

Climate Change: EFRA Committee to examine the “citizen’s agenda”

Response from the Environmental Change Institute, University of Oxford

Executive Summary

- Reducing the impact on climate change requires action by all sectors of society. As industry and the commercial sector are increasingly involved, for instance through the EU Emissions Trading Scheme, it becomes more important to involve individuals.
- This is not only equitable, but also in recognition that neither group can act independently: manufacturers have to have a market for more efficient products and services. Consumers cannot continue to be profligate in the expectation that industry or government can solve the problem. Collective action is needed.
- It is probable that the most beneficial approach would be for action to occur at both the community and the individual level. The synergies are not well understood, but could be powerful. For instance, a strong community may well begin to persuade the doubters in their midst and thus prepare them to be positive about the need for personal responsibility.
- Personal carbon allowances are a viable option. There are two main ways to restrict carbon emissions: price (ie taxation) or quantity (ie PCAs).
- Feedback to consumers through clear displays and informative bills could save more than 2Mt C per year.

- 1) Throughout this response, we use ‘residential’ for the household sector to differentiate it from ‘domestic’ (ie UK), as in domestic tradable quotas.

Q1. What is the scope for individual and local community action to contribute to tackling climate change?

Increasing energy efficiency, in particular the delivery of the EEC

- 2) We welcome the EEC initiative, as it has resulted in considerable investment in the energy efficiency of people’s homes, particularly those on low incomes. However, it has not achieved its original objective of persuading the utilities of the value of demand reduction. They do not do more than they have to. As a result, the main ethos of the companies appears to have stayed the same – to sell more gas and electricity. This is exactly what has been happening: for instance electricity consumption in the residential sector increased by 6% in the third quarter of 2005 over the same period in the previous year. Part of the explanation is the demand by consumers for ever-higher services, but part of the answer undoubtedly rests with the companies’ marketing departments. This demonstrates to us the need to ensure that from 2012, the EEC is framed as a company-wide target, not just an energy efficiency add-on. Our suggestion is that each company must reduce the average carbon emissions from its customers, year on year: what we have called AUCH – Average Utility Carbon per Household (Fawcett et al, 2000).
- 3) We are sympathetic to the utilities’ perspective that they could not be expected to undertake an obligation such as AUCH without there being a concomitant responsibility on consumers, for instance personal carbon allowances. If both requirements were in place, there would be a useful synergy between the objectives of the company, the responsibilities of the householder and the needs of the climate.

- 4) Efficient products and services are only one step towards reducing people's carbon impact. Without behaviour change, other trends can over-ride efficiency gains. For example, gains from energy-efficient fridges can be undone by trends towards larger fridges.

Reducing consumption: electricity, heating and transport

- 5) The *40% house* report, produced by the ECI, identified the scale of changes required if there is to be a 60% reduction in the carbon emissions from all energy use in the whole housing stock by 2050 (Boardman et al 2005). Two-thirds of the reduction, in this scenario, is achieved through reducing demand in electricity use in lights and appliances and heating in the home. The other third of the reduction comes from the introduction of micro-generation technologies into the home or locality, for instance combined heat and power, photovoltaics, solar hot water systems and wood stoves. The scale of the reductions proposed would be sufficient to eliminate the perceived need for new nuclear power stations during this period.
- 6) Through the UK Energy Research Centre, the Demand Reduction team are investigating the opportunities for comparable levels of carbon reductions, for instance in road transport and aviation. A summary of current UK research will be published shortly. Banister and Hickman have demonstrated the actions needed to achieve a 60% reduction in carbon emissions from cars by 2030 (VIBAT, 2005). With passenger flights there is not yet an acceptance of the need for constraint (Cairns and Newson, 2006). In reality, every sector will have to achieve a considerable reduction, as there is no sector, not even residential, where there are easy or cheap additional savings to be had beyond the 60%.

