

Climate change solutions

Global or local?

Problems for policy-makers

- *Uncertainty*
- *Credibility*: Tax take?
- *Impracticality*: labour-intensive and thus costly on the public purse
- *Impersonality*: what is our personal incentive?



Upstream or Downstream?

- Upstream – with producers – is simpler, e.g. when the fossil fuel comes out of the ground
- How can we be sure this will be passed on to consumers?
- Downstream is complex and costly
- But downstream – i.e. with consumers – does impose individuality responsibility
- Downstream is also educational

Putting a price on carbon

- Applying a price to emissions of greenhouse gases (GHGs), not just carbon dioxide (CO₂ does make up 80% of GHGs)
- Both carbon tax and cap-and-trade system are examples of carbon pricing
- Polluter pays principle: stop treating the atmosphere as a free dumping ground
- Including this cost gives an incentive for polluters to invest in using less energy and using cleaner energy (EE and RE): especially strong for heavy industry

Nice and simple!

- Estimate the cost of specific impacts of / adaptation to climate change over time



Aggregate across the world (weighting?)

Aggregate over the future (with some kind of discounting)

What is a carbon tax?

- For most sources of GHG emissions, it is applied as a fuel tax, based on amount of fuel sold e.g. gasoline:
- We know GHG emissions per litre of gasoline so convert the price per tonne into a price per litre ($\$10/\text{tonne CO}_2 = 2.3 \text{ cents/litre of gas}$)
- Apply to fuel wholesalers
- Do this for tonnes of coal and cubic feet of nat. gas

EU Carbon Tax

- Taxation is amongst the most jealously guarded areas of national sovereignty
- Where carbon taxes have been implemented, even in relatively small homogenous regions such as carbon taxes introduced across Scandinavia from 1990-1992:
- 'The taxes differ considerably regarding rates, tax base and exemptionsnominal rates are currently the highest for Danish Households. Sweden and Norway have the highest rates for industry, however, Norway applies the high rate to offshore oil and gas .. all four countries have [differing] special arrangements for energy-intensive companies'

Carbon Tax: Advantages and disadvantages



- Advantages
 - Can be implemented quickly
 - Industry and other fuel users know exactly the costs they face now and in near future
- Disadvantages
 - We are less sure of what emission reductions will result

