December/January 2004/05

AETF review

Australasian Emissions Trading Forum www.aetf.net.au

2005—A Seminal Year for ET

This year will be a seminal year for emissions trading with two major events and a host of associated activity.

Starting on 1 January 2005, the EU Emissions Trading Scheme is underway across the 25 EU member states. In its initial phase, from 2005 to 2007, the EU ETS will cover only CO2 emissions from large emitters in the power and heat generation industry and in selected energy-intensive industrial sectors. But even with this limited scope, more than 12000 installations will be covered, accounting for more than 45% of the EU's CO2 emissions.

From 16 February 2005 the Kyoto Protocol will come into force with binding emission targets for the majority of developed countries. In effect the Protocol is an international cap-and-trade scheme that will provide the framework for international trading and support for the abatement project based mechanisms, Joint Implementation (JI) and Clean Development Mechanism (CDM).

The market for credits from JI and CDM projects is expected to be substantial. Estimates indicate that EU members alone intend to procure 500-600 million tonnes of CO2 credits from such projects for the period 2008-2012. Japan and Canada are also expected to be major buyers.

As described in our first article in this issue, from Point Carbon, credits worth more than A$630 million were forward traded in 2004 in anticipation of the start of the EU ETS and the Kyoto Protocol.

Augmenting these major developments are advances in market based schemes in many countries including state and private initiatives in the US and Australia. Our second article describes the innovative 'CarbonTender' scheme operating in Victoria to foster carbon sinks and environmental rehabilitation. TB

In this Issue

Carbon Market Insights 2005

Point Carbon's annual event for the world's carbon markets will be held on 1-3 March 2005 in Amsterdam.

See back page for more detail.

The Australasian Emissions Trading Forum is sponsored by the

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State Forests of NSW and the NSW Dept. of Energy, Utilities and Sustainability

International Carbon Markets in 2004

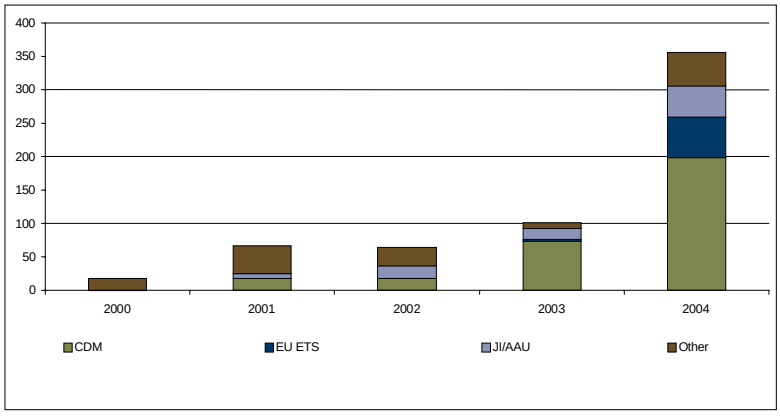
Point Carbon*

2004 was the year that the international carbon market really manifested itself as a functioning financial market. Point Carbon estimates the value of all transactions in the market in 2004 to be around €360 million. The Clean Development Mechanism (CDM) and EU Emissions Trading Scheme (ETS) account for the majority of the market, with some 80% of the financial value. Activity in the forward market in EU ETS has been steadily increasing and is expected to continue, at least until a spot market is created in March 2005. The largest volumes are still to be found in CDM, and prices in the project market are experiencing an upward trend. At the end of the year prices in EU ETS have stabilized around the €8-8.5 level, with prices in the CDM and JI market just below €5.

Value of the Carbon Market 2000-2004

More than 100 million tons of carbon credits will be transacted in 2004 in the various carbon markets worldwide. Point Carbon expects the value of the carbon market to increase considerably from €96 million in 2003 to almost €360 million in 2004, see figure 1. It is worth mentioning that CDM/JI values at future delivery have been discounted to present equivalent Euros, using an annual interest rate of 7%. EU ETS and CDM contracts are expected to contribute around 80% of the total market value in 2004.

Figure 1: Carbon market value 2000—2004 [million Euro]



The main factors that influence transaction volumes and prices in 2004 are (in ranking order):

- agreement on the EU ETS linking directive;
- final outcome of EU ETS national allocation plans;
- clarification of the CDM project cycle;
- Russian ratification and entry into force of the Kyoto Protocol, and
- climate policy reviews in Canada and Japan.

