Australian
Environment
Review

Radical thinking: personal carbon trading

Tina Fawcett *ENVIRONMENTAL CHANGE INSTITUTE, UNIVERSITY OF OXFORD and* ***Yael Parag*** *SCHOOL OF SUSTAINABILITY, IDC, HERZLIYA, ISRAEL*

Brief summary of the idea

Carbon emissions from energy use in the residential sector and from private transport make up a significant proportion of total emissions in developed countries. Personal carbon trading (PCT) is a radical approach to reducing emissions from these uses of energy by individuals and households. Unlike most current policy — which regulates energy producers and/or manufacturers of equipment (such as vehicles) and appliances (such as white goods and light bulbs) — PCT focuses on individual energy users and locates rights and responsibilities with them. PCT is an umbrella term that describes various downstream carbon cap-and-trade policies that have different detailed rules and system boundaries,[1] but all of which aim to limit carbon emissions within a society by limiting the amount of carbon that individuals are entitled to emit (for free) and by engaging individuals in the process of emission reduction. One version of PCT, known as tradable energy quotas,[2] covers all national emissions and applies to the business sector and organisations, as well as individuals, but this article focuses on PCT for individuals only. The most commonly explored version of PCT covers household energy use and personal transport. Together, these account for more than one-quarter of Australia's total energy use[3] and a similar proportion of its carbon emissions from energy use.

How PCT would operate

All personal carbon trading schemes proposed so far (eg, by researchers or campaigners) share common features: the scheme is mandatory, with no opt-outs; individuals periodically receive a carbon quota for free; for every activity that involves carbon use within the scope of the scheme, allowances are surrendered; allowances are tradable in a new personal carbon market; and allowances are reduced over time in line with national carbon reduction commitments. This implementation of a reducing cap on collective emissions is the key feature that delivers carbon savings.

For a scheme covering household and personal transport, every time a person paid an energy bill, filled up the car with fuel or bought a plane ticket, they would have to surrender carbon units from their account or pay the additional cost of buying carbon units at the market price. By allowing trading, people who live low carbon lives, who invest in household efficiency and renewable energy, who travel less, and who lead lives with a lower energy input would have a surplus to sell. Those who travel a lot, or who live in large or inefficient homes, would need to buy additional carbon units. A market price for carbon would emerge and higher carbon lifestyles would cost more than they currently do. The equal shares would not require that everyone emits equally — instead, people would have choice and could adapt to a lower carbon society at a slower pace by buying additional units.

PCT is not envisaged as replacing most current energy and carbon reduction policies. Rather, it would be an enabling policy which would be likely to encourage individuals to make the most of existing schemes, such as product and building standards, energy labels, taxation and financial incentives, as well as low carbon transport modes. In the short term, savings would be made through greater investment in energy efficiency and renewable energy options, changing household behaviours to reduce energy use, switching to lower carbon transport choices such as buses and bicycles, and reducing "optional" travel by, say, taking holidays closer to home. In the longer term, making decisions that allow a much lower carbon lifestyle — such as living closer to work, living on a public transport route, or downsizing from an under-occupied home — would become part of the necessary response.

Academic research

The concept of capping emissions from individuals has been explored in the context of developed countries — particularly the United Kingdom, where it originated. Recent reviews summarised much of the academic research on this topic,[4] which includes contributions grounded in social and political sciences and economics, as well as energy policy, geography and philosophy. The research has advanced thinking on the pros and cons of different policy design options, provided evidence on the public acceptability of PCT using a variety of methodologies, looked at costs and technologies, analysed the distributional impacts of PCT, investigated the experience of people involved in voluntary PCT-like schemes,

considered options for enforcement and control, and explored the philosophical arguments about the fairness of equal rights to emit. There is a rich variety of evidence and debate, which continues to expand.

