

air

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*“...we live not, in reality, on the
summit of a solid earth, but **at
the bottom of an ocean of air**”*

Thales of Miletus
c.625 – 545 BC

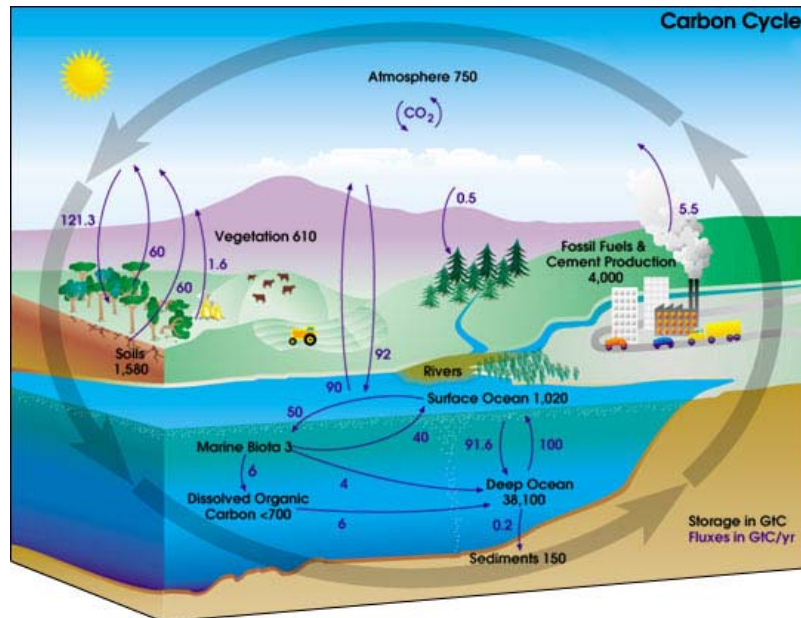
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*"the air itself is a
biological product
-a result of active
exchange of gases
with living organisms."*



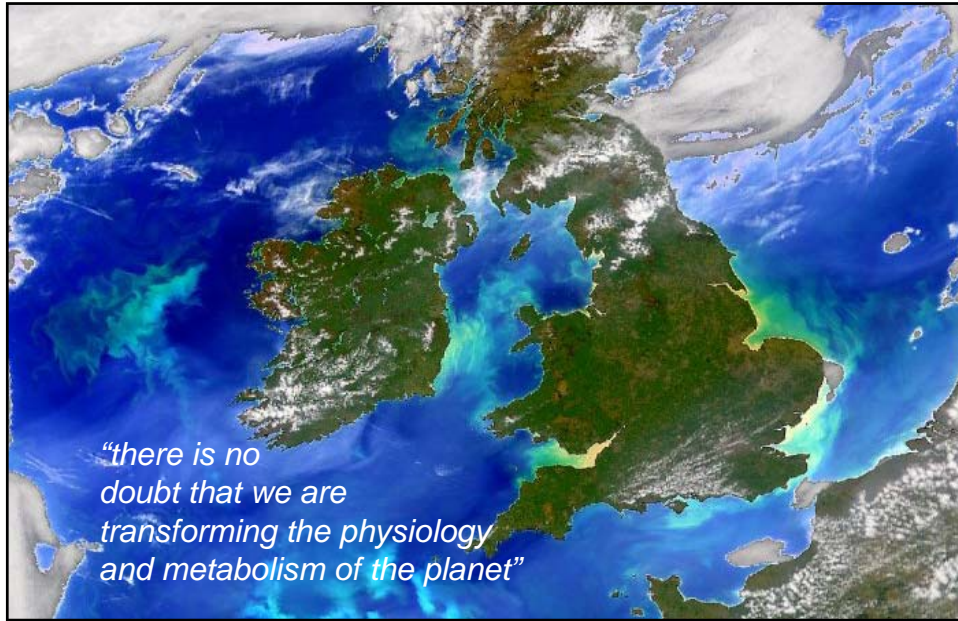
James Lovelock
GAIA – The practical science
of planetary medicine

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carbon cycle

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*"there is no
doubt that we are
transforming the physiology
and metabolism of the planet"*

Prof John Schellnhuber
Research Director
Tyndall Centre for Climate Change Research

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carbon

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what are we running out of?

seventy
million
tonnes
CO₂
/ day

- ☐ barrels
- ☐ oil
- ☐ gas
- ☐ coal
- ☐ cheap oil
- ☒ safe place for carbon atoms*

*when they have been through our energy plants, cars, trucks, planes & buildings

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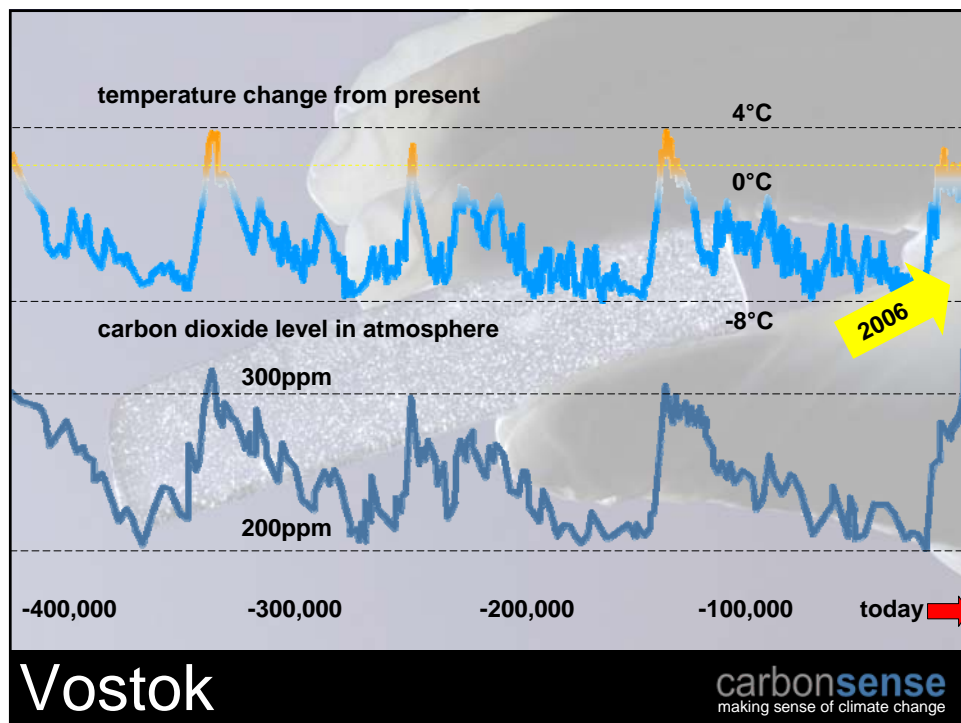
*"...we set light to four
Hemels every day."*