EU ETS

By 16 December 2004 more than 8 million EU allowances (EUAs) were reported traded in the brokered market. In figure 2, weekly transaction volumes and prices so far are given for this period. This data is provided to Point Carbon by the active brokers in the market, allowing us to report daily closing prices in the EU ETS. In addition to the OTC market (over-the-counter), market players assume that substantial volumes were traded in non-brokered (bilateral) deals.

It is worth noting that weekly variations have been high, with some weeks seeing no activity at all while other weeks have seen trades totaling close to 700,000 tons. The price developments have also been substantial, with volatility in the system close to 70% at some periods throughout the year. After prices peaked above €12 per ton in the first weeks of 2004, the price over the latter months of the year has stabilized around €8-9.

There are several reasons for these variations in prices and volumes; most importantly there is currently a limited number of market participants, limiting liquidity in the system. These players have proven to be highly reactive to political developments, which could explain why prices dropped and volumes traded increased as the outcome of the first National Allocation Plans (NAPs) became clear around March-April 2004.

It also seems that the regulatory uncertainties have prompted many players to remain on the fence for the time being, leaving potentially large volumes out of the system. However, all in all, there is a clear tendency for weekly transaction volumes to increase

* This paper was prepared by Henrik Hasselknippe, Arne Eik, Jorund Buen, Stian Reklev, Ian Roche and Kristian Tangen and is based on observed trends in carbon transactions registered in Point Carbon's Carbon Transaction Database, interviews with market actors, as well as Point Carbon's assessments of policy developments and their market impacts.

as 2005 and the emission trading system begins.

Over time, potentially large volumes from Central and Eastern Europe may hit the market, although the extent to which these companies will participate in the market is still uncertain and the impact on future prices is yet to be seen. However, once the market starts trading on fundamentals, issues like short term power demand and relative fuel prices (the gas to coal spread) will be instrumental in determining market prices.

CDM and JI/AAU

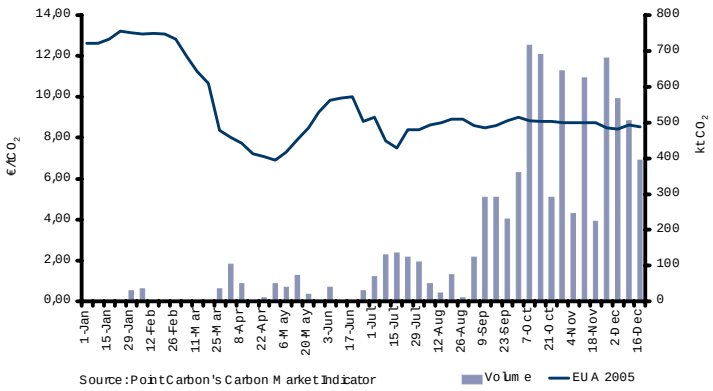
On the basis of the information contained in PointCarbon's CDM/JI database and interviews with more than 30 actors in the CDM and JI markets, together with earlier experiences, we have estimated volume and prices from already contracted and expected project-based emission reduction purchase agreements (ERPAs) in 2004. We expect that various government initiatives, carbon funds, and companies will sign ERPAs of 86 $MtCO_2e$ in 2004.

The average price for 2004 is expected to be just below €5/tCO_2e for both CERs (CDM currency) and ERUs (JI currency). The average prices vary according to the character of the buyer; from €3.5/ tCO_2e for carbon funds, where the World Bank Prototype Carbon Fund (PCF) is the most important player, to €4.9/tCO_2e for the governmental buyers, where the Dutch dominate.

Much corporate activity has taken place in Japan, but it should be noted that this is linked to only a few large-scale projects. It is striking that European corporate interest in the CDM seems to have increased significantly in spite of the fact that most EU ETS NAPs have so far been rather lax, and that the EU Commission has shown only limited willingness or ability to change this picture.

