Personal Carbon Trading Brown Bag Lunch

For

Yale School of Forestry and Environmental Studies

Catherine Bottrill
Environmental Change Institute
Oxford University

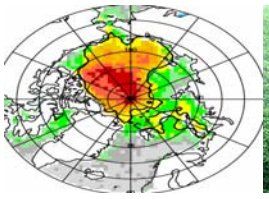
21st September 2006

UK Energy Research Centre

UKERC

Environmental Change Institute

The three main research focuses of ECI:



CLIMATE SYSTEMS & POLICY

ECOSYSTEM DYNAMICS

ENERGY

UKERC

The Energy Group: Lower Carbon Futures

- Energy demand reduction
- Our approach is to do:
  - Interdisciplinary research
  - Bottom-up modeling
  - Back-casting
  - Policy analysis
- Funded mostly by the UK research councils
- 40% House project

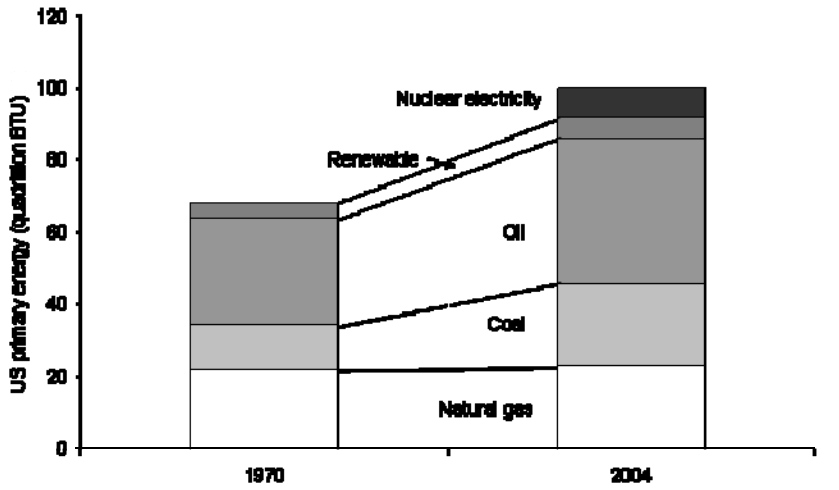
UKERC

Talk Outline

- Trends in US energy use
- The need for a new policy framework
- Personal Carbon Trading
  - What?
  - Why?
  - Current research & activities

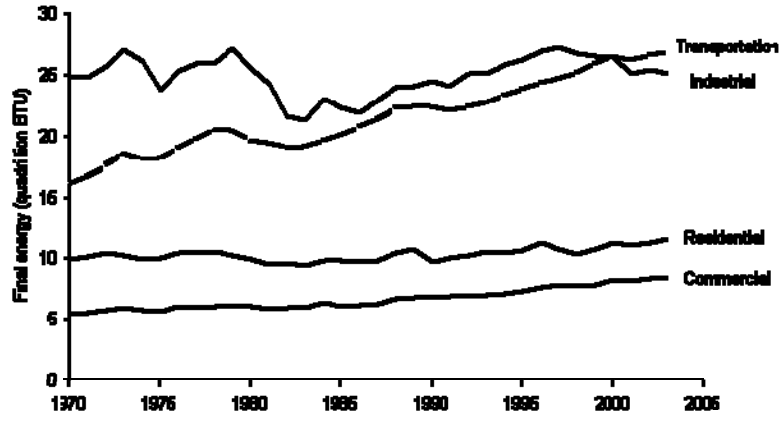
UKERC

US Primary Energy Demand 1970 and 2004



UKERC

Final Energy Demand in the US 1970 to 2003



UKERC

Sector CO_2 Emissions

Sector	Emissions (million metric tons of CO2)	Percentage
Residential	1,213	21%
Commercial	1,029	17%
Industrial	1,727	29%
Transportation	1,937	33%
Total	5,905	100%

Source: Energy Information Agency, Annual Energy Outlook 2005

UKERC

Trends in the US Residential Sector 1978 to 1997

- # households increased by 33%
- The size of people homes increased. A third of households have 7 or more rooms
- % of households using electricity for heating has doubled
- 73% of households use A.C. up from 56%
- Shift to larger fridges and more appliances

