

## **Trading of sequestered carbon – an Australian perspective**

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Paper presented to the New Zealand Institute of Foresters Conference, Wellington NZ, April 20 to 23 2006.

### **Abstract**

Carbon trading has emerged as a market-based mechanism that enables greenhouse gas emission reductions to be implemented at least cost. While Australia has not ratified the Kyoto Protocol, it is likely to meet its nominal commitment under the protocol for the first commitment period (2008-2012), due to an expansion of the plantation estate and a decrease in land clearing since 1990. The country has emerged as a leader in developing markets for carbon trading, which have involved forestry projects that encourage reforestation on agricultural lands. There are several key aspects that significantly affect the participation by the forest sector in these schemes.

Emissions in New Zealand currently exceed its commitment level under the Kyoto Protocol (zero increase over 1990 levels). New Zealand has ratified the Protocol, and as such the commitment is legally binding. The emissions profile within New Zealand is strongly influenced by activity within the forestry sector. Experience from carbon trading activity in Australia indicates that New Zealand may be able to employ an emissions trading scheme and other market-based mechanisms to encourage investment in the forestry sector, contributing towards the country's Kyoto commitment. In particular, a carbon trading scheme in New Zealand needs to facilitate the replanting of sites after harvest on Kyoto compatible land, minimize deforestation on non-Kyoto compatible land and encourage reforestation of cleared agricultural land.

### **1 Introduction**

Emissions trading has emerged as a market-based mechanism to enable business, nations and even individuals reduce greenhouse gas emissions. The mechanisms of the Kyoto Protocol, which was signed in 1997 and ratified and entered into force in 2005, established the first trading arrangements for carbon to facilitate significant greenhouse gas emission reductions below 1990 baseline levels. Through the Clean Development Mechanism

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(between developed and developing countries) and Joint Implementation (between two developed countries), emitters can purchase carbon credits from projects that avoid or sequester greenhouse gas emissions. Outside of the Kyoto mechanisms, other carbon trading markets have developed, and the world's largest non-Kyoto market operates in Australia – the New South Wales Greenhouse Gas Abatement Scheme. In total, carbon transactions increased ten-fold in 2005 to trade 800 million tones of CO<sub>2</sub> worth AU\$11.9 billion (Point Carbon 2006).

The forestry sector has contributed to the growth of these rapidly developing markets, and there are increasing opportunities for forestry investment. This paper provides an overview of forestry-based activities in carbon trading markets in Australia and discusses some of the key lessons with respect to the forestry sector.

The timber industry in New Zealand has been under pressure from low prices for export products and the resultant higher returns from agriculture over forestry, leading to a reversion of forested areas to agriculture and a decrease in planting of new forests. This is likely to increase New Zealand's emissions profile, making it more difficult to achieve its Kyoto commitment. By providing appropriate encouragement of investment in the forestry sector, well targeted carbon trading mechanisms have the potential to significantly increase carbon sequestration in forests, thereby reducing the overall emissions profile of New Zealand. This is likely to be a key component in meeting the country's Kyoto target.

## **2 Meeting Australia's Kyoto target**

Since signing the Kyoto Protocol in 1997, the Australian federal government has committed significant resources to the estimation of annual greenhouse gas emissions and in recent years has claimed that Australia is on target to meet its commitment of an increase of 108% over 1990 levels. While this is largely a public relations exercise given that Australia has not yet ratified the Kyoto Protocol and so the commitment is non-binding, the most recent figures indicate that Australia's net greenhouse gas emissions for 2003 were 550 Mt CO<sub>2</sub>-e, compared to 544 Mt CO<sub>2</sub>-e in 1990, representing a 1.1% increase (AGO 2005).

This seemingly good result can be attributed to the land-use, land-use change and forestry (LULUCF) sector, which had an emission profile in 2003 of 34.8 Mt CO<sub>2</sub>-e compared to 126.2 Mt CO<sub>2</sub>-e in 1990. The decrease in emissions from the LULUCF sector between 1990 and 2003 is due to a decrease in the rate of land clearing and a significant expansion of the plantation estate, primarily with hardwood species planted on ex-agricultural land. Without the inclusion of the LULUCF sector, net Australian greenhouse gas emissions in 2003 were 23.3% greater than 1990 levels (AGO 2005).

Although Australia has relied heavily on the plantation sector in order to meet its nominal commitments, the Australian Government has been unwilling to instigate a national emissions trading scheme that could provide real incentive for further expansion of the national plantation estate and further reduction in Australia's net emissions profile. In January 2006 the Australian Government joined with the governments of China, India, Japan, Republic of Korea and the United States in forming the Asia-Pacific Partnership on Clean Development and Climate. However, this agreement is aimed mainly at technology transfer and does not include an emissions trading mechanism, and is therefore not considered further here.

