



Catching up with the new carbon cycle

While Australia has been slow to embrace carbon emissions trading, the European Union and to a lesser extent the US have been busy exploring the potential of carbon markets, positioning themselves for a new global paradigm. **Robin Taylor** reports.

According to the World Bank, in 2006 the global market for carbon emissions trading was worth around US\$30 billion – an almost threefold increase from 2005.¹

Carbon markets function by placing a cost on carbon emissions, a value on emissions reductions, and enabling trade of the resulting allowances or credits.

Through this market-based approach to the problem of reducing greenhouse gas emissions, participants buy and sell permits for emissions or credits for emissions reductions (see box) through regulated or voluntary markets.

The proponents of emissions trading say it is the most cost-effective way of stabilising or reducing high levels of atmospheric greenhouse gases while also promoting reforestation.

Its critics, however, claim that, unless they send a strong price signal to polluters, such schemes are simply delaying the inevitable – dealing with the issue of burning fossil fuels.

The cap and trade model

The most widely accepted trading model is 'cap and trade', on which the world's largest market – the US\$24.3 billion European Union Emissions Trading Scheme (EU ETS) – is based.

Under this model, a limit or cap on the number of carbon allowances allocated creates the scarcity needed for a trading market to emerge.

The EU ETS is based on a common trading 'currency' of emission allowances. One allowance (carbon credit) represents the right to emit one tonne of CO₂.

Companies that keep emissions below

their allowance limit can sell their excess allowances at a price determined by supply and demand.

Those finding it hard to stay within their limits can either reduce their emissions – for example, by investing in more efficient technology or by using a less carbon-intensive energy source – or they can buy the extra allowances they need at the market rate. They can also choose a combination of the two.

Cap and trade proponents argue that this flexibility ensures emissions can be reduced in the most cost-effective way.

Companies that pollute beyond their allocated amount must purchase carbon credits, which represent emission reductions from elsewhere in the economy. These credits can either come from companies emitting less than their maximum allowance, or from a provider that is

¹ State and Trends of the Carbon Market 2007, World Bank

Left: The concept of buying and selling emissions credits on a global 'stock exchange' is simple but in practice actual emissions have to be monitored and tracked. Audrey Volodin

producing 'offset' credits.

Offset credits may be generated in a number of ways, such as planting trees (which absorb greenhouse gases), or flaring methane from underground mines or landfill sites (i.e. burning it to prevent it from entering the atmosphere – flaring methane results in 7.5 times less global warming potential than uncontrolled release of the gas).

Offsets are measured in tonnes of CO₂ equivalent of emission reductions compared to an established baseline.

Companies such as CO₂ Australia and Easy Being Green have been active in the local offset sector, generating credits from forest sinks and energy efficiency projects, respectively.

Regulated trading schemes

The European Union's ETS has been operating since 2005 and covers about 11 500 installations in 25 member countries, accounting for about 45 per cent of the EU's total CO₂ emissions.

The EU ETS takes as its starting point the Kyoto target for reducing combined emissions of greenhouse gases by eight per cent from 1990 levels by 2008–2012. For each member state, this target has been translated into different emission reduction or limitation targets.

The cost of achieving these targets is estimated at between 2.9 billion and 3.7 billion euros annually.

Because the scheme requires mandatory monitoring and reporting of carbon emissions, participating companies are required to establish CO₂ budgets and carbon management systems. Emitters can use this information to selectively reduce emissions – for example, by improving production processes or investing in new technologies.

Other regulated schemes include the US Regional Greenhouse Gas Initiative and the Chicago Climate Exchange and, in Australia, the NSW Greenhouse Gas Reduction Scheme (GGAS).

GGAS is a mandatory greenhouse gas emissions trading scheme set up by the NSW Government.

The scheme establishes annual statewide greenhouse gas reduction targets and requires individual electricity retailers to

meet targets for reducing or offsetting their greenhouse gas emissions. About 20 companies have a liability under the scheme. The ACT Government introduced a similar scheme in 2005.

Under the GGAS scheme, companies with a liability, such as electricity suppliers, purchase 'abatement certificates' (carbon credits) from providers that carry out greenhouse gas abatement activities. These activities would reduce or increase energy efficiency, or involve carbon sequestration – managing forests is a well-known example.

Participating companies that fail to meet their target are fined – currently \$11 per tonne of shortfall.

The proponents of emissions trading say it is the most cost-effective way of stabilising or reducing high levels of atmospheric greenhouse gases while also promoting reforestation.

Credits from trees

CO₂ Australia, an accredited GGAS provider, establishes commercial plantations of mallee eucalypts on farmland that was cleared before 1990. By calculating the biomass in the trees above and below ground, managers can estimate the amount of carbon the trees have sequestered and convert this to carbon credits, which can be traded.

