

## **Understanding DTQs and PCAs**

Prepared by Catherine Bottrill, Environmental Change Institute/UKERC

13<sup>th</sup> October 2006

This paper is a synopsis of two similar new policy concepts: Domestic Tradable Quotas (DTQs) and Personal Carbon Allowances (PCAs). There is a lot of commonality between these two concepts but also some nuances, which are worth being aware of when discussing personal carbon trading concepts.

DTQs and PCAs were originally proposed and developed by David Fleming and Mayer Hillman respectively from the early 1990s. Researchers at the Environmental Change Institute and the Tyndall Centre are actively investigating the viability of both policy concepts. In addition, there are a number of other organisations with interests in examining personal carbon trading including the Sustainable Development Commission (SDC), the Royal Society for Arts (RSA), Centre for Sustainable Energy (CSE) and Institute for Public Policy Research (IPPR).

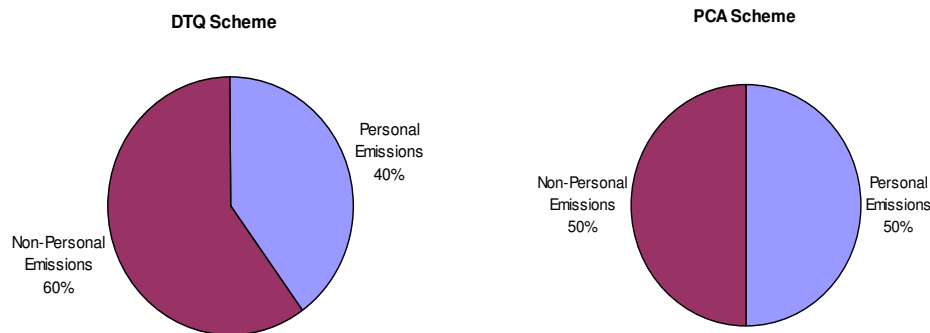
DTQ and PCA schemes would be quantity-based instruments in that a “cap and trade” system is established in order to achieve the environmental goal of stabilising carbon emission levels rather than a price-based instrument. The primary aim of both schemes would be to deliver guaranteed levels of carbon savings in successive years in an equitable way. Either scheme could be used to achieve the government’s current target of a 60% carbon emission reduction by 2050 or other further targets.

A DTQ or PCA scheme is a variant of downstream carbon trading going all the way down to directly involve individual energy end-users. The EUETS is an example of a downstream trading scheme, but because it only involves large energy-users and power companies it can be described as mid-stream carbon trading. In contrast to a downstream carbon trading scheme, an upstream scheme would be one that only involves the energy suppliers.

The most important distinguishing feature between DTQ and PCA scheme is that a DTQ policy scheme would cover all carbon emissions within the national economy (i.e. the Domestic means UK), whereas PCAs only cover personal carbon emissions. A DTQ scheme envisages a carbon trading system for all end use purchasers of fossil fuel based energy - individuals, firms, organisations, and government services (Fleming, 2005). A PCA scheme on the other hand does not stipulate what the policy framework would be for reducing non-personal carbon emissions, though a parallel scheme is assumed to exist.

In both a DTQ and PCA scheme carbon emissions within the national economy are identified as being either the result of personal or non-personal energy use. Personal carbon emissions are those generated from household energy and personal transport use. They account for 40% to 50% of all UK emissions depending on whether aviation and public transport are included. Non-personal carbon emissions are all the other emissions related to fossil fuel use from business, industry, services and infrastructure. A DTQ scheme identifies public transport and aviation to be a non-personal emission whereas a PCA scheme identifies these to be personal emissions (refer to chart 1).

*Chart 1: UK Total Carbon Emission Split in a DTQ and PCA Scheme*



### *Personal Carbon Trading*

A DTQ or PCA scheme would operate quite similarly for individuals. Both schemes are a “cap and trade” system whereby the carbon cap for total personal emissions becomes smaller over time and therefore the quota/allowance allocated to an individual also becomes smaller. The schemes would be mandatory and administered electronically. There are three key elements to personal carbon trading:

#### *1) Setting a carbon budget*

The carbon budget is the maximum quantity of carbon emissions that can be emitted from energy use in any given time period by a nation implementing the scheme. A time period for a carbon budget might be a year or it could, for example, be set for a 3-5 years period thereby allowing for variation in the yearly emission reduction. The carbon budget should be set well in advance thereby giving a long-term emissions reduction signal to society. Each budget is divided in carbon units. The budget is reduced for each time period set and in line with national and international emissions reduction targets. It is recommended that carbon budgets be set by an expert independent Carbon Policy Committee to de-politicize the process.

#### *2) Acquiring carbon units*

Emission rights are allocated to all adult individuals resident for free and on an equal per capita basis. For children it might be that they receive a partial allowance or that they receive no allowance because the existing tax/benefit system is used to compensate individuals with children. Furthermore, any other inequalities between individuals that the scheme throws up should be addressed through compensatory mechanisms rather than through the scheme itself.