UKERC

Individual Carbon Emissions in the US

- Total emissions – 20 t CO_2 per capita
- Non-personal: services, goods and infrastructure
  - 11 t CO_2 per capita
- Personal: home energy and transport
  - 9 t CO_2 per capita
- An equitable share to stabilize at 450 ppm – Mayer Hillman
  - ~1 t CO_2 per capita

UKERC

The need for a new policy framework

- Primary energy demand continues to increase
- To avoid catastrophic climate change ghg emissions need to be reduced between 60-80%
- There are limitations in the ability of energy efficiency, renewable energy, nuclear to deliver deep CO_2 cuts
- To tackle climate change requires a major transformation in the way everyone thinks about energy
- Approaches are needed that will be compatible with our vision for a low-carbon society
- The onus needs to be with the decision-maker best placed to act

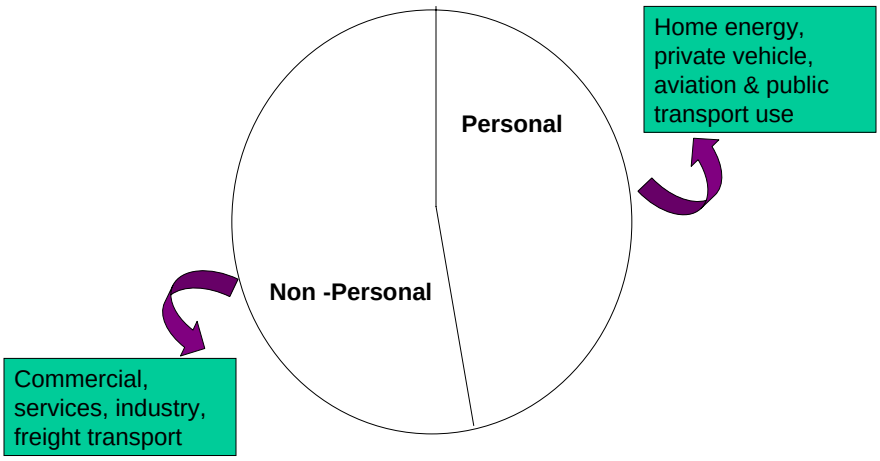
UKERC

Personal Carbon Trading: What?

- PCT is a proposed 'cap and trade' policy instrument to reduce carbon emissions from home energy and personal transport use to a sustainable level
- PCT would be part of an economy-wide scheme
- By David Fleming (known as DTQs) and Mayer Hillman (PCAs)

UKERC

PCT: Carbon Emissions Breakdown



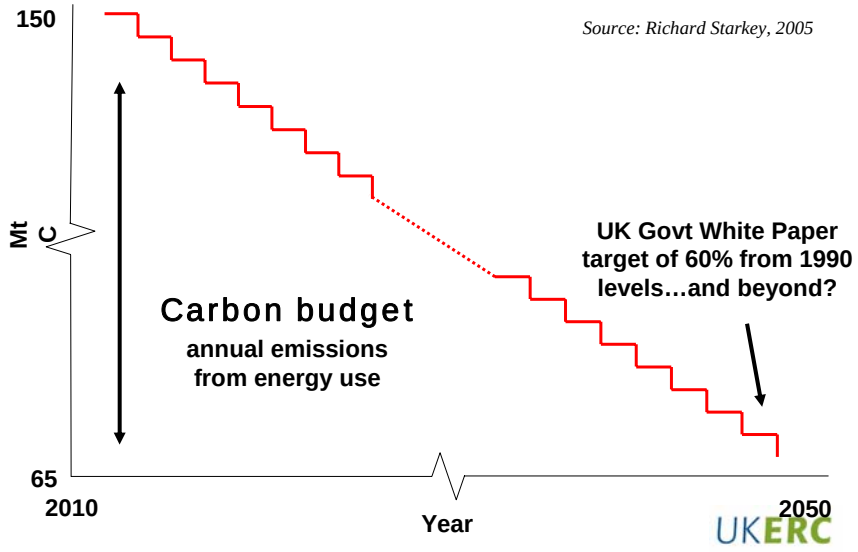
UKERC

The 3 Key Elements of PCT

- 1- Setting the carbon budget
- 2- Surrendering carbon units
- 3- Allocating carbon units