The company started in 2004 with a small planting in NSW and by the end of this season will have planted about 13 million trees.

'Trees start producing a small amount of credits after one year,' explains CO₂ Australia chief executive office, Andrew Grant. 'They continue creating credits for up to about 50 years.'

The company enters into what is known as a forestry and carbon sequestration right with landholders – effectively a lease –



Organisers of the Australian Big Day Out this year offset their carbon emissions by purchasing carbon credits. Big Day Out, www.bigdayout.com

which gives CO₂ Australia legal ownership of the trees, the carbon in them and the ability to trade it. One of the requirements is that trees have to remain in the ground for at least 100 years.

As well as the participants in the NSW scheme, CO₂ Australia also provides carbon credits to other companies and individuals who want to voluntarily offset their emissions, such as The Big Day Out concert, and travel and finance companies. It also has a joint venture with Macquarie Bank for investors interested in making money from the sale of carbon credits.

'In the case of a concert, for example, a technical expert will calculate the emission footprint, and we plant a certain number of trees to offset that level of emissions,' says Andrew Grant.

Retail customers can purchase carbon credits from the company's website at \$16/tonne. For larger clients, the price is negotiated case by case. Carbon prices vary dramatically from as low as \$10/tonne to as high as \$40/tonne.

'Tree planting is not a silver bullet. It is one aspect of a multitude of actions

Carbon trading in action

Companies A and B both emit 100 000 tonnes of CO₂ a year. Under the national allocation plan, the government gives each of them carbon credits (emission permits) for 95 000 tonnes, leaving them to find ways to cover the shortfall of 5000 credits.

They have a choice between reducing their emissions by 5000 tonnes, purchasing 5000 credits in the market or taking a position somewhere in between.

In the market, the price of a credit at that moment is \$10 per tonne of CO₂. Company A calculates that cutting its emissions will cost it \$5 per tonne, so it decides to do this because it is cheaper than buying the necessary allowances. Company A even decides to take the opportunity to reduce its emissions by 10 000 tonnes.

For Company B, the cost of reducing emissions is \$15 per tonne – higher than the market price. So it decides to buy allowances instead of reducing emissions.

Company A spends \$50 000 on cutting its emissions by 10 000 tonnes at a cost of \$5 per tonne. It then receives \$50 000 from selling the 5000 allowances it no longer needs at the market price of \$10 each. This means that it fully offsets its emission reduction costs by selling allowances; without the emissions trading scheme, it would have had a net cost of \$25 000 to bear, assuming that it cut emissions by only the required 5000 tonnes.

Company B spends \$50 000 on buying 5000 allowances at a price of \$10 each. Without the flexibility provided by the carbon trading scheme it would have had to cut its emissions by 5000 tonnes at a cost of \$75 000.

In this example, emissions trading brings a combined cost saving of \$50 000 for the companies. Since Company A chooses to cut its emissions, the allowances that Company B buys represent a real emissions reduction, even if Company B did not reduce its emissions.



Burning or flaring methane gas produced at landfill sites could be a way to earn carbon credits. Rob Hill



Andrew Grant, chief executive officer of CO2 Australia, which generates carbon credits by establishing commercial plantations of mallee eucalypts on farmland cleared before 1990.

CO2 Australia

that government and industry need to undertake,' cautions Grant.

A workable trading model

While many scientists and business leaders support the concept of emissions trading, climate change experts are concerned that a weak scheme could be used to delay the need to tackle the issue of burning fossil fuels.

In July, the Australian Government proposed a cap and trade carbon trading scheme to start no later than 2012, but has not announced either a short-term cap or a long-term 'aspirational' target.

Professor Barry Brook, Director of the Research Institute for Climate Change and Sustainability at the University of Adelaide, says any emissions trading scheme needs both.

'The cap involves working with the Australian Greenhouse Office to understand current levels and what represents a cut in emissions.

'For example, Australia's sheep population has declined by about 50 million over the last 10 years. That had a big impact on our emissions – for reasons unconnected with an attempt to reduce them.

'The idea is you have a fixed cap that decreases over time.

'You could argue that the fossil fuel industry is the most heavily subsidised of almost any industry because the true cost

'Australia's sheep population has declined by about 50 million over the last 10 years. That had a big impact on our emissions – for reasons unconnected with an attempt to reduce them.'

of the carbon pollution is not being paid,' says Professor Brook.

Dr Mark Diesendorf of the Institute of Environmental Studies at the University of NSW says that by starting with a very weak cap on emissions, some of the cleaner technologies such as wind power, which are available now, will be disadvantaged.

'Having a higher carbon price will help the cleaner fuels, especially for electricity generation, compete with "dirty" coal.