### **3 Formal trading mechanisms in Australia**

In Australia and elsewhere, carbon trading has emerged as a market-based mechanism that enables greenhouse gas emissions reductions to be implemented at least cost. Under these carbon trading schemes, projects are certified to generate offsets through emissions abatement activities (e.g. energy efficiency, low-emission electricity generation, landfill gas capture) and removals enhancement activities (e.g. carbon sequestration). Some compulsory markets are established through legislation that requires emitters, such as energy generation companies, to meet reduction targets or pay a penalty, and establishes rules for projects that wish to create credits. Similarly, there are voluntary markets with formal government backing and well defined rule sets, and there are also voluntary markets that operate outside formal legislative arrangements and are driven by business or individual motivations to become carbon neutral.

There are currently two formal platforms within Australia for the trading of carbon sequestered in plantation forests: the NSW Greenhouse Gas Abatement Scheme and the Greenhouse Friendly Program. The rules vary between these platforms, as does the potential value to participants within the forestry sector. In addition, the Australian State and Territory governments are currently developing a state-based national emissions trading scheme, to be implemented in the absence of a compulsory scheme supported by the Federal Government.

#### **3.1 *The NSW Greenhouse Gas Abatement Scheme***

The NSW Greenhouse Gas Abatement Scheme (NSW GGAS) commenced on 1 January 2003 with the aim of reducing the greenhouse gas emissions relating to the production and use of electricity ([www.greenhousegas.nsw.gov.au](http://www.greenhousegas.nsw.gov.au)). Under the scheme, electricity retailers in NSW (including the ACT from 2006) must meet an industry emissions benchmark or pay a

penalty. Retailers can meet this benchmark by buying or generating electricity with a low emission profile or by buying abatement certificates from accredited providers, who can generate offset credits from eligible projects.

One of the four mechanisms for generating abatement certificates is through sequestration in forests compatible with Article 3.3 of the Kyoto Protocol. The key NSW GGAS rules relating to forestry projects are:

- Eligible forests must be planted after 1 January 1990 on land that was predominantly non-forest on 1 January 1990 (resulting in land-use change).
- Abatement certificates are registered upon the carbon pool (estate) rather than being attributed to individual properties, allowing for harvesting and replanting of individual stands.
- Certificates are registered ex-post (after sequestration has occurred) and can only be registered for years in which there is net sequestration (c.f. net emission).
- The abatement certificate provider is obligated to maintain carbon stocks within the carbon pool equivalent to the cumulative registration of certificates, for a period of 100 years. This obligation is enforced through a restriction applied to the land title.

Currently only one forestry-based abatement certificate provider has registered and sold certificates. In 2005, 166,005 certificates (each equivalent to 1 tonne CO<sub>2</sub>-e) were registered from carbon sequestration projects, compared with a total of approximately 5.6 million certificates from all activities (demand management and low-emission electricity generation) (IPART 2005). Supply of abatement certificates exceeded demand for 2003 to 2005, and this excess is likely to be “banked” and used to meet obligations in 2006 and 2007. The scheme administrator has indicated that by 2012 the demand for certificates is likely to exceed supply by as much as 10 million certificates per annum. This provides a significant investment opportunity for the forestry sector, which could generate income from carbon sequestration to finance new plantations, resulting in further emissions reductions and certificate creation.

Abatement certificates for the 2005 vintage are currently trading at approximately \$14.20 on the spot market, with prices for 2009 vintage trading at over \$17 (Next Generation Energy Solutions, [www.nges.com.au](http://www.nges.com.au)). Prices for abatement certificates are limited by the penalty imposed for non-compliance (currently about \$15.70 per tonne CO<sub>2</sub>-e after tax considerations), which is increased annually in line with the Consumer Price Index.

### **3.2 The Greenhouse Friendly program**

The Greenhouse Friendly Program (GFP) is a Commonwealth Government initiative to engage consumers on climate change issues and broaden the basis for investment in greenhouse gas abatement above a business as usual. GFP is a voluntary scheme, whereby participants can have products or services certified as greenhouse neutral by buying sufficient GFP emissions abatements to offset any emissions generated in the production and distribution of the product or service (full life-cycle analysis).

Offsets can be generated from a variety of project types including forest sequestration, as long as it can be demonstrated that the project achieves additional greenhouse gas abatement. The rules for forest sequestration projects are currently under review, but are likely to include several key components:

- Eligible forests must be planted after 1 January 1990, on land that was predominantly non-forest on 1 January 1990 (resulting in land-use change).
- Projects must satisfy financial additionality criteria (i.e. be additional to “business as usual”). Where the forest would have been planted anyway but the project results in an additional abatement, then this additional abatement may be eligible.
- The offset provider maintains liability for the sequestered carbon for a period of 70 years, but the buyers of credits are also potentially liable in the event of unplanned reversal events.
- Projects must not have been financed through another Commonwealth or State measure.