In the CDM market, where we find the largest contract volumes by far, contracts are often signed before projects have host country approval in place, are validated, and/or have their baseline and monitoring methodology approved by the CDM EB. Hence, there is a risk that contracts could be cancelled later on if projects signed are not approved. However, in some cases, and to an increasing degree, buyers are not putting the pen on the contract before projects are almost certain to be approved. It should also be noted that an increasing number of countries are getting their Designated National Authority (DNAs) established, that more Designated Operational Entities (DOEs)/validators are being approved, and that new methodologies are emerging. Such a project cycle standardization increases the number of ERPAs and hence the volume of CERs being contracted.

Figure 2: EU allowance prices on a weekly basis—2004



Other markets

Transactions within emission trading systems in UK, Australia (NSW) and US as well as unilateral carbon transactions in New Zealand will add up to 10 million tons in 2004. The prices vary greatly from country to country and the average price is estimated to be around €5/t

Policy developments

A number of policy developments in emerging carbon markets are particularly worth following, although they will have limited impact, if any, on volumes and prices in the short term:

- *Russian ratification and entry into force of the Kyoto Protocol;* could boost future activity in EU ETS, as well as in the CDM and JI market,
- *the climate policy review processes in Japan and Canada*, respectively; this will clarify the scope for government as well as private sector investment in the flexibility mechanisms, and provide signals on the development of (possible) domestic emissions trading schemes. It is now clear that there will not be a carbon tax implemented in 2005, although where that leaves emissions trading is still uncertain;
- *state-level discussions on emissions trading schemes, in Australia*; All state governments are discussing the establishment of a national state-based emission trading system;
- *the likely linking of Norway's domestic emissions trading scheme with EU ETS* in 2005, either through mutual recognition or direct transposition of the EU Directive through the European Economic Agreement;
- *Switzerland's* preparations for either a CO_2 levy on fuels, a domestic emissions trading system, or a combination of the two;
- *Increasing government investments in project-based mechanisms*, either through strengthening of existing positions (Netherlands, Italy, Canada,

Austria), or through the creation of new initiatives (Belgium, Luxembourg, Portugal, Ireland, Spain, Japan).

It is also worth mentioning that numerous initiatives currently underway will most likely generate substantial volumes in 2005. This would make the coming year an even more dynamic one in terms of carbon market development globally.

Reference

Point Carbon (2004), various reports, proprietary databases and web-based tools. See www.pointcarbon.com for more information.

Point Carbon is the leading provider of independent analysis, market intelligence and forecasting for the emerging carbon emission markets. For information on Point Carbon's forthcoming Carbon Market Insights conference see page 8.

"CarbonTender" Sinks in an Emerging Market
Learning by Doing

Jack Holden, Vic. Dept. of Sustainability and Environment

CarbonTender is a "market – like" mechanism for investment in sinks that also provide other environmental services such as biodiversity in a cost-effective way.

CarbonTender also attempts to test the legal, technical and accounting tools that are needed in the emerging carbon market. This provides credibility for Victoria as a destination for greenhouse investments and increases the capacity of Victorian sink providers.

A trial was completed in 2004 and CarbonTender will now be expanded to the about half of Victoria.

Round 1 of CarbonTender saw contracts allocated to 26 landholders in the trial areas of the Otways, northeast Victoria and West Gippsland. Landholders submitted bids to grow carbon sinks on their land with native plants. Contracts were offered to the best value bidders ($ per tonne of CO_2).

Objectives

The primary objectives of CarbonTender are to sequester atmospheric CO_2 and provide biodiversity gains particularly by increasing the resilience of ecosystems in a changing climate.

CarbonTender is an initiative of the Victorian Greenhouse Strategy and is delivered by the Department Of Sustainability and Environment (DSE). Developing the State's ability to prosper in a carbon constrained economy is also an objective of the Victorian Greenhouse Strategy.

Using forested sinks to sequester carbon emissions (biosequestration) has been a mooted greenhouse response for many years. However field testing of this response remains an essential step in the emergence of biosequestration as a useful and attractive sector of the emerging carbon markets.

The Victorian Government, through the CarbonTender project, is acting as a private carbon investor to identify and develop and disseminate experience in sink supply.

CarbonTender process

Carbon sink establishment (revegetation) agreements up to the value of $2.3 million are being purchased from private landholders using a competitive bidding process.

