



CHAPTER 7:

The Carbon Offset Marketplace

International trade in the new commodity of carbon offsets has already begun to develop as countries and companies seek to 'test the waters' before the Kyoto Protocol comes into force. This chapter describes the evolving market for CERs in terms estimated market size, prices and buyers:

THE MARKET FOR CERS

THE REVELANCE OF NON-KYOTO MARKETS

THE OBJECTIVES OF BUYERS

CER TRANSACTION CHARACTERISTICS

CURRENT BUYERS

- The Prototype Carbon Fund
- New carbon investment funds
- ERUPT/CERUPT
- IFC-Netherlands Carbon Facility
- Asian Development Bank CDM Facility
- Individual corporate initiatives

Box 7.1: Bilateral and unilateral models of CER generation

Box 7.2: Internalizing environmental performance

Table 7.1: Last reported position and possible future position of selected Annex I (B) countries with regard to their Kyoto targets

CHAPTER 7: THE CARBON OFFSET MARKETPLACE

International agreements designed to combat climate change, including the Clean Development Mechanism, have effectively created a new 'commodity' in international trade – one that is largely produced in the global South and consumed by the more industrialized countries. International trade in this new commodity of carbon offsets has already begun to develop as countries and companies seek to 'test the waters' before the Kyoto Protocol comes into force. This chapter describes the evolving market for CERs in terms of estimated market size, prices and buyers.

THE MARKET FOR CERs

In the winter of 2002 the potential carbon credit demand in all Annex I countries was extensively researched and each country's position in the system of emissions trading was examined. The research concluded that demand for carbon credits exceeded supply by approximately 249.6 Mt CO₂e. The European Union 'burden sharing' agreement also places the EU in the position of a net carbon credit buyer with the approximate demand of 213.3 Mt CO₂e.

The following table presents by country the volume of existing emissions and proposed targets of the Annex I (B) countries. The second column indicates whether the country is a buyer or a seller in the market, which

is determined by its current position with respect to its Kyoto commitment. If the second column is positive then the country has to buy CERs to offset their emissions. The second and third columns provide the data on each country's emission levels, currently, and looking ahead to 2010.

THE REVELANCE OF NON-KYOTO MARKETS

A number of markets for greenhouse gas mitigation have emerged in parallel to those for CDM CERs, and are continuing to develop and integrate, while additional parallel markets will likely appear in the long-term. How these will impact the growth of the formal CDM market is unclear. Some recent developments include:

Domestic trading schemes (such as those operating in the United Kingdom and Denmark and under consideration in Norway) may be widened to include emission reductions in other jurisdictions. In fact, the European Union Trading Scheme may enable participants to meet their targets by purchasing CERs under the CDM beginning as early as 2005. Greenhouse gas emissions permits/credits would need to be recognized by both governments in order to be useful for increasing the liquidity of CDM credits.

The development of a *parallel emissions reduction market* in the United States is a possibility. Since its

BOX 7.1: BILATERAL AND UNILATERAL MODELS OF CER GENERATION

Under the CDM, CERs can be generated in two basic ways:

- Under the bilateral model, a project developer in a non-Annex I country develops the CDM project in partnership with an Annex I country. The goal for the Annex I country is to receive the credits realized from the project, either via an emission reduction purchase agreement or ERPA, or as a result of some other form of financial consideration. Under most ERPAs, credits purchases are committed in advance of issuance but not paid until the CERs are delivered.
- Under the unilateral model a project is designed, financed and implemented solely by the host country project developer. In this scenario, the project developer bears all risks and benefits associated with the preparation and sale of CERs. Unilateral CERs are subject to the same requirements as bilateral CERs.