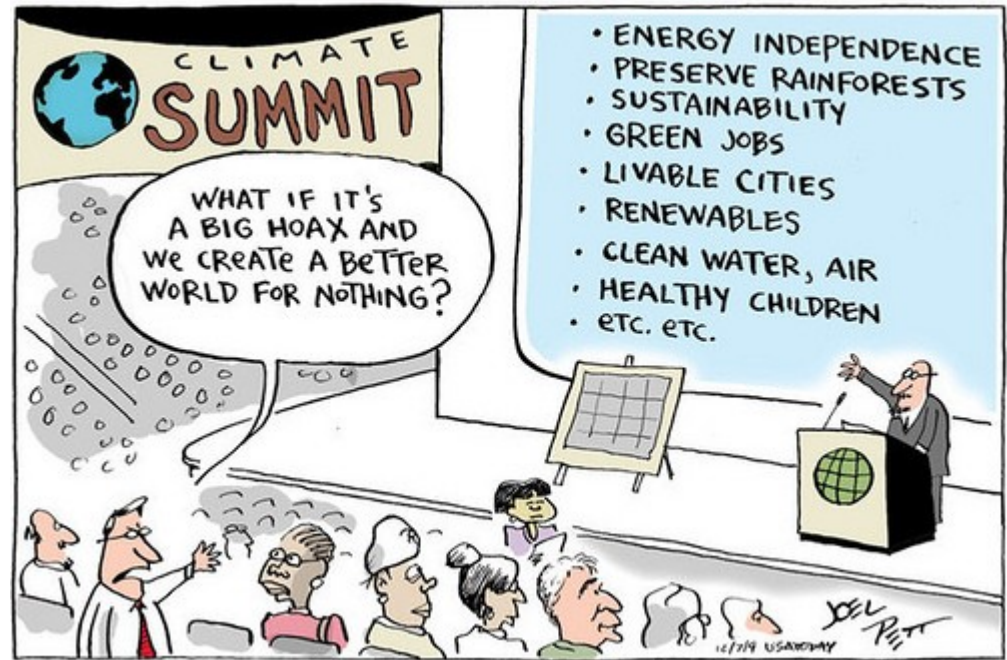
Rationale for carbon trading

- In the past there has been no market to trade and enforce environmental property rights (missing markets)
- Creating incentives to reduce pollution
- A cap is set on the emissions allowed
- The cap creates the scarcity required for the market
- At the end of each year installations are required to ensure they have enough allowances to account for their installation's emissions.
- Can be flexible to achieve the cap

Critique

- Internally inconsistent: market failure requires more markets
- How can we be sure that the market analogy will extend to a virtual good like the global atmosphere?
- ‘the problem lies with the whole economic process of business enterprise not some simple bilateral pollution problem which is a minor aberration of an otherwise perfect market system. Every product in the market place has embodied energy, is related to GHG emissions, and therefore has the “wrong” price.’

- Who establishes the market—and sets the price?
