which emerged were a lack of

enthusiasm for either PCA or a carbon tax, a preference for a carbon tax over PCA and enthusiasm for PCA. The key factors affecting participants' attitudes to PCAs were their beliefs about the relative importance of the role of the state and the rights of the individual, and their opinions on the equity, practicality, environmental effectiveness and negative aspects of the PCAs scheme. This research revealed useful insights which should be further explored. However, public acceptability is not something which remains fixed over time, it is highly context specific. The way in which alternatives are presented to people will influence their responses. Future research needs to be sensitive to the complexities of the concept of "public acceptability" and how it can be measured or judged.

13. There has been practical demonstration of public support for the idea of PCA, in the form of a quickly growing network of "CRAGs"—Carbon Rationing Action Groups ([www.carbonrationing.org.uk](http://www.carbonrationing.org.uk)). The principles adopted by CRAGs are identical to those that inform PCA. The network was founded in early 2006, and now comprises 35 groups throughout the UK and beyond. There is also an increasing number of other community initiatives throughout the country which are promoting low carbon living. While these communities may not specifically support PCA as a mechanism, they demonstrate the broadening interest in taking action at a personal and community level to reduce carbon emissions.

14. As mentioned earlier, until much better carbon emissions profile data allied with demographic and social characteristics is available, it will be difficult to make substantial progress into which groups would win and lose under PCA (beyond the initial research already carried out).

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July 2007

*Witness: Dr Tina Fawcett, Senior Researcher, Environmental Change Institute, gave evidence.*

**Q182 Chairman:** Good morning. Welcome. Thank you for coming in. By way of introduction, would you like to tell us about the work you are doing at ECI and with the support of the UK Energy Research Centre on this topic.

**Dr Fawcett:** Over the past two and a half years in the UK Energy Research Centre we have followed essentially a general programme of research into various aspects of personal carbon allowances. We do not look at the industrial and commercial side, if you like, the full DTQ, we just focus on household energy use and personal transport, including

aviation. We have held a debate with various academics and other interested parties about taxation options, upstream cap and trade as opposed to personal carbon allowances. We held a wider debate at PSI in relation to how, if we introduce personal carbon allowances, it would affect various sectors of the economy and the effect it would have on healthcare and things like that. We have also done specific pieces of research. We have done, at the moment, still a fairly small amount of research on the issue of children versus adults and allowances and we are hoping to continue with that.

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We have done a bit of work on the inclusion of public transport in the early stages. We are currently finalising a report about the prospects of having a pilot study or having some sort of trials on personal carbon allowances: Is that a researchable question? What would we find out? We are also just continuing to put the idea forward and generate a debate about it.

**Q183 Chairman:** Clearly one of the merits of personal carbon trading is that it tends to be progressive in its effect on the public rather than regressive, which most green taxes are. On the other hand, various forms of carbon taxation are pretty simple to introduce compared with the inevitable complexity of a carbon trading scheme. How do you assess the relative merits of the alternatives?

**Dr Fawcett:** Obviously there is the effectiveness, there is the equity, there is transaction cost and you can look at those things. Then there is also the whole question of public and political acceptability and psychological effect of an allowance as opposed to a tax. They have been debated under all those different headings. One of the arguments between people who want to have a personal allowance and a cap is that then you have a strong cap which tells you how much the population as a whole is going to emit per year and you are going to meet that target every year, whereas with a tax you may not get the level of taxation quite right and that varies somewhat. Some people would say that is not that important, because you can move the tax around to make a bit more savings in the following year, but one of the arguments in favour of a personal carbon allowance is the certainty of the level of carbon emissions you are getting from that sector of the economy. The equity question about who is affected is very complicated. We do not have enough information at the moment to know all the answers to that. There was some initial work done by Paul Ekins and Simon Dresner—and Paul is talking to you later—which looked at the effects of personal carbon allowances and taxation on different income groups within the population and they showed that personal carbon allowances would be more progressive. In that the poorest people would be worse off than under a taxation system, even with recycling of money towards the disadvantaged, but that some people will still lose out under personal carbon allowance, some of the poorer people. But their research was necessarily based on using proxy data and did not include international air travel or any air travel because that data was not available. So, on those sorts of evidential questions of what the effect is going to be, we need some proper research. To answer the question properly, we need more data.

**Q184 Colin Challen:** You have already touched a little bit on the variance of the much talked about TEQs, DTQs, PCAs or whatever that the Environmental Change Institute is looking at. I am wondering how that will “interface”—a dreadful word—with organisations, commercial sector businesses and so on. Do you envisage that at some point the consumer becomes the only person who

needs to trade in carbon, as it were? If you have all the embedded carbon revealed, then you could start excluding other sectors inside it one by one. Obviously that would be quite a long process and there would be quite a lot of work to be done there, but would that be your ultimate goal?

**Dr Fawcett:** No, I do not think you would. A possible way of going down that route is that you try to get the embedded carbon listed on every single product. Certainly a lot of the supermarkets are starting to look into this issue at the moment. For example, Walkers have a carbon label on their crisp packets and so on. In terms of practicality, that is a very long and difficult road, if you can even do it. I would see personal carbon allowance just being about direct energy use by individuals, and clearly we have to have a parallel system, DTQs or whatever, on the other side of the economy to reduce emissions from organisations and businesses at the same time. It just so happens we are focusing our research on the personal half of the equation because, in a sense, our research background is household energy use and personal transport. That is the scheme we are looking into, but we recognise there has to be a parallel scheme for the other side of the economy.

**Q185 Colin Challen:** How would this fit in with, say, the European ETS, where you are dealing with the same commodity, if you like, or the same unit of energy, it depends where it is sold and where it is bought. How do you avoid double counting?

**Dr Fawcett:** At the moment, if you were to bring in personal carbon allowances, there would be an element of double counting because electricity use is included under EU ETS. In personal transport, obviously aviation is not included, and gas supply is not included. So you would have a small amount of double counting at the moment. I am not entirely clear in my own mind how important that is. I certainly do not think it should be a barrier to us trying to further develop the idea of personal carbon allowances, particularly as we know EU ETS, although it might have a great deal of potential, is not actually effective in reducing carbon emissions at the moment. I recognise it is an issue. I do not think it is a reason to say this idea cannot go forward.

**Q186 Colin Challen:** It moves into the territory of where the price of carbon is set. We have seen a great deal of volatility in the European market for carbon, which we may not want to see. We certainly would not want to see that, I guess, in the personal market. There has to be a relationship between the credits in both markets for it to work effectively.

**Dr Fawcett:** That is right. The strength of researching DTQs is one thing, because you are very clear that across the whole economy there would be one price of carbon. I must admit it is not something on which we have done a lot of research. We have tried more to focus on the effect of PCAs on householders and the businesses that provide them with energy services. I cannot give you a good answer at the moment about how you would integrate the two market prices but, you are right,

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you would not want two very different carbon markets operating, because that would give you a lot of unnecessary complication.

**Q187 Jo Swinson:** You have mentioned public transport. In your memorandum you said that it should be included but there were a lot of difficulties in doing so at the initial stages of the scheme. Can you envisage public transport being included as a feasible component of the scheme? If so, when?

**Dr Fawcett:** Yes, I think we could. We would say, for simplicity, that you might leave it out initially, simply because it massively increases the number of transactions. If you have to have some sort of transaction each time you get on a bus, that is a lot more complicated. Most people pay for their energy use monthly and perhaps fill up their car once a week or whatever, so it is a very small number of transactions, essentially, that you have to manage in one system. Obviously in London now things have gone electronic, with the Oyster card and so on, so clearly there is a capability for having sophisticated systems on buses. We have just gone thorough chip-and-pin going into the tiniest retailers, so it is possible to roll out these technologies to a local level. I would imagine, if you wanted to start to include public transport, that it is going to be easiest to start with long-distance rail travel, the higher carbon trips essentially, and gradually move it down to small, local, low carbon trips. You may decide, in the end, that those are 1% of people's personal carbon emissions and frankly it is just not worth the cost of trying to include those in the scheme.

**Q188 Jo Swinson:** Could the problem be got around by involving the bus and rail companies in the scheme, so that the cost of the carbon credit was effectively built into the price of the ticket and then the companies themselves have to purchase—

**Dr Fawcett:** If you imagine the whole economy-wide scheme and you are not including public transport within people's personal carbon allowance, then, somehow, those businesses which were running the buses or whatever would have to buy their carbon on the carbon market or be allocated it—however you run that side of the economy—so that, effectively, whatever price they are paying for carbon will trickle down to the customer. It is indirect carbon taxation, in a way, by the time it hits the passenger.

**Q189 Mr Caton:** We have already touched on how personal carbon trading schemes might interact with ETS. What about other policy initiatives, like the Renewables Obligation, Energy Efficiency Commitment, Life Change Levy. Could they fit with PCAs, or would we need to wipe the slate clean and rely on PCAs?

**Dr Fawcett:** We very much see PCAs as simply an umbrella policy within which all the other policies we already have and more would work. Our research background comes out of energy efficiency, particularly household energy use. We know that people have been using energy a lot more efficiently within their homes for the past 30 years and yet energy consumption has gone up—because there has

been no cap, because we have warmer homes, because we all have more tellies, because we live in smaller household groups. It is for all those reasons. It is not that energy efficiency cannot deliver some things, but without some form of cap on demand there are always going to be more energy services out there that you can buy. We became interested in the idea of a personal carbon allowance as a sort of capping scheme because we know about efficiency, which is a very powerful policy, that even it cannot deliver the savings that we need. It is not working. If you look particularly at personal transport or aviation, the situation is even worse in terms of massively increasing demand despite new technologies that are making things more efficient and low carbon fuels. We very much see this as the top level policy, beneath which you continue doing all the things you are doing now but more, because we are trying to move quickly to a lower carbon society and you need to give people and institutions and organisations every possible help to get there, to make it publicly acceptable. Unless you have policies supporting A++ efficiency-rated fridges in the shops, so people can buy the low carbon option, unless you have policies making cars the less favoured transport option and supporting public transport and low travel lifestyles, the personal carbon allowance policy is not going to work. It has to be within a landscape of policies that are helping the whole of society, infrastructure and individuals, move towards lower carbon options.

**Q190 Colin Challen:** The level of public acceptability for the scheme was introduced and might be measured by the number of people simply passive in the market who do not want to do anything with it. The system could, I take it, survive with quite a large degree of passivity, but at what point would that become damaging to the scheme?

**Dr Fawcett:** Do you mean if people did not trade.

**Q191 Colin Challen:** Did not pay attention to the scheme and just ignored it.

**Dr Fawcett:** The only people who could do that would be people who were below their allowance level. If you have gone above your allowance level, you are going to have to buy some additional carbon. To pay your energy bill you are going to need to buy some extra carbon, whoever sells it to you, whether it is an energy company, the bank or whatever.

**Q192 Colin Challen:** They would see that simply as a tax, would they not?

**Dr Fawcett:** Possibly they would. It is a charge reflecting the impact you are having on the environment. That is right. From what we know so far, under personal carbon allowances there are going to be more winners than losers. In other words, there are going to be quite a lot more people under allowance than there are going to be people over allowance. Particularly in transport, there are a lot of emissions concentrated in the top 10 or 20% of the population. The people who are doing the most travelling are responsible for a lot more emissions

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than the bottom 10% of the population. All those people who are under the emissions allowance—maybe it is 60% of the population, we do not know what that number is—have something they could sell, they have these spare allowances. Maybe some people are not bothered about that but most people are reasonably switched on about money and values, and this is, if you like, another kind of currency. Those people have a strong incentive to do something—to sell it, if it is easy for them, or to save it—and the people who are above allowance, if they want to continue with their high carbon lifestyles simply have to buy extra carbon—so they had better hope somebody is selling—otherwise they will not be allowed to fill up their car at the pump.

**Q193 Colin Challen:** Do you think there is a danger point, as it were, if most people tend to ignore it and dispute it as yet another cost and so on? In terms of the practical management of the scheme, are there any tipping points where you have to say, “Look it has not operated properly” where it was a bit complicated technically, perhaps, and you might just want to say, “We tried and we failed.”

**Dr Fawcett:** I suppose if it was brought in and people were really against it, you might have some campaign of civil disobedience or whatever. It might all fall apart but the same thing would be true of direct carbon taxation. That has been extremely politically unpopular and that is the main competitor idea to personal carbon allowances. This idea of society not going along with the process of getting to a lower carbon world means there is the danger that whichever policy mechanism you try to use people will reject it. One of our jobs is to help people understand that this is what we have to do as a society. However we get there, we have to make these big changes.

**Q194 Mark Lazarowicz:** Is there not a danger for example in terms of people wanting to fill up their cars and use up all their carbon allowances sampling the black market. £20 to the guy in the petrol station and you will top up without points taken on your carbon card. To avoid that kind of situation you will have to have a complicated system of controls and regulations to ensure that a black market does not develop by the side of the official market.

**Dr Fawcett:** Of course in any system you would expect to get a bit of fraud and people getting round the rules, however you do it. Controls on fossil fuels are fairly tight and very well known in the economy. The government statistics are about how many billion litres of oil are sold a year and which companies are doing what. The chances of a big black market emerging are very small because these are commodities that are extremely tightly controlled and there are very good information systems about them. I do not see that as a major problem. I do not see how a petrol company would get away with it.

**Mark Lazarowicz:** There is quite a problem in the agricultural sector, but I will leave it there.

**Q195 Jo Swinson:** Most of the proposals for personal carbon trading suggest an equal per capita allocation amongst adults but obviously there are different circumstances, those based in the country, the number of your house and you mentioned whether or not children are included as well. What do you think is the best way to do this? Do you think there is a case for varying the allocation or should it be equal for every adult?

**Dr Fawcett:** I think it should be equal for every adult. I do not see practically how you can do it any other way. It delivers equity in a certain way. It is one definition of equity that everybody gets the same. It is not the definition of equity that says everybody has to make the same changes to their lifestyle. Everybody getting the same allowance, even with trading, is not going to hit some people differently from others.<sup>2</sup> That is fairly inevitable. There might be some very minor exceptions with disabled people or people with particular medical conditions who have specific energy needs. I cannot see how on earth you would try to compensate people for all the different factors. From our initial research, we know that in a room like this we might have a factor of ten differences between us as individuals about what our personal allowances are. If you go round saying that a person who has ten times higher emissions than me is allowed a lot more because there are all these factors that are problematic for them, like they have a big house and they live in the country or they simply have to drive 100 miles a day or whatever, how am I as a low emitter going to feel about that? Pretty irritated, I would think. There are more low emitters than there are high emitters. There are moral reasons for not varying the allowance, except perhaps in a small number of cases. The practical reasons completely dwarf the argument in principle, you simply could not run a system like that.

**Q196 Jo Swinson:** Do you think there is a danger that it exacerbates the problem of fuel poverty in that those that are already being hit hardest have more of a difficult time?

**Dr Fawcett:** Until we do a proper national survey of personal carbon allowances that takes a sample of several thousand and looks at their social, demographic and housing and travel needs, we will not know the proper answer to that question. We need that kind of serious research into what are people’s carbon emission profiles and who are those people before we can answer that with proper confidence. What we do know is that lower income people on average have lower carbon emissions than higher income people, largely because of travel patterns. They do not travel as much and they certainly do not fly as much. Their household emissions per capita may not be lower because they may be living in smaller household groups, generally speaking. They have less good infrastructure. There are various reasons. In general you would expect most poorer people to be better off but not everybody will be. People in fuel poverty are a

<sup>2</sup> *Note by Witness:* The witness meant to say that “Everybody getting the same allowance, is going to hit some people differently from others”.

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particular group. Not all of them are the same people who are in poverty, but there is a fair degree of overlap. Clearly, fuel poverty is still an important problem in this country, given that some of it is dealt with through income compensation, giving these additional allowances to people which could be like giving extra personal carbon allowances, but there are also things like the Warm Homes Scheme,<sup>3</sup> which is improving infrastructure for people's houses which has to be the way to go long term because it enables people to live using less energy and less carbon.

**Q197 Jo Swinson:** You mentioned you had started doing a little bit of research about whether or not to include children in the scheme. Could you touch on the findings so far?

**Dr Fawcett:** Essentially with children and adults there are three options. You can either give children no allowance and you might give adults some additional payment or you might not to try and compensate them for the additional carbon cost for their children. You could give children a partial allowance or you could give them a full allowance. We do not have good enough data on how much but we do know that having a child in the house in general increases carbon emissions in household energy use and increases some of the personal travel patterns as well. Again, we do not have good enough data to say it by 23% for a child of this age or whatever. You can talk about children's rights and therefore whether they should have some allowance on that basis but the real thing most people look at is what are the distributional impacts. We know already that as a percentage there are more children in poverty than there are adults in poverty. The last thing you would want to do, in a scheme like this which is saying we are trying to be fair; we are trying to not disadvantage people who are already disadvantaged in society, is to say that children get no allowance. Too bad, parents; you just have to deal with it. The people who will be hit hardest by that are single parents, low income parents, anybody who has more than one child. That does not seem an equitable way of doing things. You could either not give children an allowance and compensate parents financially through the child benefit system or you could say, "Okay, we have done the research and we think a child on average adds 30% to a household carbon budget and therefore we are going to allocate those allowances to the children in the care of parents until they are 16 or 18." In our initial research, we have done some workshops with teenagers debating with them what they think. They pretty much went down the partial allowance route, having had a debate on all the different options. This is early stage research but that would be our feeling at the moment. That might be the way to try to do it. We feel it is more equitable and more clearly fits with the aims of the scheme.

**Q198 Mr Caton:** This also was an issue that we raised with Mr Prescott on the usefulness of pilot schemes. In your memorandum, you refer to the contribution of carbon rationing action groups to our understanding of how personal carbon trading could work. Many of our witnesses have argued that the information you can get from any type of voluntary scheme is very limited because inevitably it is unrepresentative of the wider population. How do you respond to that? Do you think it would be feasible or indeed desirable to run a mandatory pilot scheme?

**Dr Fawcett:** To answer the second question first, we do not think it would be feasible to run a mandatory pilot scheme. This piece of research that we are doing at the moment, partly funded by the Esme Fairburn Foundation, we started off with this optimistic view: what if we could run a mandatory pilot scheme? How would we do it? We have consulted very widely. We have people on our steering group including Richard Starkey and the Centre for Sustainable Energy in Bristol. We fairly quickly realised this was not a runner. We are not going to be able to have a mandatory pilot scheme. We know that. Nevertheless, is there value in trying to run some sort of pilot scheme? Over the past few months, we have held workshops and talked to a lot of other academics. Our contribution is going to be yes, it is worthwhile but it is a difficult research task and you are going to have to be quite careful about the way you interpret the results. What we want to do is involve people in running the best mock-up we can of personal carbon allowances for a year and to give the participants essentially a year's experience of living with a version of personal carbon allowances, find out what they do, monitor their attitudes, interview them, look at their before and after carbon emissions, talk to them about how the scheme went, what they felt about it, what worked well, what did not work; what was easy, what was difficult. Through their lived experience of trying to do it we can learn a lot more on quite a deep level about people's behaviours, responses, attitudes and what they do. There are all sorts of reasons why it is not the same as running a mandatory scheme. We are very well aware of that. Nevertheless, it seems to me it is a good way of getting some quiet important data on how people really feel and react to a version of the scheme. You can go far with asking people about attitudes in focus groups. You can try and do trading type exercises that Matt was talking about using Internet only. Those all give you part of the jigsaw but we think this kind of research trial gives you a chance to go into a lot more depth and gives people real experience, so that they really know what they are talking about when they tell you what they thought about it at the end. You find out what they have done and how they have reacted. You find out was this idea of personal carbon allowances psychologically important. Can it be more powerful than a tax? We can try and find that out because we can have people we would give a dummy carbon taxation scheme to or there is a different kind of research thread or whatever. We can try and get a lot further with the human side of what this scheme

<sup>3</sup> *Note by Witness:* The witness meant to refer to the Warm Front Scheme, not the Warm Home Scheme.

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would be, but we cannot answer all the questions through trials because they are not the same as the real thing. We know that.

**Q199 Colin Challen:** What is the next thing the government should do?

**Dr Fawcett:** Defra are currently setting out their research budget to do particular pieces of research on personal carbon allowances. Either through the Research Councils or through the government, there needs to be a lot more research effort going into this. At the moment in terms of full time people doing research on this subject in the UK, there are maybe three to five full time people equivalents. This is an idea that has had a relatively small amount of research on it. It has come very high up the policy agenda which is great but the questions people are asking are well in advance of what the researchers can answer at the moment. If we want proper answers to these questions, there is no substitute for getting the evidence. There are two key, fairly big bits of research that I think the government needs to do. First, we need a large scale survey on personal carbon emission profiles at the moment, some combination of the English house condition, energy survey and a passenger transport survey and include international air travel. If we get everything that we need to know about these people, then we can answer all these questions about distributional effects, who is emitting what, where and why; what are their opportunities for reduction. Even if you are not interested in personal carbon allowances, you need that research done to say anything about indirect taxation, extending the EU ETS. Whatever you want to do in terms of moving people towards lower carbon lifestyles, you need to know who is living what kind of carbon lifestyle at the moment and we just do not know. That is absolutely vital and it is a traditional, government type task: go out there and collect the data. You have the protocols in place.

It should not be vastly expensive or difficult to do; it just needs to be done. That is my number one task. The number two task—possibly this is for a Research Council rather than the government—is to do funding for these kinds of trial schemes into personal carbon allowances to start getting the in-depth information about people's psychology, behaviour, interactions with the scheme that we really need, and then continue with the smaller, individual bits of research. We also need to do the technology research, the economics research, the legal questions, the interfacing with the EU ETS. There is a broad sweep of research that needs to be done but I would highlight those two tasks as things that we really need to push forward. They are quite big tasks. They cannot be done just by the existing four or five of us who are active in this field. It needs more people and more expertise to come in.

**Q200 Colin Challen:** Are you aware if any other countries' research establishments, universities or whatever are looking at the suggestion of PCAs?

**Dr Fawcett:** There is a minor amount of work in a few other European countries. I went to a European energy conference this summer which runs every couple of years. I met many other researchers and held a session about this. I asked them what they were doing. There has been a small amount of work in France looking at transport aspects of PCAs. Finland are starting to look at a bit of research on this. There has been some research in Holland but that has not been made publicly available. It was done by consultants for the government. I am getting a PhD student coming over from Belgium to do some research with me, so it is just starting but they are looking to the UK to see what we have done. It is just starting to get going in some other European countries but we are way ahead, even though I have said our research effort has been relatively low.

**Chairman:** Thank you very much indeed.

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**Memorandum submitted by Professor Paul Ekins, Policy Studies Institute**

The two overarching questions asked by EAC about PCAs are:

1. Are they desirable?
2. Are they practical?

The questions will be briefly addressed in turn.

**DESIRABILITY**

Desirability depends, firstly, on what they are intended to achieve, and, secondly, on whether they can achieve this better than other instruments.

*What are PCAs intended to achieve?*

The main objectives for PCAs that have been put forward are:

1. To keep personal and household carbon emissions within, or reduce them to, a desirable target.
2. To increase individuals' and households' awareness of their contribution to climate change

If appropriately implemented, PCAs could certainly do both these things (and some elements of the "appropriately" will be addressed under Practicality). On the first objective, it may be noted that they will reduce personal and household emissions by the envisaged amount only if these emissions are capped and

households cannot buy permits from other schemes, such as CDMs or from the unregulated carbon offset market. There is considerable doubt about the extent of carbon emission reduction that comes from such other schemes.

That understood, my view is that PCAs are theoretically sound in themselves.