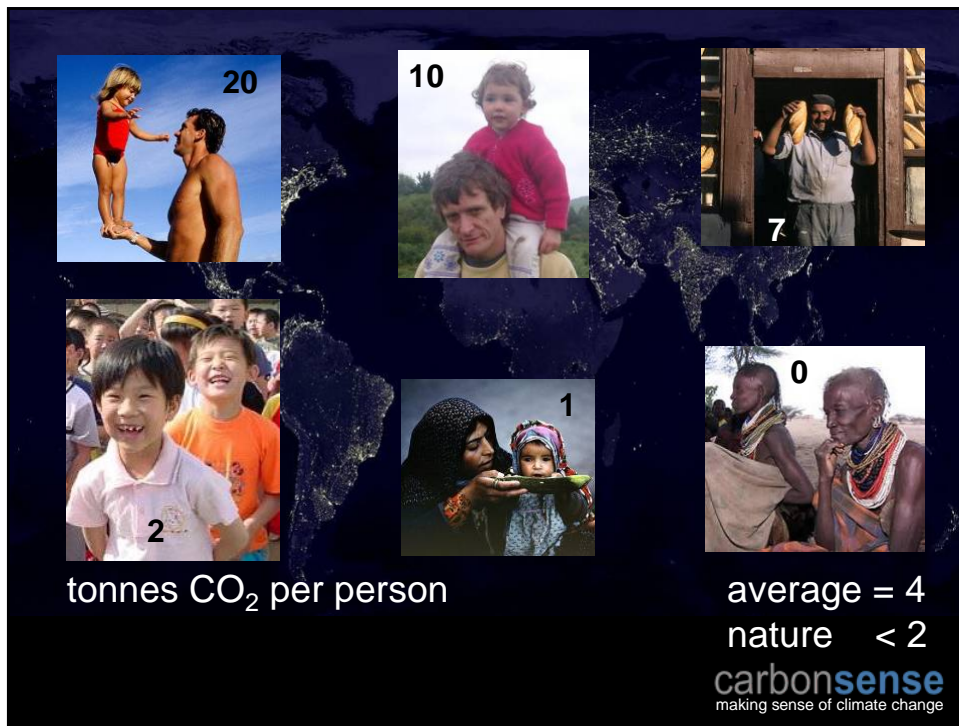
*Bill Bordass
Letter to Independent Dec 13, 2005*

150,000 tonnes oil
1/1000 of UK's
annual use

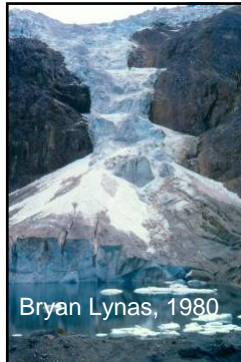
Buncefield oil depot Hemel Hempstead

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climate



Bryan Lynas, 1980



Tim Helweg-Larsen, 2002

Jacobamba, Andes

5000m - eastern side of
Cordillera Blanca Range, Peru

400km north of Lima

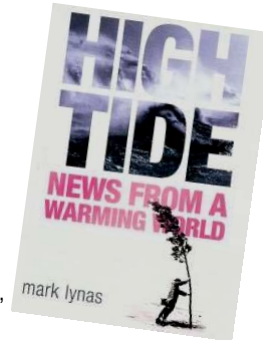
feeds the Rimac river

*"Climate change is **not an environmental problem**. It is a civilizational problem.*

*Climate change is not just another issue.
It is the issue."*

Ross Gelbspan, author of 'The Heat is on: The Climate Crisis'

see: www.theheatisonline.com & www.marklynas.org



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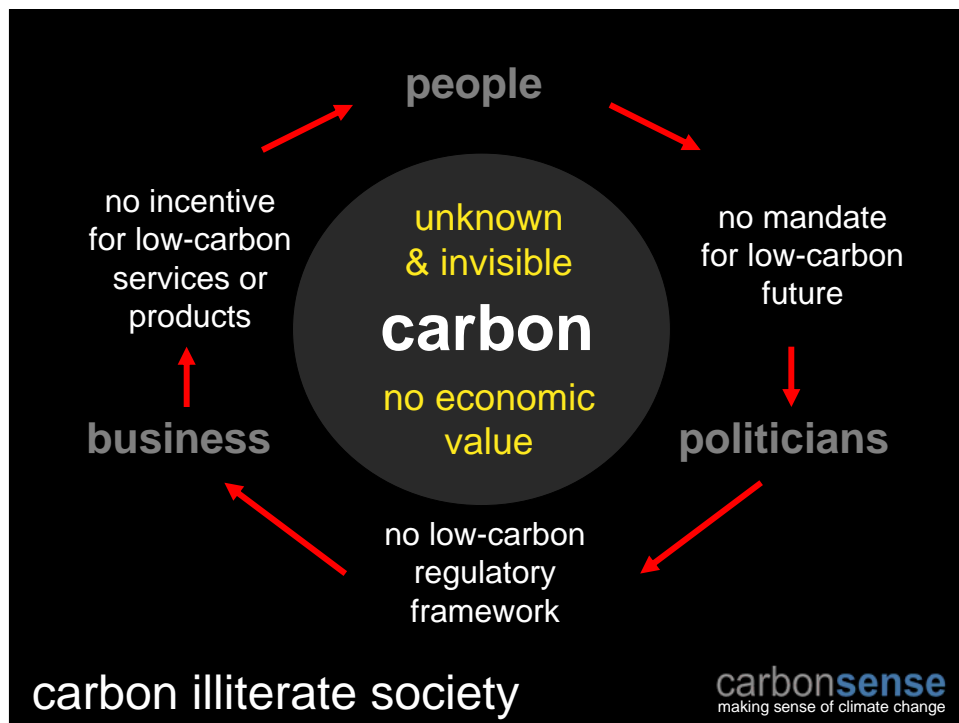
carbon literacy

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e c o₂ n o m i c s

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World's 2nd largest bank
110 million customers



"Climate Change represents the largest single environmental challenge this century. It will have an impact on all aspects of modern life.