- Are we all equally powerful consumers?
- How are we to establish the global limits? While negotiations stall emissions continue



EU-ETS: A Corporate Bonanza

- Firms have charged consumers for emission rights they received for free
- This has increased their profits. The WWF estimates that German utilities will make windfall profits of between €31-€64 billion to 2012 because of allowances.
- It has also increased the cost of electricity to consumers and businesses
- Bureaucratic expenses associated with National Allocation Plans, verification and compliance are being paid for by the public



EU-ETS: The big questions

- Whose right is it to emit? Should it be given to an arbitrary group of companies, based on their past emissions? (“grandfathering”)
- Should it be applied partially ‘downstream’
- Should valuable permits worth €170 billion at issue be given away?
- Should it cover only 43% of EU emissions?



Questions



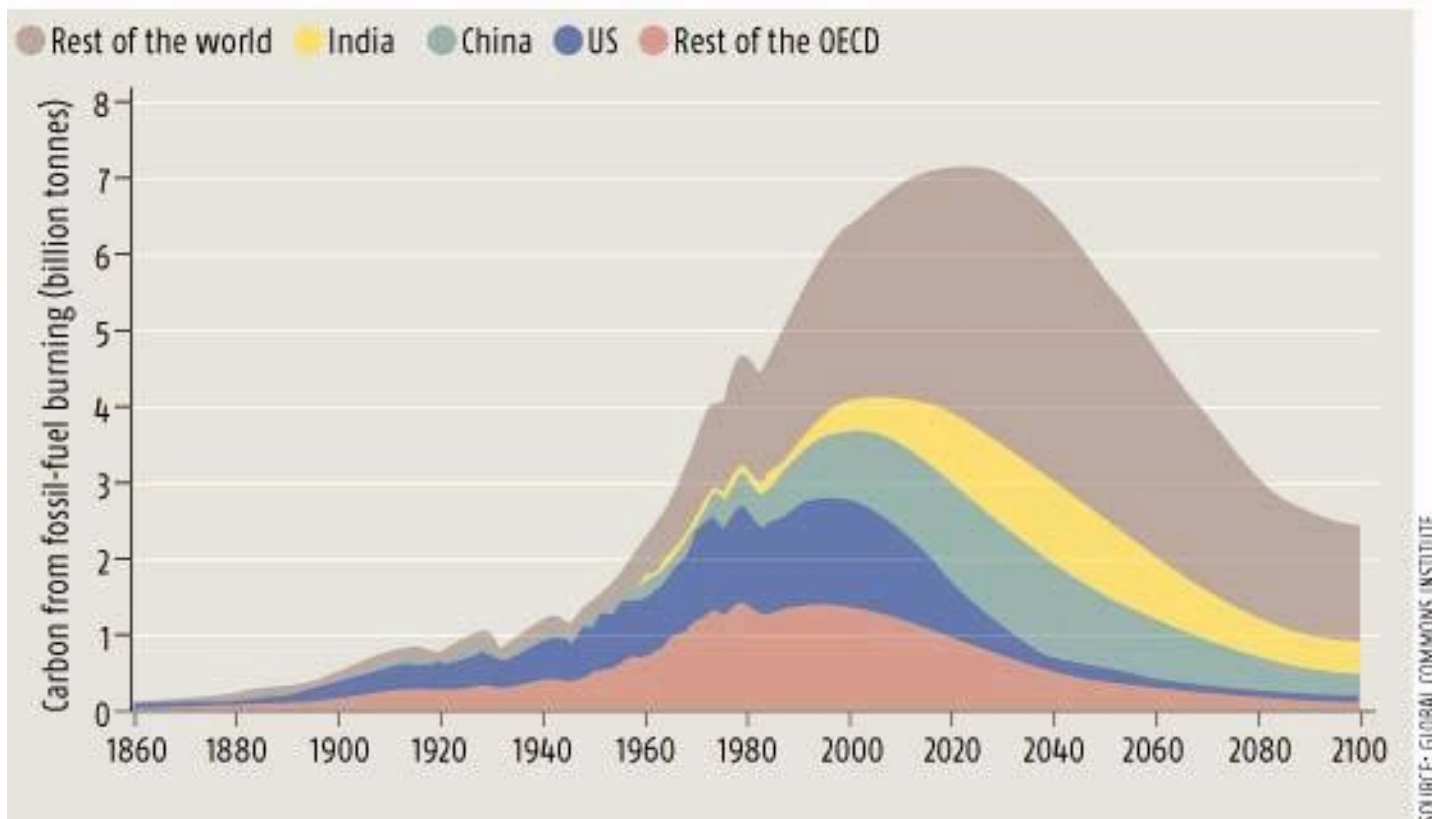
What Would an Effective Solution Include?