*Will PCAs achieve their objectives better than other instruments?*

This all depends on the design. PCAs have a number of potential theoretical advantages:

- They equalise the marginal cost of abatement across the covered sectors (they share this advantage with other economic instruments such as carbon taxes)
- They allow the emissions to be made by those who place the highest value on emitting, up to the level of their initial allocation (which may or may not be equal per capita). This is because no-one, however poor, is forced to sell their initial allocation.
- The initial distribution may be as “progressive” (ie go disproportionately to poorer people) as is socially desired. (It is often assumed that only an equal per capita distribution would be “fair” but in fact other models of fairness could be postulated, eg based on “perceived need”.)

These are potentially strong advantages, so that it is right that PCAs should be examined seriously. However, it may be noted that carbon taxes have some of these advantages too, except that they fix the price of carbon rather than the quantity (and there are good reasons for preferring this approach in the short term), and they might be more difficult to design not to be regressive. On the plus side, however, they are likely to be far more easily understood than PCAs and with proper communication (eg on people’s bills) they could also raise awareness about climate change. They is no reason therefore automatically to prefer PCAs to carbon taxes for the household sector, as is sometimes alleged<sup>1</sup>. Whether either instrument delivers on its objectives depends on the design. This leads to Practicality.

#### PRACTICALITY

It is a tautology to say that for PCAs to work they will need to be practical: politically (in order to be implemented) and technologically and institutionally (in order to work). Political practicality need not detain us here. At present, mitigating climate change is not politically practical, as witness the continually rising energy use and emissions in practically all countries. Such practicality may change. It is important that, if it does, the thinking has been done to implement instruments that are effective in such mitigation. PCAs (and carbon taxes) may be one such instrument.

Apart from politics, the practicality of PCAs depends on:

1. The technology and institutions through which they are implemented; and
2. The degree to which carbon as a new form of “money” is understood.

There is no doubt that PCAs could be implemented technologically and institutionally. In my view the best way to do this would be through the banking system with every eligible person given a carbon bank account with an associated debit card and cheque book, with allocations into the accounts on a monthly basis in advance and the usual systems against fraud that apply to normal bank accounts. Such a scheme would not be cheap to set up, but it would allow people to use their carbon money, as they consume fuel, in exactly the same way as they use normal money. Obviously arrangements would have to be thought through as to whether and how people could go into “debt” on their carbon accounts (eg when they are buying petrol on a credit/debit card), but these details do not need to be gone into here.

The great advantage of such a scheme would be, I believe, that it maximises the chances of PCAs being understood.

Other points raised by the EAC in its Inquiry Note, to be very briefly addressed here, but more fully explored in oral evidence if desired, are:

#### *Potential impact of PCAs*

Again, this very much depends on the scheme’s implementation. If it is to reduce emissions from the household sector by 60% by 2050, and if permits cannot be bought in from outside, PCAs will come severely to constrain the degree to which household can consume fossil fuels, both in their homes and their cars, and in any other area that is included in the scheme (eg perhaps aviation). This will provide a powerful incentive for low-carbon and energy-efficiency and conservation technologies to be developed and implemented. To the extent that these technologies turn out to be cheaper than fossil fuels (and no-one can predict the price of oil even in 2010 let alone 2050), households, business and the wider economy will benefit; to the extent that they are more expensive, the reverse. It may be expected that low-carbon technologies will get cheaper as they are implemented (because they are relatively immature), while the price of oil and gas will rise as they are depleted. That means that early action may be difficult, but that bold policy now may be rewarded later

<sup>1</sup> Eg the study carried out for DEFRA in 2006 by the Centre for Sustainable Energy.



on in narrowly UK terms (this is not the same argument as Stern was making, that the reduction of climate damages warranted early strong action globally). The other main determinant of the impact will be the initial distribution of PCAs. It is often assumed that this would be on an equal per capita basis, but as noted above, this need not be the case, and will be one of the most hotly contested elements of any proposed scheme.

#### *Operational feasibility*

As noted above, it is my view that PCAs could be made perfectly operational through the banking system.

#### *Different models*

PCAs are normally taken to refer to individual and household emissions (from household energy and private car use), rather than those from business. The exception is aviation. Potential complications are that electricity is, and aviation soon will be, in the EU ETS. It is not clear that it is desirable to have the same emissions in two different schemes (for example, electricity saving by households could release permits for sale by generators, though it would also reduce their profits), but it could not, as suggested by the Centre for Sustainable Energy in its study for DEFRA, lead to a rise in the overall emissions from the two schemes, as it will not have affected either cap. It could, however, reduce the abatement action required in the scheme that did not reduce its own emissions, because some of its emissions will have been reduced by the actions of others. This would reduce the price of permits in the second scheme, because they will have been made relatively more abundant.

The allocation of permits is a political decision. However it is done, it will be hotly contested, as noted above.

A voluntary scheme would be unlikely to be effective in terms of emissions reduction and would not justify the trouble of putting PCAs in place. A rewards-based scheme would have to be paid for by taxes elsewhere and it is not clear that it would be preferable to the current Energy Efficiency Commitment (which also rewards those who get involved at the expense of others), and again would be unlikely to justify the cost of setting up a PCA scheme.

#### *Public acceptability*

At present no scheme of significant carbon reduction is publicly acceptable. Whether PCAs are more likely to be acceptable than carbon taxes (for the same level of carbon reduction) is a moot point, and both instruments have (different) relative advantages (and, in my view, one or the other will certainly need to be introduced if household emissions are to be substantially reduced). Were a PCA scheme to be introduced, one may anticipate that the usual forward etc. markets would soon come into being, as well as the kind of fraudulent practices that exist in all money markets. There would have to be a substantial public education effort undertaken before PCAs were introduced, to ensure that people understood both the similarities and differences between PCAs and normal money (eg the latter only relates to energy, it appears in accounts automatically without needing to be earned etc). There seems to be no reason why people should not be able to learn these differences quite quickly.

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*Witness:* **Professor Paul Ekins** gave evidence.

**Q201 Chairman:** Good morning and welcome back. What potential do you think there is for personal carbon trading?

**Professor Ekins:** It depends what you mean by “potential”. Clearly in theory it can limit the carbon emissions from the household sector in those areas of activity for which it is defined. We have some experience now with cap and trade systems. This is a cap and trade system for that particular sector in the personal carbon allowance sense of the term rather than the DGQ<sup>4</sup> one. Therefore, the theoretical potential is established. There is the feasibility potential about whether you could do it and that seems to me also to be well established. It is clearly something we could do if we wanted to. The interesting question which you have already been

exploring in some detail is: is it a formulation of the problem that the public would be likely to accept? Might there be other, better ways of trying to achieve the same objectives?

**Q202 Chairman:** I guess most, if not all, of us on this Committee think that the issue of reducing emissions is far more urgent than any of the current policy instruments is anywhere near achieving. We are facing a global crisis of momentous proportions and therefore urgent progress in cutting emissions is the overriding need. Comparing PCT with much higher green taxation, where are the merits in the short term? Which is going to be likely to be most effective?

**Professor Ekins:** I do not think either of them are politically acceptable at the moment. It is not politically acceptable to impose policies that will

<sup>4</sup> *Note by Witness:* The witness meant to refer to DTQ, not DGQ.

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cause people to reduce their emissions. That is the baseline where we unfortunately are. With you, Chairman, I agree that that is not where I would like to be. I would like to be somewhere else. We know that environmental taxes are not popular. On the other hand, carbon allowances are rationing and it would not be long before it was being referred to in the popular press as rationing carbon and therefore energy use. I suspect that is not likely to be popular either. Once it starts being talked about in those terms, especially politically, if it is tied to the very large, redistributive effects that equal per capita allowances of carbon emissions would entail. You introduce the concept of rationing. Everyone looks back with horror at the experience of the Second World War and says, "Oh dear, back there". You also introduce very large redistribution from those people engaged in activities that are iconic activities of our time, driving cars and flying round in aeroplanes et cetera. I suspect you have a political problem. I am not a politician but it looks to me as if you probably have.

**Q203 Chairman:** We would love to have your help because we are politicians. Is there any way of making either of these alternatives remotely popular?

**Professor Ekins:** The message that to me has never been properly marketed, if we are looking at the two instruments of taxation and personal carbon allowances, is that if one was to charge very much more through taxation for environmental goods one would be able to reduce taxes elsewhere. That connection has never been properly made in the political discourse. We have had large scale increases in environmental taxes in the past, most notably during the nineties with the fuel duty escalator, which undoubtedly fiscally enabled some of the income tax reductions which we saw during that period if one looks at the numbers, but the connection was never made politically. The income tax reductions were presented as give aways from a generous Chancellor, whereas the fuel duty escalator was perceived as a stealth tax from an ungenerous Chancellor. The connection between the two in the fiscal system was never made. It may be, and I hope that might be one way of making this shift in relative prices much more attractive. The benefit of the personal carbon allowance approach and indeed of all trading approaches in the long term—I draw a distinction between short term and long term—is that it does enable you to get a pretty clear handle on the quantities. In the long term it is clearly the quantities that are important. I am enough of a brainwashed economist to believe that if you raise the price by a significant amount you will in fact reduce the quantity. We know what elasticities have been in the past when prices have gone up. They are often said to be very low but in fact they are not that low. They might be between 0.3 and 0.5 on a long term basis, which would result in very significant energy and carbon demand reductions if you were to increase energy prices significantly. You could probably increase those elasticities through information, through awareness and through

generally instilling in the public a will to reduce carbon emissions. Unless one manages to instil in the public a will to reduce carbon emissions, one is not going to get personal carbon allowances through politically either. That seems to me to be a *sine qua non* of creating that discourse whereby not just you, me and the other Members of this Committee and probably most of the people sitting behind me think it is essential to reduce carbon emissions, but that becomes an absolutely clear public objective among people at large. I think we have made progress in the 10 or 15 years that I have been working intensively on this issue, but it is nothing like as much progress as the science has made showing that global warming will overwhelm us if we do not do things on a much faster timescale. That is the challenge.

**Q204 Mr Caton:** Would there be any problem in fitting personal carbon trading into the wider environmental policy landscape? In particular I am thinking of the EU ETS.

**Professor Ekins:** There are two possibilities. You could design it so that it did not overlap at all with the EU ETS. In other words, you only designate those emissions to come under the PCA rubric that were not in the EU ETS. That is interesting because, as you know, there are talks about bringing road transport for example in the EU ETS. As far as I am aware, we have not had detailed proposals as to how that might work. It is clear to me that it would have to work rather differently from the current EU ETS unless you were simply to give all the allowances to the oil companies. At the moment in the EU ETS, you give the allowances to large enterprises, large businesses. Road transport is not generally carried out by large businesses, certainly not in the personal sector. You would have to find some other way of distributing the allowances. As far as I am aware that has not been properly investigated. I guess this is most likely to arise now with personal carbon allowances if and when aviation goes into the EU ETS, because many of the proposals for personal carbon allowances suggest that aviation should be included in the personal carbon allowances. In principle, it does not seem to me that there is a problem if there is overlap. I do not at all agree with the analysis in the document done by the Centre for Sustainable Energy which suggested that there might be an increase in emissions because in any cap and trade scheme the total number of emissions is set by the cap. If you do not change the cap, you will not change the total number of emissions. If under the personal carbon allowances aviation was included there and in the EU ETS and people reduced their aviation because that was the way the cap was going, what effectively that would mean would be to loosen the cap in the other sector, but you would still have the same number of emission permits. That would reduce the price in the other sector. It would take the pressure off the price because effectively you would have had reductions there that had not been done in that sector. I am not sure that that is a problem, though obviously you would need to account for it

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carefully and make sure that each sector's emissions were being reduced in the terms in which they were accounted.

**Q205 Colin Challen:** We would all probably agree that it would be best to have a very steep curve in the reduction of emissions. Using this scheme or perhaps other mechanisms for achieving that, do you think we would have the capacity to change our behaviour? We have our systems geared up to a high carbon consumption rate. How fast do you think we could get that cap introduced, reducing steeply our emissions?

**Professor Ekins:** In terms of personal lifestyles, the potential is very great. Some people live rather low carbon lifestyles at the moment without being obviously disadvantaged. For fun, I did my own personal carbon lifestyle on the recent government calculator that has been released. My emissions are about 30% of the per capita average across this, according to this and according to the graphs that I was shown. It leaves a certain amount to be desired in the transparency and knowledge of how these graphs are being constructed but I am not normally regarded as a particularly deprived person. I found it possible over a number of years to reduce my carbon emissions in an absolutely systematic and determined way, while still participating as a full member of society. I am sure lots of people could do that if they wished to but it obviously does have implications for the kind of life you lead. Most of the ways in which one does that are discretionary things that one can perfectly well learn to do without and still lead a full and participatory life in other ways. That sector of emissions is potentially very discretionary. Were people to be appraised and to feel the urgency of the situation, we could get large reductions from that sector relatively quickly, as undoubtedly we would have to if we went into something like a war situation. All sorts of things that people take for granted simply would not be possible. I am not sure how climate change could be presented in those lights, although I am quite certain the damage it will inflict in the long term will be fully equal to war time damage. It is not a totally inept analogy but clearly public perceptions of climate change are going to be very different to the kind of public perceptions of external threat that come about in war time. Part of the political discourse has to be to try to get across the seriousness of the situation without invoking analogies that can be shot down because they clearly do not recreate people's perceptions of these situations.

**Q206 Colin Challen:** To make anything like this work, surely we are going to have to go beyond the individual. We are going to have to look at the way society tells us we ought to lead our lives. When people like Mark Dirkin produced that programme, *The Great Global Warming Swindle*, he accused his detractors of being anti-globalist, anti-capitalist, anti-consumerist and that is the real agenda. If you take the possibility that that is the real agenda, for a lot of people who want to buy their BMW 7 series and live preferably a bit higher than on the flood

plain in a detached house with a good garden, it is a very intuitive thing to get across. Would we have to introduce parallel legislation to control what the marketing industry feeds us every day in terms of the message? It is going to be very difficult for people to make individual choices, as many people in this room have done very laudably, when out there this great torrent of information is coming at them every day which tells them that it is okay to buy a Lexus.

**Professor Ekins:** There is a fundamental inconsistency in having a recognition of the need for a ration, which is what the PCA is, and a marketing industry that tells you to go on consuming more and more of those particular commodities that are particularly intensive in respect of that rationing. I throw it back to politicians in that it is unlikely that we will get political acceptance of the need for the rationing while the message from the very powerful marketing industry is that we can go on consuming more and more of all the things that would breach this rationing. If we want acceptance of the rationing, we will have to sort out something in terms of the consistency of the messages which people are getting so that at every moment when you are encouraged to emit more carbon, whether through patio heaters, plasma TVs or motor cars of a non-efficient kind, you do get the message that this is going to hit the ration at some point in the future. We therefore need to weigh this up and balance it against reductions elsewhere.

**Q207 Colin Challen:** Would it need a statutory code, as has been suggested with advertising fatty foods to children or whatever?

**Professor Ekins:** It seems to me that the climate change issue is every bit as important as the nutritional issue. Therefore, yes, information, persuasion and understanding of what is at stake are absolutely critical. Part of the problem is that we have heard quite a lot over the last few years about climate change being just about the most important issue on the domestic agenda from scientists and politicians without anything resembling the policy mechanisms being put in place or developed that would cause people to believe that. Until we start having a very great range of policy mechanisms put in place so that people can say, "They really do look as if they are serious about this," they may reject it. The political danger is that the people who put those policy mechanisms in place will not win the support of the people. That is clearly a problem in a democratic context. At the moment I do not think people believe the politicians who say that this is the greatest threat facing us. They look at things that politicians clearly do take seriously like terrorism and obesity and they see a whole raft of policy instruments being wheeled out that do impact quite significantly on people's lifestyles and convenience and they say, "We know when politicians and government take this kind of stuff seriously. They do this sort of thing" and then they believe it.

**Q208 Jo Swinson:** Turning to the issue of how you would divvy up the allowances, we have heard already this morning the case for an equal per capita

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basis but your memorandum suggests that it does not need to be that way. Given the complexities involved, what would you propose would be an alternative model that would be workable and also perceived to be fair?

**Professor Ekins:** No one model is going to be perceived by everybody to be fair. Fairness is something that is fought out in the political process day by day. This will have to be too. The EU ETS is interesting because that was allocated not on the basis of equal per capita, whatever that might mean in company—you could have given it on the basis of turnover for example—but effectively on the basis of historical use, which is grandfathering on historical use, and that would be another way of doing it with perhaps some version of the contraction and convergence principle such that those people who were using most would be expected to reduce most quickly, so that one came down and narrowed the differences between various uses. Another option would be to give what you might describe as a basic allowance to everybody free which might cover 60% of emissions from the sector. Then you might want to sell the rest. That would be a kind of hybrid between what is being proposed for the EU ETS, in that you auction some proportion of the emission allowances, and that would become a kind of hybrid between a tax and an allowance scheme which would raise revenue which would allow other taxes to be reduced or you could spend in other ways. There are lots of possibilities for this allocation mechanism and I suspect the equal per capita one is unlikely to help its political acceptability. Quite a lot of people, as soon as they realise what equal per capita emissions meant in terms of redistribution and reallocation, would demand that while they might accept that that was a possible, long term objective, they would certainly demand an adjustment and a transition period. One would have to think quite carefully about the whole trajectory of allocation of these allowances.

**Q209 Mark Lazarowicz:** Surely there is the danger that the more complicated we become the more politics comes into it to decide what is equitable, in terms of how you make the adjustments to the per capita allocation and then you take away from the whole attractiveness of the scheme as being one which has a long term consistency taken away from the approach. My Liberal Democrat friend here will no doubt want to have higher allowances to allow people to fly to the Highlands and Islands of Scotland more easily. Other people will want to do something for health and all the rest of it. The more you allow that kind of variability, are you not going to detract from the simplicity behind the concept of a PCA?

**Professor Ekins:** Yes, one is. On the other hand, the whole purpose of doing it would be to make it more politically acceptable, just as taxation is often regarded as politically unacceptable unless it is related to ability to pay. This concept of equal burden of adjustment as opposed to equal allowance is one that has a certain currency. It certainly has a currency in trading schemes. It is the way in which

for example the Kyoto Protocol was divided up among the nations of the European Union and the reductions there, on the basis of how easy the countries thought it was going to be for them to meet the overall target that Europe was allocated in that process. Because I am not in favour of lengthy bureaucratic processes by and large, I certainly would not be wanting to argue for particular exemptions on the grounds of particular kinds of travel. The point Dr Fawcett made about the possibility that there may be some medical conditions that could, on a doctor's prescription, get you an extra allowance might have some weight, because otherwise you will certainly get very high profile opposition to a scheme from people who by and large are very good at generating column inches in the tabloids about unfairnesses to do with people with certain medical conditions who are not given special dispensation. I would certainly want to keep those to a minimum. It would seem to me that some scheme that combined a basic allowance for everybody with certain well thought out, broad distinctions such as perhaps based on medical conditions, perhaps even based on age given that very often older people are less mobile, spend more time at home and need and use more energy, where some extra part of that basic allowance gets allocated on that basis and then perhaps selling some portion of the rest. That would still be a very simple scheme compared to something like the Climate Change Levy that took armies of bureaucrats to negotiate these climate change agreements with very large numbers of energy intensive sectors. I like the simplicity of the idea but I do not think it is likely to be politically acceptable straight off like that.

**Q210 Jo Swinson:** On the politically acceptable point, the Energy Saving Trust has described personal carbon trading as overwhelmingly unpopular amongst people. You said earlier on that any form of significant carbon reduction is not likely to be popular but clearly we, as politicians, need to find a way of encouraging people to take that seriously. First of all, how confident are you that the public can be convinced? Secondly, what do we need to do to make that happen?

**Professor Ekins:** Looking at the evidence of the way in which social change has happened over the last 15 years, it is quite clear to me that the public can be convinced. We have moved a very long way down the track of people being aware of this issue and being vaguely perturbed about it. The problem is that the length of time that this trend if projected before we would do anything serious about reducing emissions is simply at variance with what the science is telling us. As you will know, a particular characteristic of the climate change issue is that there is no smoking gun. There is no single event that you can ever point to definitively and say, "That is the result of climate change. Therefore we must do something about it." There are people swimming about in the Midlands after an event which is the kind of event which, 15 years ago, we were told was likely to become more frequent and worse. It entirely fits with what the climate scientists were telling us

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was more likely. I cannot say, you cannot say, no one with any credibility can say that it is definitively because of climate change that these guys are swimming around in Tewkesbury. It is one of these probabilistic events that our political system finds it very difficult to deal with. We need to have a much more sophisticated discourse, I am afraid, than that television programme that Colin Challen referred to earlier.

**Q211 Mark Lazarowicz:** I think you were here for the question from Colin Challen about whether the public were engaged in a system of actively trading allowances and take advantage of the market. What are your views on that issue?

**Professor Ekins:** I think it depends on the extent to which the public understands what a really radical innovation it can be. One would be setting up I think for the first time in history a projected, second currency to run alongside the first currency. It is a very peculiar kind of currency because it is both a commodity, a thing that you can buy and sell, and it is a money, a means of exchange. We have moved away from money being a kind of commodity in anything except the most esoteric, financial markets so most people do not think of money as a commodity any more, although of course it used to be. We are reintroducing that idea in an absolutely explicit way. If people understood that carbon was money, they would take it very seriously. They would participate in any scheme that was set up. They would find that they would need carbon bank accounts. In my memo, I suggest I cannot envisage how you would implement the scheme except through a whole parallel bank accounting system in which all adults had their account and carbon fell into their account monthly or whatever and they had their smart cards and they could use it in the same kind of way that they use any other kind of money. As soon as people recognise that that is what it is all about, they would participate in it. They need not necessarily understand it any more than most people understand the financial system at the moment which is not very much if the survey evidence that I have come across is anything to go by. The challenge will be to really connect that very abstract, transactional environment which will resemble the money environment with people's energy use and perceptions of energy use and a recognition that, when they turn the central heating up, that will mean that this parallel money as well as their normal money is going to be hit. The big difference about the parallel money is that it is rationed. There is a fixed amount out there in the nation and they will need to buy in a market that is fixed. That is quite a different kind of market to the one people are used to.

**Q212 Mark Lazarowicz:** You are right to say that it is radical and probably arguably revolutionary. It is not only a second currency; it is also one that wipes out the savings in relation to that particular part of the market covered by the scheme because you would not be able to rely upon your savings to buy your travel. You would have to rely on your allocations of carbon allowances.

**Professor Ekins:** You would be able to rely on your savings provided your savings were large enough to purchase carbon allowances from somebody else. The difference would be that that total fixed number of carbon allowances, especially if we are going out to 2030 and one can see that one is on a declining trajectory by 35 or 40% on the carbon emission reductions envisaged in the Climate Change Bill by that date, one would be talking about very large sums of money needing to change hands in order to buy discretionary carbon allowances. This would be a serious commodity and would require a revolution in the way that we view these activities. I am a little doubtful that that kind of revolution and perception will happen very fast in the absence of some really fundamental event that causes us to re-evaluate this issue.

**Q213 Mark Lazarowicz:** You are assuming people would not turn down free carbon allowances but there have been plenty of examples where members of the public do not appear to take advantage of free money. For example, there are areas to do with energy efficiency where we all know people do not make rational choices in terms of insulating lofts and so on when it would save energy. We have the example of the Child Trust Fund where a substantial number of people do not take any active steps to try and get hold of free money. Can we really be sure that we would have sufficient liquidity in the market?