TABLE 7.1: LAST REPORTED POSITION AND POSSIBLE FUTURE POSITION OF SELECTED ANNEX I (B) COUNTRIES WITH REGARD TO THEIR KYOTO TARGETS

Numbers in parenthesis refer to position of countries with regards to their EU 'bubble' target (when applicable)

COUNTRY	LATEST REPORTED POSITION (MMtCO ₂ e)		BAU PROJECTIONS FOR 2010 (MMtCO ₂ e)		POSSIBLE POSITION IN 2010
AUSTRALIA	+31		+18		Buyer
AUSTRIA	+9	(+13)	+9	(+13)	Buyer
BELGIUM	+19	(+18)	+8	(+18)	Buyer
BULGARIA	-45		-10		Seller
CANADA	+117		+103		Buyer
CZECH REPUBLIC	-38		-27 to -53		Seller
DENMARK	+6.5	(+15)	+12	(+21)	Buyer
FINLAND	+7	(+1)	+37	(+31)	Buyer
FRANCE	+49	(+5)	+70	(+26)	Buyer
GERMANY	-95	(+60)	+66	(+222)	Buyer
GREECE	+24	(-10)	+32 to +49	(-2.3)	Buyer
HUNGARY	-8		-10*		Seller*
ITALY	+63	(+55)	+103	(+96)	Buyer
JAPAN	+176		+319		Buyer
NETHERLANDS	+34	(+30)	+53	(+49)	Buyer
NEW ZEALAND	+2		+15		Buyer/seller (?)
NORWAY	+6.7		+16		Buyer
POLAND	-130		-3 to -85		Seller
PORTUGAL	+16	(-6)	+16	(-6.2)	Buyer/seller (?)
ROMANIA	-80****		+41****		Buyer/seller (?)
RUSSIA	-1073		-89 to -122		Seller***
SLOVAK REPUBLIC	-17		-5.4 to -13		Seller
SPAIN	+82	(+14)	+84	(+15)	Buyer
SWEDEN	+6.4	(-1.9)	+9	(+1)	Buyer/seller (?)
SWITZERLAND	+4.3		+4.2		Buyer/seller (?)
UKRAINE	-455		-152 to -68		Seller
UNITED KINGDOM	-11	(-25)	+5	(-11)	Seller
UNITED STATES**	+1033		+2154		Buyer

Source: Calculations by EcoSecurities based on emissions levels and business as usual projections for 2010 included in the latest National Communications to the UNFCCC available until March 2002 (the date of report completion)

Notes: *Hungary's National Communication projected only CO₂ emissions, not aggregate greenhouse gas emissions. Projections are provided only for 2002 – they do not continue until 2012.

**We report the US data for comparative purposes regardless of the US withdrawal from the Kyoto Protocol.

*** EcoSecurities gives the most conservative estimate of Russia's potential supply of AAUs.

****As of January 2002, Romania's most recent National Communication to the UNFCCC was dated 1994. Therefore, there is a great uncertainty associated with emissions projections for Romania.

withdrawal from the Kyoto Protocol in early 2001, the US is not a part of the international emissions trading market. However, political momentum to develop some type of cap and trade system, similar to Kyoto, is developing at the federal level and – more importantly – across nearly a dozen states, including New York, California, Massachusetts and Oregon. Since the current US administration does not recognize Kyoto regulations and standards, project eligibility criteria would need to be widened if the US were to join the CDM regime. While such inclusion would increase the international demand for carbon credits, its impact on CER prices is uncertain. The US appears to be highly sensitive to the costs of climate change mitigation and may not introduce measures that force would the price of abatement beyond current permit prices. The table above includes information for the US because of its significant emissions.

A 'retail' market for emission reductions is also emerging, based on commitments from individuals, companies and other institutions to activities or operations that are less greenhouse gas intensive. Organizations such as the Climate Neutral Network, Future Forests, Clean Air/Cool Planet and others are helping facilitate 'carbon offset' transactions. While it is unlikely these will ever be more important than the 'compliance' market, they may prove a valuable outlet for projects that have demonstrably other positive impacts, such as sustainable human development or maintaining integrity of the environment.