"It is therefore a major issue for our customers and our staff, as well as for every organisation on the planet, no matter how large or how small."

Sir John Bond, Group Chairman HSBC

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“Sky to become the world’s first carbon neutral media company – a milestone expected to be achieved by June.”



James Murdoch, CEO, BSkyB, March 2006

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“Climate Change is the major challenge facing the world”

David Attenborough, 9:00PM
BBC1 24/5/06

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The Economist

SEPTEMBER 9TH-15TH 2006 www.economist.com

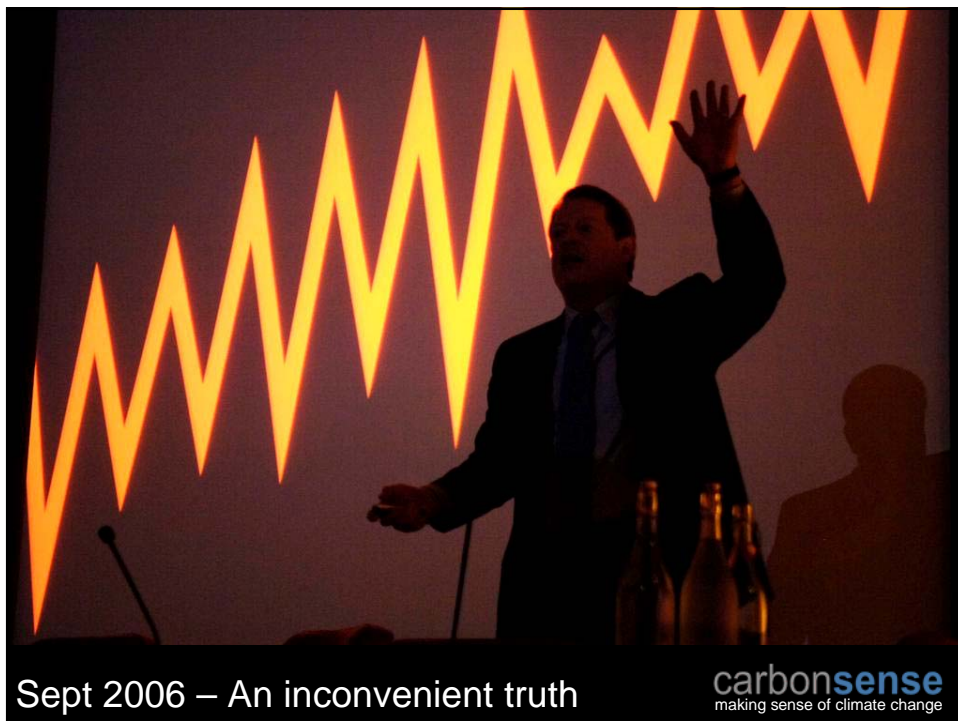
The Blair leadership crisis
The new boss at Ford
An honest in-flight announcement
Catastrophe looms in Darfur
Fancy a Swedish model?

The heat is on

A special report on climate change

“The technological & economic aspects of the problem are not quite as challenging as many imagine. The real difficulty is political.”

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Sept 2006 – An inconvenient truth

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"If we don't tackle climate change, we have to brace ourselves for population shifts on a scale we have never seen before."

Margaret Beckett, Foreign Secretary, 24 October 2006

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"Climate change is the greatest and most wide-ranging market failure ever seen."

Sir Nicholas Stern, Stern Review, 30 October 2006

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“...imagine a
country where
carbon becomes
a new currency.”

*David Miliband, UK Environment
Minister, speech at the Audit
Commission Speech, July 2006*

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personal carbon shares

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A particular form of personal carbon shares...

- ...Domestic Tradable Quotas (DTQs)
- Proposed by David Fleming in 1996
- Since July 2003 assessed by Tyndall for
 - *feasibility*
 - *appropriateness*
- Being examined by Royal Society of Arts & Manufacturing (RSA)
 - *CarbonLimited Project*
- Supported by David Milliband, UK Minister for Environment

Slides from Richard Starkey, Tyndall Centre for Climate Change

© Richard Starkey 2006

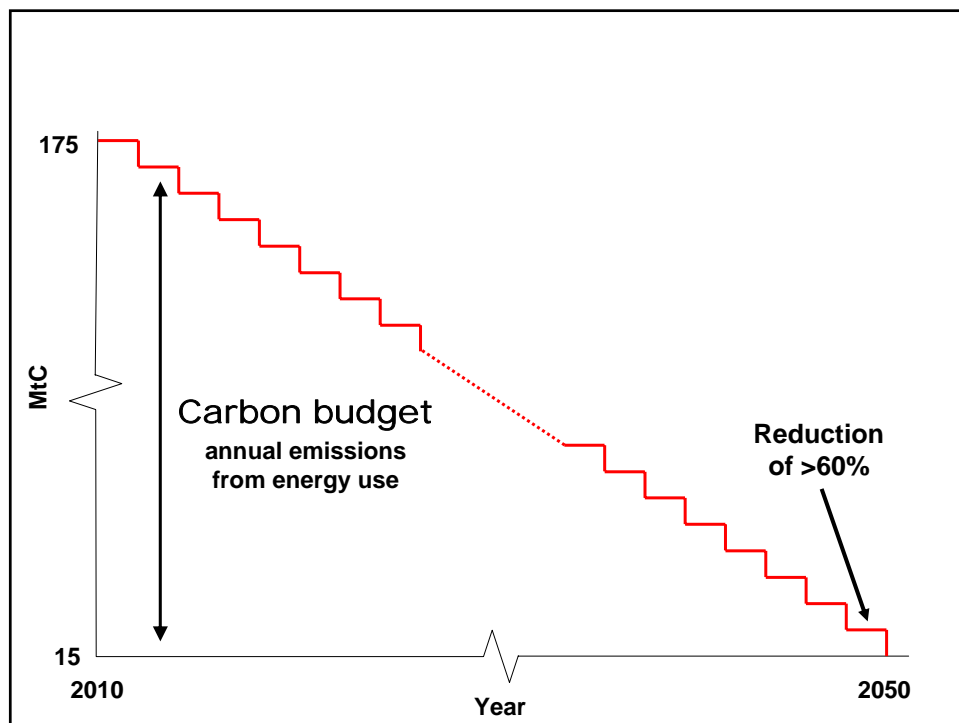
What are DTQs?