**Professor Ekins:** The key is, firstly, information and, secondly, public perception. There are different reasons why people do not take up energy efficiency options, partly due to transaction costs, hassle factors, all those other things that people like the Environmental Change Institute have written lots about and so have many other people. People have to do quite a lot. As soon as you go into your house and think, "What do I have to do to take advantage of all these free energy efficiency options?" it immediately gets extremely boring and rather tedious. You have to make lots of telephone calls to people you do not really trust. They come and wander about your house and suggest to you all sorts of things which you think will not make it look very nice. There are serious problems in that sector. On the non-take up of benefits, I believe that there is still a stigma factor which people have worked hard to try to overcome. There are some people, perhaps quite laudably, who feel they do not want to take advantage of benefits. This scheme will be different in the sense that you would have a bank account. There are not many people who have a bank account who do not draw on it. Under this kind of scheme, you would have to have a bank account. People would have to have a carbon allowance bank account which received these things on a regular basis. They would be sent statements about how much they had. I do not think there is any evidence that people who have bank accounts do not draw on them. That is the correct analogy. If people understood that this was money and they knew that they had an account in which this money resided, they would spend that money on a regular basis as they consumed energy and as they emitted carbon;

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but they would know if they had money at the end of the year they would know that they could sell it. There would be any number of brokers, marketers, people sending them flyers and e-mails saying, "If you have carbon, come to us. We will reduce the transaction costs. We will offer you however much real money you want." There might even be a problem that people would participate too freely in the carbon market to start with. They might sell all their allowance because they did not really know what it meant. They would then find that they have to buy further allowance back at a later date when they started consuming and they recognised that they needed this secondary kind of money in order to cover their energy consumption. I think people would cope with that after a while but the introduction of the scheme would have to be very carefully prepared and people would really need to understand what was going on which is why I am a little sceptical about the value of a pilot. I do not think that with something as fundamental as people's perceptions of money—and that is what we are talking about—there is any substitute for the real thing. We know in many instances when people are asked hypothetical questions about money it is quite different to what happens when the real thing comes along and it affects their behaviour in an absolutely concrete way.

**Q214 Mark Lazarowicz:** It is money but it is not money as we know it. Are you confident that we can operate a system of personal carbon allowances through the banking system? There have been examples where IT systems have not always worked quite as wonderfully as they ought to have.

**Professor Ekins:** I am not confident because I am not an expert in this. We have a very sophisticated banking system which seems to work. To me, this scheme would probably be best operated through that banking system. I do not see that the kinds of transactions people would be making through their carbon accounts would be far less frequent and far less complicated<sup>5</sup> than the kinds of transactions that they make through their normal money accounts. I would be very confident that the banking system could handle it. Some of those who are doing detailed work on this issue might be coming up with other schemes which they think could work even better. I do not know about those. When I look at the way in which the banking system works and the way in which it enables people to engage in this very wide range of transactions in hugely different contexts, in many different ways, from cash to cheques, to Internet trading, to electronic accounts, to credit cards, to debit cards, I think some adaptation of some small subset of those possibilities would enable a carbon market to work pretty well.

<sup>5</sup> *Note by Witness:* The witness meant to say he did not think the kinds of transactions people would make through carbon accounts would be far **more** frequent and far more complicated than the kinds of transactions they made through their normal money accounts.

**Q215 Joan Walley:** Can I press you a little more on what you said about pilot schemes? You said that you did not see much point at this stage in pilot schemes because you would be dealing with not having real money or it would all be not properly worked out. Is there anything else that we should be doing in preparation for getting some kind of public readiness to accept this kind of a proposal? Do you rule out pilot schemes completely?

**Professor Ekins:** What I am sceptical about is that a pilot scheme would tell you very much about how such a scheme would work in the real world when it was for real. Quite apart from anything else, anyone engaging in a pilot scheme would know it was going to finish in 12 months. All the strategies and perceptions they might have would have this very time limited character whereas obviously, if a PCA scheme were to be introduced, it would be for real and for ever. Just as no one suggested having a pilot scheme for decimalisation that I remember and I do not think any country had a pilot scheme for the introduction of the euro, they just had to set it up, prepare it really carefully, ensure that people really understood what was involved. Of course you did get your glitches in the transitions with people being fraudulent and all that kind of stuff. One would just have to try to prepare against that. That seems to me to be the correct analogy of the sort of thing that is being introduced. If however you wanted to play games in schools in order to get across the idea that energy is linked to carbon and carbon will need to be rationed and this is a game in schools which kind of enables you to do that, you might link that in some way to carbon calculators. I think carbon calculators are a very interesting innovation. They are interesting as an educational tool, trying to make palpable and real to people this very abstract idea that energy contains this stuff, when we use it, of carbon dioxide which we cannot smell or see and it is changing the climate. This is pretty difficult stuff for people to grasp in their every day life. You do not find very often any more people thinking it but I remember 10 or 15 years ago members of this August House who did not know that climate change was not the result of depletion of stratospheric ozone. These are difficult issues to get across. There may be all sorts of ways in public education processes that would help. That is fine. You can call those pilots and I would entirely think that they could be very useful because clearly there is lots of public education that is required in the field. I am doubtful as to how much useful information they would give about how such a scheme would work in practice.

**Q216 Joan Walley:** Presumably the difficulty is how do we bridge that gap and prepare a public who are not ready to understand the issue and the urgency of it, who are not as informed as they could be even despite the floods that we have just had over the last few days, where we do not have as much education for sustainability in schools being taught and at every professional level? How do we get people to prepare to be ready with some kind of readiness to accept this when it comes in? If pilot schemes are out, are you saying that we should be relying upon

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academic work behind the scenes in preparation for when there would be some public acceptability that doing nothing is not an option? It has to be done quickly.

**Professor Ekins:** The kind of work that Tina Fawcett was talking about, about trying to understand better the distribution implications, is very important. The work that Simon Dresdner and I did on the distributional consumption of energy, the data is rotten. It is very poor indeed and I think we will need to get a handle on what the detailed distributional impacts of these different allocation mechanisms are likely to be. That seems to me to be a very important area where we need to understand it but again we need to understand that for all sorts of reasons, not just because of PCAs. We need to understand that because if we were serious about climate change in the domestic sector we would already have a complete characterisation for domestic housing stock. We would already know through a GIS system what every single house was in terms of its U value and the kinds of energy efficiency measures that you could put in place in order to bring it up to scratch. Then we would have proper incentives to get people to do that. In a sense, we need to do all that stuff just to show that we are serious about the issue and for people to perceive that politicians are serious about the issue. It is very damaging when what to me is an extremely important innovation—the home information pack, which would start to give people detailed information about the carbon performance of their building—fell apart because we could not train 3,000 or 4,000 people in time. When that sort of thing happens, it is not surprising that the public thinks, “These guys do not take this issue seriously” because they would have ensured that we have enough surveyors out there in time, given that this Directive has not exactly been sprung on us. This has been in preparation through the European Commission for at least ten years so this is not something that just hit us between the eyes without us knowing about it. Those are the kinds of things we need to do in order to raise the acceptance among the population that politicians of all parties—it will not be possible to vote for a party that says, “This issue does not matter” and that is not serious about putting in place policies that would cause people to believe that. Once we are there I think we are in a much better position to start having a sophisticated discussion about the kinds of policy instruments that we want, the balance between taxation, regulation and trading and all those other things which policy wallahs like me spend their lives thinking about. At the moment frankly, it is not something that most people are ready to engage with at that level because we are not even at the basic level of being able to characterise the issue.

**Q217 Joan Walley:** In the evidence that you have given to us, you are suggesting that there is not so far a political acceptable state of affairs where intervention of this kind is necessary. What is it going to take for a government to be in a situation where it would be able to go along with proposals of

this kind and take the population with it, without which it would not be in a position to do it in the first place?

**Professor Ekins:** If I knew a definitive answer to that question, I would be a very successful politician.

**Q218 Joan Walley:** You cannot just be an academic, can you?

**Professor Ekins:** I absolutely agree. Political acceptability is a dynamic phenomenon. It is something that can change quite quickly and things that would not have been politically acceptable become politically acceptable. Clearly it is the work of the whole climate change action community, of whom I am certainly one in an academic and research sense, to try to work for that. The Climate Change Bill is a very important political innovation because that will make it more difficult for politicians to opt out of the agenda altogether. I think it will mean that politicians, given these targets, if they do not like one set of policies for carbon reduction, they will have to put forward another set of policies for carbon reduction instead of just saying, “We do not like that.” That is potentially an important discipline. We might then start having a proper debate about the right tools for carbon reduction. At the moment if we look at aviation for example, there is practically no recognition in the mainstream political world that the rises in aviation that are currently being facilitated through government permissions are simply inconsistent with any sort of carbon target that we may be anticipating is likely to have purchase on the problem. For as long as that is the case, the public will not believe that politicians are serious. That is a very difficult place for politicians to be because, on the one hand, they say things that are so unpopular they get de-elected and, on the other hand, they do not say things and yet they have an important message that has to be articulated but they are not believed because they have not put in place the means to implement the necessary actions. We all have a role in trying to ameliorate the situation. There is still quite a lot of scope for adventurous political and policy activity which is not being taken and where we do need further leadership on all sides.

**Q219 Joan Walley:** In terms of the evidence that you have given, you have very much one foot in the academic world but obviously you interact with politicians or through the UN in different ways. I take what you say about it being the sum total of what we each do and what we each do acting together that really makes a difference. You talked just now about leadership. Just thinking about the academic community, is there more leadership that the academic community could be giving in order to be able to provide the information, the education, the research, to make it much more likely for there to be political action on this?

**Professor Ekins:** The academic community is in many parts. The natural scientific community over the last five years particularly has become far more vocal and perturbed about this issue, with all this

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talk of tipping points and potential catastrophe and this kind of stuff, which was ruled out as more or less not polite conversation back in the late eighties/early nineties. That aspect of the debate has changed and it has definitely had an impact on public perception. The academic policy community, of which obviously I am part, yes, we are driven as much as anybody by Research Council funding. The increase in Research Council funding for things like the UK Energy Research Centre which has a very large policy component enables us to do much more work and therefore we can come along and talk about it much more. We are able to be much more solidly grounded in the evidence base. That is very useful and helpful. The kind of work on behaviour change that has been funded and is going on has so far been very inconclusive, which is not terribly surprising to me because this is a really difficult systemic problem about not knowing where to push a system and what is going to happen at the other end. I am doubtful that we will ever get any magic bullets on that and I suspect that quite a lot of that will come about through the suck it and see actions of politicians. You are the group of people whose profession is to feel where public opinion is in certain ways and be able to articulate things in ways that will send the public off to where you perceive to be a good direction. When all the major political parties feel that this is a real priority and they do articulate it in those ways, I think we will make much more progress. That would be quite a different place to where we were five years ago with things like the fuel duty protests. The whole role of the fuel duty escalator in curbing car fuel demand and the environmental benefits of that almost went completely by default from practically all the parties, with some honourable exceptions. We are moving and we need to intensify and accelerate these processes by factors of ten or 100 if we are going to make the 15 year Stern window.

**Q220 Joan Walley:** You are not going to be doing impromptu seminars in Gloucester in the floods?

**Professor Ekins:** Perhaps. When the first question was asked: "Can you categorically say that these floods are due to climate change?" and the answer was very academically proper, "Well, on the one

hand, we were warning this 15 years ago and it would be a greater probability", you have lost people. That is a big difficulty and one that we have to get across because it will not do anyone any good if we start over-blowing the science and exaggerating where that is not justified.

**Q221 Chairman:** We are all at one in the recognition of the urgency of the problem and the challenge of introducing what will be quite controversial and unpopular solutions. You quite rightly in an earlier answer said that the tax system could be used much more effectively than it has been. We have not seen enough carrot alongside the stick and therefore people do not see the benefits. It would be fairly easy to have benefits for low carbon choices but we have not done that sufficiently. This Committee has been consistently recommending that we should have more carrot than stick. In terms of the possible pilot for a PCT system, I take entirely your points about artificial one year experiments. However flawed that is, would not one of the benefits be that those people, many of whom are poorer people who inevitably lead a lower carbon lifestyle, would see immediate financial benefit? Would not that be one way of trying to make this quite dramatic potential solution acceptable?

**Professor Ekins:** It would all depend how it was set up. I tend to be of the "no free lunch" school of thought. Therefore, if these people were to see a financial benefit, there would need to be a financial cost somewhere, unless the government were to subsidise it of course, unless the government were to say, "We will buy your carbon permits from you rather than someone else having to buy them" or whatever. You could introduce incentive schemes of that kind which might indeed have educational and political value. In those terms, I think a pilot could well be useful because it would enable people to get a bit of a handle on what is a very difficult and radical idea. What I do not think it would do is enable you to judge very much about how people would behave under those circumstances if this was for real. That is not to say that the other objectives might not be very worthwhile.

**Chairman:** Thank you very much indeed for a very interesting session.

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# Written evidence

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## Memorandum submitted by the Sustainable Development Commission

1. The SDC first raised the issue of personal carbon allowances in 2005, drawing on the important work done on this subject by David Fleming, Mayer Hillman, and the Tyndall Centre.<sup>1</sup> Since then, interest in the idea has grown considerably, and it is currently the subject of a new Defra-led study (see below), along with a two-year project led by the Royal Society for the Encouragement of Arts, Manufacture and Commerce (RSA)<sup>2</sup>. In addition, work continues at the Tyndall Centre<sup>3</sup> and the Environmental Change Institute.<sup>4</sup> A good description of the different forms of personal carbon allowances, and the possible costs and benefits of such an approach, was published by Defra in 2006.<sup>5</sup>

2. The SDC welcomes the UK Government's commitment to further explore personal carbon allowances as a long-term policy option, as set out in the 2007 Energy White Paper.<sup>6</sup> We also welcome the extensive programme of research that has recently been announced by Government, to be led by Defra. The SDC has been asked to contribute to this work as a member of the Project Board and we look forward to working with the Defra team to take forward this important area of work.

3. On climate change, we strongly support the conclusions of the Stern Review<sup>7</sup>, which identified three important policy elements for reducing emissions:

- Carbon pricing, through some combination of tax, trading and regulation.
- Technology policy, in order to support the development of a range of low carbon and high efficiency technologies.
- Removal of barriers to behavioural change, which is particularly important in ensuring take-up of opportunities for energy efficiency.

4. Personal carbon allowances could be introduced in a wide variety of forms, ranging from an economy-wide emissions trading scheme (covering both businesses and individuals) to one focussed simply on individual emissions, or a scheme to limit emissions from a single sector (eg personal allowances for aviation). Some of these options may link into existing or planned policies, whereas others would require radical changes to be made.

5. In their generic form, personal carbon allowances have the potential to engage individuals with climate change mitigation in a way that is harder to achieve under upstream emissions trading schemes. By providing a fixed quantity of carbon credits to each individual, information on carbon consumption can be provided alongside a price for carbon. This could raise carbon awareness, helping to drive behavioural change through lifestyle and purchasing decisions, as well as stimulating take-up of energy efficiency measures and low carbon technologies.

6. There may be net economic benefits to this bottom-up approach (after allowing for higher transaction costs) if individuals were to find it easier to identify and reduce their carbon emissions than under an upstream scheme. This may be a key factor in determining the viability of personal carbon allowances. However, accurately estimating the costs and benefits of a personal carbon allowances scheme would be extremely challenging as there is limited real-life data to draw on.

7. In addition to the issue above, there are a large number of unanswered questions on the viability of personal carbon trading, including: the impact on fuel poverty, public acceptability, the fair allocation of allowances, and setup and operational issues.

8. The SDC continues to recommend that more research is carried out on the issue of personal carbon allowances. This should include a more detailed analysis of the costs and benefits of such a scheme; its fit within the current and future policy landscape; and how it might be introduced and run.

July 2007

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<sup>1</sup> SDC (2005). Climate Change Programme Review: SDC submission. Available at: <http://www.sdcommission.org.uk/publications.php?id=256>

<sup>2</sup> Further information available at: <http://www.rsacarbonlimited.org>

<sup>3</sup> Further information available at: [http://www.tyndall.ac.uk/research/theme2/summary\\_t3\\_22.shtml](http://www.tyndall.ac.uk/research/theme2/summary_t3_22.shtml)

<sup>4</sup> Further information available at: <http://www.eci.ox.ac.uk/research/energy/pct.php>

<sup>5</sup> (2006). A Rough Guide to Individual Carbon Trading. Available at: <http://www.defra.gov.uk/environment/climatechange/individual/pca/pdf/pca-scopingstudy.pdf>

<sup>6</sup> HM Government (2007). Meeting the Energy Challenge. Energy White Paper 2007. <http://www.dti.gov.uk/energy/whitepaper/page39534.html>

<sup>7</sup> HM Treasury (2006). Stern Review on the Economics of Climate Change. [http://www.hm-treasury.gov.uk/independent\\_reviews/stern\\_review\\_economics\\_climate\\_change/stern\\_review\\_report.cfm](http://www.hm-treasury.gov.uk/independent_reviews/stern_review_economics_climate_change/stern_review_report.cfm)

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**Memorandum submitted by Steve Sorrell, Senior Fellow, Sussex Energy Group, SPRU, University of Sussex**

EXECUTIVE SUMMARY

This submission proposes a hybrid emissions trading as an attractive alternative to Personal Carbon Allowances (PCAs). It argues that a hybrid scheme provides most of the benefits of personal carbon allowances, but is likely to cost much less to implement and is more likely to gain political acceptability. Most importantly, the hybrid allows an effective interface with the EU Emissions Trading Scheme (EU ETS) and the global carbon market.

This document is based upon evidence submitted in August 2006 to the EFRA Select Committee inquiry on *Climate change: the citizens agenda*. In addition, the Annex to this document is based upon follow-up evidence to the EFRA inquiry, submitted at the request of the Clerk in December 2006. At the time of writing (July 2007), the EFRA Committee has still to publish its final report.

The main message of this submission is that personal carbon allowances should not be investigated in isolation. Potential alternatives need to be considered, together with the interaction of such schemes with other existing and proposed policy instruments. These interactions may preclude the introduction of either a hybrid scheme or a personal carbon allowance scheme within the short to medium-term. However, given its potential benefits, I recommend that the government investigate a hybrid scheme as a possible basis for UK climate policy in the long-term.

INTRODUCTION

Interest in a Personal Carbon Allowance (PCA)<sup>8</sup> scheme has grown in recent years, encouraged through research and advocacy work by Mayer Hillman of the Policy Studies Institute (Hillman, 2004), the Environmental Change Institute at Oxford University (Fawcett, 2005) and the Tyndall Centre for Climate Change Research (Starkey and Anderson, 2005). The proposal has gained widespread media attention, with strong views being expressed both in support of the idea and in opposition to it.

The government commissioned a scoping study on PCAs in 2006 (Roberts and Thumin, 2006). This noted how researchers had focused excessively upon the operational minutiae of specific schemes and neglected assumptions about public responses and political feasibility (Roberts and Thumin, 2006). The 2007 Energy White Paper promised a programme of further research on PCAs, but highlighted concerns about the practical viability of such a scheme and the implications for social equity. Both of these issues are addressed in this submission.

Given the radical nature of the PCA proposals, it is encouraging that the government should show such an interest in the idea. However, concerns over the cost, practicality and political feasibility of PCAs may be well founded. In investigating a PCA scheme, it is essential to ask whether there are simpler and more practical alternatives that could provide comparable economic and environmental benefits, as well as be introduced within a shorter period of time. I believe that a hybrid emissions trading scheme provides such an alternative and deserves serious consideration.

This submission describes the basic elements of such a hybrid scheme and compares it with the PCA scheme under five headings: economic efficiency; environmental effectiveness; social equity; administrative costs; and political acceptability. It concludes that, overall, the hybrid scheme provides the more attractive option.

BASIC ELEMENTS OF A HYBRID SCHEME

In the design of a carbon trading scheme, there is a basic choice between a downstream scheme, in which fossil fuel users surrender allowances for their emissions, and an upstream scheme, in which fossil fuel producers (or suppliers) surrender allowances for the carbon content of the fuel they sell. The EU ETS is a downstream scheme confined to the largest emitters, while PCAs are a downstream scheme for all emitters, including households. An upstream scheme places a cap on carbon emissions from the whole economy, while most downstream schemes only cap the emissions of a subset of the economy. What is unusual about the PCA proposal is that it combines a downstream scheme within economy-wide cap.

The EU ETS is already in place and is likely to remain in its present form for the foreseeable future. In this context, both an upstream trading scheme and a PCA scheme would face potential problems of:

- Double regulation: EU ETS participants could simultaneously face two sets of carbon prices for the fuel they consume (ie the EU ETS price and the PCA/hybrid price), while all electricity consumers could face two sets of carbon prices for the electricity they consume (because the EU ETS carbon price is reflected in the wholesale price of electricity).
  - Double counting: A single abatement action could lead to two separate carbon allowances being sold—one in each scheme (Sorrell and Sijm, 2003).
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<sup>8</sup> Also known as a Domestic Tradable Quota (DTQ) scheme.

Proponents of the PCA scheme have not provided adequate proposals for how these problems would be addressed. However, with an upstream scheme these problems could be avoided relatively simply through a hybrid approach (Hargrave, 2000; Mazurek, 2002). In this, the EU ETS would operate alongside an upstream scheme that covered all other fossil fuel CO<sub>2</sub> emissions, including those from households, non-domestic buildings and transport.

In a hybrid scheme, fossil fuel producers or suppliers would be responsible for the carbon content of fuel sold to downstream consumers that are not participating in the EU ETS. The upstream participants would include oil refineries, oil and gas importers and coal companies and the relatively small number of companies involved should keep the administrative costs low. These companies would need to surrender an allowance for each tonne of carbon contained in the fuel sold to eligible customers, and would pass these allowance prices on in fuel prices. The incentive effect for downstream consumers would be akin to a carbon tax.

To avoid double regulation and double counting, the system would need to ensure that the fuel purchased by EU ETS participants did not include the price of carbon allowances in the upstream trading scheme. This would require a “paper trail” to be established to track fossil fuel sales along the supply chain, via wholesalers and intermediaries to final consumption. Upstream producers would require allowances for all the fuel sold, unless they could demonstrate that a participant in the EU ETS ultimately consumed the fuel.

The UK could introduce an upstream scheme in parallel with the EU ETS to create a hybrid that covered the majority of CO<sub>2</sub> emissions from the UK economy. This could accommodate the expansion of the EU ETS in Phase 2 and beyond by simply modifying the accounting system for fuel sales (ie extending the exemptions) and adjusting the cap in the upstream scheme.

If the upstream scheme used free allocation of allowances, fossil fuel suppliers would receive large windfall profits. These firms will raise fuel prices to reflect the opportunity cost of allowances, while only incurring expenditures for any net allowance shortfalls. This is similar to the current situation in the EU ETS, where free allocation of allowances has allowed UK electricity generators to benefit from windfall profits of the order of £1 billion/year (Sijm, *et al*, 2006). Hence, in an upstream stream, the great majority of the allowances should be auctioned and the revenues redistributed to fuel consumers to compensate for the higher prices they face. As with carbon tax proposals, the overall scheme would then be revenue neutral.

The redistribution of funds could take place through the existing tax and benefit system, or a separate system could be established. A commonly cited model is the Alaska Permanent Fund, which distributes mining and drilling royalties on an equal per capita basis to all Alaskan citizens. An equal per capital allocation has the advantage of simplicity and should minimise administration costs.<sup>9</sup> However, the rules could be modified to reflect a variety of distributional objectives, including compensating the fuel poor. The impact of the scheme on fuel prices should be identical, whether free allocation or auctioning is employed.

#### ECONOMIC EFFICIENCY

By putting a price on carbon, both schemes encourage economic efficiency in fuel use and emissions reduction. The PCA scheme encourages fuel consumers to engage directly in trading. If a consumer chooses to use more fuel than her PCA allocation allows, she must either purchase additional allowances or pay a premium on the fuel price—thereby foregoing the consumption of other goods and services. Conversely, if she chooses to use less fuel than her PCA allocation allows, she may sell her surplus allowances and use the money in other ways.

