

The entire renewables industry appears to be based on the premise of carbon trading. But what is carbon trading, and how does it work? Will it prove successful? **Dan Lewis** lifts the lid on this murky world.

# a blagger's guide to carbon trading

GRAPHIC NEWS

EVERY SO OFTEN, in any field of public policy, there comes a point when the experts become so introspectively mired in detail, they completely lose Joe Public's interest and limited attention span. This happens because these nerds have failed to explain what they are actually talking about in everyday

language. Nowhere is this more true than carbon trading.

The ongoing assumption in the mainstream media is that we are all conversant with the underlying principles and the day to day execution of carbon trading. And that it is elementary that when the carbon price reaches x \$ per ton, carbon

capture and storage, straw-fired plant or even nuclear fusion become financially feasible. But the reality is that most of us can't even begin to grasp what this all really means. So what are they going on about, and are these experts really as clever as they think they are?

Here follows a brief guide on

all you need to know to bluff your way through a discussion on carbon trading.

## WHAT IS CARBON DIOXIDE?

Carbon dioxide (CO<sub>2</sub>) is a gas. The man-made emissions of CO<sub>2</sub> are believed to be responsible for the small amount of global

e	26
on	0
le	0.180
argon	18
Ar	39.948
krypton	36
Kr	83.80
xenon	54
Xe	131.29
radon	86
Rn	[222]

warming that has occurred since the 1970s. The fear is that these emissions might accelerate global warming into something much worse, particularly if we continue to increase the concentration of CO<sub>2</sub> in the atmosphere from 384 parts per million to double that by the end of the 21st century.

### WHAT IS CARBON?

Carbon dioxide must not be confused with carbon. Both are measured and traded in tonnes, and one tonne of carbon is equal in value to 3.67 tonnes of carbon dioxide, because of the additional weight of the oxygen atoms (which are worthless). So, if one tonne of carbon is priced

at \$10, one tonne of carbon dioxide would be worth \$2.72, because carbon dioxide has 3.67 times less carbon per tonne.

### WHY ARE WE TRADING CARBON, AND WHOSE IDEA WAS IT?

By putting a price on carbon, you create a cost to its emission which wasn't there before, thus creating an incentive not to do so. If you set a limit on carbon emissions and issue carbon permits to trade, i.e. the right to emit carbon, then it creates commercial flexibility for companies – they can either reduce carbon and fulfil their quota or, if they can't afford that, buy permits from those firms that have reduced more than their required amount.

The idea of carbon trading is American, originally pioneered by Dr Richard Sandor, a Chicago economist, who based it on the successful pollution trading schemes of sulphur dioxide of the 1980s.

### HOW BIG IS THE MARKET?

There are carbon markets in Europe and America and it is traded all over the world. The European Climate Exchange is

the biggest and, in October 2008, traded 412 million tonnes of carbon. Compared to other financial markets though, it is very small.

### WHAT HAPPENS IF THE PRICE OF CARBON REACHES X PER TONNE?

Right now the price of carbon is around €18 per tonne in Europe and \$1.15 per ton of CO<sub>2</sub> at the Chicago Climate Exchange.

In a recent report by the International Energy Agency, they postulated that if the price of CO<sub>2</sub> reached \$90 per tonne in 2030, emissions would stabilise at 550 parts per million. For emissions to come down much faster, to 450 parts per million, the price would need to be \$180 per tonne in 2030.

You'll often hear it expressed with great authority that if the carbon price goes to \$50 per tonne, then nuclear power/carbon capture and storage becomes feasible. This is all very theoretical. All future projections about what carbon prices could do ignore that profitable investing in electricity plants require an up to 40-year time horizon and the carbon markets don't look much further than a few years ahead. Moreover, the price of carbon is volatile and has remained low, so it is quite unsuitable as an incentive for any new electricity plant to recoup their capital costs.

### WHAT IS PERSONAL CARBON TRADING?

This is an idea that has been pushed hard for some time by the Royal Society for the Encouragement of Arts and now up and running on a very small scale. The concept is that we will one day all carry around carbon permits on our credit cards and happily trade with each other, with average UK per capita emissions of nine tonnes of CO<sub>2</sub>. Critics would cite the difficulty of designing a trading system on that scale for such low values and be able to continually monitor and verify its operation.