PCT has also been considered as a means to reduce Australian transport and carbon emissions.[5] Emissions from the transport sector are significant, have proved unresponsive to policy to date, and are forecast to rise under "business-as-usual" scenarios. While PCT would face considerable barriers to being adopted as a policy, it would connect individuals to the implications of transport choices in a way that top-down carbon taxation would not, and might lead to some fundamental beliefs about mobility in modern societies and the role of government being challenged.

Some of the most interesting current research is underway in Australia. Norfolk Island, 1500 kilometres off the coast of Australia, is undertaking "the first real test of personal carbon trading in the world" for the Norfolk Island Carbon/Health Evaluation Study, known as NICHE. The trial is in its early stages, but already 350 people are registered for it and there is an electronic carbon accounting system, feedback on carbon emissions and rewards for participation.[6]

Political, public and commercial interest

PCT has attracted high-level political interest in the United Kingdom, particularly during 2006–08. The interest of the Secretary of State for the Environment led to a program of research work being commissioned by the Department for Environment, Food and Rural Affairs (Defra). On the basis of its commissioned research, Defra concluded that PCT was ahead of its time and that the government should remain engaged in the debate around PCT, but that further work should be taken forward by academics and research organisations and not the government itself.[7] There is currently much less political interest than previously in the United Kingdom and PCT is not considered as a mitigation policy option. PCT would be more likely to be considered seriously if other policies were seen to be failing at a time when there is a political pressure to act more radically on climate change. Political pressure for PCT could arise from the public (bottom up) or from the international arena (top down), or both.

However, as recent Australian experience shows, climate mitigation concerns are generally secondary to economic growth concerns, and even relatively unambitious policies to mitigate climate change can be highly contentious.

PCT has proved an attractive idea to some: voluntary groups in the United Kingdom and the United States have experimented with capping individuals' emissions and personal carbon trading. Their experiences, which were largely positive, have been documented.[8]

There has also been some interest from the commercial sector. For example, Coca-Cola and the UK Carbon Trust have collaborated in publishing research on personal carbon trading. They expanded the boundaries of personal carbon to include the embodied carbon in food and drink and in leisure activities.[9] In 2008, WSP, an international engineering and environmental consultancy company, launched PACT, a personal carbon allowance tracking scheme. The voluntary carbon allowance scheme has helped around 4000 employees to cut their carbon footprints by an average of 10%. Employees use an online tool to calculate their own carbon footprint and are able to compare with others in their company. They set a reduction goal and will be rewarded if they achieve it. Low carbon lifestyle tips are supplied via various communication channels, including Facebook, newsletters and posters. Scheme members also receive discounts on low carbon goods and services, and are advised on how to take advantage of existing national schemes, such as free home insulation.[10] The combination of personalised information and feedback, goal setting linked to incentives, being part of a learning community, practical tips and low carbon discounts results in significant carbon savings.

Why PCT might work

A PCT scheme would cover emissions under an individual's direct personal control, such as household energy use (mainly electricity and gas), private transport and aviation. As such, it provides an overarching approach and could be framed as a carbon budgeting process that gives individuals ownership and control over their emissions and that allows individuals to make their own preferred carbon saving trade-offs and decide themselves where and when to save carbon.

PCT is unique because it combines a number of mechanisms to drive behaviour change: economic, psychological and social:[11]

- **Economic** — The price of carbon provides the economic incentive for reducing emissions. This price would be determined by the market of traded allowances. The mechanism penalises high-emitters while rewarding low-emitters.
- **Psychological** — The intrinsic psychological mechanism is driven through a combination of the carbon price, the scale of the individual allowance, and the awareness and visibility of the carbon emissions related to each individual's actions. Experimental work indicated that people may be inclined to respond to PCT partly based on the absolute size of the allowance and whether they are in credit or debit, rather than responding with pure economic rationality.[12]

- **Social** — The social mechanism relies on the insights that decisions, even about individually allocated resources, are subject to social forces,[13] and that energy conservation arising from normative concern — as opposed to hedonistic or cost reasons — is more robust against changes and therefore more durable.[14] The carbon "budget" allocated to individuals suggests an acceptable and fair personal carbon footprint.