The incentives in a hybrid scheme are entirely analogous. Fuel is more expensive since it embodies the carbon price, but consumers are allocated a lump sum from the auction revenues with which to compensate. If a consumer chooses to use more fuel than her lump-sum allocation (of money) permits, she must forego the consumption of other goods and services. Conversely, if a consumer chooses to use less fuel than her lump sum allocation permits, she has additional money available to spend.

The key point is that if the cap (and hence carbon price) is the same in both schemes and if the rules for allocating PCAs are the same as those for allocating auction revenues, then the economic impact on individual consumers is the same in both schemes. As a result, the economic incentive to reduce fossil fuel consumption should be the same. It should be noted, however, that consumers would need to engage in trading in the PCA scheme if they wished to convert their surplus allowances into money. In a hybrid scheme, consumers would be given the money directly.

<sup>9</sup> Estimates of the total cost of managing a comparable scheme in the US (the “Sky Trust”) have been put at less than .04% of total revenues.

Business and the public sector face a uniform carbon price in both schemes and would seek to include this in the price of their goods and services. The extent to which they can do so will depend upon the extent to which the relevant goods and services can be imported from outside the UK from companies that do not face a comparable carbon price. Again, if the cap and allocation rules are comparable in both schemes the impact on the price of goods and services should be broadly the same in the two schemes. In practice, the price impact will also depend upon the administrative and transaction costs of the scheme and the manner in which they are distributed between different participants. As argued below, these costs are likely to be higher in the PCA scheme than in the hybrid.

The economic efficiency of either the PCA or hybrid scheme could be increased (at least over the short to medium-term) if there was scope for trading allowances with other schemes, including the EU ETS. Such “links” should equalise allowance prices in the two schemes, which means that allowance prices in the PCA or hybrid scheme could either rise or fall. If credits from Joint Implementation (JI) and Clean Development Mechanism (CDM) projects were allowed to be imported into the PCA or hybrid scheme, allowance prices would probably fall, thereby reducing compliance costs in the UK. As Box 1 shows, there are legitimate concerns over whether such short term cost reductions may actually increase the cost of reducing emissions over the long-term. This highlights the difficult trade-offs that need to be made in the design of any emissions trading scheme. Both a hybrid and a PCA scheme face the same trade-offs, but the scope for linking is greatly constrained in the latter because of the risk of double counting emission reductions. In particular, links with the EU ETS may not be feasible. A hybrid scheme avoids these difficulties since there is no double counting of emission reductions.

Proponents of PCAs have argued that, when faced with a personal carbon allowance individuals may respond by engaging “more fully” in the task of identifying emission reduction opportunities, thereby reducing the cost of carbon abatement (Starkey and Anderson, 2005). Comparable arguments have been made by the Carbon Trust in support of the Carbon Reduction Commitment for business and the public sector (Carbon Trust, 2005b). These propositions deserve further research, since neither the Tyndall Centre nor the Carbon Trust cite any empirical evidence in their favour. Moreover, any efficiency benefits that do result need to be set against the greater administrative cost of the PCA scheme.

#### *Box 1 Open or closed trading schemes*

The ability to trade carbon allowances between different trading schemes is known as “linking”. An “open” trading scheme allows linking while a “closed” trading scheme does not, although in practice there will be a range of choices over which links are established and with what restrictions. The Linking Directive allows credits from Joint Implementation (JI) or Clean Development Mechanism (CDM) projects to be imported into EU ETS and it is envisaged that the EU ETS will be linked to other regional or national trading schemes in the future. Hence, the potential for linking UK trading schemes with the EU ETS and with schemes in other countries needs to be seriously considered—especially over the long-term.

As argued by the Stern Review, linking should reduce the overall cost of compliance in the two schemes, help prevent the abuse of market power, improve liquidity and reduce allowance price volatility. In addition, links to the CDM may allow investment finance to be channelled to environmentally beneficial projects in developing countries, thereby encouraging technology transfer and sustainable development.

Linking should equalise the allowance prices in the two schemes, or at least bring them closer together. Hence, if a UK trading scheme is linked to a scheme with lower allowance prices, the allowance price in the UK will fall. While this will reduce compliance costs for UK participants, it will also reduce the incentive for developing or adopting low carbon technologies. There may also be concern about the stringency of the caps in the linked schemes, the implications of design features such as non-compliance procedures and the environmental integrity of emission reductions achieved through project-based mechanisms such as the CDM (Ellis, *et al*, 2007). Some of these concerns are reflected in the Kyoto Protocol requirement that international trading be “supplemental” to domestic action, but this requirement has yet to be operationalised in an effective manner.

Trading schemes that are relatively “open” can minimise abatement costs in the short-term by maximising the flexibility to trade. But if this flexibility is combined with uncertainties over long-term carbon prices and relatively unambitious caps, the incentives for structural change, innovation and investment in low carbon technologies will be undermined. The consequent lock-in to carbon intensive technologies and infrastructures could make it prohibitively expensive to achieve deeper emission cuts in the long-term as well as reinforcing the political opposition to such reductions.

In contrast, trading schemes that are relatively “closed” will increase abatement costs in the short-term by restricting the ability to trade. But if these restrictions are combined with greater predictability over long-term carbon prices and more ambitious caps, the incentives for structural change, innovation and investment in low carbon technologies will be increased. The drawback is that the consequent increase in short-term abatement costs and could make it correspondingly more difficult to agree ambitious short-term targets.

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## ENVIRONMENTAL EFFECTIVENESS

The environmental effectiveness of the scheme depends upon the stringency of the overall cap. In principle, this could be the same in both schemes. The PCA proposals typically include a “carbon budget” that gives some long-term (eg 20-year) predictability in carbon targets, and hence indirectly in carbon prices. Since this is very similar to the proposals contained in the Draft Climate Change Bill, it suggests that a PCA scheme could provide a straightforward means of implementing the Bill’s provisions. But this applies equally to the hybrid scheme, since both can provide an economy-wide cap on emissions.

The carbon price will depend upon both the stringency of the cap and the balance of supply and demand. A shortage of allowances could push the carbon price to a high level, which could be politically unpopular. This disadvantage is balanced by the advantage that (unlike with a carbon tax) both schemes could guarantee attainment of a particular CO<sub>2</sub> target. This price/quantity trade-off is central to the choice between carbon taxes and carbon trading (Weitzman, 1974). One way of mitigating the allowance price risk would be to introduce a “safety valve” in the form of a relatively low penalty price for non-compliance (Mckibbin and Wilcoxon, 2002). The penalty price would set a ceiling on compliance costs and allowance prices. If abatement costs are higher than anticipated, and the price of allowances rises above the level of the penalty, participants will prefer to pay the penalty rather than purchase allowances from the market.

A “safety valve” could improve the political acceptability of both schemes, but it would remove the guarantee of meeting a particular emission target as well as creating an obstacle to linking to other trading schemes (Ellis and Toirpak, 2006). An alternative therefore may be to establish a link to the EU ETS and/or other emissions trading schemes. The resulting expansion of the market should reduce price risk and volatility, and—in the case of the hybrid scheme—reduce the potential for the exercise of market power by fuel suppliers.

The key point, however, is that the risk of high allowance prices is an issue for both schemes. While this risk could be mitigated in both schemes, there is greater scope for doing so with the hybrid scheme since there are few obstacles to linking.

## SOCIAL EQUITY

Research by the Tyndall Centre on PCAs has paid particular attention to social equity, with a focus on the philosophical rationale for allocating allowances on an equal per capita basis. A difficulty with this approach is that it could hurt the fuel poor. Research by the Policy Studies Institute has shown that low income households vary widely in their energy consumption, owing largely to wide variations in the energy efficiency of housing (Dresner and Ekins, 2006). As a result, an equal per capita allocation would be regressive. While the impact could be reduced through the allocation of additional allowances to fuel poor households, in practice these are difficult to identify.

A hybrid scheme faces similar problems. Dresner and Ekins (2006) have shown how the regressive effect such a scheme could be mitigated through recycling the revenues through the existing tax and benefit system. However, this would not prevent a worsening of fuel poverty for 20% of the poorest households, including those who are already most badly affected.

Fuel poverty is therefore a generic obstacle to both types of scheme. The accelerated elimination of fuel poverty, coupled with the development of compensation schemes to protect low-income households is likely to be an essential prerequisite for the introduction of either. However, such compensation may be much simpler to administer with the hybrid scheme, since it would simply involve modifying the existing tax and benefit system. In contrast, the PCA scheme requires allocation rules for a newly created currency of carbon allowances.

The Tyndall researchers have also argued that allocating emission rights to individuals gives them additional “control” over those emission rights compared to the lump-sum recycling of auction revenues—including choosing to whom to sell (or not sell) units and choosing to retire units (Starkey and Anderson, 2005). But consumers could also choose to purchase and retire allowances in the hybrid scheme, using their lump-sum allocation. Decision rights over allocated allowances may potentially be valuable for a small group of “ethical” consumers, but is likely to be a marginal concern for most.

## ADMINISTRATIVE COSTS

The PCA proposals amount to establishing an entirely new currency in which 45 million citizens will be participating, together with all of business and the public sector. Individuals would primarily participate through a new electronic card system, similar to existing credit/debit cards or the proposed ID cards. The Tyndall Centre has argued that this is administratively feasible, but has not been able to estimate the associated costs. It seems reasonable to assume that these will be large. Business and the public sector would participate via auctions. Interestingly, research on PCAs has tended to focus disproportionately on the mechanics of individual participation, and has paid relatively little attention to the implications for energy-using organisations. Research into the proposed Carbon Reduction Commitment for non-energy intensive organisations in the business and the public sector has suggested

that, for smaller sites, the transaction costs can easily exceed the benefits of participation in emissions trading schemes (Radov, *et al*, 2006). As a result, the government has raised the proposed size threshold for participation (DEFRA, 2007).

In contrast, the administrative costs associated with a hybrid scheme should be relatively small. The total number of participants should be less than 50, monitoring and verification arrangements would be straightforward and the recycling of auction revenues could be implemented relatively easily through the existing tax and benefit system or some other means. The requirement for a “paper-trail” for fuel sales would impose administrative costs on the fuel supply chain, and would require independent auditing and verification. But while these costs require further examination, there are parallels in the current electricity market with the use of Levy Exemption Certificates. In general, it seems reasonable to conclude that a hybrid scheme would be substantially cheaper to set up and administer than a PCA scheme.

#### POLITICAL FEASIBILITY

Both schemes are likely to attract opposition from both households and business. As argued above, the carbon cap and hence the carbon price could be broadly equivalent in each scheme, together with the mechanisms for compensating badly affected sectors or individuals. Hence, what matters is how the two schemes are likely to be perceived by different groups.

From the perspective of consumers, a hybrid scheme is similar to a carbon tax. However, instead of a fixed and visible tax rate, the carbon price will be variable and largely hidden within the price of fuel. In some respects, the scheme would resemble the existing Renewables Obligation and Energy Efficiency Commitment. The cost of these is recovered through household electricity and gas bills, but the premium is not explicit and the instruments remain uncontroversial, partly because the price impacts are relatively small (although not trivial) and partly because their implications are poorly understood. However, this may not be the case for a hybrid scheme if the cost implications are much greater. Potential mitigating measures here include the use of a relatively weak cap at the inception of the scheme (gradually tightening over time), the inclusion of a safety valve provision and the scope for reducing carbon prices by linking the scheme to the EU ETS and the international carbon market.

For the perspective of consumers, a PCA scheme is similar to rationing—indeed, “carbon rationing” is Mayer Hillman’s (2004) preferred term. Of course, a hybrid scheme also amounts to rationing, but since it is indirect and less visible, it may also be less controversial. With its connotations of wartime austerity, the notion of “carbon rationing” could prove unpopular in many quarters.

Proponents of PCAs argue that individual allowances should encourage greater awareness of the threat of climate change, provide a more tangible “share” of a common resource and generate a sense of common purpose in tackling the problem (Starkey and Anderson, 2005). However, it is equally likely that this level of awareness is a precondition for the acceptance of PCAs in the first place. The relative acceptability of the two approaches should be a priority for further research—together with the measures necessary to improve the acceptability of either. However, my judgement is that the hybrid approach is likely to be more feasible in the medium term.

#### SUMMARY

While PCAs are an attractive idea, I do not believe their time has come. In my judgement, a combination of high administrative costs, the inability to link with the EU ETS and the political difficulties associated with carbon rationing considerably reduce the attractiveness of the scheme.

However, most of the benefits of PCAs can be achieved through a hybrid scheme, in which an upstream cap on fuel suppliers is combined with the downstream EU ETS. This combines comparatively small administrative costs with (in my judgement) greater political acceptability, while at the same time delivering comparable performance in terms of economic efficiency, environmental effectiveness and social equity. Most importantly, it has the potential to interface effectively with the global carbon market.

The government has indicated its interest in including surface transport within the EU ETS, but it could be difficult to do this in a way that is acceptable to all Member States. A hybrid scheme provides an alternative means of capping the emissions from surface transport, as well as from other sectors, while at the same time achieving other policy objectives and avoiding the need for EU-wide agreement.

As discussed in the Annex, both the hybrid scheme and a PCA scheme may run into conflict with other existing and proposed policy instruments. These interactions may preclude the introduction of either scheme within the short to medium-term. However, given its potential benefits, I recommend that the government investigate a hybrid scheme as a possible basis for UK climate policy in the long-term.

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### **Annex: Implementing a hybrid scheme**

#### INTRODUCTION

This Annex expands upon the practical challenges associated with implementing a “hybrid emissions trading” scheme as an alternative to a system of personal carbon allowances. Many of the issues raised are similar to those associated with implementing a programme of environmental tax reform as well as a system of PCAs. One advantage of a hybrid emissions trading scheme is that it can provide most of the benefits of such reforms and reduce overall abatement costs by interfacing with the global carbon market.

#### THE NATURE OF A HYBRID SCHEME

First, I would like to clarify the terminology. The key element of this proposal is for an upstream carbon emissions trading scheme in which fossil fuel producers (or importers) surrender allowances for the carbon content of the fuel they sell. However, a conventional upstream scheme would lead to double regulation or double counting of emissions that are already covered by the EU ETS—an outcome that I consider undesirable. To avoid this, I propose that producers should only be liable for the carbon content of fuel sold to consumers outside the EU ETS. The downstream EU ETS would then operate alongside the upstream scheme to give a hybrid that covered all of the fossil fuel emissions from the UK economy, while avoiding any overlaps between the two schemes. Since this proposal differs somewhat from an upstream scheme as normally understood, I have used the term hybrid scheme. While the terms “upstream” and “downstream” are widely used in this context, the term “hybrid scheme” (for a combination of the two) is less well established.

A hybrid scheme should avoid double counting of emission reductions, since a reduction of fossil fuel emissions anywhere in the economy should “free up” carbon allowances in one scheme or the other, but not in both at the same time. For example, a reduction in household gas consumption will free up allowances in the upstream scheme, while a reduction household electricity consumption will free up allowances in the downstream scheme (the EU ETS). In contrast, double counting is an unavoidable feature of the current PCA proposals.

In principle, the hybrid scheme should also avoid the double regulation of fuel consumption. Fuel suppliers will incur additional costs for purchasing allowances in the auction and will seek to pass these on in fuel prices. However, the marginal cost of supplying fuel to EU ETS participants will be lower than that to non EU ETS participants, since the latter includes the cost of allowance purchase. Assuming competitive fuel markets and an adequate system for tracking fuel sales, these differences should be reflected in lower fuel prices to EU ETS participants. Hence, fuel prices for individuals and companies outside the EU ETS should include the price of allowances in the upstream scheme, while fuel prices for EU ETS participants should not. If allowances can be traded between the two schemes (ie if the two schemes are “linked”) the carbon prices in the two schemes should converge, leading to a single price for carbon throughout the UK economy.



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 THE FEASIBILITY AND COST OF A HYBRID SCHEME

All existing carbon emission trading schemes are downstream, in that they regulate emissions from fuel users directly. An upstream scheme that involves fuel suppliers is therefore a significant departure from existing practice. Nevertheless, this approach has been widely discussed within the academic and policy community for a number of years (Hargrave, 2000; Mazurek, 2002) and several well-developed policy proposals include elements of an upstream or hybrid approach.<sup>10</sup>

The upstream approach is also a less radical departure from existing practice than it first appears, because it has a great deal in common with an upstream carbon/energy tax. This type of tax has been implemented in a number of OECD countries and is subject of a considerable academic literature (Ekins and Barker, 2001; Zhang and Baranzini, 2004). In principle, the macroeconomic impacts of an upstream trading scheme should be broadly similar to those from an upstream carbon tax, as should many of the practical issues associated with implementation. Generally speaking, it is the impacts on industrial competitiveness and income distribution that provide the biggest challenge to implementing such schemes, rather than practical issues such as monitoring and verification. But the experience and analysis accumulated over the last 20 years provides a good basis for the design and implementation of such a scheme.

The hybrid scheme does involve some additional design challenges that are not faced by carbon taxes, but again there is a great deal of relevant experience on which to draw. For example, the design of the allowance auction can be informed by the experience with airwave spectrum auctions, as well as by the experience with auctioning emission allowances in the US Acid Rain Programme, the UK Emissions Trading Scheme (UK ETS) and the EU ETS. Similarly, the mechanisms for tracking fuel sales may be informed by UK experience with Levy Exemption Certificates and the Renewable Transport Fuel Obligation (RTFO). In each case, the practical challenges appear significantly less than those associated with creating an entirely new currency of personal carbon allowances.

I cannot provide estimates of the administrative costs associated with establishing a hybrid scheme, since the relevant research has yet to be undertaken. As an illustration, the costs of administering the RTFO (which is a tradable obligation on fuel suppliers to supply biofuels) is estimated to be around £1 million/year for the government and £2 million/year for industry (DfT, 2006). The costs are low because only around 20 companies are involved and because fuel sales are already monitored for the purposes of levying fuel duty (Grayling, *et al*, 2006).

The total administrative costs for the hybrid scheme would be greater than this because coal and gas suppliers (who do not pay fuel duty) would also be included, systems for tracking fuel sales would need to be established and mechanisms such as allowance auctions would need to be administered. Nevertheless, the total administrative costs are likely to represent only a small fraction of either the total revenue raised from the scheme, or the turnover of the companies involved. For example, if the clearing price in the allowance auction was £10/tCO<sub>2</sub>, (~15€/tCO<sub>2</sub>) the revenue raised from the upstream scheme would be of the order of £3 billion.<sup>11</sup> This compares to approximately £0.8 billion from the existing Climate Change Levy, £24 billion from fuel duties, £134 billion from income taxes and £483 billion from all forms of taxation (in fiscal year 2005–06). A hybrid scheme with a carbon price of 15€/tCO<sub>2</sub> (broadly equivalent to current prices in the EU ETS) would therefore allow income taxes to be reduced by around 2.2%.

The biggest obstacles to implementing a hybrid scheme are the potential impacts on business competitiveness and income distribution. Both of these will depend upon how the revenues from the allowance auction are redistributed. As with carbon taxes, the revenue raised from the auction may be used to reduce other taxes that charge for—and thereby discourage—beneficial activities such as employment. As a consequence, a hybrid scheme has the potential to deliver both environmental and economic benefits—the so-called “double dividend” (Bovenberg, 1999). However, there is likely to be a trade off between economic efficiency in revenue redistribution and political acceptability. While mechanisms are available to mitigate many of the adverse impacts on business competitiveness and low income groups, it will not be possible to satisfy all the competing claims and attempts to do so could both reduce the efficiency of the scheme and increase administrative costs. The relevant issues are briefly reviewed in the following sections.

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<sup>10</sup> Perhaps the best known is the Climate Stewardship Act, proposed by Senators John McCain and Joseph Lieberman, which would cover more than 70% of US carbon dioxide and industrial greenhouse gas emissions. Large installations in the industrial, public and commercial sectors would participate directly in a similar manner to the EU ETS. However, transport emissions would be covered through the participation of refineries and fuel suppliers, who would surrender allowances for the carbon content of fuel sales. This is therefore a hybrid scheme, since it includes both upstream and downstream elements.

<sup>11</sup> Approximately 300MtCO<sub>2</sub> of emissions would be covered by the scheme.

## THE IMPACT ON BUSINESS COMPETITIVENESS

The impact of an upstream scheme on a firm or sector's competitiveness depends upon a host of factors.<sup>12</sup> As a result, the impacts are hard to predict, may be greater in the short term than in the long-term and may easily be overstated by well-organised and influential lobby groups. If auction revenues are recycled to reduce labour taxes, many sectors will gain from the scheme. But energy intensive sectors may lose and may therefore seek additional forms of compensation.

Claims regarding the potential impact of carbon pricing on industrial competitiveness frequently lack a sound analytical basis. For example, recent studies by the IEA (Reinaud, 2005) and the Carbon Trust (Carbon Trust, 2005a; b) have suggested that, for carbon prices around €10/tCO<sub>2</sub>, the EU ETS is unlikely to reduce the profitability of most industrial sectors and that the anticipated increases in product prices will be insufficient to make non-EU imports profitable on a large-scale. While the impacts on individual companies may be greater, this analysis suggests that the claims made by many industrial groups during the process of negotiating the National Allocation Plans were exaggerated. This, in turn, has contributed to the negotiation of relatively weak targets in Phase 1 and Phase 2 of the EU ETS<sup>13</sup> and has allowed the electricity generators to enjoy large windfall profits (Sijm, *et al*, 2006).<sup>14</sup>

The most energy intensive UK companies are already included in the EU ETS, or are likely to become included at a later stage. This suggests that the majority of companies affected by the proposed upstream scheme will be relatively non-energy intensive. At present, however, a total of 6000 companies from 54 industrial sectors are signatories to Climate Change Agreements (CCAs) (a total of 14000 sites). The CCAs provide exemption from 80% of the Climate Change Levy (CCL) in return for meeting negotiated targets to reduce energy consumption or carbon emissions. The rationale for the CCAs was that the full rate of the CCL could damage the competitiveness of these sectors because energy forms a significant proportion of total costs. In practice, however, for many of these sectors, energy accounts for a small fraction (<2%) of total costs.

It seems reasonable to assume that many of the sectors currently signed up to a CCA will either oppose the introduction of an upstream scheme or seek special treatment to compensate for the higher fuel costs that will result. However, there are at least three reasons why the need for special treatment should be less than in the case of the CCL:

- The proposed upstream scheme only affects fuel costs, while the CCL covers both fuel and electricity. Companies are already paying higher electricity prices as a result of the participation of the generators in the EU ETS, but this will be case regardless of whether an upstream scheme is introduced. Fuel costs in turn, are much less than electricity costs for a large number of CCA companies.
- The lack of adequate data on energy intensity meant that the eligibility for CCAs was based upon the coverage of existing regulation, which proved to be poor proxy.<sup>15</sup> But the CCAs themselves have provided considerable information on energy consumption that may permit a more informed judgment over whether a sector deserves special treatment.
- Exemptions from carbon taxes and trading schemes are commonly justified as a transitional arrangement, to avoid high adjustment costs. However, after a nearly a decade of the CCL the grounds for such exemptions are now weaker.

If there is a case for special treatment, the most appropriate mechanism would be to increase the amount of revenue recycled to those sectors and companies that are considered vulnerable. In general, revenue recycling may take place in a variety of ways, with different implications for administrative costs and for the relative burdens imposed upon different sectors. For example, the £0.8 billion of revenues raised by the CCL were primarily recycled through a reduction in employers' national insurance contributions. This meant that sectors that were relatively labour intensive were net winners, while those that were relatively energy intensive were net losers. However, reductions in labour taxes are not the only option available. To compensate vulnerable sectors for the high fuel costs from the upstream scheme, additional revenues could be recycled in proportion to best practice benchmarks of energy intensity, or some comparable measure. Experience with the CCAs suggests that this type of compensation could be

<sup>12</sup> Including the stringency and future predictability of the emissions cap, the timeframe for introducing and tightening the scheme (relative to asset lifetimes), the contribution of fuel to total input costs, the carbon intensity of fuel use, the extent to which the relevant product markets are open to international competition, the extent to which competitor companies in other countries face comparable carbon prices, the scope for switching to lower carbon products, the own-price elasticity of the relevant products and the opportunities available for abating emissions through energy efficiency improvements or fuel switching (Barker & Kohler, 1998).