THE OBJECTIVES OF BUYERS

A number of different buyers are entering the marketplace as well, with diverse objectives, including:

Purchase of low-cost emission reductions as investments.

Most of the buyers are sensitive to the cost of emission reductions. Current market prices for CERs are quite low compared to prices forecast under many market studies. Current buyers may be able to sell at a much higher price in the future.

Minimization of future risk. This is a primary determinant of buyer behavior. Buyers are concerned about the potentially large liabilities associated with future non-compliance.

A number of markets for greenhouse gas mitigation have emerged in parallel to those for CDM CERs, and are continuing to develop and integrate, while additional parallel markets will likely appear in the long-term.

Risk-diversification. A number of buyers are purchasing different types of credits under all of the trading mechanisms in order to spread risk across a portfolio.

Learning-by-doing. Some buyers are keen to undergo early-stage learning by engaging in comprehensive project documentation, external verification and certification of CERs, in order to improve their knowledge of the market and reduce risks and transaction costs in the future.

Good publicity. Some buyers are purchasing credits in order to demonstrate that they are contributing to sustainable development and are concerned about the future of the global environment.

CER TRANSACTION CHARACTERISTICS: MARKET SIZE AND PRICES

The current emissions trading market is characterized by the following transaction types and prices, according to Natsource (2001) and Point Carbon (2001-2002):

- As of September 2002, over 125 transactions of greenhouse gas emission reductions are known to have occurred involving approximately 335 MtCO₂e¹ (more trades are likely to have gone unreported). Most of these trades have occurred in Annex I (B) countries.
- With respect to the CDM, there is price differentiation based on the perceived risks associated with different types of credits, with additional considerations given to the creditworthiness of the seller. Emission reductions with a perceived high likelihood of acceptance under the CDM are selling at a premium – between \$3²-\$8 per tCO₂e. Other verified credits that are considered less likely to meet either host government acceptance or other verification criteria are selling at a dis-

¹ Point Carbon, September 2002.

count, in the range of \$1.75 to \$3.00 per tCO₂e. This is further illustrated in the following section.

- In 2002, the total market size, since 1996, involving private and publicly funded transactions of carbon credits reached between \$350 million and \$500 million (representing conservative and a liberal estimate, according to Natsource, October 2002). Total project volumes for 2002 are estimated at 70 Mt CO₂ versus last year's volume of 12 Mt CO₂.

As of late 2003, the market prices ranged between about \$3-\$10 per tCO₂e, with the majority of transactions at the lower range. Predictions about future prices are helpful in that they provide a rough sketch of market activities as they happen. However, price forecasts in this market include a high degree of uncertainty and should be treated with caution. Moreover, forecasts reflect the joint CDM/JI carbon market and not prices/volumes traded solely under the CDM. CDM projects are regarded as having higher risk than the Joint Implementation projects of Eastern Europe.

CURRENT BUYERS

As mentioned earlier, the carbon credit market, which includes the CDM, is currently characterized by relatively few buyers with a range of objectives. The vast majority of the publicly known capital for purchasing emission reductions comes from various funds and multilateral buyers. As of late 2002, the major institutional buyers include;

■ The World Bank Prototype Carbon Fund	\$180M
■ Carboncredits.nl, the Dutch ERUPT/CERUPT	€250M
■ The Netherlands Carbon Development Fund³	€35M/year for up to four years
■ International Finance Corporation-NetherlandsCarbon Facility	€40M
■ The Andean Development Bank	€40M
■ Community Development Carbon Fund (World Bank)	\$100M (target) – STATUS \$ 35M

- **Bio-Carbon Fund (World Bank)** **\$100M (target) – STATUS (not operational yet)**

■ The European Bank for Reconstruction and Development	€100M
■ Canada CDM fund	\$100M
■ Denmark JI.CDM Fund	€100M (approximate over five years)
■ Development Bank of Japan	\$100M
■ Japan Bank for International Cooperation	\$100M

EcoSecurities estimates that there is over \$1 billion will be committed via institutional purchasers by the end of 2003.

