



CG11 workshop on capacity building and emissions trading

The CG11 workshop was organized by UNCTAD and the Earth Council, in collaboration with Enviros, and with support from the UK Foreign and Commonwealth Office Climate Change Challenge Fund and the United Nations Fund for International Partnerships. The workshop took place in Zagreb, Croatia, on 28–29 May 2002, immediately following a scheduled CG11 coordination meeting. The objectives of the workshop were:

- to share knowledge on the range of policy options available to implement the Kyoto Protocol, and on the advantages and disadvantages of these as they apply to CG11 countries, including the application of the Kyoto Protocol mechanisms; and
- to discuss and identify practical and concrete next steps in order to further develop the capacity of CG11 countries to implement the Kyoto Protocol.

The workshop was able to assist CG11 countries in developing a ‘road map’ of policy options for implementation of the Kyoto Protocol, as well as an initial CG11 capacity-building plan of action. The workshop was attended by more than 30 participants, with representatives from all CG11 countries except Romania and Slovakia. Other participants included: UNDP/GEF; UNEP-Risø Collaborating Centre on Energy and Environment; ERUPT Programme of the Netherlands; representatives from Denmark and the UK Foreign and Commonwealth Office; Regional Environmental Centre for Central and Eastern Europe; and NRG Energy.

Summary of key points

Stocktaking—country information

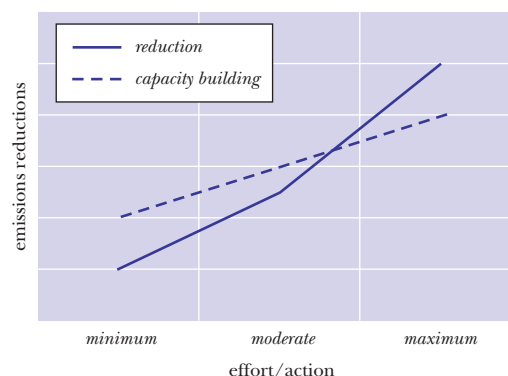
The stocktaking work indicated that all CG11 countries are likely to have an emissions surplus in the first commitment period, with the exception of Croatia, Slovenia and, possibly, Lithuania. There has been limited consideration of the second commitment period, given this anticipated surplus. Higher levels of energy intensity in CG11 countries suggest greater opportunities for emissions reductions, although there are great variances between countries. Joint implementation is more developed than emissions

trading. Some CG11 countries see advantages in early action on emissions trading, because it will promote industry involvement and will facilitate linking in with the planned EU emissions trading scheme at an early date. EU accession has been more of a driver than compliance with the Kyoto Protocol for CG11 countries.

Policy options

Allocating the emissions surplus is a critical issue, and one which CG11 countries need to resolve urgently. The workshop agreed that a national dialogue with all sectors and stakeholders in society is essential, in order to reach an agreed government policy on implementation of the Kyoto Protocol. The benefits of coordinating strategies on the allocation of emission surplus, including banking some of the surplus, were raised, as was the need to integrate domestic measures with international mechanisms. It was also agreed that it is desirable to move from a situation of minimum effort and compliance with Kyoto Protocol requirements to one of maximum effort, mobilizing additional resources to develop a more proactive strategy, so that countries are best able to take advantage of emerging opportunities.

Emissions reductions and capacity building



Capacity-building framework

The CG11 workshop identified three immediate priorities:

- The CG11 supported an UNCTAD proposal which puts forward an innovative approach

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Issue 11 • June 2002

Global Greenhouse Emissions

T R A D E R

is published by the Carbon Market Programme of the United Nations Conference on Trade and Development (UNCTAD) and the Earth Council Institute (Geneva)

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The emerging global greenhouse gas market

By Steve Drummond, CEO, CO2e.com

A substantial voluntary market for greenhouse gas (GHG) emissions reductions first emerged several years ago, in advance of formalized legislation. CO2e.com estimates that approximately 200 million metric tonnes carbon dioxide equivalent (tCO₂e) had been transacted up to the end of 2001.