<sup>13</sup> The aggregate Phase 1 cap was approximately 3% above baseline emissions and only 1% below official "business as usual" projections. When verified emission data was released in May 2006 it showed that emissions were a below allocations—leading to a substantial fall in allowance prices. The caps proposed in the National Allocation Plans (NAPs) for Phase 2 were sufficiently weak to create a risk of a zero carbon price in Phase 2 (Rogge, *et al*, 2006). The Commission has requested more stringent targets in most of the allocation plans it has reviewed (a notable exception being the UK).

<sup>14</sup> The primary reason for the large windfall profits (ie beyond what is required for compensation) was that the allowances were allocated for free, rather than being sold in an auction. Windfall profits for UK electricity generators during Phase 1 have been estimated at £0.8 billion/year (IPA Energy Consulting, 2006).

<sup>15</sup> Eligibility for CCAs was originally based on the coverage of the Integrated Pollution Prevention and Control Directive, but following extensive lobbying the eligibility rules were widened to include other "energy intensive" sectors.

complex to administer, but at the same time the CCAs have provided a mass of data with which to build. However, additional recycling of revenue to energy intensive sectors will reduce the pool of revenues available to compensate non energy intensive sectors and households, as well as increasing overall abatement costs.<sup>16</sup>

#### THE IMPACT ON INCOME DISTRIBUTION

In the absence of revenue recycling, an upstream scheme would be regressive and could have a damaging impact on the “fuel poor” who spend more than 10% of their income on energy. However, there are a wide range of options available to reduce the regressive impact of the scheme, including: increasing income tax thresholds or reducing rates of tax on low incomes; raising welfare payments such as unemployment, disability and child benefit; providing subsidies for energy efficiency improvements in low-income households; increasing winter fuel payments; and returning an equal lump sum to each individual (Clinch, *et al*, 2006).

Lump-sum redistribution is straightforward and partially corrects for the distributional impacts because low income households will receive a higher amount, relative to their income, than high income households. However, reductions in income taxes or changes in the benefits system are likely to be more effective. While earlier studies have suggested that careful targeting of tax and benefit changes could minimise distributional impacts (Metcalf, 1999), research by the Policy Studies Institute has suggested that this is unlikely to prevent a worsening of fuel poverty for up to a third of the poorest households (ie those in the lowest income decile), including those who are already badly affected by rising fuel prices (Dresner and Ekins, 2006). The reason is that low income households vary widely in energy consumption, owing largely to wide variations in the energy efficiency of housing—and some are very high energy users. Electrically heated homes and those with solid walls present the greatest difficulties, and these have been largely untouched by the Energy Efficiency Commitment (EEC) and Warm Front programmes.

These negative impacts on the fuel poor are of critical importance for the political feasibility of either an upstream or PCA scheme. They may make it difficult to introduce such a scheme within the medium term—and possibly for longer if the elimination of fuel poverty is delayed. This makes the scaling up of existing energy efficiency measures and the introduction of new measures in this sector an urgent priority.

Concern over distributional impacts has led to household gas and electricity consumption being subsidised through VAT exemptions. It makes little sense to internalise carbon prices in this sector while such large subsidies remain. Similarly, if the government continues to exempt all households from carbon pricing in order to protect the fuel poor, emissions in this sector will rise making it more difficult to meet carbon targets in the future. There is therefore a need for a dual approach: to accelerate the elimination of fuel poverty while at the same time introducing alternative approaches that encourages improvements in the energy efficiency of non-fuel poor households. The measures proposed in the 2007 Energy Review (in particular the Supplier Obligation) represent a welcome step forward, but it is unclear whether these will be sufficient.

In contrast to energy use in homes, the impact of an upstream trading scheme on energy use for surface transport should be broadly progressive (Dresner and Ekins, 2004). Nearly two thirds of households in the lowest income quintile do not own a car, compared to only one third of households overall. However, the scheme may be regressive among motorists, with larger impacts for motorists in the rural areas who lack public transport alternatives (Blow and Crawford, 1997). A 30% increase in fuel prices, for example, would reduce the standard of living of the poorest tenth of motorists by around 2%. As with household energy use, there is considerable scope for reducing distributional impacts through measures such as abolishing vehicle excise duty (VED), subsidising public transport and increasing benefits. Dresner and Ekins (2004) found that abolishing VED was the best method of compensating low-income motorists, while increasing benefits was the best method of compensating the population overall.

It is important to note, however, that the increases in petrol and diesel prices that would result from an upstream carbon trading scheme will be relatively small. For example, a carbon price of 15£/tCO<sub>2</sub> would increase petrol prices by less than one pence a litre, which compares with current duty levels of 47 pence per litre, and total taxation (including VAT) of 60 pence per litre. The distributional impacts for transport users are therefore a much smaller concern than those for households.

At the same time, if the price impacts are small, the incentive to reduce emissions in this sector is correspondingly small, suggesting the need for complementary policies. Including surface transport in any wider trading scheme could be problematic, since the high abatement costs in this sector may push up carbon prices for other sectors, with adverse effects on industrial competitiveness and income distribution. However, this issue is broadly the same whether surface transport is included in a hybrid or PCA scheme, or within the EU ETS. The government is currently reviewing the latter option and has encouraged the Commission to do the same.

<sup>16</sup> Another possibility would be to introduce border tax adjustments, with exports receiving a refund while imports are taxed. This would need to use relatively crude methods to estimate the carbon content of imports and must be consistent with World Trade Organisation rules (Ismer and Neuhoff, 2006).

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## PUBLIC UNDERSTANDING AND ACCEPTABILITY

Whatever the impact on competitiveness and income distribution, an upstream trading scheme could also face more general problems of public understanding and acceptability. The nature of these was highlighted in a recent European-wide project that used interviews and focus groups to assess social responses to environmental tax reform (Clinch, *et al*, 2006). This found that:

- People did not trust assurances that the revenues will be used in the way promised by government and wanted the use of the revenues to be transparent.
- People did not understand the purpose of increasing taxes on energy while lowering taxes on employment, and did not accept the double dividend argument when it was explained to them.
- People were aware of higher energy taxes since they were visible, but were not aware of the lowering of income and other taxes since they were less visible.
- People wanted incentives as well as penalties and expressed a strong preference for the revenues to be used for encouraging energy efficiency improvements and related measures.

These factors will need to be taken into account in the design of a hybrid scheme. For example, the trust issue may potentially be mitigated by devolving decisions about cap setting and revenue distribution to the proposed Committee on Climate Change. The understanding issue may partially be dealt with through a prolonged public information campaign that also raises awareness about the link between energy use and climate change and the opportunities available to reduce energy consumption. The visibility issue may be partially dealt with through the use of regular lump-sum payments to each household that are clearly linked to their “share” of the overall carbon cap. Finally, the incentive issue may be dealt with by using a portion of the revenue to encourage investment in energy efficiency and renewable energy projects. None of these approaches are straightforward and each involves trade-offs with other objectives. The reaction of the UK popular press to proposals for environmental tax reform (“a green stealth tax”) suggest that there is much work to be done in improving understanding of such measures and in gaining public support. This again suggests that a lead time may be required before a hybrid scheme can be implemented.

## COMPARABLE BARRIERS TO A PCA SCHEME

It is important to note that the barriers described above apply equally, or to a greater extent, to a PCA scheme. Moreover, these costs will be in addition to the much higher costs of establishing, introducing and monitoring a PCA scheme compared to an upstream scheme.

While households will receive allowances for free in a PCA scheme, the distributional impacts and hence political disputes over allocation will be broadly similar. It is also possible that a hybrid scheme may be able to protect low income households more easily than PCAs. This is because it allows straightforward adjustment to existing tax and benefit arrangements without a loss of government revenue. In contrast, a PCA scheme is more likely to address such concerns by changing the number of allowances allocated to different groups (eg giving bonus allowances to pensioners), which could be more costly to implement. Alternatively, if the PCA scheme uses fiscal measures to address such concerns, the government may lose revenue.

With a PCA scheme, approximately 60% of allowances would be auctioned to banks and other primary traders who would then sell them on to energy using organisations. The mechanisms for compensating these organisations for their allowance expenditures have not been specified,<sup>17</sup> but could be broadly similar to those outlined above. As with an upstream scheme, the revenue raised from the PCA allowance auction may be used to reduce “distortionary” taxes—potentially providing a double dividend. However, while the hybrid scheme allows the revenue from 100% of the allowances to be used in this way, the PCA scheme only auctions 60% of the allowances—with the remainder being distributed free. This suggests that the aggregate costs of meeting an emission target could be higher with a PCA scheme since the available revenues are smaller.

For organisations, a PCA scheme is analogous to both a hybrid scheme and environmental tax reform, since it involves additional expenditure on fuel and accompanying reductions in other forms of taxation. To that extent, it faces similar problems of understanding and acceptance to those discussed above. For household, a PCA scheme is analogous to rationing, which has a variety of negative connotations. As indicated in the main submission, it is difficult to judge whether an explicit form of rationing would be more or less acceptable than a hybrid scheme in which the origin of the fuel price rise is somewhat hidden. This issue is therefore priority for further research.

Another key difference between a hybrid and a PCA scheme is that the latter includes the emissions from electricity consumption. But these are already covered by the EU ETS and electricity consumers are already paying higher prices as a result. This suggests that a PCA scheme would have a significantly greater impact on energy costs for all consumers. Moreover, these higher costs would have no immediate

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<sup>17</sup> Indeed, the disproportionate focus on the implications for households, rather than organisations, is a weakness of the current PCA proposals.

environmental benefit because any reductions in the emissions from electricity generation that result will simply “free up” allowances in the EU ETS. These will either be sold to other participants or banked, and will therefore be used to cover emissions somewhere in the EU. While it is possible that UK emissions will be reduced, the contribution to EU and global CO<sub>2</sub> emission reductions will nevertheless be zero. The coverage of electricity consumption by the PCA scheme will only lead to real environmental benefits if it contributes to a subsequent tightening of the overall EU ETS cap (Sorrell and Sijm, 2003). This important point is frequently overlooked in policy debates.

#### THE PROBLEM OF POLICY INTERACTION

As argued in the main submission, I believe that a hybrid scheme is substantially simpler than a PCA scheme and could therefore be introduced within a considerably shorter timescale. It also interfaces much more effectively with the EU ETS and the global carbon market. However, a policy proposal needs time to gain interest and support, needs “windows of opportunity” for implementation (such as when an existing scheme come to an end) and must “fit” within an increasingly crowded policy landscape. This last issue is problematic for both the hybrid scheme and PCAs. Both provide a comprehensive approach that caps the total fossil fuel emissions from the UK economy and the former offers the potential of a uniform carbon price—as recommended by the Stern Review. But both also have the potential to interact negatively with a number of existing and proposed policies that target different sectors of the economy in different ways. For example, introducing a hybrid scheme on top of the existing Climate Change Levy (CCL) would create a “double regulation” problem, in that fuel purchases would include the carbon price from the hybrid scheme as well as being eligible for the CCL. In the case of the PCA scheme, this problem would also apply to electricity (indeed, if the CCL was retained, the PCAs would effectively lead to triple regulation of many organisations’ electricity use—ie PCA, CCL and EU ETS).

Such overlaps already exist in the UK policy mix and may sometimes be acceptable (Sorrell and Sijm, 2003). But in many cases, they are likely to increase the cost of meeting UK carbon targets. If a PCA or hybrid scheme were simply to be imposed on top of existing instruments, such problems could be made substantially worse. This suggests that the introduction of such a scheme may need to coincide with the removal of such instruments. However, the 2007 Energy Review proposed additional instruments that are likely to increase the complexity of the overall policy mix. These include:

- The Carbon Reduction Commitment (EPC), which is a downstream cap and scheme for large organisations in the public, commercial and industrial sectors that are not eligible for the EU ETS. Allowances are to be distributed throughout revenue neutral auction.
- The post 2011 Supplier Obligation (EEC) which may take the form of a cap and trade scheme for gas and electricity suppliers. The cap could be denominated in either energy or carbon and will relate solely to the energy supplied to households.
- Expansion of the EU ETS: The European Commission has published a draft legislative proposal for the inclusion of aviation emissions in the EU ETS from beyond 2011, while the UK government is proposing the inclusion of surface transport as well.

In addition, the Climate Change Agreements (CCAs) for large industrial sites are expected to continue until 2013. Companies with CCAs will still be allowed to trade carbon allowances as part of the UK ETS, even though the “direct participant” part of that scheme ends in December 2006.

If the above proposals go ahead as planned, is likely that the majority of UK carbon emissions will be covered by one or more trading schemes by 2012. It is also possible that four different types of carbon allowances (EU ETS, CRC, SO and CCA) will be being traded within four separate markets at four separate carbon prices. In each case, there will be problems of “double regulation” of electricity, because the electricity generators are already participating in the EU ETS and therefore pass on the carbon price within the price of wholesale electricity. Each UK market will also lead to “double counting” of emission reductions, because two carbon allowances (in two separate markets) will be generated from a single one-tonne reduction in emissions. This, in turn, will make it difficult or impossible to “link” the schemes to allow trading between them. Taken together, this patchwork of policies will not provide a comprehensive coverage of UK carbon emissions, while at the same time introducing multiple administrative requirements.

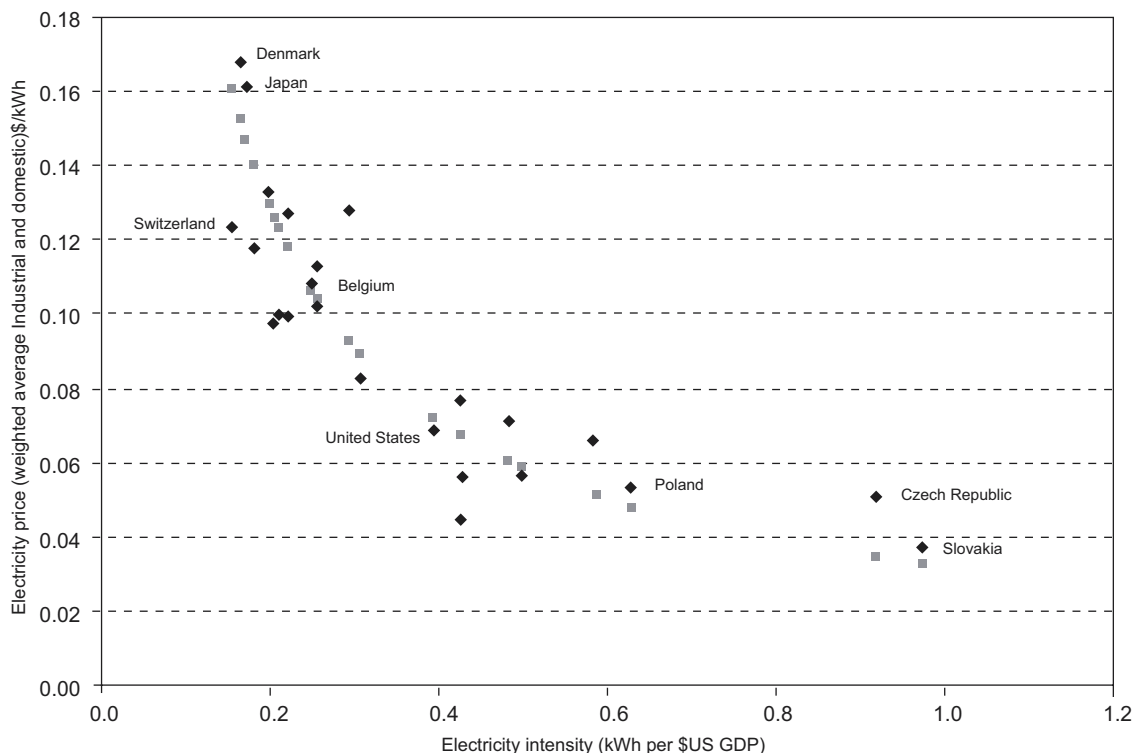
I do not want to argue that the above policies are without merit: on the contrary, the CRC proposals, in particular, are the product of much careful analysis (Radov, *et al*, 2006). However, introducing a hybrid or PCA scheme on top of these instruments is likely to be costly, unnecessary and unrealistic. The government has indicated that both the Carbon Reduction Commitment and the Supplier Obligation will remain in place in some form until 2020. Hence, in combination, it is possible that the current policy

proposals could preclude the introduction of a hybrid or PCA scheme for the next 14 years.<sup>18</sup> This timeframe could be longer than is required to eliminate fuel poverty. Alternatively, the introduction of a PCA or hybrid scheme will require the early termination of existing policy proposals. This leaves the current discussion on personal carbon allowances in something of a vacuum, as current government policy may preclude the introduction of such a scheme in the short to medium-term.

#### THE NEED FOR A POLICY MIX

Carbon pricing is a necessary but not sufficient condition for a transition to a low carbon economy. It is necessary, because the theoretical benefits of market-based instruments are strongly supported by empirical evidence. In particular, the inverse relationship between energy (carbon) prices and energy consumption (carbon emissions) that it is predicted by basic economic theory appears confirmed by empirical data (Figure 1).

**Figure 1: Relationship between electricity price and electricity intensity in OECD member states (1998)**



Source: Verbruggen (2003).

Notes: The figure shows cross sectional data from 24 OECD countries for 1998. A double log function  $\ln(\text{Intensity}) = a + b \cdot \ln(\text{Price})$ , gives an  $R^2$  of 82.3 and a residual standard error of 0.2296. The estimated elasticity  $b$  equals  $-1.17$  (standard error 0.12 and  $t$ -value  $-10.11$ ), implying that a 1% increase in electricity prices leads to a 1.17% reduction in long-term electricity intensity.

Carbon pricing in isolation, however, is insufficient because it only addresses the environmental externalities of fossil fuel combustion and does not overcome the variety of reinforcing market failures that inhibit the innovation and diffusion of low carbon technologies (Jaffe, *et al*, 2004; Sorrell, *et al*, 2004). On its own, carbon pricing is likely to provide insufficient support for promising low carbon technologies that are in the early stages of deployment as well as being relatively ineffective in encouraging energy efficiency in sectors with a low energy intensity.

<sup>18</sup> The difficulty here is one of inertia. For each instrument, a legislative framework will be established which may be difficult to change; regulatory institutions will be established, or responsibilities assigned to existing institutions; procedures and standards will be established for functions such as monitoring, reporting and verification; a network of private organisations become involved in implementation; and the target groups themselves will invest substantial time and money in gaining familiarity with the policy instruments and putting the appropriate procedures in place. All these activities will cultivate vested interests and encourage resistance to change.

<sup>19</sup> These include: the presence of hidden costs (including the opportunity cost of time, disruption etc.); limited information (about energy use, cost of measures, benefit of measures); uncertainty about length of tenure at a property and the associated inability to recoup any uncapitalised expenses; split incentives (most notably between landlords and tenants); and difficulties in accessing capital.

This is particularly the case in the household sector, where the adoption of cost effective energy efficiency improvements is hindered by a series of market failures.<sup>19</sup> The net result is that the price elasticity of energy consumption is very low in this sector, which means that carbon prices would need to be very high to have a significant impact on behaviour and emissions. The associated distributional impacts are unlikely to be acceptable. At same time, there is no prospect of curbing emissions in the domestic sector over the longer term without increasing energy prices.

This points to the need for a coordinated policy mix that “gets the prices right”, overcomes barriers to the adoption of cost effective technologies and facilitates and encourages the complex processes of technological change. This is not an argument for a “kitchen sink” approach, but does suggest that a range of measures will be required. For example, I would argue that there is a strong case for traditional regulatory measures to eliminate standby power and to impose minimum energy efficiency requirements on electric appliances. Many of these measures are better focused on the supply chain for energy using devices, rather than the consumer, and need to be targeted and differentiated by energy service. The revenue stream from an upstream trading scheme may be used in part to fund R&D, demonstration projects, investment subsidies and other measures to facilitate the diffusion of energy efficient technologies. Hence, it is not a question of either a trading scheme or traditional regulatory measures: instead, both are likely to be required.

#### SUMMARY

This submission has expanded upon the practical obstacles to implementing a hybrid trading scheme and speculated on the timescales involved. The key points are as follows:

- There are relatively few practical obstacles to implementing a hybrid trading scheme and the administrative costs should be relatively small. Instead, the biggest difficulties relate to its potential impact on business competitiveness and income distribution.
- The impact of a hybrid scheme on business competitiveness can easily be overstated. The impacts should be positive for many sectors and with targeted recycling of revenues, most negative impacts could be substantially reduced.
- Revenue recycling may also be used to minimise the impact of the scheme on low income households. However, the scheme could still worsen the position of a significant number of households that are worst affected by fuel poverty. This may make it difficult to introduce the scheme within the short to medium-term.
- Introducing a hybrid scheme on top of existing and proposed policy instruments could be costly, unnecessary and unrealistic. Current policy proposals could therefore preclude the introduction of a hybrid scheme in the short to medium-term.
- A hybrid scheme has many similarities with a programme of environmental tax reform, but at present both business and the general public have a poor grasp of the implications of such reforms. A variety of measures may need to be taken to make such changes more acceptable.
- A personal carbon allowance (PCA) scheme will have very similar impacts on business competitiveness and income distribution. It will also face similar problems of policy interaction and may face greater difficulties with public understanding and acceptance. It is therefore even less likely to be introduced in the near future.
- In addition, the aggregate costs of meeting an emission target are likely to be higher with a PCA scheme; the administrative costs of establishing, introducing and monitoring the scheme will be much higher; and a PCA scheme will not offer the opportunity to link to the EU ETS and the global carbon market.
- While carbon pricing mechanisms such as a hybrid or a PCA scheme are necessary to reduce carbon emissions, they will not be sufficient. A range of supporting policies will also be required.

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<sup>19</sup> These include: the presence of hidden costs (including the opportunity cost of time, disruption etc.); limited information (about energy use, cost of measures, benefit of measures); uncertainty about length of tenure at a property and the associated inability to recoup any uncapitalised expenses; split incentives (most notably between landlords and tenants); and difficulties in accessing capital.

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**Memorandum submitted by Laurence Matthews**

## EXECUTIVE SUMMARY

The Committee asks whether personal carbon allowances (PCAs) are desirable, and whether they are practical. There remain doubts about their practicality, and PCAs are only desirable because of the ends they achieve—they cap personal carbon emissions effectively and equitably. Cap & Share achieves these same ends, but is simpler, faster and cheaper to implement. Under Cap & Share the UK emissions cap is shared out equally to the adult population: everyone receives certificates which they sell, via banks, to the primary fossil fuel suppliers. Cap & Share delivers personal carbon trading implicitly, avoiding many of the problems with PCAs (impacts, operational feasibility, public acceptability) that concern the Committee.

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1. Introduction
2. Cap & Share
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1. Treatment of electricity
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4. The EU ETS, hybrids and transitional arrangements

## ABOUT THE AUTHOR

I am a writer, previously a university lecturer, and with 20 years' experience in the transport industry. I gave evidence to the Efracom Inquiry into "Climate Change: the Citizen's Agenda" in January 2007, and I am now working with the Cap & Share campaign ([www.capandshare.org](http://www.capandshare.org)), which is developing and promoting Cap & Share.

## RECOMMENDATION

That the Committee evaluate Cap & Share as a practical alternative to personal carbon allowances, with a view to advocating the early adoption of Cap & Share as the preferred method of implementing the forthcoming Climate Change Bill.