### WHAT ARE THE PROBLEMS WITH CARBON TRADING?

The greatest problem is that it

## Carbon trading – going up in smoke?

Emissions trading is based on the idea that the environment has a value and that polluting it therefore has a cost. Regulatory caps on greenhouse gases (GHG) have created an "emissions allowances" market, while the trend towards "offsetting" has provided investment for clean technology

### CARBON TRADING – CUSTOMERS

- 1 Regulated**  
Government sets emissions limits (currently 5.8% below 2005 levels in EU)
- 2 Voluntary**  
Companies and individuals seeking to offset emissions

Limits apply mainly to power, cement, steel, oil and gas industries



Transport, responsible for 26% of emissions, will soon be included in EU caps

### MARKETS

**Carbon credits:** Companies buy emission "allowances" – 1.131bn tonnes CO<sub>2</sub> in 2006

50m tCO<sub>2</sub> over-supply of EU allowances led to price crash in 2006



**Carbon offset:** Funding for emission reduction projects  
**Regulated – 508m tCO<sub>2</sub>**  
**Voluntary – 10m tCO<sub>2</sub>**

Voluntary market unregulated – prices range from \$1-\$78 per tonne

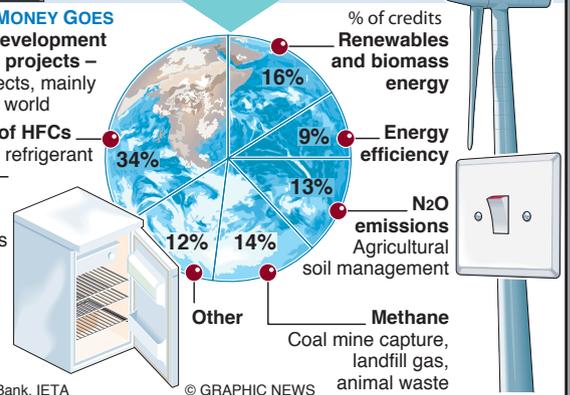
### WHERE THE MONEY GOES

**UN "Clean Development Mechanism" projects** – Certified projects, mainly in developing world

**Destruction of HFCs**  
By-product of refrigerant manufacture – each tonne equivalent to 11,700 tonnes CO<sub>2</sub>. Very inefficient method of reducing HFC output

Sources: World Bank, IETA

© GRAPHIC NEWS



does not consider energy security. If Europe is to meet its carbon reduction targets by 2020, it will have to burn much less coal and a lot more Russian gas. Another issue is, will you ever be able to price and capture all of the man-made emissions, enough to have any impact on the global climate, many decades down the line?

With India and China not committed to reducing their CO<sub>2</sub> emissions, one certainly can't see that happening at the moment.

### WHAT IS THE ALTERNATIVE?

There are lots of people who think a carbon tax is a far better way of reducing carbon emissions. However, it would be very hard to universally agree on its implementation and its price. There is also an implicit assumption that we should have faith in the government's ability to forecast the market response to the carbon tax and then change their minds – in good time – when, inevitably, the price turns out to be wrong.

### WHAT IMPACT WILL THE NEW US PRESIDENT, BARRACK OBAMA, HAVE?

President-elect Barack Obama formally takes office on the 21 January 2009. He has stated

that it is his intention to push through a national emissions trading scheme, primarily to reduce dependence on foreign energy sources and reduce emissions.

There may even be a cap and trade system in place by 2010, though some have doubts about this because of the financial crisis reducing the momentum towards it.

Moreover, the looming bankruptcy of General Motors augurs ill for an early introduction of carbon trading, because it will hit their gas-guzzlers even harder.

### WHAT HAPPENS NEXT?

The first phase of the Kyoto Protocol, which currently underpins carbon trading, runs out in 2012. A successor system will have to be agreed by the 190 nations of the world by, at the latest, December 2009.

More than likely, we will continue to see more of the same; a Kyoto 'mark two' that runs for a few years, with national trading of carbon. But the prices will still be volatile, lowish and not trading more than a few years into the future.

The difference between the future and now is that there will be larger volumes of carbon traded and the price will seep a bit more into the public consciousness. ■

Copyright of Engineering & Technology (17509637) is the property of Institution of Engineering & Technology and its content may not be copied or emailed to multiple sites or posted to a listserv without the copyright holder's express written permission. However, users may print, download, or email articles for individual use.