UKERC

1. Setting a Carbon Budget



2. Surrendering Carbon Units

- Fuels and electricity are assigned a carbon rating based on the quantity of ghg emissions emitted by the combustion
- Carbon units are surrendered at the point of energy purchase

UKERC

3. Allocating or Acquiring Carbon Units

- Individuals receive a free and equal per capita carbon allowance
- Individuals exceeding their free allowance will have to buy additional carbon units from the market
- Individuals having surplus carbon units will be able sell or save them

UKERC

Why PCT?

- Equity
  - Everyone given an equal carbon share
- Effectiveness
  - Guarantees carbon emission cuts
- Efficiency
  - Takes advantage of the market

UKERC

Making Carbon Part of Everyday Life

- Smart bills
- Smart meters
- Smart receipts
- Enhanced petrol pumps
- Carbon-ometers
- Carbon responsibility in advertising
- Carbon labels
- Carbon promises
- Carbon-rated homes
- Carbon watchers

UKERC

Key Research Areas for PCT

- Philosophical underpinnings
- Public and Political Acceptability
- Scheme Design
- Administration
- Technology
- The Carbon Market
- Implementation

UKERC

Scheme Design: Exclude ground public transport

- Only a small percentage of individuals' travel emissions are from public transport
- Difficult to calculate individuals' public transport emissions
- Significantly reduces the number of transactions
- Involves substantially less IT and infrastructure
- Motivates individuals to switch away from driving private vehicles
- Puts the onus on transport operators
- Increases public acceptability (by reducing the hassle factor)

UKERC

Scheme Design: Allocation equity: adults vs. kids

- **If only adults**
  - Each adult receives a slightly larger allowance
  - Benefit one-person & multi-person adult households, especially pensioners
- **If adults and kids**
  - Each adult receives a small allowance
  - Benefit households with dependent children, especially lone-parents
  - Engages children in the carbon and energy issue from a young age

UKERC

Activities in UK

- The UKERC & the Tyndall Centre are continuing research on PCT
- The 2006 UK Government's Energy Review has asked 4 Departments to undertake a scoping study into the viability of PCT
- Parliamentary Select Committee for Environment, Food and Rural Affairs has asked for evidence on PCT as part of their enquiry on the Citizens Agenda
- The UK Sustainable Development Commission recommends the government undertake a PCT pilot
- The Royal Society for Arts has a 3-year project on PCT to push the concept beyond academic circles.

UKERC

Conclusions

- A policy framework is needed that appeals to people both as consumers and citizens
- A PCT scheme is one potential option for ensuring an equitable, effective, and efficient means for achieving deep cuts in carbon emissions
- It would be compatible with a low-carbon future that involves individuals being actively responsible for their energy consumption
- It would require a number of complementing measures to support individuals to reduce their carbon emissions

UKERC

What are your thoughts?

UKERC

Further reading

- Kevin Anderson & Richard Starkey (2005). Domestic Tradable Quotas: Tyndall Final Report http://www.tyndall.ac.uk/research/theme2/final_reports/t3_22.pdf
- Taxing and Trading: Debating Options for Carbon Reductions (2005) http://www.ukerc.ac.uk/content/view/110/57
- David Fleming (2005). *Energy and the Common Purpose: Descending the Energy Staircase with Tradable Energy Quotas (TEQs).* The Lean Economy Connection, London
- Mayer Hillman (2004). *How we can save the planet*. Penguin, London
- Mayer Hillman & Tina Fawcett (In press). The Suicidal Planet: our last chance to prevent climate catastrophe. Thomas Dunne, St. Martin's Press – this book will be launch on Earth Day 2007.

UKERC

UK Energy Research Centre

www.ukerc.ac.uk

Environmental Change Institute

www.eci.ox.ac.uk

Catherine.bottrill@eci.ox.ac.uk

UKERC