a scheme that

- covers emissions from **energy use**
- allocates emissions rights to **energy end-purchasers**
 - individuals*
 - firms*
 - other organizations*

3 elements

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



Carbon units

- Carbon units are **emissions rights**
- 1 carbon unit = right to emit 1kg CO₂ equivalent

Surrendering

- Units surrendered whenever fuel/electricity purchased
- **N.B.** No surrender when purchasing e.g. train ticket, food, consumer goods etc.
- Quantity surrendered covers carbon content of purchase
 - 2.3 carbon units / litre petrol
 - **23** carbon units surrendered if **10** litres petrol purchased

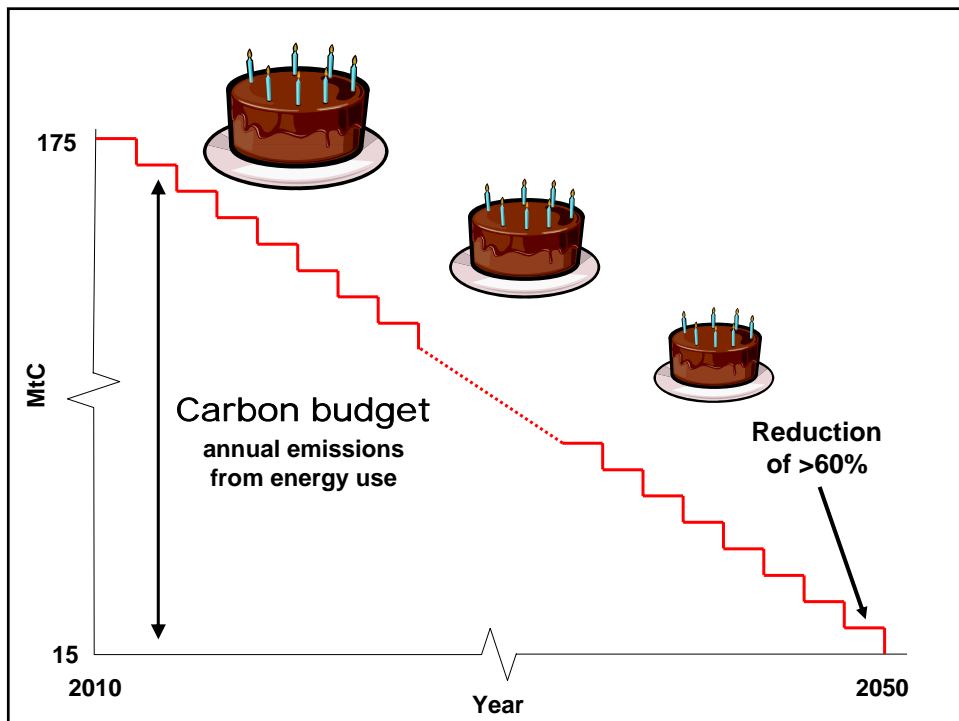
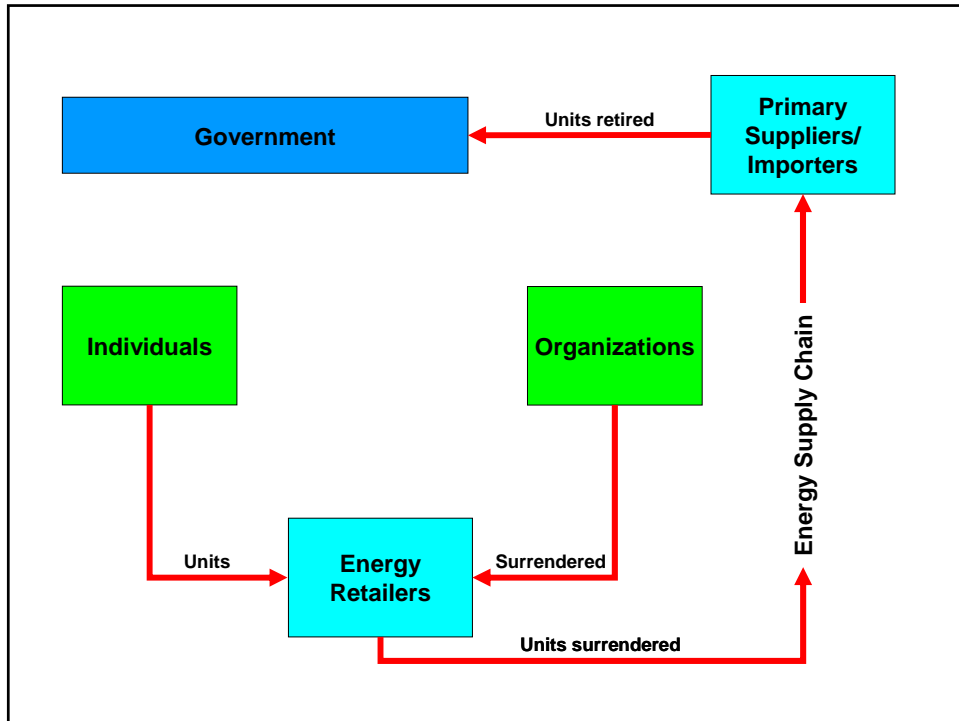
Easy and convenient

When paying

- **gas and electricity bills**
surrender units by direct debit from *carbon account*
- **for petrol/diesel**
surrender by...

...carbon card





How are carbon units allocated?