- A firm and 'scientifically based' cap on emissions
- A fair method for sharing the emissions – equality between and within countries?
- Prevention of financial leaks by countries controlling reserve currencies
- A soft landing for the inevitable end of a growth-driven global economy

Contraction and Convergence

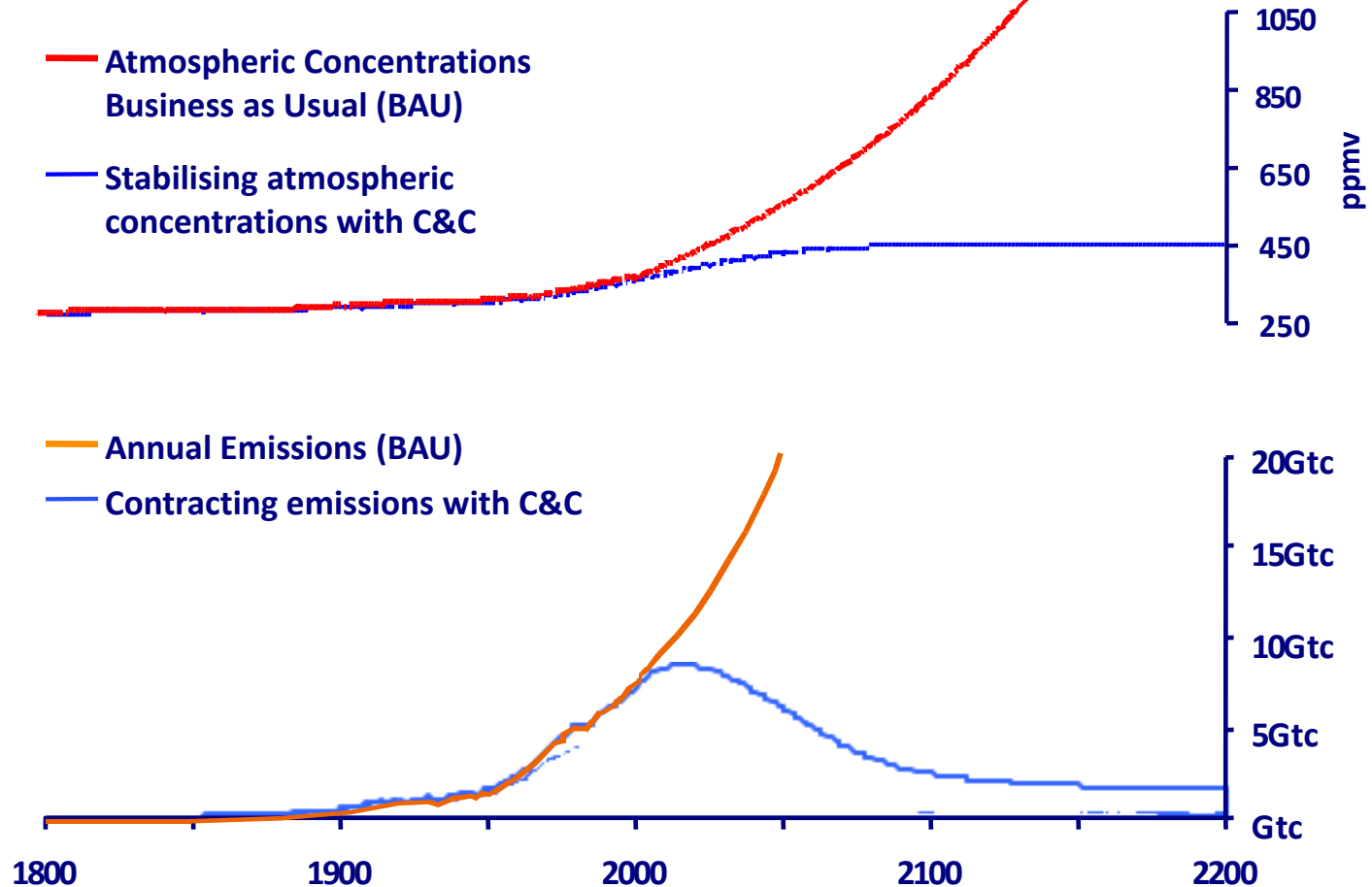
CONTRACTION & CONVERGENCE MODEL

Convergence (universal emissions target per person) achieved by 2050.
Contraction (falling global emissions) completed by 2100

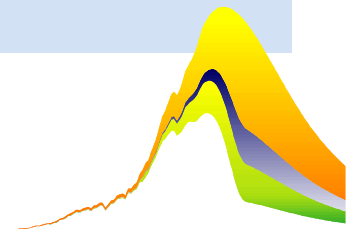
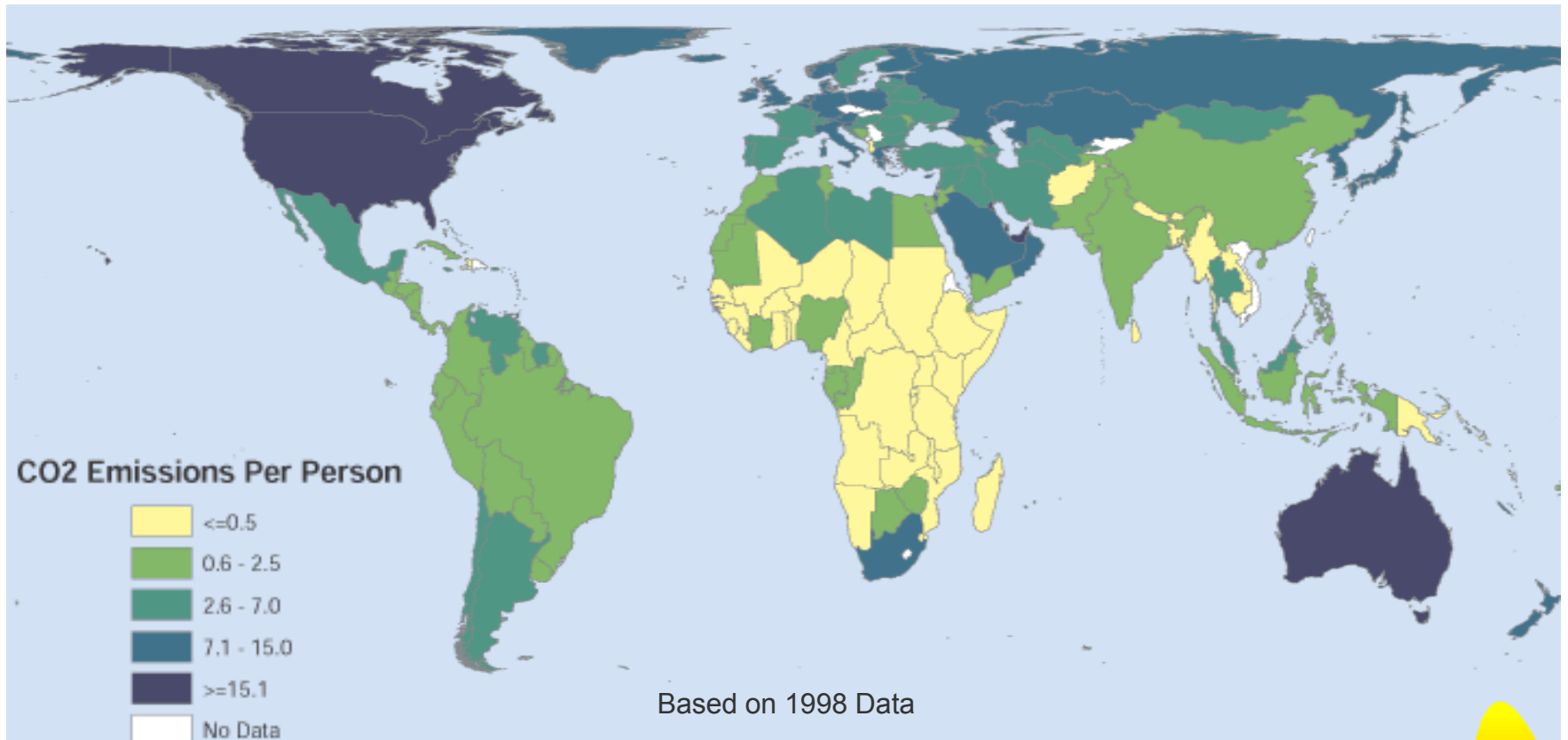