The provision of desirable low carbon alternatives such as energy-saving lightbulbs or public transport

- 7) In all cases, action by consumers needs to be supported by the provision of low-energy products by manufacturers. One of the problems with the present situation is that industry can continue to produce and sell energy-profligate equipment to unwitting consumers, with the penalty being further carbon emissions. Government has an obligation to work closely with the European Commission to bring forward strong product standards and labels, much more quickly than has been achieved in recent years (Hinnells, 2006). In addition, the Government needs to develop a comprehensive method of making sure that consumers can understand the efficiency of all energy-using equipment that they buy, for instance by making sure that each product has an energy label (Boardman 2006). Implementing the 1Watt initiative agreed by G8 at Gleneagles would also be helpful.
- 8) If more conscious consumption is to occur, less choice and more information is needed. The Sustainable Development Commission's concepts of 'choice editing' along with 'permission to manufacture' are required.

Barriers to micro-generation

- 9) Two of the main obstacles are financial: ensuring that householders obtain a fair price for the electricity that they export (e.g. a feed-in tariff) and funding the installation of the equipment in the first place (which may require the development of energy service companies).

- 10) The benefits of generating electricity in the house (CHP, PV and wind) are enhanced if the householder has an attractive, informative display. This encourages them to use their own supply more carefully (Keirstead, 2006). There are therefore considerable synergies between the encouragement of micro-generation and the design of smart meters and clear monitors.

The potential for 'smart metering'

- 11) Most gas and electricity meters in use today are based on a design that is at least 20 years old, with a display that is usually hidden from view and often means little to the consumer (energywatch 2005).
- 12) The description 'smart' covers a wide range of meter types, but it basically refers to metering that provides a level of service over and above simple measurement of consumption. A smart meter can measure consumption over representative periods, store data for multiple time periods and allow ready access to the data by consumers as well as suppliers.
- 13) The main interest in smart meters from a carbon reduction point of view is the extent to which they can support improved feedback to the energy user:
 - a) Directly, through connection with a display panel. Savings have been shown in the range 5-15% for electricity and for heating, (provided that the heating is shown separately from other end-uses). The benefits will be most fully realised when customers have really clear, well-presented information on their consumption and can learn how to control their usage by experimenting. (Darby 2006). But display panels do not have to be connected with smart meters: they are already being used with old-style meters.
 - b) Indirectly, by enabling more accurate bills that can give credible feedback on consumption compared with previous billing periods. Savings of 0-10% have been achieved this way. The requirement for accurate bills in Sweden was the main driver behind the introduction of 'smarter' meters which could be read automatically. More accurate bills are the best option for gas at present, with displays some way down the road.
- 14) The estimate in the July 2006 Energy Review of 0.1MtC annual savings in 2020 from improved billing looks modest. A 5% saving in fossil-fuel-based energy in residential buildings as a result of improved direct and indirect feedback would give an annual saving of around 2MtC, based on annual emissions of 38MtC from the residential sector (DTI 2006 Annex C).
- 15) Smart meters may also be important for maximising the benefit from microgeneration.

Awareness of climate change and availability of information about the role of the individual in tackling the problem

- 16) There is evidence that people are concerned about climate change: the proportion of 'worried' or 'very worried' people in opinion polls continues to rise. There is considerable ignorance of the exact causes of climate change but this is not necessarily a barrier to action. In the UK, we have not found the appropriate policy tools or practical interventions that would make activity easy or inevitable for householders.

- 17) There seems to be a public perception that industry and government are responsible for reducing our carbon emissions. A Tyndall survey of nearly 1500 people found that most people believed the main responsibility for change lay at the national and global level, not with the individual (Poortinga et al 2005). This can be reinforced by the press who can demonise industry – for example a recent Guardian article ‘New figures reveal scale of industry’s impact on climate’ (16/05/06) pointed an accusatory finger at four power companies for being the worst polluters in Britain. It did not occur to the authors that these power companies are responding to demand. More publicity is required on what industry is currently doing to reduce its carbon emissions.
- 18) Carbon calculators: an information tool is needed at the household level that would help people understand the connection between fossil fuel energy use and carbon emissions. This could be an accurate personalised carbon calculator. The ECI are doing research in this area.
- 19) The current remit for the ‘Citizens Agenda’, as laid out in the Press Notice, does not include general consumption. Yet fossil-fuel-derived energy is used to create goods and services, with some being more carbon intensive than others. Food, recreation, clothing and footwear are estimated to account for 40% of the UK’s carbon emissions (Carbon Trust 2006). How people choose to consume has a carbon consequence and therefore needs to be incorporated into the Citizens Agenda.