'If the price of carbon rises, the first energy supply measure to benefit would be natural gas, which is much cleaner than coal, but still "dirty". After that probably comes wind power, then bio-electricity from residues of existing crops and landfill gas.

'Maybe in 20 years time, coal with CO₂ capture and burial will be available, but not before.'



There is still debate about how long it will take to establish 'clean' coal power stations with CO₂ sequestration. Andy Olsen

The Australian Conservation Foundation (ACF) has also criticised the lack of a short-term target in the Australian Government's and the Opposition's proposed schemes.

'The crucial feature of a cap and trade emissions trading scheme is the cap – the target,' says ACF Executive Director Don Henry.

'Without a target, there is no certainty for business and no certainty for the environment.'

Free credits or auction?

The other key to the success of any scheme is allocating the right number of initial credits, and allocating them in the right way.

Under the scheme announced for Australia, businesses will be given a free allocation of permits (credits). At least 1000 companies will have a liability under the scheme.

Professor Brook is concerned that many of these permits will be allocated to the larger polluters, and that such an approach runs the risk of 'over-allocation'.

'You need to have enough constraints to keep the real dollar value,' he adds. 'Initial over-allocation of credits under the EU scheme saw their value fall dramatically.'

Dr Diesendorf believes the government should allocate permits by auction rather

A global 'stock exchange'

The Kyoto Protocol allows countries with 'unused' emissions permits to sell this excess capacity to countries exceeding their targets. Countries not meeting their commitments will thus be able to 'buy' compliance.

The Protocol provides a basic framework for participating governments to link up compatible domestic trading schemes and create a larger, more cost-effective market.

A global 'stock exchange' where emissions units are bought and sold is simple in concept but in practice the protocol's emissions trading system has been difficult to set up. The problem is that actual emissions have to be monitored and guaranteed to be what they are reported to be and precise records have to be kept of the trades carried out.

Countries will get credit for reducing greenhouse gas totals by planting or expanding forests, for carrying out 'joint implementation projects' with other developed countries, and for projects under the protocol's clean development mechanism (CDM), which involves funding activities to reduce emissions from developing countries. Credits earned may be

than by giving them to the large emitters.

'It is essential that companies pay for these permits and that the money raised is used for funding the transition to a cleaner energy future,' he says.

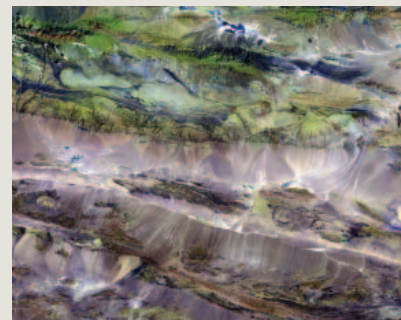
The Australian Government says its immediate policy objective is to achieve its Kyoto Protocol target of limiting emissions to 108 per cent of 1990 levels in the period 2008–2012.

The most recent estimates indicate that Australia is broadly on track to meet this target, but only because of the impact of stopping land clearing in Queensland and New South Wales. Obviously, this one-off action will not be repeated.

Without new action, ongoing strong economic growth is expected to result in emissions rising to 127 per cent of 1990 levels by 2020, according to the Prime Minister's task group on emissions trading.

Dr Diesendorf says that delayed action will only cost Australia more down the track. 'Our emissions have been soaring from energy, particularly electricity, generation. Things are going to get much worse under "business as usual".'

Frank Muller, Professorial Visiting



Developing countries such as Mongolia (above) will benefit from clean development subsidies to support wind power, biofuels or solar projects. NASA/Landsat

bought and sold in the emissions market or 'banked' for future use.

Through the CDM option, companies may be a participant in and purchaser of credits from an approved project, or a project developer in a joint venture where they supply technology, equipment or intellectual property. Projects supported under the European scheme, for example, include an electricity plant that uses mustard crop residue for fuel in India and a wind park generating electricity in Mongolia.

Fellow at the University of New South Wales' Institute of Environmental Studies, warns that Australia will continue to miss out on opportunities in global clean technology and carbon trading markets if emissions trading is delayed until 2012 – as proposed by the present government – and we fail to join the Kyoto system.

'Globally, an emissions trading scheme is going to emerge. Whether it's sooner or later is difficult to know but if we have an internal scheme going, we will be prepared when a global scheme comes along.'

More information:

Australian Greenhouse Office,
www.greenhouse.gov.au

European Emissions Trading Scheme,
www.ec.europa.eu/environment/climat/emission.htm

NSW Greenhouse Gas Reduction Scheme,
www.greenhousegas.nsw.gov.au

United Nations Framework Convention on Climate Change, <http://unfccc.int>

Australian Business Round Table on Climate Change, www.businessroundtable.com.au

CO₂ Australia, www.CO2Australia.com.au

Easy Being Green, www.easybeinggreen.com.au