The two most influential institutional purchasers of carbon credits are the Prototype Carbon Fund of the International Bank for Reconstruction and Development (World Bank) and the Carboncredits.nl (also referred to as ERUPT/CERUPT) programmes are discussed below.

The Prototype Carbon Fund

The Prototype Carbon Fund was established by the World Bank in 1999 and has been capitalized at \$180 million. Investors include governments and private sector⁴. The fund invests in carbon projects that qualify under JI or the CDM. Its main objectives are:

- **Financing and procurement of high quality emission reductions that qualify under the UNFCCC:**

The fund invests only in projects that produce identifiable carbon benefits and contribute to the sustainable development of host countries.

- **Knowledge:** The fund develops and shares carbon-specific knowledge through experience in the development and financing of carbon projects. It aims to build an extensive knowledge base that can be shared with other market stakeholders.

- **Build public/private partnerships:** The fund aims to build partnerships between the public and private sectors to address various risks resulting from climate change.

The fund's extensive project documentation require-

² Unless otherwise noted, prices are in US dollars.

³ A parallel fund managed by the World Bank of \$35M per year for 4 years

⁴ The current participants of the Fund include: Government of Canada, Government of Finland, Japan Bank for International Cooperation, Government of the Netherlands, Government of Norway, Government of Sweden and a range of private companies, which include: British Petroleum (UK), Chubu Electric Power Co. (Japan), Chugoku Electric Power Co. (Japan), Deutsche Bank (Germany), Electrabel (Belgium), Fortum (Finland), Gaz de France (France), Kyushu Electric Power Co. (Japan), Mitsubishi Corporation (Japan), Mitsui & Co. (Japan), Norsk Hydro (Norway), RaboBank (the Netherlands), RWE (Germany), Shikoku Power Co. (Japan), Statoil (Norway) and Tohoku Electric Power Co. (Japan).

ments and screening process mirrors the processes required under the CDM and JI protocols. This includes the independent certification and verification of emission reduction units and extensive public consultation. The Prototype Carbon Fund assumes risks involving the creation of the commodity that other buyers do not – for example, contracts are for ‘validated emission reductions’ rather than CERs, which means that even if Kyoto does not come into force, the fund can – and will – still execute the transaction.

As of the fourth quarter 2003, the Prototype Carbon Fund had successfully signed eight emissions purchase agreements. An additional 20 projects are currently being negotiated. Purchase prices have reportedly ranged between \$3/tCO₂e and \$4/tCO₂e, which is on the low end of the current price and future projections. Furthermore, the fund is in the position to commit to 30-40 projects, and it intends to identify and approve them by mid-2004.

Increasing the geographical diversity of its portfolio is a key focus of Prototype Carbon Fund policy. For instance, the share of Latin American CDM projects has continued to grow. Because this region was active in early CDM activities, it established an early competitive advantage. East European and African projects are creating a better balance. A number of CDM projects are undergoing the final evaluation, including small hydro in Guatemala, municipal solid waste in South Africa, bagasse cogeneration in Thailand, solid waste management in India, a wind farm in Honduras, afforestation in Moldova, and a wind project in Morocco. East Asia remains an underrepresented region in the current Prototype Carbon Fund portfolio, and the fund plans expanding its activities in that region. In addition the World Bank has created the forestry specific Bio-Carbon Fund discussed below.

New carbon investment funds

In 2002, the Carbon Finance Unit at the World Bank announced the development of two new carbon investment funds – the Bio-Carbon Fund and the Community Development Carbon Fund – that aim to produce verified carbon reductions and a range of other sustainable development and environmental benefits by offering higher prices to sellers of CERs than the market would

otherwise deliver.