Given that this is a voluntary market and there is no central trading house for GFP offsets, it is difficult to gauge the size of the market. GFP credits are currently trading at \$7.00 ([www.nges.com.au](http://www.nges.com.au)), which is half the price of credits under the NSW GGAS due the voluntary nature of participation.

The Australian Government has recently announced that from 1 July 2006 it will be a requirement for Australian companies receiving fuel excise credits of more than \$3 million to join the Greenhouse Challenge Plus program. While participation in this program does not place a mandate on companies to reduce their greenhouse gas emissions, the increase in the number of companies having to report annual emissions (a requirement of Greenhouse Challenge Plus membership) may lead to an expansion in the market for GFP offsets from companies wanting to demonstrate leadership in corporate social responsibility.

### **3.3 National Emissions Trading Taskforce**

In the absence of a national emissions trading scheme supported by the Commonwealth Government, the State and Territory Governments (through the National Emissions Trading Taskforce, [www.cabinet.nsw.gov.au/greenhouse/emissionstrading](http://www.cabinet.nsw.gov.au/greenhouse/emissionstrading)) are currently negotiating a trading platform that will have national scope but operate in the State and Territory jurisdictions. The rules for this scheme are still under development, but indications are that forestry based offsets will be included and the associated rules will follow closely those of the NSW GGAS. This scheme is expected to become operational in 2010.

### **4 Bilateral trades**

In addition to the trading of carbon credits under the NSW GGAS (compulsory) and GFP (voluntary), voluntary transactions outside these formal schemes are increasing. This provides some opportunity for the sale of carbon credits from forestry projects that are outside NSW or do not meet the financial additionality requirements of the GFP.

Verified Emission Reductions (VERs), the unit of voluntary trading, are based on an a set of parameters agreed between buyer and seller, which may include consistency of accounting with the Interim Australian Standard (Standards Australia 2002), an obligation to maintain stocks for a set period and independent verification. Large-scale buyers of VERs are primarily organizations who have no legislated requirement to purchase credits but have either developed a product or service that is stated as being greenhouse neutral (brand differentiation), or are looking to meet internally set targets for emissions reductions (corporate social responsibility / mitigate reputational risk). There is also an emerging market for smaller-scale transactions, primarily through specific offset products such as Greenfleet ([www.greenfleet.com.au](http://www.greenfleet.com.au)) that are developed for retail sales to companies and individuals wanting to offset their emissions.

In 2005 the worldwide market for VERs was about US\$69 million (Point Carbon 2006). Prices range from US\$1 to US\$38 per tonne of CO<sub>2</sub>-e for all project types with sequestration projects at the lower end of the scale.

### **5 Lessons to be learned from the Australian experience**

The development of mandatory and voluntary schemes for carbon trading and the emerging market for VERs in Australia has provided the opportunity to assess the impact of several key rules on investment in forestry based projects and participation in carbon trading markets.

### **5.1 Project eligibility**

The requirement for financial additionality imposed by the Greenhouse Friendly Program is a significant deterrent to investment in forestry projects, since it acts against projects that are financially viable without the sale of carbon. Further, financial additionality introduces a degree of subjectivity into the determination of eligibility and may result in identical plantations having different eligibility status even though they provide the same environmental benefit.

In contrast, the eligibility of forestry projects under the NSW GGAS is based on Kyoto criteria. This is seen by some as providing a windfall gain for the commercial forestry industry, since the plantations may have been planted anyway and are therefore not necessarily in addition to “business as usual”. However, there is considerable merit to this approach, given that (a) these plantations provide a significant environmental service through the sequestration of carbon dioxide, which should be recognized in any emissions trading scheme, and (b) inclusion of commercial plantations in the scheme introduces an incentive for the ongoing management and replanting of the forest after harvest, resulting in long-term land-use change and reducing the likelihood of deforestation or reversion to agriculture after one or two rotations.

### **5.2 Ongoing liability**

The sale of carbon credits from forestry projects under both the NSW GGAS and the GFP generates a long-term liability to maintain sufficient carbon stocks within the forest estate equivalent to the volume of credits registered or sold. This is necessary in order to achieve equivalence with credits derived from emission reduction projects, ensuring that forestry credits are fully fungible within the market.

The NSW GGAS uses a restriction placed on the land title to ensure the ongoing compliance by the land owner and carbon pool manager with liabilities incurred through the sale of carbon. This restriction takes the form of a legally binding agreement between the Scheme administrator, carbon pool manager and land owner. The buyers of abatement certificates bear none of the liability for unplanned depletion events (emissions) resulting in the carbon pool manager being in breach of obligations. The carbon pool manager enters into a single agreement (with the Scheme administrator), irrespective of how many different organizations purchase abatement certificates generated by the carbon pool.