<http://www.gci.org.uk/contconv/cc.html>

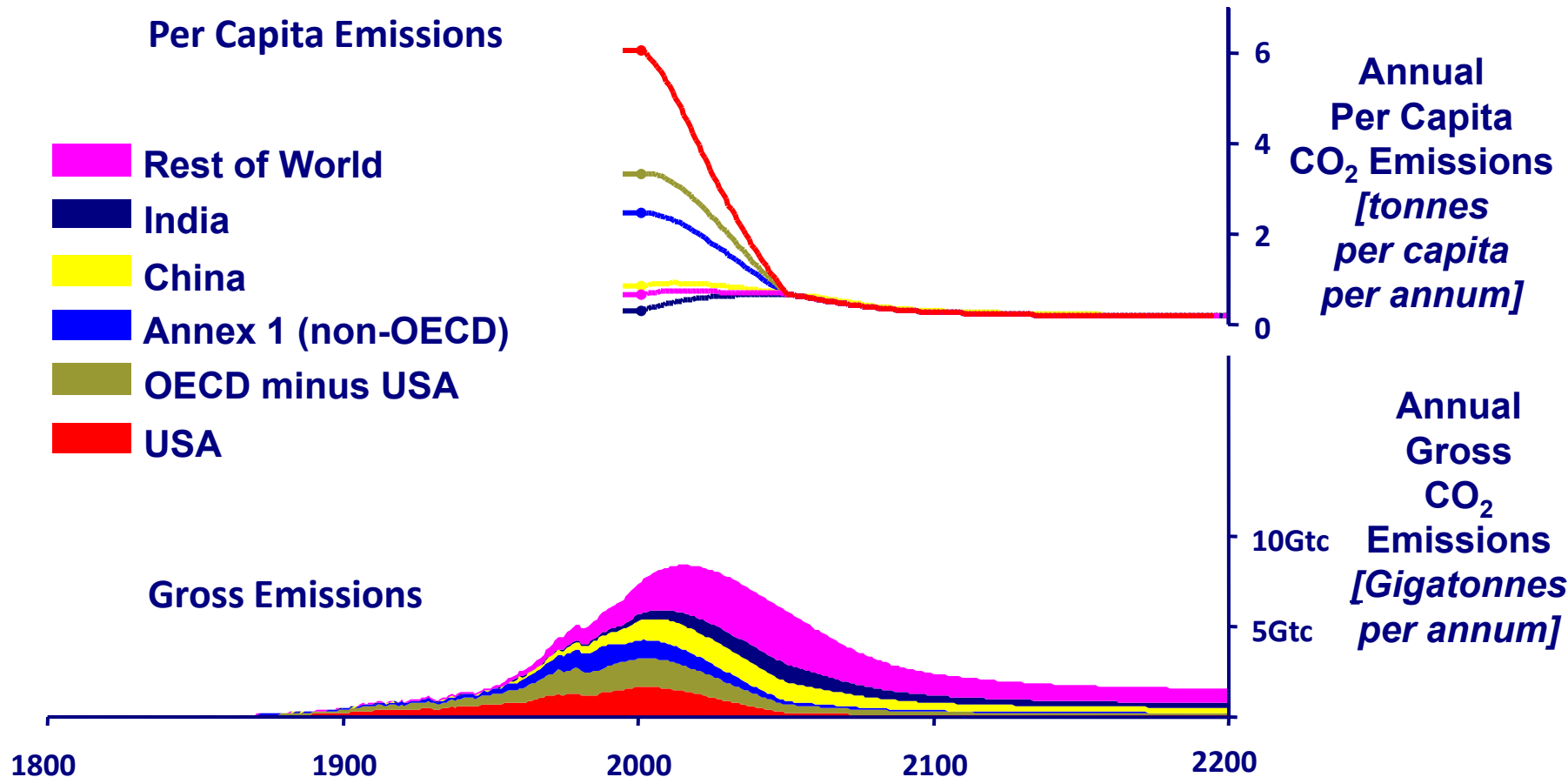
Contraction and stabilisation at 450 ppmv