The Bio-Carbon Fund aims to develop capacity in host countries through practical experience and technology transfer. Although fundraising was still underway in late 2003, the fund is hoping to receive \$100 million from a variety of governmental and private sector entities. It aims to demonstrate the potential of carbon sequestration in forest and agro-ecosystems and land-use projects to deliver verified emission reductions as well as a wide range of social and environmental benefits. The Bio-Carbon Fund will allow participating companies to diversify their emission reduction strategies, and also provide an incentive for project developers to innovate and test projects. It will also support a variety of national development objectives, such as improving rural livelihoods, stopping soil erosion and combating desertification. The BioCarbon Fund is expected to be operational by early 2004.

The Community Development Carbon Fund will seek to purchase emission reductions from small projects that produce a range of sustainable development benefits not limited to the reduction of greenhouse gas emissions, particularly if those benefits apply to rural communities. It aims to encourage small-scale projects in least developed countries and poorer areas of all developing countries. The fund was officially launched at the 2002 World Summit on Sustainable Development in Johannesburg, and declared operational on 11 July 2003 in Washington DC. Initial capitalization is planned to be \$100 million drawn from public and private sources. Investors will receive CERs. The Community Development Carbon Fund became operational in 2003.

ERUPT/CERUPT

The ERUPT/CERUPT carbon project investment programmes are managed by Senter International (www.carboncredits.nl) for the Government of The Netherlands. Through ERUPT, Senter buys credits from JI projects – principally in Eastern Europe – on behalf of the ministries responsible for economic and environmental affairs and buys the CERs from CDM projects through CERUPT on behalf the Dutch Ministry of Environment. The Dutch Government funds both.

Both ERUPT and CERUPT programmes are implemented on a tender basis, during which interested parties are invit-

ed to submit 'Expressions of Interest' over stipulated periods. From these documents, Senter International shortlists all final project grant co-financing candidates. Short-listed parties are then invited to submit a detailed project proposal, including a full project design document.

Although they are similar in some respects, functional differences between ERUPT and CERUPT include:

- ERUPT has a higher minimum for credits contracted. The minimum scope of credits required for financing under the ERUPT scheme is set at 500,000 tCO₂e in the commitment period (has been reduced to 250,000 tCO₂e in ERUPT-3). CERUPT handles contracts for a minimum of 100,000 tCO₂e for the total crediting period. Under both schemes interested parties are allowed to bundle projects in order to achieve the necessary emission reductions. However, bundled smaller projects must come with a single (the same) Letter of Approval from the host-government. That means that bundled projects must be implemented in the same country.
- The proof that a project contributes to the sustainable development is emphasized more in CERUPT project assessments.
- Under ERUPT the Dutch government is willing to pay upfront for credits up to a maximum of 50 per cent. Senter International provides a reasonable amount of the contract value; in which case they are effectively buying claims on emission reduction units rather than the ERUs themselves. CERUPT considers advance payments under exceptional circumstances only if proven unavoidable and to a maximum of four projects. It also states that a request for prepayments will negatively affect the ranking of the project.

Currently ERUPT is preparing the fourth Request For Proposals to select the next set of emission reduction projects for the year 2004. However a new tender for CERUPT is not envisaged in the near future as the Dutch Ministry of Environment has diversified its approach by contracting other organizations (World Bank, International Finance Corporation and CAF) to buy CDM credits on their behalf.

In case a tender is offered for CERUPT, private entities willing to sell CERs to the Dutch government will be invited to follow the familiar CDM project cycle procedure,

As with the Prototype Carbon Fund, CERUPT aims to invest in high quality carbon projects that will comply with the CDM. A detailed and comprehensive project development and assessment process is applied, designed to meet the requirements of the CDM, including public consultation. CERUPT projects can be developed in the areas of energy efficiency, transportation, energy supply (including renewables and waste-to-energy), fuel substitution and other types of projects. However, CERUPT will not invest in forestry-related carbon sequestration projects (such as afforestation and reforestation), but will consider all other types of projects, including 'greenfield' biomass energy development.