In contrast, the current draft guidelines for forest sequestration projects under the GFP indicate that liability for the ongoing maintenance of carbon stocks must be determined through an agreement between the abatement provider and purchaser. However, implementation of mechanisms to ensure that liability is not transferred to the buyer (such as

restrictions on the land title) are not practical, particularly for large managed carbon pools where carbon is sold annually, perhaps to a variety of buyers. The complexity of these arrangements is likely to increase compliance and transaction costs for abatement providers, and coupled with greater uncertainty for buyers associated with the possible ongoing liability will decrease the financial attractiveness of sequestration abatement projects.

This highlights the need for the creation of a regulator to oversee the registration of credits and ongoing compliance with any given program.

## **6 Opportunities for the forestry sector in New Zealand**

New Zealand ratified the Kyoto Protocol in 2002, and has committed to a legally binding target of zero increase in greenhouse gas emissions for the first commitment period (2008-2012) over 1990 emission levels. The New Zealand inventory of greenhouse gas emissions for 2003 indicates that net emissions (emissions minus sequestration in forests) for that year were 52.5 Mt CO<sub>2</sub>-e, compared to 40.1 Mt CO<sub>2</sub>-e in 1990, an increase of 31% (Ministry for the Environment 2005). Almost half of New Zealand's emissions come from the agricultural sector (37.2 Mt CO<sub>2</sub>-e in 2003), whereas the forest sector is a net sink for greenhouse gases (22.9 Mt CO<sub>2</sub>-e in 2003).

The plantation forestry sector in New Zealand, while relatively mature, faces issues relating to low returns brought on by the exposure to export markets and (until recently) high exchange rate between the NZ and US dollars. There is real opportunity for the forestry sector specifically, and New Zealand in general, to benefit from the positive impact that ongoing forest management can have on greenhouse gas emissions. For the potential benefits from this opportunity to be realized, the rules relating to emissions trading within New Zealand need to be clarified, both in terms of participation of forest growers in carbon trading, as well as mechanisms to reverse the trend of increasing deforestation/reversion to agriculture. The forest sector needs a greater level of certainty than currently exists, on which to base long-term investment decisions.

The mechanisms for achieving a reduction in New Zealand's emissions profile through the forestry sector should not be limited solely to consideration of Kyoto consistent forests and agricultural land. There is merit to some form of incentive payment to encourage the replanting of pre-1990 plantations after harvest, given that the reversion of these forests to agriculture has a dual effect on the country's emissions profile due to the reduction in carbon stocks in forests coinciding with increased emissions from agricultural production.



Similarly, ensuring that stands are replanted after harvest should also be a priority within the current estate of Kyoto consistent forest. There is the potential for the reversion of these forests to agriculture over the next few decades, which will impact negatively on the emissions profile of New Zealand.

Expanding the plantation estate through the planting of Kyoto consistent agricultural land is another important strategy in achieving New Zealand's long-term commitments under the Kyoto Protocol. This incorporates multiple benefits due to the increase in carbon stocks in forests, and the decrease in emissions from agricultural production.

The current emphasis on the Permanent Forest Sinks Initiative to achieve carbon sequestration goals largely ignores the very real and significant contribution that forests managed on a rotational basis make towards reducing the emissions profile within New Zealand. The mechanisms developed around carbon trading need to recognize these benefits and include rotational forestry as an eligible management option.

Reducing deforestation and increasing new plantings may require a suite of mechanisms to ensure that an effective outcome is achieved at lowest cost possible to the New Zealand economy. These mechanisms could include a 'grey' market for carbon credits, traded solely within New Zealand between forest growers, who can generate the credits based on replanting of previously forested land, and large emitters. Pricing signals from this market should encourage the large emitters to move towards a lower emissions profile for an equivalent activity level. A 'green' market for carbon credits could also be established, whereby carbon sequestration in Kyoto consistent forests would be used to generate RMUs or, preferably, AAUs that could be traded within New Zealand and internationally. An important consideration of this market mechanism is the need for the New Zealand government to retain some of the benefit from this sequestration given that it is responsible for any shortfall in the Kyoto target. This could be achieved by providing AAUs for only a portion of the sequestration, with the balance eligible to generate certificates on the domestic 'grey' market.

## **6 Conclusions**

The Australian carbon trading platforms are supporting a rapidly growing and increasingly sophisticated trade in offsets, and this development is mirrored in the voluntary market. Carbon sequestration in forests plays an important role in generating offsets for greenhouse gas emissions, and this is recognized in both the formal trading platforms and the voluntary market.

New Zealand has an opportunity to build on the strength of its forest sector to achieve real progress towards its target for the first Kyoto commitment period. This will require the establishment of appropriate market mechanisms to encourage new plantings on Kyoto consistent land, as well as avoiding deforestation and reversion to agriculture in existing stands.

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