Q2 What are the barriers to uptake of CC mitigation strategies at the level of the individual, and how can they be overcome? Are current incentives such as the EEC or graduated VED sufficiently strong to affect behaviour?

- 20) Sustained behaviour change requires feedback on the effects of change. Using climate change as the sole ‘hook’ for behaviour change risks disheartening people, as the benefits of their actions will not be seen in their lifetime. Therefore it is important that climate change mitigation strategies focus on a healthy, sociable, low-carbon society that offers employment, security and enjoyment and that is well-integrated internationally, not fighting for access to fuel supplies. Such a vision is likely to gain more support from individuals and communities.
- 21) VED should be differentiated more widely, so there is a real financial penalty to owning an energy-inefficient car.

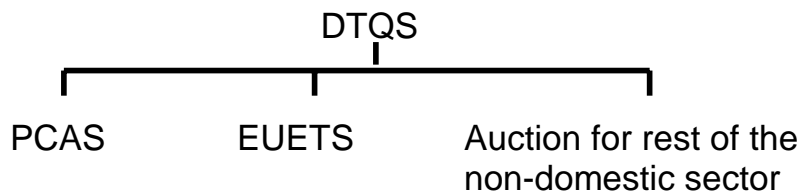
Q3 How can Government and other agencies – at national, regional and local levels – encourage the uptake of domestic emission reduction measures? What is the role of community projects in schools and other public institutions?

- 22) There may well be a role for communities in contributing to tackling climate change. However, we would argue that many people do not have a ‘local community’ in the traditional sense – especially in cities. Instead, an individual’s work community may be important. Seeing wholesale buy-in by one’s employers and subsequent change in the work place will make this issue seem important, immediate and a priority. The best place to start this would be in the public sector – not only does this employ an estimated 1 in 5 people, it is also under government jurisdiction and would have a huge impact on encouraging innovation and lowering costs.

Q5 Are DTQs/PCAs a viable option? What other economic and other incentives for behavioural change might also be considered?

23) Domestic Tradable Quotas (DTQs) is the umbrella phrase for a trading scheme that includes all UK carbon emissions. Some trading would be by non-residential users, as has already started with the EUETS. Other trading would be for the residential sector, known as personal carbon allowances (PCAs). The combined effect could be to deliver 60% or more carbon reductions across the UK economy within the next three to four decades, thereby ensuring that UK's carbon emissions approach a sustainable level. This gives everyone an explicit role in the transition to a low carbon economy.

Figure 1: Breakdown of DTQs scheme



24) One of the main attractions of a PCA scheme is that it provides the framework to motivate people to act to reduce their carbon emissions and, therefore, to both change behaviour and invest in energy efficiency improvements. PCAs combine messages about the way we emit carbon as a result of energy-using activities, with a clear indicator of what society deems to be an acceptable carbon reduction target. At the moment, householders are left ignorant about the ways in which they are impacting on the climate and what constitutes a profligate lifestyle. The main message is that if you can afford it, you can have it. A PCA scheme will create a demand pull from consumers for zero- and low-carbon energy sources, technologies, products and services.

25) There are two important attributes of personal carbon allowances: they are equitable and provide certainty. By the latter, we mean that the Government will know that emissions are reducing at the rate required by international agreements, because that is the amount of carbon permits that have been issued. The equity comes from giving equal emissions to all recipients. This will mean that below-average carbon emitters will both spend less on energy and have carbon permits to sell into the market, resulting in a direct money transfer from the rich to the poor.