IFC-Netherlands Carbon Facility

Another new fund managed by the International Finance Corporation of the World Bank Group on behalf of the Dutch Government is the IFC-Netherlands Carbon Facility (InCAF). According to the IFC website⁵, InCAF is an arrangement under which the IFC will purchase CERs for the benefit of the Government of The Netherlands. The Netherlands will use these emission reductions to help meet its commitments under the Kyoto Protocol. It has allocated € 44 million (about \$ 55 million) for InCAF to be used over the next three years. InCAF will provide additional revenues to eligible projects that generate emission reductions in developing countries.

InCAF will make future payments to the project over a period of 7-14 years upon annual certification of actual greenhouse gas emission reductions. In return for these payments, The Netherlands will receive the CERs. It is possible that InCAF will consider advance payments under certain conditions. A contract between InCAF and the project will specify the volume of emissions that are expected to be reduced, the price agreed per ton of CO₂ equivalent, and the crediting period.

InCAF is looking for projects with the following characteristics:

Location Projects can be located in most developing countries. Projects in newly industrializing countries in Central and Eastern Europe are not eligible. A list of eligible countries is available on request.

Likely project closing Projects must be likely to reach financial closing within the short term.

IFC and non-IFC investments InCAF prefers to work with projects in which IFC is an investor but will also consider non-IFC financed projects. For non-IFC projects, the InCAF will look for well-established sponsors with access to confirmed sources of conventional financing. Non-IFC projects will require additional due diligence on project fundamentals.

Environmental and social impact All projects, including non-IFC financed projects, must comply with IFC's environmental and social policies and guidelines. Projects that have large-scale adverse environmental or social impacts will not be considered.

Host country approval The government of the host country will have to approve the project. IFC can support the application of the project company to the gov-

ernment for such approval. The host country will also need to have ratified, or initiated domestic procedures to ratify, the Kyoto Protocol.

Independent Verifications The initial design of the project will need to be validated by an Operational Entity, as required under the Kyoto Protocol. Once a project is operational, the emission reductions produced by a project must be verified and certified periodically by auditors.

As of September 2003, there was no information available as to the number of projects under consideration. However no projects have yet to be approved for funding.

BOX 7.2: INTERNALIZING ENVIRONMENTAL PERFORMANCE

Some observers fear that simplifying guidelines and procedures will lead to cutting corners in project development and monitoring. They argue that without proper checks and balances, projects that do not meet core CDM criteria could receive approval. The procedures for due diligence are considered necessary because the whole market for CERs is new, and demands a high level of environmental integrity in order to be considered success. As time passes, and competitive forces and experience bring greater efficiency to the process, many believe transaction costs will be reduced while the integrity of the system is maintained.

The higher the transaction costs, the fewer the number of projects that will realize enough benefit to make the process worthwhile. One way to cope with this issue would be to raise the purchase price of CERs. The World Bank's two newest funds, the Bio-Carbon Fund and Community Development Carbon Fund, are exploring this alternative. Rather than purchasing at \$3 per ton like the Prototype Carbon Fund, these new funds will offer \$6-8 per ton in order to compensate some of the higher relative transaction costs.

In this early stage of the market, certain buyers have indicated that they are taking sustainability criteria into account while determining prices they are willing to pay for CER transfers. For example, under the Netherlands CERUPT Tender projects, there is a sliding price scale for projects that have different qualitative aspects, with fossil fuel-switching receiving the lowest pricing and renewable energy projects, such as solar, small hydro and wind power, receiving the highest pricing.