Carbon units equivalent to carbon budget divided between

ADULT INDIVIDUALS

and

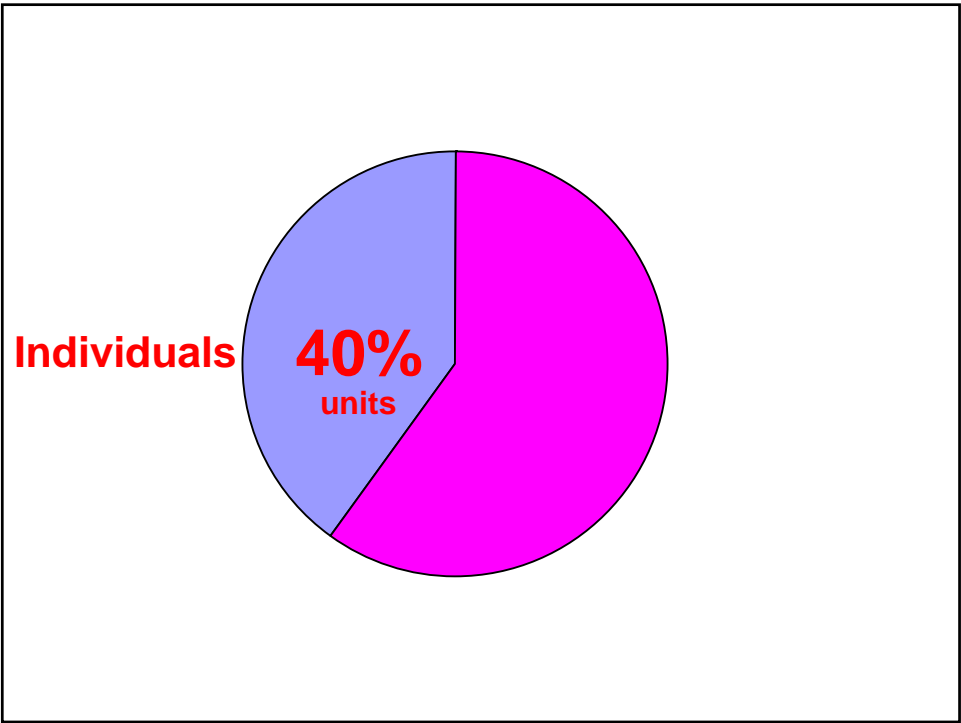
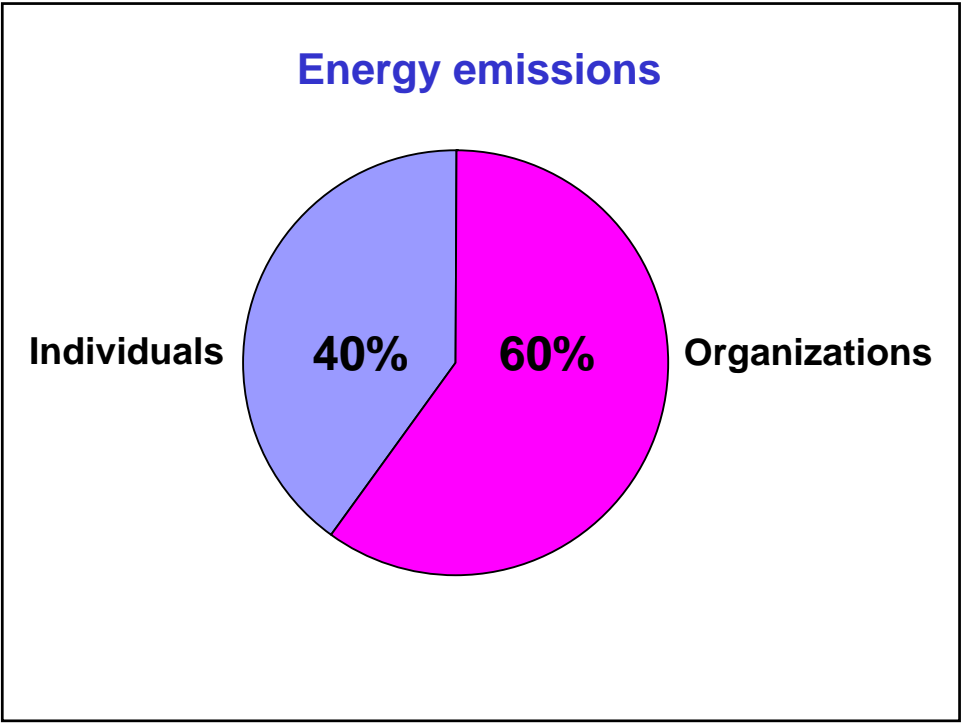
ORGANIZATIONS

Individuals

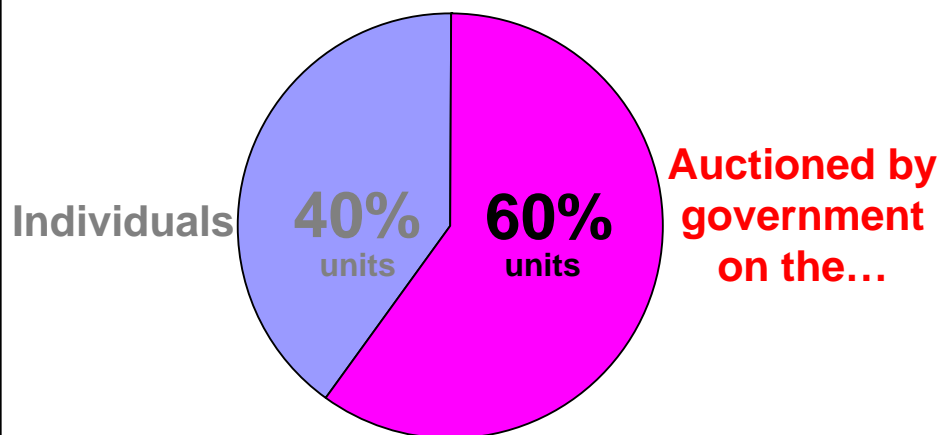
% carbon units to individuals

equal to

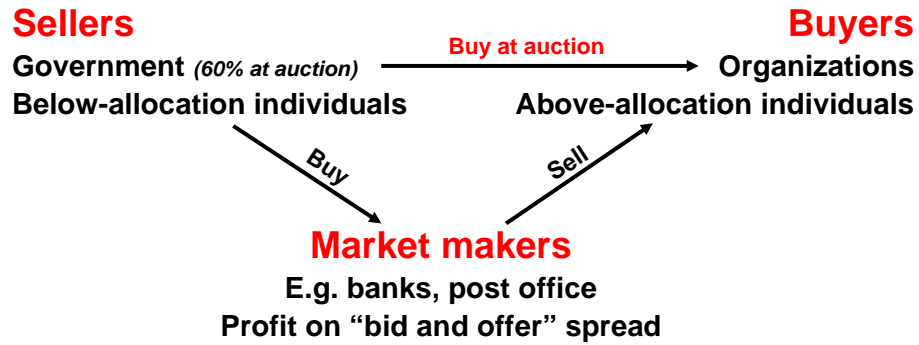
% total energy emissions arising from
individuals' purchase of **fuel** and **electricity**