26) There are a number of steps that can be taken to pre-empt some of the concerns about living with a personal carbon allowance. For example, visible energy monitors in the home, informative energy billing and labelling and an accurate carbon calculator (para 18).

27) A pilot of the actual scheme could be a valuable precursor for testing how PCAs would work in practice as well as helping to increase public acceptability. It could also help reduce uncertainty about the extent to which having an 'allowance' would be more psychologically influential than a price rise in motivating people to live within their allowance.

28) A part of the UK Energy Research Centre's focus on PCAs has been to investigate some of the options in the design of the scheme. An example of

recent research is on whether PCAs should cover ground public transportation or not. Our research suggests it should be excluded and be covered further upstream because:

- a) It is only 4% of individuals' total transport emissions.
 - b) It is difficult to calculate the emissions associated with an individual's travel on different modes of public transport accurately
 - c) Inclusion would increase the number of transactions by as much as 80% per year, with little impact on emissions.
 - d) Inclusion would require the development of an extensive IT administration infrastructure
 - e) Exclusion would create an incentive for individuals to switch from private vehicle use and transport operators, who are in the best position to make investment decisions to improve the energy efficiency of their fleet, would have responsibility for the emissions.
 - f) Exclusion would reduce the hassle factor, making it easier for individuals to understand the scheme and manage their carbon budget.
- 29) Many operational questions are outstanding as the PCA concept is still in its infancy. For instance:
- a) How should allowances be allocated – adults only? Partial allowance for children? Different age bands?
 - b) Is it correct that rural residents will not be penalised, because they drive more but fly less than their urban neighbours?
 - c) An interim judgement is that individuals can save up their allowances but cannot borrow from the future.
- 30) Seven key areas for DTQ and PCA research are: philosophical justification, policy design, administration, information technology and infrastructure, the carbon market, public acceptability, and implementation.
- 31) There may be other examples of policies that provide individuals with the stimulus to action, but they must include:
- a) a clear incentive (eg extra carbon expenditure will cost money);
 - b) a regular reminder or prompt that a response is needed;
 - c) a target or indicator of what constitutes acceptable consumption;
 - d) the opportunity to be flexible and make your own, personal choices (to fly or to drive);
 - e) if possible, an easy route to taking action.

The last condition is perhaps the most difficult. A problem for policy is, therefore, to provide appropriate support systems so that consumers can exercise choice, but through informed decision-making – PCAs may provide that impetus.

References:

- Banister, D. and Hickman, R. (2005). Three Reports to DfT on the VIBAT project – Visioning and Backcasting of UK Transport Policy.
- Boardman, B. (2006). Creating a virtuous circle for climate change with consumers, manufacturers and sufficiency. Environmental Change Institute, University of Oxford.
- Cairns, S. and Newson, C. (2006). Predict and Decide. UK Energy Research Centre
- Darby (2006) Darby S (2006) *The effectiveness of feedback on energy consumption. A review for DEFRA of the literature on metering, billing and direct displays.* Environmental Change Institute, University of Oxford

Energywatch (2005) Get smart: bringing meters into the 221st century

Fawcett, T, Lane, K, Boardman, B (2000). Lower Carbon Futures. Environmental Change Institute, University of Oxford.

Adams, D. and Evans, R. (16/05/06). 'New figures reveal scale of industry's impact on climate'. The Guardian, UK

Hinnells, M. (2006). Achieving a 60% reduction in CO₂: implications for micro-generation. Paper given at the EEDAL Conference (2006). Environmental Change Institute, University of Oxford.

Keirstead, J. (DPhil University of Oxford 2006, unpublished). Behavioural Responses to Photo-Voltaic Systems in the UK Domestic Sector. Environmental Change Institute, University of Oxford.

Poortinga, W., Pidgeon, N., Lonrenzoni, I. (2006) Public perceptions of nuclear power, climate change and energy options in Britain: Summary findings of a survey done during October and November 2005. Understanding Risk Working Paper 06-02. <http://www.tyndall.ac.uk/publications/EnergyFuturesSummary.pdf> Accessed 29/08/06