The project establishes new vegetation that is compliant with Article 3.3 of the Kyoto Protocol (Afforestation & Reforestation) and is also locally indigenous and permanent. This effectively excludes commercial timber plantations and precludes payments for retention of existing native vegetation. Incentives for timber plantations and vegetation retention activities are also supported by Victorian Greenhouse Strategy through the "Plantations For Greenhouse" and "BushTender" programs respectively.

In CarbonTender DSE will pay an "agreed price" to contracted landholders. Contracts are offered to eligible bidders who offer the most potential carbon sequestration per dollar up to a reserve price. Eligibility includes meeting biodiversity thresholds. Landholders then enter contracts with DSE that proportions carbon rights, and specifies payments and site management. Landholders are free to trade or hold their proportion of carbon rights as they see fit.

DSE sought expressions of interest and undertook site inspections. Following this landholders were sent an invitation to bid that included an agreed site plan, planting specifications and a site specific carbon "index" or score.

Bidders then lodged their price for revegetation of the specified area and standard. Bids were then

opened and analysed for cost per tonne of CO_2 offered to DSE.

Round 1 results

The first round of *CarbonTender* received 33 eligible bid and then offered 26 contracts totalling 167 ha of "Kyoto-compliant" sinks. These will sequester about 55,000 tonnes of carbon dioxide emissions.

The median price of carbon offsets was $16 per tonne of CO_2. Some sites offered sequestration at below $3 per tonne of CO_2. The reserve price was set to be barely constraining in the initial trial but it is anticipated it will be lowered in the next round. Consequently median prices may reduce.

24 out 33 bidders elected to retain the minimum proportion of carbon rights.

Carbon accounting

The carbon "index" or score was primarily concerned with the relative carbon sequestration rather than absolute sequestration value of each site in tonnes of CO_2. There are lower levels of confidence in the actual values compared with relative carbon values.

The index values were based on total carbon accumulation in native vegetation at maturity. Values were adapted from the "3PG Plus" model developed by Jim Morris of the Forest Science Centre at the University Of Melbourne. Inputs included, climate, soil attributes and species and stocking rates. Output values were provided in a 1km x 1km grid.

Confidence in the relative values was adequate for the needs of this initial round but further calibration with other carbon prediction tools is required to verify absolute values. Consequently conservative assumptions have been used in the initial trial. Further collaborative work is needed.

Biodiversity preferences

Revegetation can support biodiverity by linking and buffering remaining native vegetation patches. Sites that optimise linking and buffering opportunities are preferred in CarbonTender.

DSE has developed a "landscape preference" model that identifies the sites that will provide the most benefit from revegetation. Sites outside of the high priority areas need to be considerably larger to be eligible. These larger isolated patches provide habitat improvement as "stepping stones" rather than links or buffers.

Planting standards that best approximate the vegetation that existed prior to clearing are used.

Landholder contracts

The Victorian *Forestry Rights Act* allows carbon rights to be created and separated from land. In CarbonTender these rights will be shared by DSE and a landholder (or grower). In the initial trial landholders were able to elect to retain either 50% or 10% of the carbon rights.

The next stage of CarbonTender will allow bidders to choose to retain any proportion of carbon rights between 0 and 50% with the balance offered to DSE as part of their bid price.

CarbonTender agreements will be registered on land title using the *Conservation, Forests and Land Act*. Contracts will also be registered in the carbon module of DSE's Catchment Activity Monitoring System (CAMS) and be cross indexed with local government planning system databases.

Contracts are currently for 100 years. A 15 year contract will be also be introduced in the next offering but carbon scores for this option will be reduced to compensate for timber and grazing removals of carbon that are permitted under the *Planning and Environment Act*. Monitoring of contract compliance and sink performance will be undertaken using a combination of remote sensing and spot audits.

Offset permanence is achieved after the expiry of these contracts as the vegetation will still be protected under the *Planning and Environment Act* which precludes clearing without a planning permit.

The DSE payments to landholders can be spread over 5 years to allow planting in right seasonal conditions, adequate site preparation and maximising seed collection opportunities.

Contracts preclude grazing, burning off and timber removal but allow seed collection.