CO₂ Emissions Per Capita



Convergence by 2050



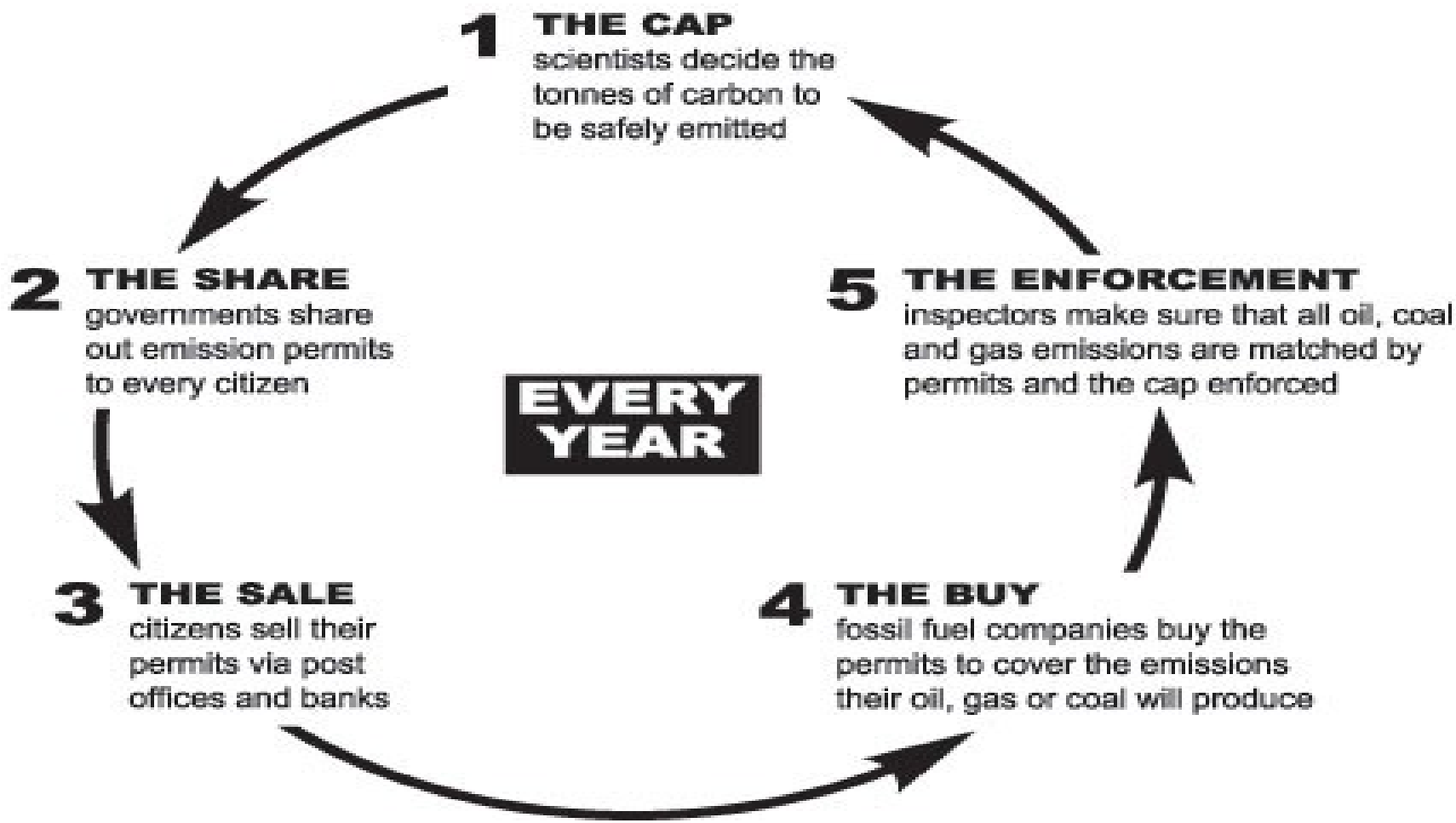
Support for C&C

- Group of African Nations
- India and China
- 5 of 7 British political parties
- Over half of the MPs in parliament
- David Miliband, Minister for the environment
- European Parliament
- C&C meets every objection raised by the US to Kyoto

Cap & Share

- Issues entitlements for all the emissions allowed in a year under the EU's Kyoto target or that set by its successor.
- Gives equal entitlements to each EU resident
- Recipients then sell their entitlements at the current market rate, via banks or post-offices
- The entitlements are sold by the banks to companies producing or importing fossil fuels in the EU
- Each importer or producer needs to buy enough permits to cover the eventual emissions from the fuels they sell.





Cap & Share

1234567890 EUROPEAN UNION EMISSIONS TRADING SCHEME

10.5tonnes CO²

If this emissions entitlement certificate is presented at a bank or post office before the expiry date printed below, it can be exchanged for the buying price of the weight of emissions shown above on the day it is presented.

Please take a passport, driving license or some other form of photographic identification with you when you go to cash your entitlement.

EXPIRY DATE: July 31st, 2009

Any entitlement certificates not presented before their expiry date will reduce the EU's total emissions for the year.

Mr. John Tyndall

Emissions Entitlement 2008

1234567890



Cap & Share

- C&S acknowledges the right to pollute the global commons is a human right and responsibility
- It compensates people via their emission entitlements for higher energy prices
- It emphasizes and promotes the idea the climate security is a societal issue, not merely a commercial or political one.
- All emissions, including transport and aviation can be included in C&S
- Perverse incentives removed
- It is far less prone to corruption
- It allows more efficient implementation and should provoke fewer national squabbles