## 1. INTRODUCTION

1.1 Cap & Share (C&S) is a regulatory and economic framework for climate stabilisation, originally developed by Feasta, the Foundation for the Economics of Sustainability ([www.feasta.org](http://www.feasta.org)).

1.2 The world has only a very brief window of opportunity to prevent catastrophic climate change. The UK, with its draft Climate Change Bill, is in a position to lead by example, gain valuable operational experience, and demonstrate an approach that could be used globally from 2013 onwards as a successor to the Kyoto protocol. In addition, any global agreement will require practical tools to implement agreed caps domestically. In the UK, a domestic framework is also needed if the exhortations (by Defra and others) for individuals to "do their bit" are not to be undermined by free-riders. C&S is just such a framework.

1.3 The emissions from some large companies are being addressed by the EU ETS (not without teething problems), but this does not cover the emissions caused by households. At the moment personal carbon trading is the most prominent proposal for bringing these household emissions under an overall cap.

1.4 The mechanism for implementing personal carbon trading is to operate Personal Carbon Allowances (PCAs) using personal carbon debit cards. The overall approach is “economically efficient”, but many see it as impractical, possibly intrusive, and at the very least costly and cumbersome—given the history of government computer systems. A typical comment in this vein is:

“ . . . carbon allowances are an administrative nightmare, impossibly complex to run, and could be circumvented in an almost infinite number of ways . . . Carbon rationing is an elegant and completely impractical option.”—(Chris Goodall, *How to Live a Low-carbon Life*, Earthscan, 2007, page 41).

1.5 The C&S campaign strongly supports the aims of personal carbon trading, but sees a better way of achieving those aims. We want to deliver the benefits fast, at a fraction of the cost of PCAs, and in a way which side-steps many problems and objections which might bog down PCAs. C&S achieves precisely the same ends but by different means: means which are simpler, more flexible, more effective and, we believe, more publicly acceptable.

1.6 However, although C&S is a simple idea, it is relatively new. C&S appears at first glance to be very different from personal carbon trading, and we have found that many people initially reject it as a solution—seemingly because of what is called in psychology a “framing effect”. There is a story about a visiting Soviet official who asked who was in charge of the supply of bread to the population of London: his question betrayed his frame of reference. It is worth making the effort to jump out of the “frame of reference” of PCAs, because the advantages (fast, cheap, public appeal) are so great.

## 2. CAP & SHARE

2.1 Cap and Share is most naturally explained by standing right back and considering what we are trying to do. In Section 3 we will compare C&S with PCAs, but for the moment let’s forget PCAs and look at the big picture.

2.2 Climate change is a global problem, so we need to cap and reduce CO<sub>2</sub> emissions globally. (For clarity we will talk in terms of CO<sub>2</sub> only; for other greenhouse gases see paragraph 8.12 below). The best science currently available suggests that to avoid a climate catastrophe humanity needs to maintain global average temperatures at or below 2 degrees C above pre-industrial levels. Emissions reduction paths (a series of caps for each year into the future) that have a reasonable prospect of limiting the temperature rise to this figure can be calculated. The annual caps must cover all CO<sub>2</sub> emissions from the combustion of fossil fuels: there can be no exclusions (such as excluding international aviation “because it is not covered in the Kyoto Protocol”).

2.3 Methods have been proposed for working out the UK’s share of each year’s annual global cap (see Section 7), to give an emissions reduction path for the UK. The total amount of CO<sub>2</sub> emissions allowed for each year would be the “Cap” used by “Cap and Share”.

2.4 UK emissions would be limited to the level set by the cap by means of emissions permits. But before proceeding to consider trading mechanisms, C&S pauses to ask the question: who should own these permits? Do they belong to the government, to big companies, or to you and me? Who owns the sky? C&S takes the view that the Earth’s atmosphere and natural sinks are a fundamental common resource, and that the rights to emit the limited amount of greenhouse gases which can be safely be emitted should be shared out equally among everybody in the world (in practice, among all adults). That is the “Share” in “Cap and Share”.

2.5 In a C&S scheme for the UK, all adults would receive certificates entitling them to an equal share of the emissions permitted under that year’s cap. These would arrive monthly (or maybe quarterly or annually; see Section 8), and would then be sold, via banks or post offices, to primary fossil fuel suppliers—the companies who import fossil fuels (or extract them from the ground). Each primary fossil fuel supplier would have to acquire and surrender certificates equal to the emissions from burning the fossil fuels that they introduce into the economy. In other words, C&S enforces the cap at the upstream end.

2.6 That’s the system in a nutshell. But what are the consequences? The price of certificates (paid by the fossil fuel suppliers) is built into the cost of fossil fuels, which then flows through the economy (as it would under a carbon tax—see Annex 3). So for consumers, “carbon-intensive” products and services become more expensive—but on the other hand, consumers get the money from selling their certificates. People with lower than average carbon footprints will come out ahead.

2.7 Since only the fossil fuel companies need to be policed, this is a cheap system to run and a quick one to implement. It is clearly equitable, and engages the public imagination with a positive psychology: my certificate is my tangible connection to the national effort to reduce carbon—and I even get paid for it! All this is achieved without the need for the machinery of carbon debit cards—and we could also do away with the red tape of carbon trading for companies both large and small.

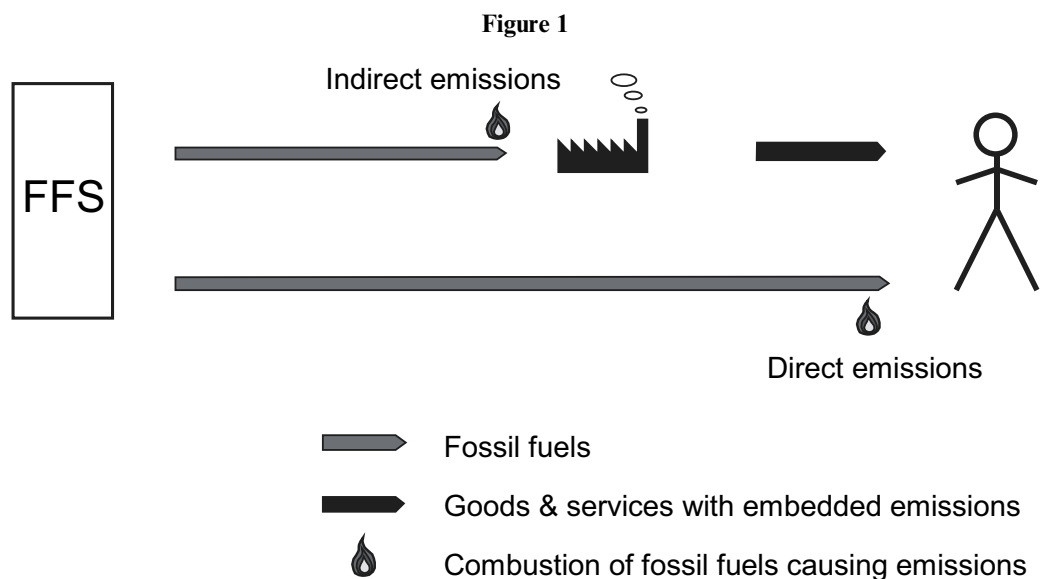
2.8 C&S is potentially a global system. In the future, with a successor to Kyoto in place, it could be the mechanism for averting catastrophic climate change while also helping Africa to “make poverty history”. We have found a public appetite for the “global justice” aspects of a transfer of wealth from (say) the EU to Africa if both blocs were trading in a future scheme.

2.9 However, C&S is flexible and can be introduced initially at the EU level, at the UK level, or even at a sectoral level. So let’s stick with the UK for the moment. The following section compares C&S with PCAs.

### 3. A COMPARISON OF C&S WITH PCAs

3.1 Using the standard terminology, we can regard each individual as responsible for two types of CO<sub>2</sub> emissions: personal direct emissions and personal indirect emissions. Personal direct emissions cover the CO<sub>2</sub> emitted directly by the individual when burning petrol, gas or other fossil fuels. Personal indirect emissions are caused by organisations producing the goods and services bought by the individual.

3.2 Figure 1 illustrates these two types of emission, and shows the flows of fossil fuels from the primary fossil fuel suppliers on the left-hand side of the diagram to the individual citizens on the right-hand side.



3.3 A downstream system applies the cap at the downstream end of each of these energy flows. For personal direct emissions, this is usually taken to mean personal carbon trading using PCAs.

3.4 PCAs (and many carbon footprint calculators) focus on the personal direct emissions. Household electricity is generally also included, although strictly speaking this is an indirect source of emissions. This complicates the situation and for clarity I will ignore electricity for the moment (the full picture is given in Annex 1 where electricity is separated out).

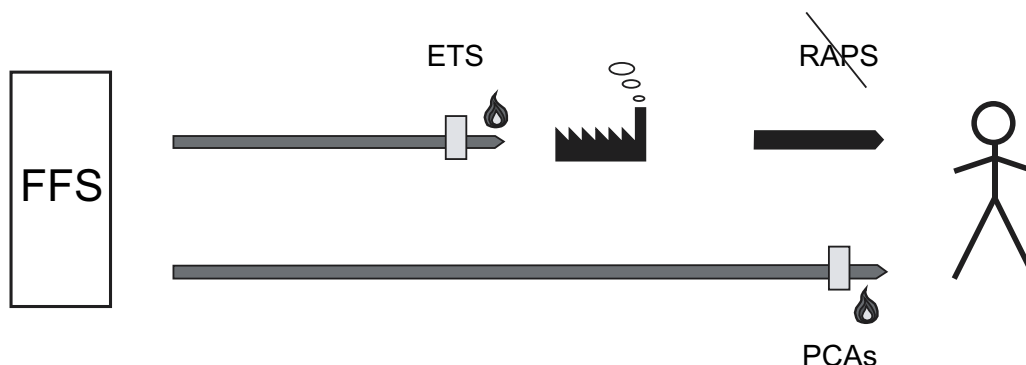
3.5 Personal indirect emissions cannot be covered downstream in this way. To do so would entail Rating All Products and Services (RAPS), that is, working out how much embedded carbon was contained in all goods and services (every pair of scissors, every haircut). This is widely seen as impractical. So instead, personal indirect emissions are usually tackled by considering them as the direct emissions of the companies which provide these goods and services.

3.6 This is done by having companies trade carbon too, for example in an emissions trading scheme (ETS). It is usually assumed that around 40% of the total UK cap is allocated to the PCA scheme (on the basis that 40% of UK emissions arise from the personal direct emissions sector at the moment), with the remainder going to the ETS. Notice that by rejecting RAPS and moving to an ETS, we have tackled the personal indirect emissions sector by moving (halfway) upstream.

3.7 Proposals for downstream systems thus take the form of a combined PCA + ETS package, as illustrated in Figure 2. TEQs (alias DTQs) are an economy-wide proposal which has two parts like this (although the two parts can trade in a single combined market, or the ETS could be replaced by a process of tendering). In such a downstream scheme all CO<sub>2</sub> emissions are being capped at the point of combustion.

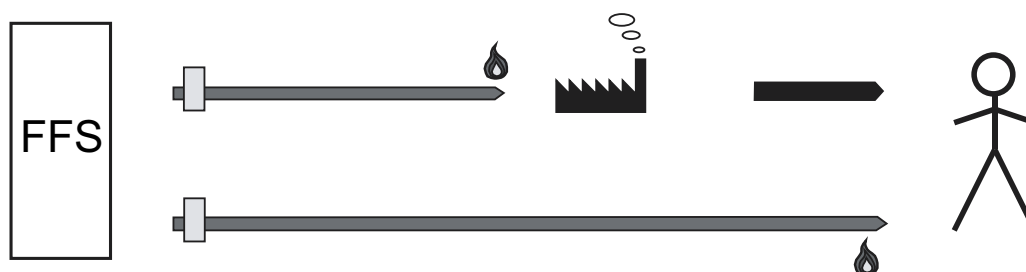
3.8 In Figure 2, and subsequent diagrams, the small rectangles straddling the horizontal lines represent the emissions permits and indicate the point at which each energy flow is capped.

Figure 2



3.9 An upstream system, on the other hand, applies a cap by requiring the fossil fuel suppliers to surrender certificates. Examples of upstream systems are an upstream auction of emission certificates (see Annex 3), and C&S. Figure 3 illustrates this.

Figure 3



3.10 In its simplest form, C&S is a substitute for TEQs, or in other words it can replace the whole of a combined PCA + ETS package.

3.11 However, C&S is flexible, and we can apply C&S in just the personal direct emissions sector if desired, leaving an ETS to cover the personal indirect sector. In order to compare C&S directly with PCAs, we will confine C&S to the personal direct emissions sector for the rest of this section.

3.12 On this level, the main point is that C&S delivers the same result as PCAs. And we stress that C&S is not just a vaguely similar alternative approach; C&S delivers precisely the same effects as explicit personal carbon trading.

3.13 To illustrate this, let's just consider two people, A (for affluent) and B (for basic), whose only purchases are petrol. (The following example is described in more detail as a numerical worked example in Annex 2).

3.14 Suppose that last year A and B bought 100 litres and 20 litres per week, respectively: a total of 120 litres. Now suppose we bring in a cap for this year which limits them to (the emissions from) 110 litres per week. Consider how this is achieved by PCAs and by C&S.

3.15 In "PCA-world", A and B are each issued with a carbon debit card and are allocated emissions allowances equivalent to 55 litres per week each. A and B must each swipe their carbon debit cards at each petrol purchase.

3.16 Now A is used to buying more than his allocation of 55 litres. To achieve this, A can buy some allowances from B (probably through a broker). A buys the right to buy more litres of petrol, and B gets money for selling the right to buy those same litres. But there are only 110 litres of allowances in total, so A and B will have to reduce their joint petrol purchases slightly compared with last year.

3.17 Now let's see what happens to their counterparts in "C&S-world". Here, A and B are both allocated certificates equivalent to 55 litres. They sell them at the bank or post office. The fossil fuel suppliers must buy them (in order to be allowed to introduce 110 litres of petrol into the system) and they then pass this cost on, resulting in higher petrol prices. So A and B find that the petrol price is higher; but in compensation they get the money from selling their certificates.

3.18 In C&S-world, there are no explicit restrictions on what A or B can buy; but the price is higher than it was, so A and B will not buy quite as much as last year. Initially, one might suppose that A and B would try to carry on as before, swallowing any petrol price rise, but here is the crucial point: in C&S-world too, there are only 110 litres in the system (as that is the limit the fossil fuel suppliers can sell). So if the demand is high, the price of petrol rises until demand falls back to 110 litres per week (see Section 5 for more discussion on this point).

3.19 In fact, because the cap is the same as it was in PCA-world (110 litres), the price will rise until A and B buy exactly the same amount of petrol as in PCA-world. Moreover, A and B are each exactly as well off financially as they were in PCA-world. It turns out that the extra paid by A in C&S-world (to buy petrol at the higher price, minus the amount he got for selling his certificates) is exactly the same amount of the money A would have spent in PCA-world to buy the allowances from B. Meanwhile B has come out ahead in C&S-world (because for him the money he gets for selling his certificates outweighs the petrol price rises), and the amount by which B is ahead is exactly the same amount he would have received from A in PCA-world. The numerical example in Annex 2 shows in detail how this happens.

3.20 This is what is meant by saying that C&S delivers implicit personal carbon trading. The end result, both in terms of petrol sold, and in terms of A's and B's financial positions, is the same in both worlds.

3.21 But although the two worlds may produce the same result, they feel very different. In PCA-world, A and B have their every petrol purchase tracked; they have to keep checking they have enough allowances; and they buy and sell allowances accordingly. In C&S-world, A and B simply sell their certificates once a month: they never have to worry about carbon budgets; they don't have carbon credit cards; they simply choose to buy petrol or not, according to the pump price.

#### 4. ADVANTAGES OF CAP & SHARE

*Advantages which C&S and PCAs have in common.*

##### 4.1 *Effective*

PCAs and C&S are both mandatory systems which guarantee that a cap is met (unlike relying on incentives and voluntary solutions, which are inadequate responses to the crisis we face).

##### 4.2 *Complete coverage*

Both PCAs and C&S give complete coverage of the personal direct emissions sector. C&S also gives complete coverage of the indirect emissions sector (see Section 6), and PCAs could achieve this by teaming up with a total-coverage ETS or tendering system (as advocated under TEQs).

##### 4.3 *Equity*

C&S is inherently equitable, and captures the same robust fairness as PCAs. It also resonates strongly with global equity issues (see Section 7). Equity is a very strong plus point when considering public acceptability. In tackling windfalls (see Section 6), C&S is more equitable than the existing EU ETS.

*Advantages of C&S relative to the alternative of PCAs.*

4.4 We start with the practical advantages, more relevant to feasibility and efficiency, and then move on to the more intangible points which are important to public acceptability.

##### 4.5 *Cheap*

C&S has very low capital costs (setting up a register based on the electoral roll, as opposed to setting up a computerised transaction system); low running costs (printing and distribution of certificates, as opposed to tracking each individual fuel purchase); and low enforcement costs (only the fossil fuel suppliers need to be policed).

##### 4.6 *Fast*

C&S could have a lead-time of less than a year, compared with several years for PCAs. We cannot afford to fritter away the next five to 10 years putting a system in place to reducing our CO<sub>2</sub> emissions substantially. This is particularly so if we are looking (as we should be) to the global situation: the experience gained by operating a scheme early on in the UK will prove invaluable in shaping global schemes and furthering global agreements, both of which are urgently needed. Early implementation would also mean that experience can be gained in relatively benign conditions (when caps are mild).

##### 4.7 *Simple*

“Simple” leads to “fast” and “cheap”, as already noted. But simplicity is also valuable in itself. Firstly, simple systems are easier to implement (some would go as far as to say that only upstream systems are feasible in the first place: I have heard the comment “doing it downstream is madness”). There are two further important reasons for keeping things simple:

- As it is, we will have many other climate-related tasks on our plate, from dealing with deforestation to planning adaptation measures, so we cannot afford to become bogged down with a complex method of capping CO<sub>2</sub> emissions.
- Early adoption by the UK of an effective system is likely to be used as a model elsewhere, and even for an embryonic global system. Only simple systems have any hope of being practical in this context, especially in developing countries.

#### 4.8 *Not onerous*

Whilst C&S captures a feeling of involvement in solving the climate crisis (see below), it avoids having to persuade the whole population to adopt carbon budgeting, educating them how to do so, providing them with help in doing so, etc. PCAs claim the advantage that carbon budgeting raises awareness, but this is only a means to an end, and not something we should have to rely on in order to implement a scheme.

#### 4.9 *Robust*

C&S is much less vulnerable than PCAs to power cuts (under C&S people can simply pay for petrol with cash), software failures and the like.

#### 4.10 *Less corruption*

Policing a small number of fossil fuel suppliers would give fewer opportunities for fraud than policing myriads of small companies and petrol retailers. Furthermore, upstream systems provide little opportunity for black markets. PCAs have a white market in allowances, so avoid a black market in allowances, but still leave open the potential for a black market in petrol. The black market incentive arises because in PCA-world petrol itself is still cheap if it can be acquired illegally without parting with allowances. In C&S-world, petrol itself has the certificate price built in, so the incentive disappears.

#### 4.11 *Positive psychology*

C&S does not have the negative connotations of a “tax”, or the restrictive connotations of “allowances” or “rations”. Instead, everyone is given a certificate, which they can then sell. Consumers do not face any explicit restrictions on their purchasing decisions, other than those set by price and their own financial constraints—constraints which they are used to.

#### 4.12 *Not intrusive*

As already mentioned, there is no need to track individual fuel and energy purchases. C&S avoids civil liberties implications, whereas mandatory carbon debit cards are already seen in some quarters (rightly or wrongly) as being akin to ID cards.

#### 4.13 *Public engagement*

Under simple C&S (covering the whole economy) my certificate is exactly my equal share of the country’s carbon budget, and is my tangible connection with the national effort to reduce carbon. I am part of the solution to climate change, not part of the problem. (Under a global system, it would be my global share of humanity’s emissions—see Section 7). By contrast, my PCA is only my share of 40% of the country’s carbon budget.

#### 4.14 *Rights-based*

My certificate is my entitlement to my share (of the country’s carbon budget), which I then sell upstream; it is not an “allowance” or “ration” handed down to me. It is not a state handout (which I may or may not trust the government not to raid in the future).

#### *Disadvantages of C&S*

4.15 The main handicap suffered by C&S is its recent emergence and hence its unfamiliarity (compared with PCAs). As discussed in the next section, this means it sometimes faces difficulties in persuading people (not least policymakers and commentators) of its effectiveness.

## 5. PSYCHOLOGICAL STUMBLING BLOCKS

5.1 But it can't work, can it? On hearing about C&S, many people instinctively feel that something doesn't add up; it can't be that simple. In communicating C&S, I have encountered this reaction many times, even among economists versed in PCAs, and so it is worth exploring what the stumbling blocks are. Ironically, public understanding is sometimes easier to achieve.

5.2 The first point is that C&S is functionally equivalent to (achieves the same results as) PCAs in the personal direct sector, but it is not psychologically equivalent. People often fail to make this distinction. C&S has no apparatus of downstream rationing, and so it doesn't feel like PCAs; but that does not mean that it can't deliver the same result.

5.3 The first step then is to realise that functional equivalence is different from psychological equivalence. We can then look more dispassionately at whether or not C&S might be functionally equivalent to PCAs, for example by looking at the numerical worked example in Annex 2 in detail.

5.4 However, even if this is convincing intellectually, people often still have a residual feeling of unease. This second psychological block amounts to a distrust of upstream systems, and is best encapsulated by the question, "What's to stop someone just buying more petrol?"

5.5 What seems to lurk behind this question is that we think we know how rationing works—from tales (and experience) of rationing during and following the second world war. In such a system, everyone is issued with ration coupons and they are highly visible to individual citizens. The coupons are issued and everyone must stay within their limit. Moreover, when buying goods you have to surrender some of your precious supply of coupons, so you can see the limit being enforced.

5.6 Ration coupons were not legally tradable, but if they had been, we would have had a system very similar to PCAs. So, ask the same question in PCA-world: what's to stop someone just buying more petrol (by buying a few allowances off someone)? Indeed, in PCA-world, people would be allowed to buy allowances at petrol stations. In PCA-world, the answer is more obvious: buying and selling allowances does not affect the total number in circulation, and so it's easy to see that the cap is still being enforced.

5.7 What this amounts to is that to cap the volume of petrol used, we rely on counting up all the petrol coming out of all the petrol pumps in the country, and then accounting for it all by checking it off against PCAs. This is one way of capping the petrol used. It simply remains to realise that another equally valid way to cap the volume of petrol coming out at the bottom end of the system is to cap the amount going in at the top. This is true even if the petrol comes out at the bottom end at a remote location and at a later point in time.

5.8 Nevertheless, a niggle remains about how this is achieved: with an upstream system, there seems to be no control at the point of sale. What if I want to buy more petrol—surely this will breach the cap?

5.9 Again, the missing element is the time factor. C&S works at the consumer level through the price mechanism. If there is more demand than supply (at a given fuel pump price) in a given week, say, then the system quickly adjusts. The fuel retailers will demand more petrol from the fossil fuel suppliers. But these suppliers only have a fixed supply to sell (governed by the quantity of emissions permits they have bought), and so will put up the price to the retailers in accordance with supply and demand. The retailers will pass this cost on, and the pump prices will rise. The next time the motorists fill up, they will face a higher price. Over a (fairly short) period of time, the price will rise until the demand levels off (see the numerical example in Annex 2). Meanwhile, the fossil fuel supplier would dearly like more permits, to meet the demand for fuel from the retailers, and so he seeks further permits, driving the permit price up. (This means that all citizens get more money when they sell their next batch of certificates.)