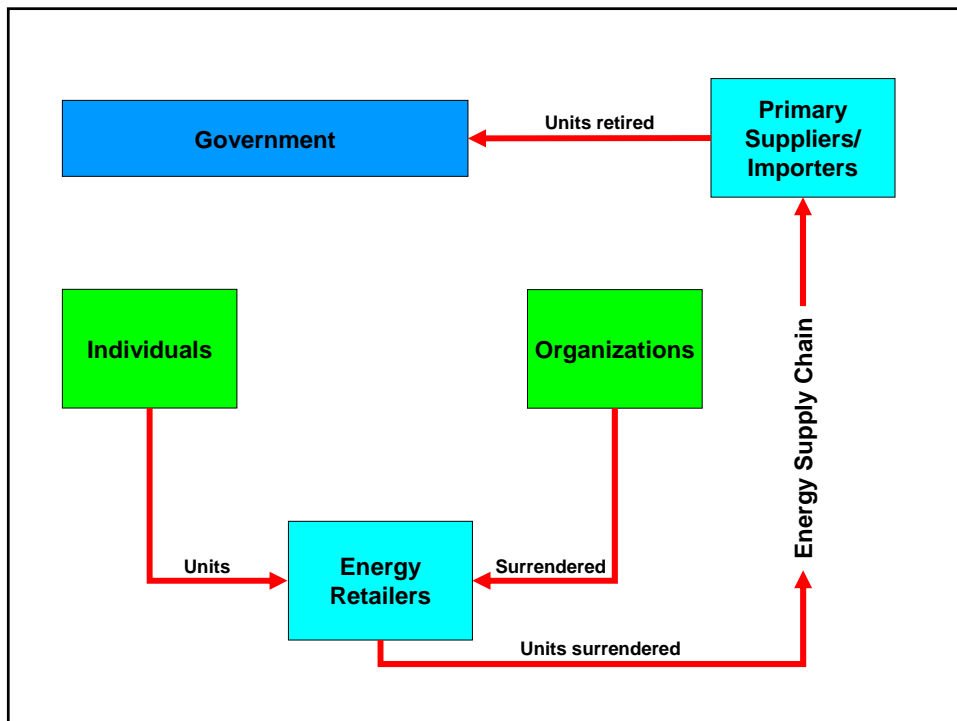
Free and on an
Equal per capita basis

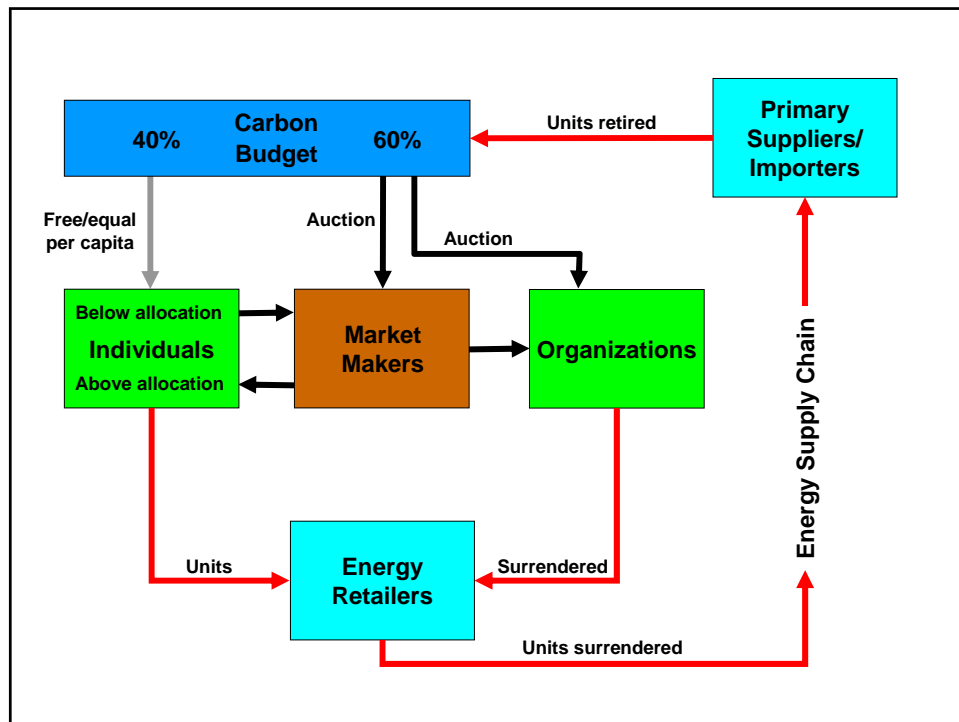


National carbon market



Trading made easy – online, by phone or over-the-counter





Question

What if customer has no units at point of sale?
(e.g. forgotten carbon card, overseas visitor, run out of units)

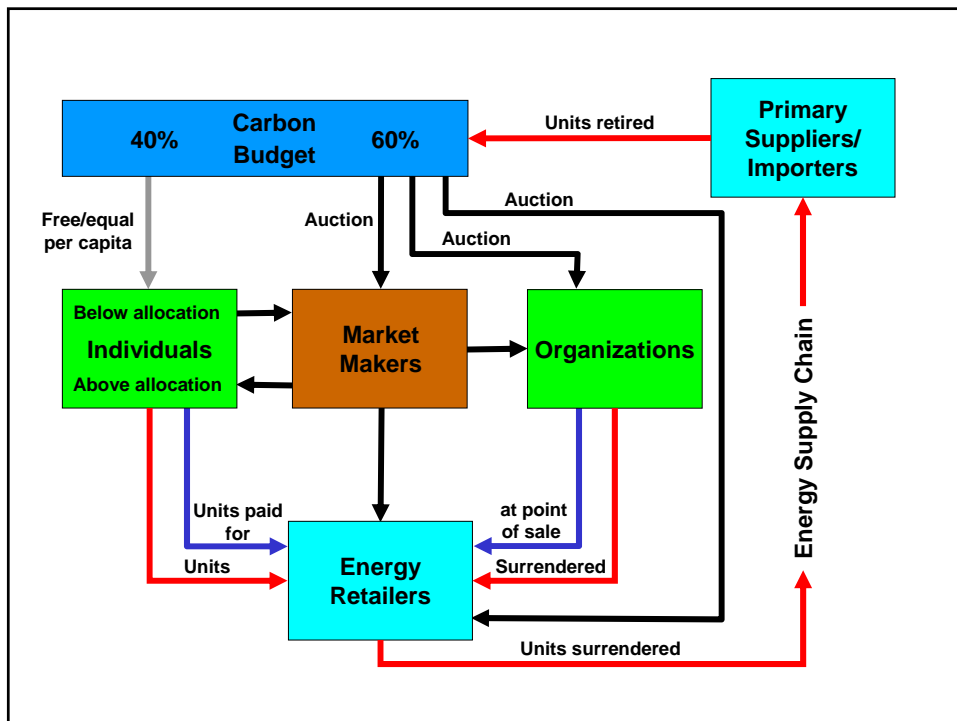
Answer

- (1) Retailer buys units required by customer on market
- (2) Sells units to customer and adds cost to bill

For those who don't understand...