■ Renewable energy (excluding biomass)	€5.50
■ Energy production by using clean, sustainably grown biomass (excluding waste)	€4.40
■ Energy efficiency improvement	€4.40
■ Others, including fossil fuel switch and methane recovery	€3.30

Also, in Colombia the Prototype Carbon Fund has developed a series of sustainability criteria, unrelated to carbon emissions reductions, that will be measured throughout the lifetime of the CDM project. The contract specifically states that the project will receive higher or lower prices, depending on how well those criteria are ultimately achieved on a year-to-year basis.

Whether price differentiation due to 'relative sustainability' will continue or increase as the market evolves, is difficult to predict. One possibility is that CDM projects that meet high standards may have advantage in tapping other financial mechanisms, such as loan guarantees.

Asian Development Bank CDM Facility

Unlike other development banks, the Asian Development Bank has not chosen to manage carbon purchase funds on behalf of an Annex 1(B) countries. Rather, the bank is establishing an intermediary facility to operate on behalf of projects in its member countries. As of late 2003, the facility was still in the planning phase – however, the following components have been made publicly available.

The CDM facility will assist the ADB's developing member countries in

- Addressing global climate change issues and sustainable development goals by sourcing funds for emissions reductions; and
- Processing the CDM requirements for identified projects.

It aims to bridge the gap between buyers and sellers, ensuring a fair return for greenhouse gas abatement initiatives and assisting developed countries to meet their commitments

The main objectives of Asian Development Bank's CDM facility are to:

- Promote projects that contribute to poverty reduction and sustainable development;
- Support CDM project identification, development, registration and implementation;
- Facilitate monitoring and verification of quality ER credits;
- Help find competitive prices for ER credits; and
- Facilitate sourcing of financing for greenhouse abatement projects in developing member countries.

Individual corporate initiatives

A number of large companies have been involved in carbon transactions, based mainly on voluntary greenhouse gas emission reduction targets accepted by individual business entities. With the approach of 2008 and the significant requirements for emission compliance in the EU, Japan and Canada, the corporate markets for CDM credits are likely to accelerate rapidly. While many potential buyers will seek reductions within their own portfolio of international operations, others will continue to seek the sustainable development and publicity aspects incumbent with the CDM.

The best-known voluntary initiative is BP's (former-

ly British Petroleum) emissions reduction programme, which has implemented a trading system across all business units in the company. It emphasizes high quality credits with strict verification requirements. This programme constitutes a part of BP's overall strategic investment in clean technologies and renewables. Since most of these programmes are private and operate in the traditional financial markets, much information about the transactions – including lessons learned and prices – are not publicly disclosed. However it can be assumed that these programmes operate on a very commercial basis and offer lower prices due to the relative maturity of the market.

In 2001-2002, BC Hydro, a British Columbia (Canada) electric utility, issued multiple requests for purchases. The utility was seeking up to 5.5 Mt of emission offsets to meet a voluntary commitment to compensate 50 per cent of the increased greenhouse emissions from two new gas-fired generation plants. Another Canadian entity, Ontario Power Generation Ltd., has also purchased greenhouse gas emissions permits in order to satisfy its voluntary emission reduction targets. TransAlta, a large Canadian coal fired utility, has announced its intention to become 'net carbon neutral' by 2020, an initiative which, given the company's core assets in coal-fired generation, would signify the need to purchase millions of tons of emissions reductions each year.

Japanese companies have been participants in a number of projects, particularly in economies in transition that will pursue CDM activities and East-Asian economies. Examples of such transactions, both in credit trade and CDM investments, include:

- Tokyo Electric Power invested in LULUCF projects in Australia, funding plantations managed by State Forests of New South Wales;
- Tohoku Electric bought Australia's Powercoal Pty Ltd. emission credits bundled with coal (estimated emissions reduction 1.6 MtCO₂e/year);
- Toyota Tsusho purchase of 400,000 tons from the V&M fuel switch Project in Brazil in 2003; and
- J-Power's purchase of one million tons from a portfolio of projects in Latin America in 2003.

⁵ www.ifc.org/enviro/EFG/CarbonFinance/carbonfinance