#### *3) Surrendering carbon units*

Individuals are required to surrender carbon units when purchasing fossil fuel and electricity for personal uses. This may or may not include public transport and aviation.

Individuals who surrender less carbon units than they are allocated are entitled to sell their surplus on the national market. On the other hand, individuals who require rights

additional to those they were allocated must purchase them on the market or buy them with products (Starkey and Anderson, 2005).

The personal emission boundaries vary between DTQs and PCAs (refer to table 1). Both cover emissions from home energy use the same however they vary in how they deal with personal transport. PCAs would include all personal transport use – private vehicles, public transport and air travel (Fawcett, 2005). PCAs cover all personal travel for ensuring an equitable scheme. For example, a recent Oxfordshire survey of nearly 500 people found that the upper 50% emitted 91% and the lower 50% emitted 9% of the total travel emissions (Brand, 2006). However, work done by the Environmental Change Institute does suggest that ground public transport be excluded in the initial stages of a personal allowance scheme for simplicity (Bottrill, 2006). DTQs on the other hand would only cover the fuel use for driving private vehicle(s). Other forms of transport would be included in the non-personal side of a DTQ scheme.

*Table 1: Personal emission boundaries for DTQ and PCA schemes*

	<b>DTQ</b>	<b>PCA</b>
<b>Home energy</b>		
Gas, coal, oil	✓	✓
Electricity (fossil fuel derived)	✓	✓
<b>Transport</b>		
Petrol/diesel for private vehicle use	✓	✓
Public transport (trains, light rail, underground, ferries, coaches, buses, taxis)	✗	✓ (Perhaps excluded in the initial stages)
Personal air travel	✗	✓

A major reason behind DTQ and PCA schemes allocating individuals emission rights for their personal emissions is to ensure equity. If a “cap and trade” scheme involving individuals only covered home energy use it would have a regressive impact by making some individuals disproportionately worst off than they would otherwise be. This is because although energy use and hence carbon emissions do rise across income deciles there can be significant variation within deciles. Research undertaken by the Policy Studies Institute indicates some 30% of households in the two lowest income deciles are above-average carbon emitters if the allowance covered only home energy. These households are likely to be fuel poor therefore before introducing a personal carbon trading scheme fuel poverty programmes are needed to ensure all low-income households emit at average or below-average emissions levels. Furthermore, only a tiny minority of households in the lowest two deciles are above-average emitters due to private transport use (Dresner and Ekins, 2004). For the equity of a personal carbon trading scheme it is important both transport and home energy be part of an individual’s carbon allowance or quota. In an Oxfordshire survey, 20% of individuals neither flew nor drove themselves in the last year (Brand, 2006).

Personal carbon trading whether it is as in DTQs or PCAs requires the introduction of a number of other measures to make it easier for individuals to be aware of their carbon impact and be able to make informed purchasing decisions to live within their carbon allowance. Such measures would include: smart meters, informative electricity and gas billing, greater emphasis on electricity disclosure (of fuel mix and carbon content) energy labelling on appliances and electronics, energy-rated homes, enhanced petrol pumps, and carbon responsible advertising (Hillman et al., 2004).

## References

- Bottrill, C (2006) *Excluding ground public transport in personal carbon trading*, Environmental Change Institute, Oxford University, Oxford
- Brand, C. (2006) *Personal Travel and Climate Change: Exploring climate change emissions from personal travel activity of individuals and households*, Unpublished Doctoral Thesis, Environmental Change Institute, Oxford University, Oxford
- Ekins, P and Dresner, S (2004) *Green taxes and charges: reducing their impact on low-income households*, Joseph Rowntree Foundation, York
- Fawcett, T. (2005) *Investigating carbon rationing as a policy for reducing carbon emissions from UK household energy use*, Unpublished Doctoral Thesis, University College London, London
- Fleming, D. (October 2005) *Energy and the common purpose: descending the energy staircase with tradable energy quotas (TEQs)*, The Lean Economy Connection, London <http://www.teqs.net/download.htm>
- Hillman, M. & Fawcett, T. (2004) *How we can save the planet*, Penguin, London
- Starkey, R. and Anderson, K. (December 2005) *Tyndall Technical Paper 39: Domestic Tradable Quotas: a policy instrument for reducing greenhouse gas emissions from energy use*, Tyndall Centre for Climate Change Research, Manchester [http://www.tyndall.ac.uk/research/theme2/final\\_reports/t3\\_22.pdf](http://www.tyndall.ac.uk/research/theme2/final_reports/t3_22.pdf)  
(Date accessed: 13/10/2006)
- ## Other useful references
- Hillman, M. (June 2006) *What we must do to save the planet*. RSA Journal, London <http://www.thersa.org/journal/article.asp?articleID=755#>  
(Date accessed: 13/10/2006)
- Starkey, R. and Anderson, K. (September 2005). A summary on DTQs from Tyndall's *Decarbonising the UK Report* [http://www.tyndall.ac.uk/research/theme2/dtqs\\_summary.pdf](http://www.tyndall.ac.uk/research/theme2/dtqs_summary.pdf)  
(Date accessed: 13/10/2006)