...or who don't want to transact in carbon units

1. Sell ALL units immediately upon receipt
2. Buy ALL units required at point of sale
3. Deal only in money (like a carbon tax)



Assessing DTQs

1. **Equity** ...Are DTQs fair?
2. **Effectiveness** ...Will they meet emissions targets?
3. **Efficiency** ...Will they keep costs down?

Equal per capita allocation (EPCA)

“Every human is entitled to release into the atmosphere the same quantity of greenhouse gases”

Royal Commission on Environmental Pollution (2000)

EPCA not fair - the welfare argument

Equalizing welfare means that, for example...

- people living in cold regions
- people living in the countryside

require more energy...

...and thus more **emissions rights**

Still an argument for EPCA

- Imagine that everyone starts with EPCA
- *Then, IN THEORY, in order to equalize welfare...*
EPCA needs to be adjusted to take account of
 - temperature
 - travel required to live ones life
 - etc etc
- *But, IN PRACTICE...*
these adjustments are just too difficult/expensive

...and so

EPCA is

closest affordable approximation

to (fair) allocation required to equalize welfare

Effectiveness

1. Feasible
2. Orderly market
3. Publicly acceptable

Information technology

- Credit card technology – tried and tested
- Not pushing the technological envelope
 - *ID cards*
 - *Road user charging*
 - *London Oyster card*
- Can govt successfully procure large IT systems?
“The govt’s record on large-scale IT projects is not encouraging”
Home Affairs Select Cttee

The future’s bright...

- DTQs makes individuals equal stakeholders in the atmosphere
- Equal stake (EPCA) is regarded as fair
- Fairness + stakeholding leads to sense of **common purpose**
 - *All in this together*
 - *All in the same boat*

Efficiency

- Use of markets recognized as efficient
- Transaction costs low
- More intensive search for energy efficiency savings

More intensive search

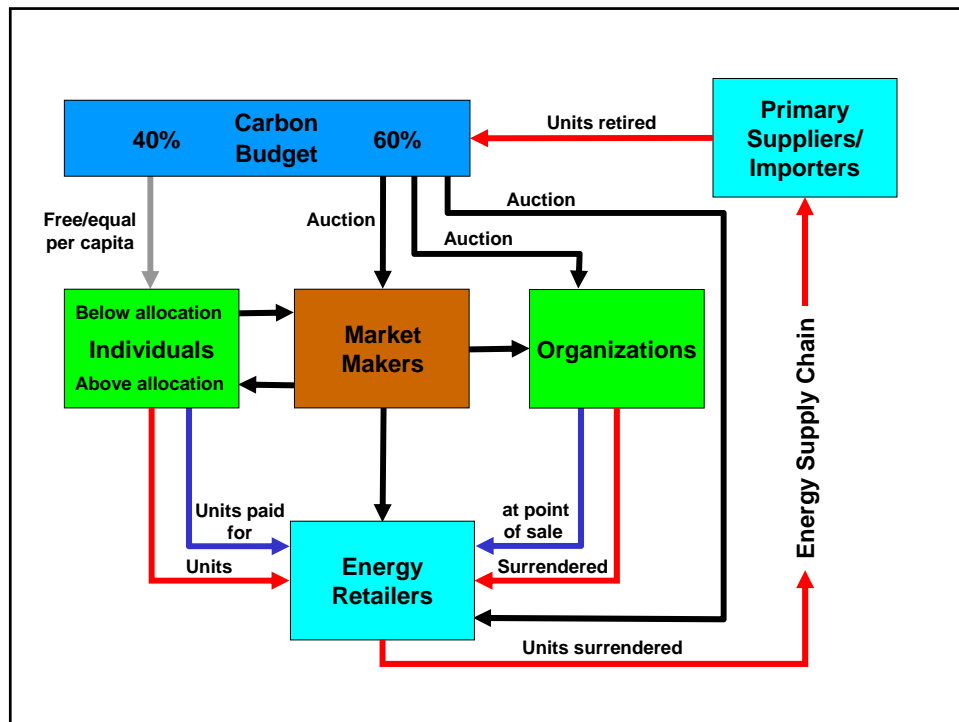
1. Provision of explicit allowance/ration

plus

2. requirement to surrender when purchasing energy
makes emissions visible

“An inescapable reminder”

Nora Radcliffe, MSP



carbon as currency

'The next 10 to 20 years will be a period of transition from a world where carbon-pricing schemes are in their infancy, to one where carbon pricing is universal and automatically factored into decision making.'

Sir Nicholas Stern, Stern Review, 30 October 2006



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'We are the first generation that can look extreme poverty in the eye, and say this and mean it.'

We have the cash, we have the drugs, we have the science. Do we have the will to make poverty history?'

Bono



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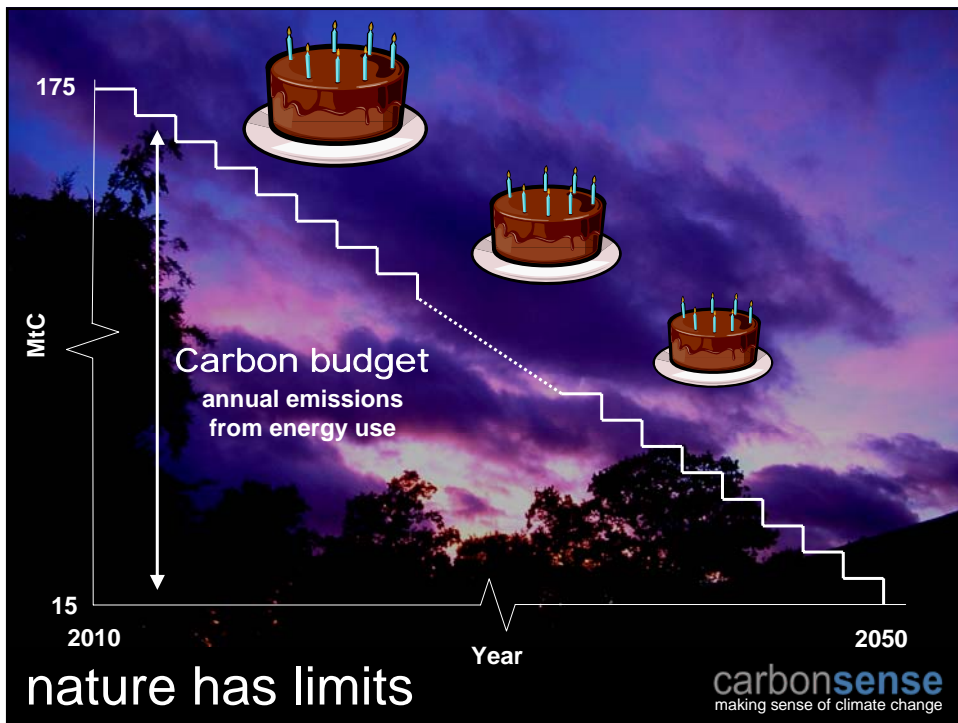