All of these mechanisms need to considered when trying to understand the potential impacts of PCT. In addition, the interaction between the mechanisms is likely to be contingent upon a range of other factors and supporting policies.

Legal issues

PCT would create new rights and responsibilities for individuals and a new carbon market, as well as other governing institutions that manage processes such as carbon allocation, registration, surrendering procedures and an enforcement regime. All of these aspects would have to be covered under either existing or new legal frameworks. Enforcement of the scheme, for example, requires the identification of some set of actors that are legally responsible for a specified outcome, with sanctions in the event of their failure to do so. Despite PCT being generally conceived as a legally enforceable system, there has been little research into legal aspects of PCT.[15]

Conclusions

The urgent need for increased action to reduce carbon emissions from developed countries is unarguable. Personal carbon trading has the potential to tackle a significant proportion of emissions in these countries. It can provide an over-arching approach to carbon emissions reduction in the residential and transport sectors and accesses psychological, social and economic mechanisms to engage individuals and help them reduce their carbon emissions. It explicitly involves citizens in meeting the carbon reduction targets their governments have signed up to.

Presently, PCT is unlikely to be adopted by any governments. The idea is not yet fully developed into an implementable policy and, more importantly, governments are not taking radical action on mitigating climate change. However, once the impact of climate change becomes more tangible to individuals and governments, and if existing mitigation technologies and policies fail to deliver emissions reduction, interest in PCT might rise. Continuing to explore and develop this idea means that it will be an available option, if and when radical action to reduce carbon emissions is taken.

Tina Fawcett
Environmental Change Institute
University of Oxford
United Kingdom
Yael Parag
School of Sustainability
IDC Herzliya
Israel

Footnotes

1. T Fawcett and Y Parag "An introduction to personal carbon trading" (2010) *10 Climate Policy* 329–38.
2. D Fleming *Energy and the Common Purpose: Descending the Energy Staircase with Tradable Energy Quotas* (TEQs) The Lean Economy Connection, London 2007.
3. Australian Bureau of Statistics *Year Book Australia, 2012* 2012, available at www.abs.gov.au (accessed 1 December 2014).
4. Above, n 1; Y Parag and T Fawcett "Personal carbon trading: a review of research evidence and real-world experience of a radical idea" (2014) 2 *Energy and Emission Control Technologies* 23–32.
5. L Glover "Personal carbon budgets for transport" in *Australasian Transport Research Forum 2011 Conference Proceedings* Adelaide, 28–30 September 2011.
6. NICHE "What is NICHE?" 2014, available at www.norfolkislandcarbonhealthevaluation.com.
7. Defra *Synthesis Report on the Findings from Defra's Pre-feasibility Study into Personal Carbon Trading* London 2008.
8. R A Howell *Living with a Carbon Allowance: The Experiences of Carbon Rationing Action Groups and Implications for Policy* Energy Policy 2011, doi:10.1016/j.enpol.2011.10.044.
9. Carbon Trust Advisory and Coca-Cola Company *Personal Carbon Allowances White Paper: How to Help Consumers Make Informed Choices* 2012.
10. WSP PACT — *Making Sustainable Living Engaging and Easy for All* 2013, available at www.content.yudu.com (accessed 1 December 2014).
11. Y Parag and D Strickland "Personal carbon trading: a radical policy option for reducing emissions from the domestic sector" (2011) 53(1) *Environment* 29–37.
12. S B Capstick and A Lewis "Effects of personal carbon allowances on decision-making: evidence from an experimental simulation" (2010) 10(4) *Climate Policy* 369–84.
13. See, for example, P W Schultz et al "The constructive, destructive, and reconstructive power of social norms" (2007) 18(5) *Psychological Science* 429–34.
14. S Lindenberg and L Steg "Normative, gain and hedonic goal frames guiding environmental behavior" (2007) 63(1) *Journal of Social Issues* 117–37.
15. N Eyre "Policing carbon: design and enforcement options for personal carbon trading" (2010) 10(4) *Climate Policy* 432–46.