5.10 Markets adjust to supply and demand. For example, the housing market operates on the basis of there being a finite supply of land. The fact that "there is nothing to stop me buying another house if I want" doesn't increase the amount of land.

5.11 Also, it is worth pointing out that the same problem lies buried in PCAs. PCAs do not form a self-contained solution to emissions capping, as they only apply to the personal direct sector. They can only work if combined with a scheme (such as an ETS) to tackle the indirect personal emissions. And as we noted in paragraph 3.6, these emissions are capped not downstream at the consumer level, but (halfway) upstream.

5.12 Note that these arguments are different from the related objection to trading, on the grounds that "rich people can just go on buying petrol" (with an implied "what about the poor?"). This objection applies equally of course to PCAs. Rich people can also buy apartments in Mayfair; life is like that. However PCAs and C&S both result in a transfer of wealth from the rich to the poor. (Fuel poverty is discussed in paragraph 8.6).

5.13 After all this we have a final stumbling block, a feeling that "surely it can't be that simple". Once people have grasped the idea of C&S, they can still find it hard to shake off thought-patterns from the more complicated systems. A typical question is, "Yes, I see how C&S works, but how do people work out their allowances?" The answer, of course, is that they don't: there are no such things as allowances. There is no need for carbon budgeting: people make choices based on price alone. The budgeting is all done for them. There are many similar questions which a "visiting Soviet official" (see paragraph 1.6) might ask.

## 6. THE INDIRECT EMISSIONS SECTOR

6.1 C&S sees no distinction between personal direct and indirect emissions. In its simplest form, C&S replaces both parts of the ETS + PCAs package. Although this inquiry is into the PCAs, the personal indirect emissions sector is relevant (as we shall see below), and is briefly considered in this section.

6.2 In the personal indirect emissions sector, an upstream system has the same advantages over a downstream ETS, as C&S enjoys over PCAs in the personal direct emissions sector: it is effective, cheap, simple, fast, has no red tape, and renders completely irrelevant the “visiting Soviet official” questions about which companies should be included, how to treat new entrants, how to treat retiring plant and so on. In addition, an upstream system completely avoids threshold problems (of deciding where the threshold should be between large companies in the ETS and smaller ones outside it) by delivering complete coverage at a stroke. Finally much of the “crowded policy landscape” (CCL, CCAs etc.) can be dismantled, or at the very least not extended.

6.3 Given that an ETS scheme is up and running, however, there will be a natural desire not to have to scrap it and start again. Fortunately, it is simple to construct an upstream system which dovetails with an ETS in an upstream/ETS hybrid system (see Annex 4).

6.4 Why is this relevant to the personal direct emissions sector? There are two reasons. Firstly, unless there is complete coverage of the indirect sector, the overall PCA + ETS scheme does not have the complete coverage of the economy that is required.

6.5 Secondly, C&S shares out 100% of CO<sub>2</sub> emissions among the population, on the basis that emissions are caused by us all, whether directly in our own homes, or indirectly by companies providing goods and services on our behalf. Under PCAs only (around) 40% is shared among the population. This leaves the remaining 60% outside the public’s control. This is reflected in people’s frustration when trying to minimise their personal carbon footprints (of say four tonnes of CO<sub>2</sub> per year): they find they are only weakly able to affect their indirect footprint (another six tonnes).

6.6 Moreover, the 60% of the money in the ETS system is at present given to the ETS companies (who pass on embedded costs downstream to the consumer and pocket the windfall profits). Replacing the current system of grandfathering by an auction with proceeds recycled to the ETS companies would not alter this. If the proceeds went to the government instead, it would be seen as a tax. Only if the proceeds are returned to the population would the situation prior to the introduction of the ETS be restored. Since this would be part of the introduction of C&S, it would hugely add to the public attractiveness of C&S, and would also go a long way to alleviating concerns over fuel poverty.

## 7. EQUITY AND THE GLOBAL SCENE

7.1 C&S is based on a robust equity of equal shares for all. Although everyone could claim to be a special case, this equality has a simple fairness that is hard to argue against, like the one-person-one-vote basis for democracy.

7.2 C&S can work at the UK level, EU level, or at global level, and as such a UK scheme can serve as a model for an EU scheme, and an EU scheme for a global one.

7.3 C&S arose as a way of implementing Contraction & Convergence (C&C), a framework for sharing global emissions between nations, developed by the Global Commons Institute ([www.gci.org.uk](http://www.gci.org.uk)). C&C proposes that national emissions converge to a global per capita average (during this process the total global level of emissions is also being reduced). C&C is itself based on the same robust equity, and a belief that anything more complicated is less likely to be agreed. Given a global emissions path (set by science), C&C can provide the corresponding UK emissions path, as mentioned in paragraph 2.3. C&S resonates strongly with C&C.

7.4 Climate change is a global problem, and any domestic scheme for the UK will be of limited use unless other countries adopt similar measures. However, the swift adoption of a UK cap would do two things: it would furnish operational experience with an effective domestic scheme, and possibly influence the shape of systems later adopted globally; and it would strengthen negotiators’ efforts to bring in a global solution such as C&C. In the end, only with such a global agreement will our efforts in the UK be meaningful. C&S can deliver such a domestic scheme for the UK with the kind of speed that is urgently required.

7.5 In the interim, while global agreements are not yet in place, there will always be objections that adopting a scheme in advance of everyone else will lead to competitive disadvantage. This objection is reduced for the UK if C&S is adopted at an EU level. Nevertheless, there will still be border effects.



7.6 One particular issue is the inclusion of international aviation and shipping. Emissions from these activities must be included in the overall global cap (it has been pointed out that excluding them is tantamount to going on a diet, but not counting calories from chocolate) and an obvious way to do this is that, for each flight between two countries, half the flight's emissions are allocated to each of the two countries. For a downstream system, an obvious way of doing this is to count emissions only from departing aircraft and ships (analogous to the one-way tolls on the Severn Bridge). Under C&S, it is only necessary to classify incoming "tankerage" (bringing in excess fuel) as importing fossil fuels and hence requiring permits. Otherwise, everything is taken care of automatically. (Aviation kerosene should be multiplied by 2.7 when calculating emission equivalents, to account for the particular effects of emissions at altitude).

7.7 There is a final point on equity and competitiveness. Sometimes the claim is made that whoever moves first will be at a competitive disadvantage when it comes to negotiating the final agreement. This argument recalls the arts of haggling (if you are buying something in a market, it is better to start by getting the seller to declare a price than to start by making an offer yourself). However, when you move up to an obvious line (global equality) and invite others to join you, the very obviousness and fairness of the line chosen provides a natural focal point or "attractor" and reduces this effect.

## 8. OPERATIONAL CONSIDERATIONS

8.1 A decision would have to be made on whether a UK scheme or an EU scheme should be adopted. A UK scheme could easily trade with other schemes in the EU, and these could merge into an EU-wide scheme.

8.2 The cap should be set by an independent committee, along the lines of the Committee on Climate Change envisaged by the draft Climate Change Bill, according to the latest science and with regard to international agreements. (The committee would also produce CO<sub>2</sub> conversion rates for oil / gas / coal etc according to their emissions per tonne, and advise on the treatment of other greenhouse gases). The cap applies to fossil fuel extraction and imports. C&S would guarantee that the cap is met.

8.3 The cap provides a single lever (akin to the MPC setting interest rates), leaving other institutions such as markets to take decisions accordingly. A long term signal should be given by setting the cap at least 5–10 years ahead, with a firm indication of the direction beyond that timescale.

8.4 Certificates would be distributed annually (or maybe quarterly or monthly). There are arguments in favour of an annual distribution (lower distribution costs, annual excitement generated) and in favour of more frequent distribution (less worrying about when to cash in your certificates). A compromise might be to issue annually a book of monthly vouchers. In either case, futures markets are well suited to providing a service to smooth out end-of-year price fluctuations.

8.5 The distribution would be to adults (18 or over) only. People with large families will claim that this is unfair, but adjustments should be made through other targeted means, such as through Child Tax Credit. Making exceptions for everyone who claims that they are a special case in some way would undermine the simplicity and robust fairness of the scheme.

8.6 Fuel poverty is also an issue best addressed separately. Introducing C&S for the whole economy (rather than just to the personal direct emissions sector) would reduce this problem, but it remains an issue of concern, just as it does with PCAs.

8.7 A register would be based on the electoral roll. There would have to be detailed decisions on how to treat expatriates, resident foreigners, and so on.

8.8 Banks and other market makers would be encouraged to set up arrangements to buy certificates from the general public and broker them to the primary fossil fuel suppliers.

8.9 There would be more muted opportunities for developing domestic carbon markets than if all companies and individuals were indulging in carbon trading, but still scope for an international carbon market (between a UK or EU scheme and other reputable schemes around the world).

8.10 Primary fossil fuel suppliers would have to buy certificates to cover the CO<sub>2</sub> emissions produced by burning the fossil fuels they introduce into the economy. Certificates are denominated in tonnes of CO<sub>2</sub>, so the number of certificates required would depend on the CO<sub>2</sub> emissions per unit burnt of the fossil fuel in question.

8.11 Individual citizens would be allowed to sell, keep, retire or hold back (save) their certificates. Fossil fuel suppliers would be allowed to hold over their certificates for a limited time, but not to borrow against future emissions.

8.12 The simplest method for dealing with other greenhouse gases would be to include them in the cap on the basis of their global warming potential (GWP) relative to CO<sub>2</sub>. However it may be preferable to maintain separate schemes (or regulation) for separate gases (as some are restricted to specialised industrial sectors).

8.13 Policing is only required of the primary fossil fuel suppliers (and companies within an ETS). No compliance is required by other companies, or by individuals. The regulatory authorities would have to be vigorous in looking for anti-competitive behaviour among the fossil fuel suppliers, but this process would take place in the full glare of public interest and scrutiny.

8.14 The inclusion or not of personal public transport (a question debated among supporters of PCAs and TEQs) is irrelevant to C&S.

8.15 Very few conditions are needed as prerequisites for the introduction of C&S. A scheme could be running in the space of a single parliamentary session. The main research questions relate to public attitudes and to acceptability of the scheme. Pilots and trials might iron out wrinkles in the administration of the scheme, but are probably best carried out by panels and role-play simulation than live regional pilots. However, there is an opportunity to pilot the scheme by introducing it at a sectoral level. Transport is a suitable case, being considered by the Irish government at the present time.

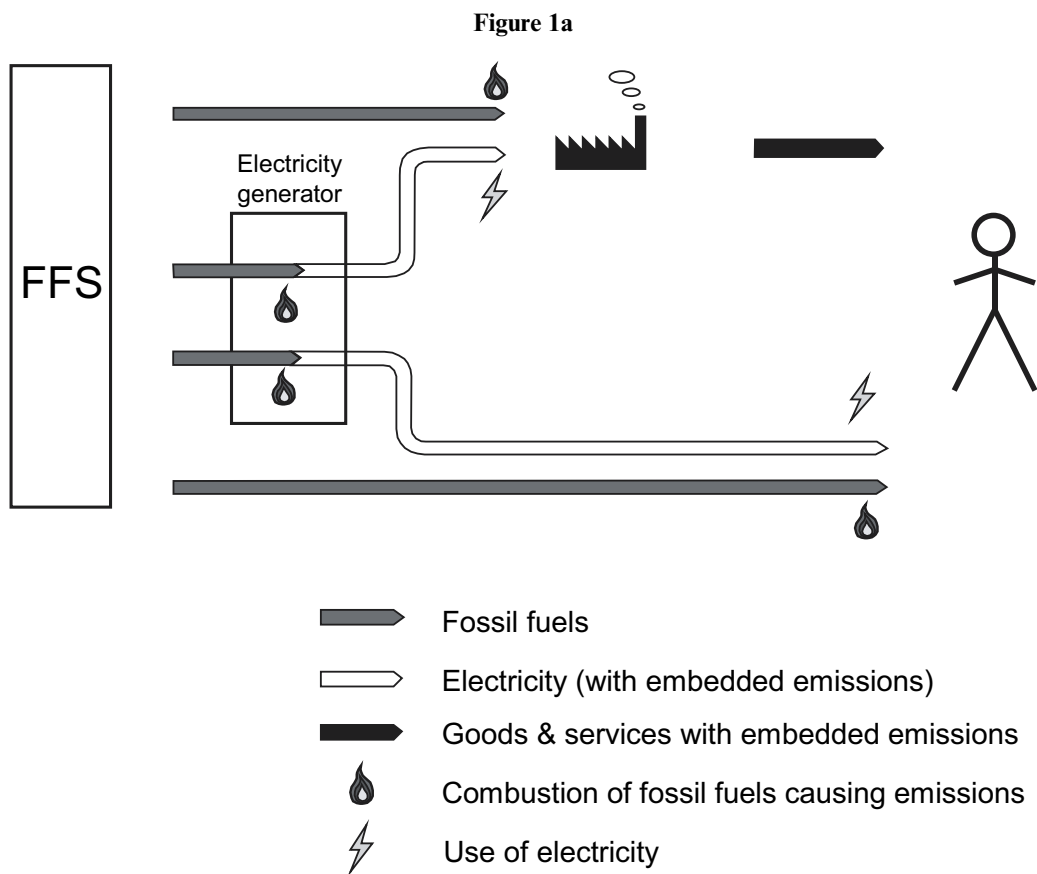
8.16 In all this it is vital to address the urgency of the issue. Governments must get to grips with the urgent, scientifically-grounded need for action. If action had been taken 15 years ago the situation today would be less serious than it is; similarly, a delay of a further 10 years before any effective scheme is implemented will lead to a critical state requiring draconian measures. We have no time to waste before getting started.

ANNEX 1: TREATMENT OF ELECTRICITY

A1.1 For clarity, in the main text I have ignored electricity. This annex gives the full picture. Figures 1a, 2a and 3a below are the equivalents of Figures 1, 2 and 3 respectively in the main text, but treating electricity separately.

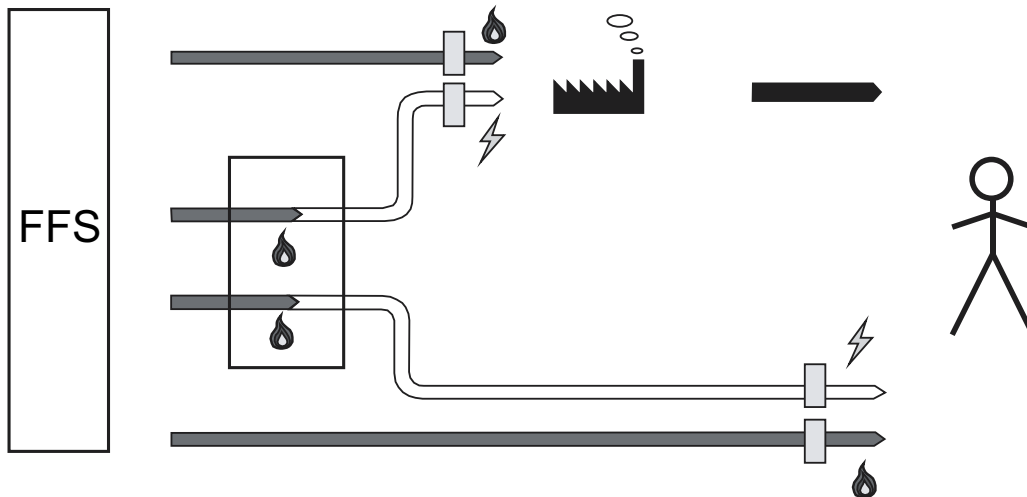
A1.2 For PCAs, household electricity is usually lumped together with personal direct emissions. This is sensible, because the generation of electricity causes CO<sub>2</sub> emissions and we would therefore like consumers to focus on reducing their use of electricity; and also because there are tradeoffs between household electricity and domestic gas and other fuels.

A1.3 Strictly speaking, electricity is a cause of personal indirect emissions (since the CO<sub>2</sub> is emitted at the power station), and the electricity supplied by the power generator contains “embedded” carbon emissions. If we treat electricity generation separately, Figure 1 becomes Figure 1a.



A1.4 In a downstream system, electricity is capped at the point of use of the electrical power, as shown in Figure 2a. Thus household electricity is included in PCAs (likewise, electricity use by large companies is included in an ETS—see Annex 4).

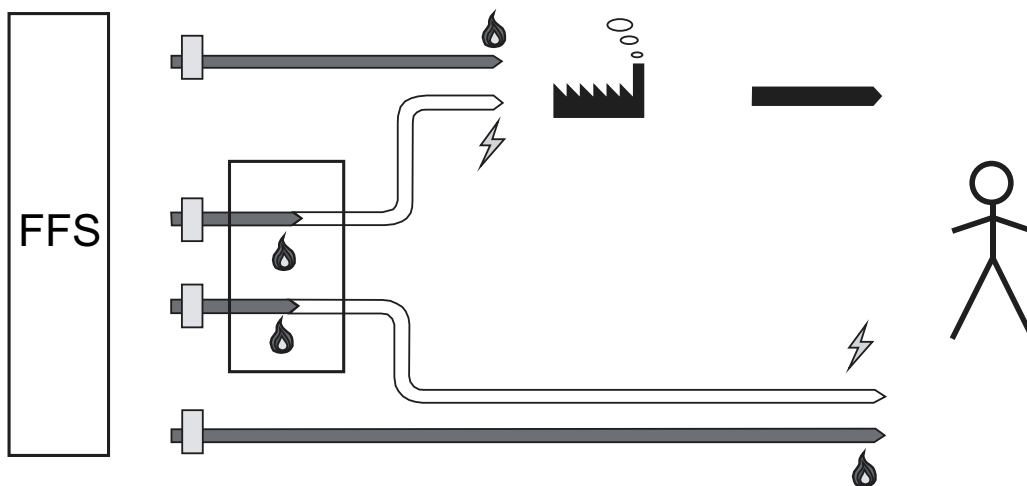
Figure 2a



A1.5 Conversion factors apply; a tonne of CO<sub>2</sub> as part of a PCA is equivalent to a given number of kWh, depending on the generating method used. (Of course it would equate to a very large number of kWh for electricity generated from renewables).

A1.6 In an upstream system like C&S however, the generators are just like everybody else: they buy fossil fuels from the fossil fuel suppliers and produce their own direct emissions (Figure 3a). The fossil fuel price, of course, includes the price of the permits bought by the fossil fuel supplier, and the electricity generator passes on this cost, by means of an increased price for electricity. To the consumer, the price of permits is simply built in to the cost of electricity, just as it is into the price of all other goods and services, and there is no need for carbon budgeting for electricity use. Of course, there are strong economic effects of all this: an incentive for all companies and households to economise on electricity, and an incentive for generators to develop renewable sources.

Figure 3a



## ANNEX 2: A NUMERICAL WORKED EXAMPLE

A2.1 This example (referred to in Section 3) illustrates how Cap & Share works, and how it achieves the same results as personal carbon trading using PCAs. In this simplified example we suppose petrol is the only fossil fuel and that the country only has two people, A (for Affluent) and B (for Basic).

A2.2 Suppose that last year petrol was 90p per litre, and that A used 100 litres per week and B used 20 litres per week, so that their total consumption was 120 litres. Now suppose that this year we wish to achieve a cap on emissions that equates to 110 litres per week. Let's see how this works out both in "C&S-world" and in PCA-world".

A2.3 In C&S-world, we issue certificates totalling 110 litres (the certificates are actually denominated in tonnes of CO<sub>2</sub>, but since in this example petrol is the only fossil fuel, I have converted all amounts to litres of petrol for simplicity). The fossil fuel suppliers have to acquire these certificates, and are thus limited to supplying 110 litres of petrol into the system. But A and B are used to consuming 120 litres between them, so there is more demand than supply. This means that the petrol price goes up.

A2.4 As the price goes up, A and B reconsider their use of petrol, and start to use slightly less. The more the price goes up, the less they will use. Suppose that by the time they have reduced to 110 litres between them, the price has gone up to £1.20 per litre. We might have A using 92 litres (down by 8%) and B using 18 litres (down by 10%).

A2.5 Meanwhile let's look at the fossil fuel suppliers. Suppose they are used to making 22p per litre profit. They are now only selling 110 litres instead of 120 litres, so they increase their margin by 2p per litre to make the same amount of profit overall (since  $120 \times 22p = 110 \times 24p$ ). They are charging 30p more for petrol (it is now £1.20, up from 90p), and so can afford to pay up to 28p per litre for the certificates. So (in a competitive market) the certificate price will be 28p.

A2.6 Under C&S, A and B get certificates for 55 litres each, and they sell these certificates at the bank, getting 28p each for them. So A and B fare as follows in C&S-world:

	A	B
Petrol cost	£110.40	£21.60 at £1.20 per litre
Income from certificates	-£15.40	-£15.40 55 x 28p
Total cost	£95.00	£6.20
Total cost last year	£90.00	£18.00
Better / worse off by	-£5.00	£11.80

A2.7 Next, let's look at the same scenario in PCA-world. We start with the same situation last year: petrol at 90p per litre, A using 100 litres per week and B using 20 litres per week, giving a total consumption of 120 litres.

A2.8 Suppose once again that this year we have a cap of 110 litres. This time we issue A and B with a quota of permits for 55 litres each. These permits are needed to buy petrol.

A2.9 In PCA-world the fossil fuel suppliers aren't involved. But, as in C&S-world, they can only sell 110 litres instead of 120 litres, so they increase their margin by 2p per litre to make the same amount of overall profit, and the pump price rises to 92p per litre.

A2.10 A is used to consuming 100 litres, so wants 45 more than his allocation of 55; and B is used to consuming 20 litres, so his allocation of 55 is 35 more than he needs. So A wants more permits than B has available to sell, and the price of permits goes up.

A2.11 As the price goes up, A and B reconsider their use of petrol, and start to use slightly less. The more the price of permits goes up, the more A has to pay for each permit, and the more B can get for any unused permits. The price of petrol is effectively the inclusive price (of the pump price plus the going rate for a permit—under PCAs people would be allowed to buy permits while buying petrol, thus paying this inclusive price). The more this inclusive petrol price goes up, the less petrol A and B will use. Assuming the same reactions to price rises apply in PCA-world as in C&S-world, A and B will behave exactly as they did in C&S-world. This means that by the time they reduce to using 110 litres, the effective price has gone up £1.20 per litre. At this point the going rate for permits will be  $£1.20 - 92p = 28p$ .

A2.12 As in C&S-world, we will have A using 92 litres and B using 18 litres. This is achieved by B selling 37 permits to A. So A and B fare as follows in PCA-world:

	A	B
Petrol cost	£84.64	£16.56 at 92p per litre
Buying/ selling permits	£10.36	-£10.36 37 x 28p
Total cost	£95.00	£6.20
Total cost last year	£90.00	£18.00
Better / worse off by	-£5.00	£11.80

A2.13 Notice that the total cost is exactly the same in both worlds; so is the amount of petrol bought.

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 ANNEX 3: UPSTREAM AUCTIONS AND CARBON TAXES

A3.1 This annex compares C&S with two other schemes: upstream auctions and carbon taxes.

A3.2 An upstream auction of emission permits would be a practical solution to capping emissions levels. Primary fossil fuel suppliers would bid for emissions permits, which would then allow them to introduce fossil fuels into the economy. The number of permits to be auctioned would be set by the cap. The major question is who gets the proceeds of the auction. If this is the government, the auction is likely to be seen as a carbon tax (see below).

A3.3 In the current discussion about reform of the EU ETS, there are proposals to replace grandfathering (allocating permits free to polluting companies, who then reap windfall profits) with auctioning and recycling of the proceeds. However, when companies advocate recycling of the auction proceeds, they tend to mean recycling of the proceeds to the companies participating in the ETS (in effect, perpetuating the windfall profits), rather than recycling the proceeds to the general population (see Annex 4).