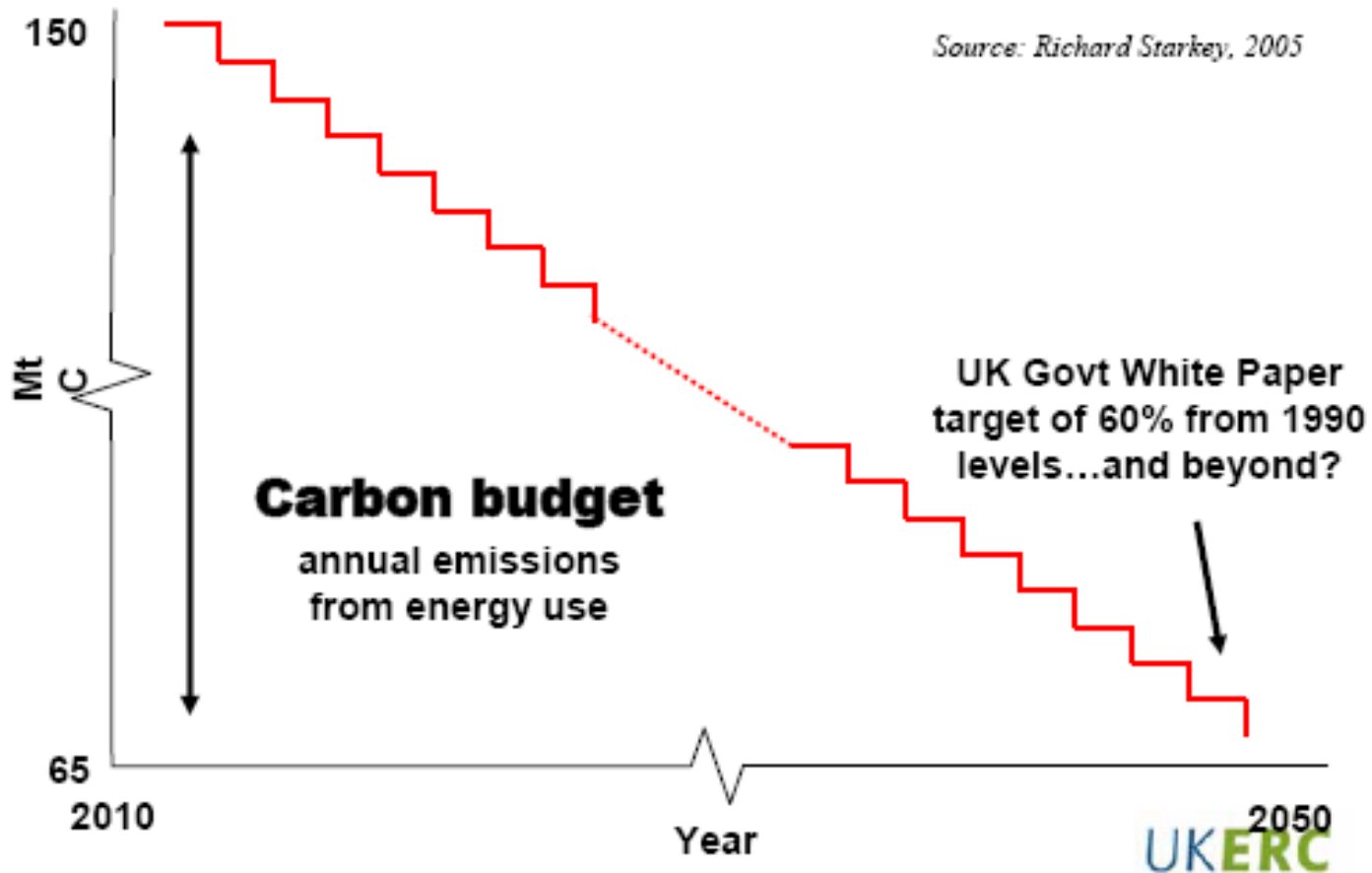
Personal carbon trading

- Total emissions in the US: 20 t CO₂ per capita
- Non-personal: services, goods and infrastructure--11 t CO₂ per capita
- Personal: home energy and transport-- 9 t CO₂ per capita
- An equitable share to stabilize at 450 ppm – Mayer Hillman ~1 t CO₂ per capita

Three key elements of personal carbon trading

- [?] 1- Setting the carbon budget
- [?] 2- Surrendering carbon units
- [?] 3- Allocating carbon units

Setting a carbon budget



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

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

Why TEQs?

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

Making carbon a 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

Questions

- Which scheme would you favour if you were one of the following:
 - CEO of an oil company
 - A retired pensioner living in Brno
 - A peasant in rural China
 - An employee in a UK-based manufacturing company