Take home messages

- New native vegetation can provide cost effective carbon sinks whilst providing significant biodiversity benefits but good site selection is important..
- CarbonTender has revealed, and partly quantified, the considerable variation in landholder & service provider capacity, revegetation costs and land opportunity costs.
- Low cost reforestation opportunities exist where disturbance has removed the overstorey but understorey has returned.

Carbon accounting tools and contract mechanisms need development to be more accessible and cost effective for smaller projects.

Jack Holden is a Senior Policy Officer - Carbon Sinks in the Victorian Department Of Sustainability and Environment and manages the CarbonTender project.

For further information go to www.greenhouse.vic.gov.au/carbontender.htm or email at jack.holden@dse.vic.gov.au.

Regulating Geosequestration

A Corporate Response from Origin Energy

In the last issue of this Review (Oct/Nov. 04) we published a Draft Guiding Regulatory Framework for carbon dioxide geosequestration developed by a working group under the Australian Ministerial Council for Minerals and Petroleum Resources as part of a Consultation Regulation Impact Statement (RIS).

In this issue we publish a corporate response to that Draft Framework from Origin Energy, a major Australian utility intimately involved in issues of greenhouse gas management.

Overview

In order for business to invest in R&D, demonstration or commercial carbon capture & storage (CCS) technologies, the appropriate regulatory framework must be agreed on a consistent basis across the Australian jurisdictions. This consultation RIS is therefore timely.

However, Origin believes that a broader regulatory framework than that covered by the RIS is essential to provide the necessary incentive for investors, namely the framework around a carbon signal. There is currently little impetus for investments in greenhouse gas mitigation technologies as there is no framework which outlines the mechanism by which carbon will be valued in Australia, nor any clear guidelines about the treatment of existing assets and new entrants. A carbon signal is an essential component of a regulatory framework to support the development of geosequestration in Australia. Commercial deployment of this technology is therefore likely to be delayed until a comprehensive framework that values greenhouse emissions is established.

Access & property Rights

Origin supports the specification, initial assignment and regulation of property rights and obligations by government. This approach provides transparency, certainty for investors, participants, government and the community and would specifically regulate carbon dioxide geosequestration activities with the aim to minimise associated risks to health, safety and the environment.

We agree that Government regulation would best protect the community's interests by including the best features of existing frameworks and introducing new regulation where there are gaps. We support the principle that codes of conduct would be enforceable and the framework would be nationally clear and consistent and it would be flexible enough to allow for any future changes.

More discussion is required to consider how such a regulatory framework will resolve specific issues, for example

- Property rights / ownership of CO_2
- Long term risks and management.
- Definition of the gas being sequestered
- Joint permitted activities on sites
- Regulations covering permits for exploration & utilisation of storage sites

Long Term Responsibility

The management of long term responsibilities and liabilities will be a key factor in gaining community acceptance of carbon dioxide geosequestration projects. The longterm risk of carbon dioxide geosequestration to health, safety and environment can be minimised by regulation of these aspects where possible at the commencement of the project. Therefore, Origin supports full government regulation as recommended in the RIS.

There is considerable experience across the petroleum and mining industries that should form the basis for agreements between proponents and governments for geosequestration projects. Expectations must be outlined at the beginning of projects. Assignment of long term responsibility for carbon storage is the major non-technical issue associated with geosequestration. Many of the long term risks at this stage are yet to be quantified. Pilot and demonstration projects in Australia as well as experience gained from overseas projects will improve knowledge of potential risks. Under these circumstances it may be appropriate for government to assume long term responsibilities. Government can manage these risks by requiring compliance with standards during operation and closure of the facility and being satisfied that those requirements were met at the time of closure of the facility.

Environmental Issues

Origin agrees that existing Commonwealth and jurisdictional environmental legislation, which may require minor amendments, should be applied to carbon dioxide geosequestration activities. This would ensure that the regulatory framework was cost effective, clear and consistent as well as protective of the community's interests. It is critical that the community has confidence in the projects and a positive perception that the industry is complying with best practice. Therefore, Origin supports the option of explicit government regulation to achieve

desired environmental outcomes.