A3.4 The Sky Trust proposal ([www.usskytrust.org](http://www.usskytrust.org)) calls for an upstream auction of emissions permits, conducted by an organisation called the Sky Trust, which would then distribute the auction proceeds equally to all (adult) members of the population. This is very similar to C&S, and the distinction is a fine one. In C&S I get an emissions entitlement and sell it; under Sky Trust I get the money. The advantage of C&S is the public engagement and feeling of empowerment and control from having the emissions entitlement as a right. For example, under C&S, if I feel passionately about climate change I can decide to “retire” (tear up) a few of my certificates, which would have the effect of reducing the country’s carbon emissions by a small but finite amount. Under Sky Trust, I do not have this option. This is a subtle point, but possibly an important one, given that this note has emphasised the importance of psychology to public acceptability. Set against this, C&S does incur transaction costs (when selling the certificates), which the Sky Trust scheme does not.

A3.5 A carbon tax is more problematic. C&S is functionally equivalent to a carbon tax set at a sufficiently high level (with recycling of the tax revenue to the adult population on an equal per capita basis), and hence delivers the same (economic efficiency) advantages. But it is hardly psychologically or politically equivalent. Recent experience with fuel duty suggests that it would be politically impossible for even a courageous government to impose a carbon tax at a level where it significantly affected demand. There would also be the suspicion that revenues would at some point disappear into general taxation. Fiscal instruments may help to effect mild changes in behaviour, but are unsuited to the more substantial changes necessary to tackle climate change effectively.

## ANNEX 4: THE EU ETS, HYBRIDS AND TRANSITIONAL ARRANGEMENTS

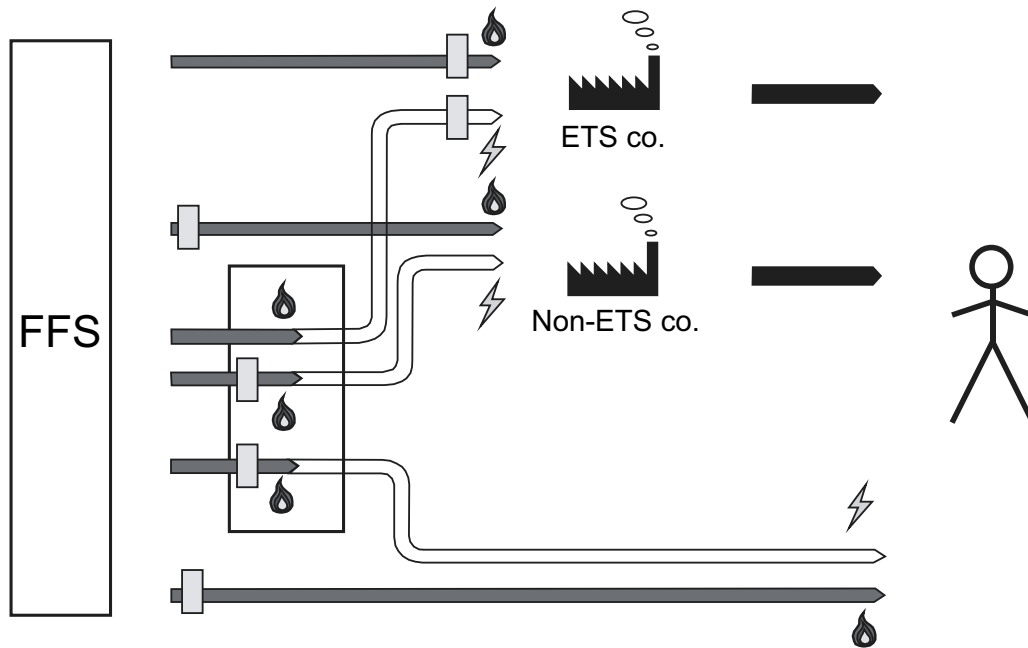
A4.1 The EU ETS has been criticised on several fronts: caps have been set ineffectively; it has given large windfall profits to participating companies at the expense of the consumer; the scheme is only partial, yet the bureaucracy would be daunting if the scheme were extended to smaller companies. The first of these criticisms has to be addressed at the political level, while the second can be tackled by moving from grandfathering toward auctions. The third is a structural problem. Nevertheless, the experience gained has been valuable, and building on the ETS would be preferable to scrapping it.

A4.2 The current move to extend the ETS to more companies, by reducing the size thresholds, would make the problems worse without addressing the criticisms. More and more companies would be involved in the red tape of carbon trading; yet the scheme would still leave many small companies outside the scheme, so would still be incomplete.

A4.3 The alternative is to move in the upstream direction. Hybrid upstream/ETS systems have been proposed which could immediately give complete coverage of the economy, yet leave the existing ETS untouched. (See the submission by Steve Sorrell to the Efracom Inquiry into “Climate Change: the citizen’s agenda”, August 2006).

A4.4 C&S can work with an ETS in a similar hybrid scheme, and this is illustrated in Figure 4. We now have two types of company: one trading in the ETS and another outside the ETS. In looking in turn at each part of this diagram, the point to look for is that each energy flow in the diagram is captured (by having an emissions permit straddling it).

Figure 4



A4.5 Certificates are issued to the population as under “pure” C&S but now, instead of all of these being bought by the primary fossil fuel suppliers, some are bought instead by the ETS companies.

A4.6 For an ETS company, emissions and electricity are traded in the ETS (as depicted by the permits shown next to the ETS company in Figure 4). Each company need only look at its own direct emissions (and electricity use); embedded CO<sub>2</sub> from other goods and services upstream is simply included in the prices paid for these, and is passed on downstream.

A4.7 For the non-ETS company, its direct emissions and its electricity use are both captured upstream. It just pays a higher rate for fuel and electricity to cover the embedded emissions, as in any upstream system. The non-ETS company therefore has no bureaucracy to deal with at all.

A4.8 The individual consumer is treated exactly as under “pure” C&S, with no need for carbon trading.

A4.9 The fossil fuel supplier must acquire and surrender certificates to supply fossil fuel, except that fossil fuels supplied to ETS companies are exempt. In Figure 4 the electricity generator is assumed to be in the ETS.

A4.10 The electricity generator is required to acquire certificates to cover its own direct emissions, and passes on the cost of these certificates downstream in the form of a higher electricity price. There is an exception for electricity supplied to an ETS company, which is exempt (so does not require certificates, and can thus be sold on without attracting a markup for a certificate price). This exception is necessary to avoid double-counting of the electricity used by the ETS company, as can be seen by referring to Figure 4.

A4.11 This system captures the emissions from non-ETS companies at a stroke, without the need to extend the ETS; however the existing ETS can carry on virtually unchanged.

A4.12 The only change to the ETS is that certificates are no longer awarded free to participating companies. The effect on these companies is exactly the same as if certificates were now to be auctioned with the proceeds given to the population. If this is deemed to be too abrupt a withdrawal of windfall profits, it is easy to conceive of transitional arrangements whereby certificates start off in an ETS auction (with the proceeds recycled to the ETS companies), and then over the course of (say) 5 years are transferred over to the C&S scheme.

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## Memorandum submitted by Defra

### INTRODUCTION

1. The concept of a personal carbon allowance is one of a number of potential long term ideas being explored by Government that could help to make individuals better informed about, and involved in, tackling climate change. David Miliband (then Secretary of State for Environment, Food and Rural Affairs) made a speech<sup>20</sup> to the Audit Commission on 19 July 2006 outlining his interest in considering personal carbon trading as a potential policy option, building on the Energy Review's commitment to undertake a study looking at the role of "community level" approaches to mobilising individuals. The Government remains committed to exploring the potential of personal carbon trading.

### BACKGROUND

2. The UK has a target to reduce its CO<sub>2</sub> emissions by 60% by 2050, and the new Climate Change Bill will make this a statutory target. All sectors of the economy must contribute to meeting this target, including the domestic sector, which is responsible for 40% of CO<sub>2</sub> emissions (from domestic energy use and transport).

3. Following the Government's Energy Review in 2006, Government commissioned a scoping study from the Centre for Sustainable Energy<sup>21</sup> (CSE) providing an initial analysis of the ideas and issues involved in the concept of individual carbon trading. CSE's main findings were that:

- a. by having an overall cap on carbon, a personal carbon allowance could guarantee a certain reduction in domestic carbon emissions,
- b. it is unlikely that such an allowance could work in isolation,
- c. such a scheme might have the potential to achieve emissions savings in a fairer way than a carbon tax; and
- d. there is little evidence currently available about key wider issues critical to the success of a personal carbon allowance such as public and political feasibility, technical feasibility, cost, and relative effectiveness.

4. The Government believes that the current system of taxation strikes the right balance between protecting the environment, protecting the most vulnerable in society and maintaining sound public finances. There remain many high-level questions about whether a personal carbon allowance scheme could be a proportionate, effective, socially equitable and financially viable policy option, particularly when compared or combined with existing policies and other options for controlling carbon emissions; whether it could be a practical and feasible option; how such a scheme might work in practice; and whether it would avoid placing undue burdens on individuals.

### NEXT STEPS

5. Building on CSE's scoping study, Defra has developed an initial work programme designed to look further at personal carbon trading. The work programme is looking at similar areas and issues as those being addressed by the EAC Inquiry, and consists of four work strands focusing on:

- a. the value of personal carbon trading—eg its pros and cons when compared to other means of seeking to achieve the same end; their interaction with the rest of the policy framework;
- b. equity issues—eg the equity and distributional impacts of a personal carbon trading system depending on factors such as income, household type, and geographical location;
- c. public acceptability—eg on what basis would the public consider personal carbon trading acceptable, whether they would actually interact with such a scheme, and whether it would change behaviour;
- d. technical and cost issues—eg how a personal carbon trading system could be run, by which sector and type of organisation, and how much it might cost.

6. The work programme is being run in a way designed to complement the work being undertaken by researchers and academics such as The Tyndall Centre for Climate Change, the Environmental Change Institute and the Royal Society for the Encouragement of Arts, Manufactures and Commerce. The work programme reports to a project board made up of representatives from across a number of government departments.

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<sup>20</sup> <http://www.defra.gov.uk/corporate/ministers/speeches/david-miliband/dm060719.htm>

<sup>21</sup> <http://www.defra.gov.uk/environment/climatechange/uk/individual/pca/pdf/pca-scopingstudy.pdf>

## CONCLUSION

7. The Government welcomes the Environmental Audit Committee's Inquiry into Personal Carbon Allowances, and the additional analysis that the Inquiry will bring to this area. The Government looks forward to seeing the Committee's conclusions and recommendations and will use these to help inform its own analysis.

July 2007

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**Memorandum submitted by Dr Mark Roodhouse, Department of History, University of York**

The author is Dr Mark Roodhouse, Lecturer in History in the Department of History, University of York, Heslington, York, YO10 5DD.

History & Policy is an independent initiative working for better public policy through an understanding of history. The initiative was founded by historians at Cambridge and London Universities who believe today's "evidence-based" policy environment would benefit from more historical input and the involvement of professional historians. History & Policy works to increase the links between historians and those analysing, discussing and deciding public policy in the UK today, and makes historians and their research findings more accessible to policy and media audiences. See <http://www.historyandpolicy.org> or email [mel.porter@sas.ac.uk](mailto:mel.porter@sas.ac.uk) for more details.

## SUMMARY

- Politicians from all parties acknowledge the need to reduce consumption of energy from fossil fuels if carbon emissions are to be cut.
- There are two policy instruments available to politicians: carbon taxes and carbon rationing.
- Carbon taxes are currently the frontrunner, although doubts have been expressed about their efficacy and equity.
- Personal carbon allowances have been proposed as an alternative to taxation by the Green Party and independent experts, and were recently floated by the former Environment Secretary David Miliband.
- Personal carbon allowances are carbon rationing by another name; in assessing their feasibility, it makes sense to consider the British experience of rationing during the 1940s and 1950s.
- In 1939 and 1940 the government rejected proposals to rely upon increased taxation to cut consumption because the impact of tax rises would be inequitable and slow.
- The government introduced rationing instead as it was the best way to cut consumption quickly and ensure that reduced supplies were shared out equitably.
- Policymakers rejected tradable rations, a feature of current carbon rationing proposals, fearing they would undermine the moral basis of rationing, encourage coupon fraud and feed inflation, thereby negating the socially progressive aspects of tradable rations.
- The public accepted that rationing was a temporary but necessary measure due to persuasive economic arguments, underlying trust in central government, and positive memories of rationing during the First World War.
- To introduce a successful carbon rationing scheme, the experience of World War II indicates that the government must convince the public that rationing levels are fair; that the system is administered transparently and fairly; and that evaders are few in number, likely to be detected and liable to stiff penalties if found guilty.

## 1. INTRODUCTION: A HISTORICAL PERSPECTIVE ON PERSONAL CARBON TRADING (PCT)

1.1 PCT is one of a range of proposed policy instruments for reducing domestic carbon emissions. There are several variants of PCT, but they share the following characteristics:

- a. The government determines the level of greenhouse gas emissions from energy use they will permit during a fixed period ("the ration period").
- b. The government allocates emissions rights to final consumers of fuel and electricity as "carbon units".
- c. Final consumers surrender carbon units when they pay for their fuel and electricity.
- d. Final consumers can buy or sell surplus carbon units from one another.
- e. Retailers pass these carbon units back up the supply chain to a small number of energy suppliers.



1.2 PCT is points rationing of carbon emissions by another name. As such it bears close comparison with points rationing of clothes and food during the 1940s. The PCT schemes currently proposed differ from wartime points rationing schemes on two important issues:

- a. Transfer of units: consumers can gift or trade their surplus carbon units, unlike during the 1940s and 50s when members of a household could pool their points, but were not permitted to transfer surplus points to people outside the household.
- b. Ration entitlements: only adults will receive carbon units and they will all receive the same number of units whereas all consumers received points with a small number of groups receiving additional points.

1.3 The idea of carbon rationing is not new:

- a. The environmentalist Mayer Hillman first put forward the idea in 1991 while head of the Policy Studies Institute's environmental group.
- b. Several variations have been proposed over the past fifteen years.
- c. But proponents have drawn only superficial lessons from history.

1.4 The wartime Coalition government considered and rejected proposals for tradeable rations and flat rations. Looking at the reasoning behind these decisions and the experience of rationing, casts light on the following questions:

- a. When should rationing be used?
- b. What type of ration should be used?
- c. Should rations be tradeable?
- d. Should individual allocations be fixed or variable?
- e. How best to make the case for rationing?

## 2. ALTERNATIVE MODELS AND THEIR LIKELY IMPACT

### 2.1 *Taxation vs. rationing*

2.1.1 The current debate about the relative merits of "green taxes" and PCT mirrors the debate about motoring taxes and petrol rationing during the Second World War. The government needed to rapidly reduce civilian consumption of motor fuel to economise on shipping space and maximise the amount of motor fuel going to the Armed Forces.

2.1.2 John Maynard Keynes and others suggested that the government could use the tax system to change civilian motorists' behaviour instead of rationing petrol. They wanted to make motoring more costly by raising the duty on petrol, and the cost of motor vehicle and driving licences.

2.1.3 The government opted for petrol rationing. Increasing the cost of driving and vehicle licences was too crude a policy instrument as all drivers bought these licences regardless of their contribution to the war effort. Increasing licence fees would have taken too long to change behaviour as drivers bought their licences annually. Although increasing petrol tax and motoring taxes would make motoring more expensive and perhaps lead to a reduction in private motoring, it would have been inflationary and socially regressive. Rationing allowed the government to ensure supplies of controlled goods reached the groups who needed them at a reasonable price.

2.1.4 Conclusion: rationing is the best way to effect a very rapid change in consumption of a particular commodity in a crisis.

### 2.2 *Specific vs. group rationing*

2.2.1 During the 1940s economists classified rationing schemes into one of three types:

- a. specific rationing of an individual commodity such as petrol;
- b. group rationing of related goods such as clothing and footwear using points; and
- c. general rationing of purchasing power.

The British government operated a mixture of specific and group rationing schemes, but did not introduce a general rationing scheme. The government used the tax system to limit consumer expenditure.

2.2.2 Group rationing of related goods using points was a wartime innovation. Government economists persuaded the Board of Trade to points ration clothing and footwear in June 1941. They argued that points rationing:

- a. allowed the government to control aggregate consumption;
- b. allowed the government to balance demand and supply by varying the points value of individual goods within the scheme;

- c. was cheaper and easier to administer than several specific rationing schemes; and
- d. preserved a degree of consumer choice within a group of products.

2.2.3 The scheme proved so successful that the Ministry of Food introduced points rationing of some foods later that year. Reflecting on their wartime experience of government service, academic economists felt that the introduction of points rationing was one of their greatest successes and recommended that future policymakers opt for points rationing above specific rationing, although it was only feasible for products whose supply could be guaranteed.

2.2.4 Conclusion: group rationing of related commodities such as fuel and electricity is cheaper, simpler and less restrictive than rationing fuel and electricity individually.

### 2.3 *Inconvertible vs. convertible rationing*

2.3.1 Tradeable rations were not a feature of wartime rationing schemes. Members of a household could pool ration coupons, but they were not permitted to give them or sell them to people outside of their household.

2.3.2 A black market in surplus points emerged, which brought previously law-abiding citizens into conflict with the law and proved hard to stop. Consumers felt morally justified in using their ration entitlement as they saw fit and did not consider that gifting or trading surplus points deprived others of their ration. Law enforcement agencies found it impossible to police the law effectively, bringing the law into contempt.

2.3.3 It is important to note that black markets never realised their full potential. Many consumers possessing the means and motives to evade rationing regulations did not do so when they had the opportunity. High levels of compliance have often been attributed to patriotism and respect for the law, but support for rationing remained high once the war had ended.

2.3.4 Contemporary critics pointed out that the government could have prevented the emergence of black market by allowing consumers to freely exchange surplus points. They also argued that a legal market in surplus points would be socially progressive as working-class consumers could sell surplus points to wealthier middle-class consumers.

2.3.5 The government rejected the arguments for tradeable rations, because policymakers felt that:

- a. the trade would undermine the moral principle of equality of sacrifice as wealthier consumers would not have to make substantial changes to their lifestyle; and
- b. the redistributive effect of trading in rations which might offset this was an illusion because the cost of goods would increase to match increased demand.

2.3.6 Conclusions: a black market is an inevitable by-product of a non-tradeable rationing system. Tradeable rations avoid criminalising large number of consumers but could undermine the principle of equality of sacrifice and the socially progressive effects of trading may be negligible.

### 2.4 *Who should participate?*

2.4.1 The architects of the wartime rationing schemes did not limit rations to adult consumers nor did they grant all consumers the same ration entitlement. Popular notions of distributive justice did not accord with the idea of a one size fits all “fair share”.

2.4.2 Policymakers tried to strike a balance between political necessity and administrative efficiency by limiting the number of groups receiving supplementary rations. Clearly identifiable groups such as vegetarians, Jews, young children and expectant mothers received extra food supplies. Public sympathy for their plight or the existence of a vociferous political lobby helped a group’s case.

2.4.3 Of particular interest, are the two groups of private motorists who received a supplementary ration of petrol:

- a. motorists in rural areas received enough extra to permit a weekly shopping trip and a weekly trip to church; and
- b. motorists who used their private vehicles for business purposes, such as clergymen, family doctors and vets.

2.4.4 The ration scale for the planned fuel rationing scheme covering coal, gas and electricity differs from PCT schemes too. Sir William Beveridge, who drew up the scheme in 1942, intended all civilians, young and old, to receive a personal fuel ration. Supplementary rations would be issued to the following groups:

- a. People over the age of 65.
- b. The long-term sick or disabled.

2.4.5 Beveridge also planned to vary fuel rations according to where a consumer lived. He assumed that the further north consumers lived the more fuel they would need to heat their homes. Not taking this into account would have penalised people for living in northern Britain. Beveridge divided the country into three climatic zones:

- a. Scotland and Northern England.
- b. Wales and the Midlands.
- c. London and Southern England

The further south you went the smaller the fuel ration you received. The public acceptability of the scheme was never tested because of determined resistance from Conservative backbench MPs and mine owners.

2.4.6 Conclusion: while a universal flat-rate ration is easy to administer, it conflicts with popular notions of fairness. Rationing schemes have to balance administrative simplicity and public pressure to grant exceptions.

### 3. PUBLIC ACCEPTABILITY

3.1 The Minister of Food Lord Woolton understood that popular support for food rationing depended upon the public feeling that ration levels were fair and that rationing was administered fairly. He referred to this as “fair shares and fair play”. Today, political philosophers would talk about distributive justice and procedural justice.

3.2 Many civilians did not appreciate the economic case for rationing, but trusted the government’s judgement enough to give rationing their support. They supported rationing because:

- a. it had worked so effectively during the First World War; and
- b. it was a temporary emergency measure.

Public support was wide and shallow as it did not rest upon a full understanding of the economic need for rationing.

3.3 Given the provisional nature of public support for rationing, it was crucial that it worked smoothly. In addition to fair shares policies, administrators had to ensure that:

- a. appeals and complaints were handled quickly, efficiently and equitably; and
- b. rations were always honoured, with everyone able to obtain their full share when they wanted.

3.4 Enforcement was very important. Evaders had to be detected and punished swiftly and publicly. The authorities understood that support for control could be undermined if the public thought significant numbers of people avoided or evaded the regulations with impunity.

3.5 Policing methods and sentencing had to be proportional. The use of undercover policing tactics to detect minor offences and harsh sentences for “technical” offences threatened to undermine support for food rationing between 1942 and 1944.

3.6 Conclusion: given contingent consent for rationing, ensuring procedural justice is as important as ensuring that ration levels are in accord with popular notions of distributive justice.

### 4. GENERAL CONCLUSIONS

#### 4.1 *Historical perspectives on the desirability of PCT*

- Rationing is an effective policy instrument for swiftly reducing personal consumption in times of crisis.
- PCT, or carbon rationing, would dramatically cut domestic energy consumption.
- Taxation would work more slowly and its effects on consumer behaviour are harder to predict and control.

#### 4.2 *Historical perspectives on operational feasibility*

##### 4.2.1 Feasibility of a rationing system

- Wartime and post-war governments rationed the British people with great success using paper-based technologies; today, the technological challenges would be far greater.
- Rationing depends on a national identity scheme to establish people’s entitlement; one of the biggest challenges for PCT would be the civil liberties issues raised, rather than implementing the scheme itself.

#### 4.2.2 Feasibility of PCT

- The British experience of points rationing of food and clothing shows that this is preferable to rationing individual commodities.
- Allowing consumers to gift or trade surplus carbon units would prevent the emergence of a black market in spare carbon units.
- However, tradeable rations could undermine the principle of equality of sacrifice and the redistributive effects of trading in surplus carbon units could prove to be exaggerated or non-existent.

#### 4.3 *Historical perspectives on the public acceptability of PCT*

- Persuading the public of the need for carbon rationing is probably the biggest hurdle policymakers will have to face.
- Public support for rationing during the 1940s suggests that consumers will accept carbon rationing as a temporary crisis measure, provided they trust the government's judgement.
- The government would have to convince the public that:
  - a. the risk of catastrophic climate change is serious and increasing in severity;
  - b. such climate change poses a grave threat to British society and will have a direct and dramatic impact on their way of life if unchecked;
  - c. catastrophic climate change can be prevented if the government takes immediate action, implementing a strategy to reduce carbon emissions;
  - d. a carbon rationing scheme is central to this strategy and without it the strategy will fail;
  - e. the scheme is a temporary measure during the transition from a high carbon economy to a low carbon economy (it will be removed when the unit price and/or consumption levels drop below a certain level);
  - f. ration levels are fair (ie in accordance with popular notions of distributive justice and not those of political philosophers);
  - g. the system is administered transparently and fairly; and
  - h. evaders are few in number, likely to be detected and liable to stiff penalties if found guilty.

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