'It is now apparent that the world has to urgently agree a more equitable method of reducing greenhouse gas emissions based on per capita emission rights allocations.'

Anyang Nyong'o, Kenyan Minister for Planning & National Development, April 2004

global emissions rights

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Step 1. World Bank (?) creates new currency – the 'carbon'.

carbon as currency

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Step 1. World Bank (?) creates new currency – the 'carbon'.

Step 2. 'Carbons' are equitably allocated to every country based on (1990?) population.

carbon as currency

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carbon as currency

Step 1. World Bank (?) creates new currency – the 'carbon'.

Step 2. 'Carbons' are equitably allocated to every country based on (1990?) population.

Step 3. New WTO trade rule:
"All carbon-based fuels must be paid for with conventional AND carbon currency."

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carbon as currency

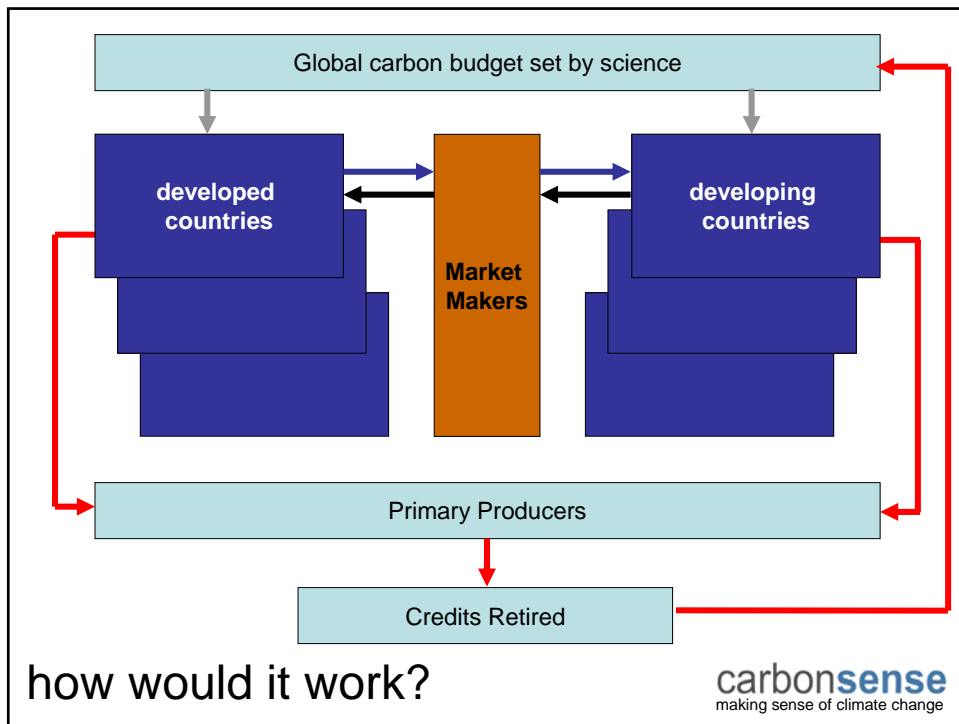
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Step 4. After (5 year?)
 adjustment period allocations
 reduce from 4 tonnes towards
 science-set limit (2 tonnes?)

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10



Country: **UK**

Population: **60 million**

Emissions: **10 tonnes per capita**

Excess required: **6 tonnes per capita**

	<u>cost of excess (\$5)</u>	<u>cost of excess (\$10)</u>
<i>total</i>	\$1.7 billion	\$3.4 billion
<i>per capita</i>	\$27	\$54

Current aid budget: \$5.3 billion

how would it work? - UK

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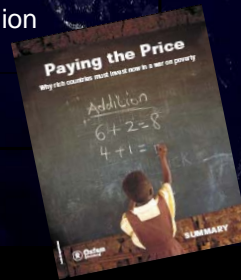


20

Country: USA
Population: 300 million
Emissions: 20 tonnes per capita
Excess required: 16 tonnes per capita

	<u>cost of excess (\$5)</u>	<u>cost of excess (\$10)</u>
total	\$23.7 billion	\$47.4 billion
per capita	\$79	\$158

Current aid budget: \$10.7 billion
Current military budget: \$441.6 billion



how would it work? - USA

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3

Country: China
Population: 1.3 billion
Emissions: 3.2 tonnes per capita
Surplus available: 0.8 tonnes per capita

	<u>value of excess (\$5)</u>	<u>value of excess (\$10)</u>
total	\$5.2 billion	\$10.4 billion
per capita	\$4	\$8

how would it work? - China

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Country: **Kenya**
Population: **36 million**
Emissions: **0.3 tonnes per capita**
Surplus available: **3.7 tonnes per capita**

	<u>value of excess (\$5)</u>	<u>value of excess (\$10)</u>
<i>total</i>	\$660 million	\$1.3 billion
<i>per capita</i>	\$18	\$36

how would it work? - Kenya

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global & simple system – no complex negotiations
'cap & trade' means level playing field
incentivises all of society
tackles poverty & global warming



benefits

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"Ultimately it is not about any
scientific discussion or
political dialogue;

it is about who we are
as human beings...

...this is a moral,
ethical and
spiritual challenge."



[www • carbonsense • org](http://www.carbonsense.org)
people • engagement • strategy • solutions
photos: National Geographic / NASA / British Antarctic Survey
/ Adam Nieman / Mark Lynas

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