Authorisation & compliance

As authorisation and compliance is a major part of minimising risks, having no specific regulation or relying on a code of conduct without government backing would not be publicly acceptable. A nationally agreed framework for regulation on the other hand, which is common and consistent, would specifically address issues regarding the minimisation of risks, and could be cost effective because existing legislation could be slightly modified to apply to carbon dioxide geosequestration activities therefore minimising costs. Therefore, Origin supports the option of explicit government regulation to best achieve the desired objectives for authorisation and compliance.

Monitoring & Verification

Origin agrees that a regulatory framework should be able to deliver mechanisms for monitoring and verification to:

- establish data on the surface and subsurface environment;
- monitor the project environment to manage and mitigate health, safety and environment risks;
- ensure certain standards for health, safety and environment and subsurface behaviour of geosequestration gas are met before responsibility for the project is transferred from private to public interests; and
- develop and manage a monitoring and verification plan to cover the post-closure period after responsibility for the project has been transferred to public hands.

Monitoring and verification frameworks that are currently used for underground storage facilities such as pipelines, petroleum, mining, or waste disposal sites could be adapted to apply to carbon storage.

Origin supports regulatory guidelines for the monitoring and verification of projects and suggests that such guidelines mirror existing requirements for oil & gas projects whilst acknowledging that the timelines for monitoring may be longer than currently outlined, given the issues of community confidence, carbon value and the potential for physical changes (especially in the case of aquifer storage).

Transportation

Existing standards governing transportation of natural gas through pipelines could form the basis from which specific standards for carbon dioxide transportation are developed. Information gathered from overseas experience should also be used to contribute to the development of the most appropriate approach for regulating transportation in Australia.

Financial Issues

We support the recommendation that government regulation is required to clarify ownership. The principle should be that of least cost while meeting the necessary hurdles of managing risks.

It will be important for project finance, insurance, carbon value, residual monitoring and verification costs, to firmly establish ownership and agreement on responsibilities of parties prior to commencement of any project.

In order to provide incentives for R&D or demonstration projects, Origin recommends the Government accept long term liability (i.e. after closure of the project) for the carbon dioxide storage. Without this clear acceptance of liability by the Government, it is unlikely that proponents will move forward with necessary investments to build capacity, prove the technologies and encourage deployment.

At this early stage is it unclear how geosequestration projects will be viewed by insurers. A clear, consistent regulatory framework will assist in assessing risk and therefore lead to a better commercial arrangement for insurance.

Carbon markets will require monitoring and verification, most likely governed by international rules, to enable credits from such projects to be traded at full face value. Establishing a rigorous regulatory framework is an essential first step in this process. The carbon accounting and financial framework around carbon value will also be key aspects of the regulatory framework.

Conclusions

An appropriate regulatory framework must be agreed on a consistent basis across all Australian jurisdictions in order for business to invest in R&D, demonstration or commercial CCS technologies. Origin supports government regulation under each of the principles outlined.

However, Origin believes that a broader regulatory framework incorporating a carbon signal is essential to provide the necessary incentive for investors. There is currently little impetus for investments in greenhouse gas mitigation technologies as there is no framework which outlines the mechanism by which carbon will be valued in Australia. Commercial deployment of geosequestration technology is therefore likely to be delayed until a comprehensive framework is established.

For more information on geosequestration regulation see www.industry.gov.au

For information on Origin Energy see www.orginenergy.com.au

30% early bird discount for conference delegates until 23 January 2005

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⇒ Global market developments

⇒ CDM and JI

⇒ Corporate risks and opportunities

Point Carbon is once again hosting this annual event for the world's carbon markets covering independent analysis, market intelligence and forecasting for the emerging carbon emissions markets. The AETF is pleased to be a Regional Partner supporting this event involving 120+ speakers and panelists, 3 streams to cover all market aspects, and 60+ exhibitors. See Point Carbon website www.pointcarbon.com for program and registration details.

In cooperation with Point Carbon, the AETF is able to offer you a **€100** discount, meaning that if you book before 23 January you pay only **ˆ€595** + VAT!

Join the AETF Business Roundtable

The AETF Business Roundtable provides a range of additional services, information and networking for companies that have a particular interest in emissions trading developments and opportunities, and are seeking a more interactive involvement with market participants and policy makers.

The AETF Business Roundtable is pleased to welcome new members for 2005.

For more information contact the AETF Coordinators or visit www.aetf.net.au/BR

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