This year, CO2e.com has witnessed a marked increase in activity from both buyers and suppliers in the GHG market, following advances made at the international negotiations in late 2001 within both the policy and legislative frameworks. As a consequence of this, the volume of GHG transacted in this voluntary market is expected to increase substantially during 2002 and beyond.

Emerging emission trading schemes and related green markets

Various domestic emissions trading schemes have also emerged within the GHG marketplace. Legislated schemes have been established in Denmark and in the UK, and a mandatory Europe-wide trading scheme has been proposed to commence in 2005. Various other governments, including the Netherlands, Australia, Canada and Japan, are also looking to emissions trading schemes in order to help with meeting Kyoto Protocol emissions targets.

A surge of political and commercial activity has occurred in renewable energy trading schemes, which allows the emergence of a market for 'tradable green certificates', closely related to the GHG market. Green trading schemes are generally national schemes that seek to increase the total amount of renewable energy supplied by creating a market in renewable energy certificates (or, in the UK, Renewables Obligation Certificates), which provide an additional cashflow to generators of renewable energy.

Greenhouse gas transactions—present and future

Because transactions in GHG emissions reductions cannot be standardized at this

time, transactions are executed on a bilateral basis. A detailed contract is used, which specifies the asset being traded and the terms of the transaction. Emissions reductions may refer to: reductions in actual emissions; avoidance of potential emissions; or the removal of atmospheric carbon, and storage in a sink.

The market is not yet liquid, and prices vary from as low as US\$0.25 tCO₂e to US\$10 tCO₂e, depending on the quality

of the emissions reduction and the requirements of the buyer. Transactions are primarily on a long-term basis and, currently, spot market demand is minimal. Prices for emissions reductions vary significantly by project type, project location and the timing of the reductions. For example, prices of emissions reductions occurring during the Kyoto compliance period of 2008–12 are significantly higher than for pre-2008 reductions. A number of

Trade spotlight: a global transaction— Perspectives from Canada, South Africa and Brazil

Environment Canada recently purchased greenhouse gas (GHG) emission reductions in order to make the G8 Environment Ministers meeting of 12–14 April 2002, and the recent Health and Environment Ministers of the Americas meeting, emissions neutral. Through the initiative, Environment Canada purchased GHG emission reductions from an energy-efficient housing project in South Africa and from a biomass power generation project in Brazil. Both projects reduce carbon dioxide and other air emissions, while delivering high sustainability and social benefits.

The buyer's perspective

The trades, facilitated by CO2e.com, demonstrate how Environment Canada took a leadership role, and illustrate how emissions reductions can be achieved by offsetting the emissions associated with international meetings.

'Canada is committed to finding innovative partnerships and solutions to fight the challenges of climate change,' said Environment Minister David Anderson. 'These projects demonstrate how the government and the private sector can partner to reduce greenhouse gas emissions while also investing in sustainable development.'

In addition, these trades showed that investing in emissions reductions can truly effect global environmental solutions.

The sellers' perspectives

Dr Lilia Abron, President of PEER Africa (pty.) Ltd, the engineering firm working to implement energy-efficient housing in South Africa, explained that funds from the sale of the GHG emissions reductions will be used to purchase ceilings, insulation and other energy-efficient features to be installed in the homes.

'The new passive-solar designed homes and community facilities to be built under this project will provide significant improvements in the quality of life, health and well-being of the occupants,' said Dr Abron. 'At the same time, the energy-efficient operation of these homes will help protect the environment by reducing the amount of greenhouse gases that would otherwise have been produced.'

The purchase of Brazilian GHG emission reductions will support a renewable energy project—the Piratini, CGDE, Koblitz Energia S.A.—where wood processing residues, which were formerly discarded, will now be used to generate electricity.

'This emissions trading illustrates the potential for integrating renewable energy projects with sustainable development in developing nations,' said Carlos de Mathias Martins Jr, Director of Ecoinvest, representing the biomass project in Brazil. 'The international nature of this emissions trading demonstrates how countries and corporations can cooperate to attain meaningful and mutually agreeable environmental benefits.'



buyers within the GHG marketplace are also looking to offset emissions resulting from corporate activities such as travel and conferences which entail long travelling times and result in significant GHG emissions. Emissions reductions achieved through these efforts carry additional sustainable development and social attributes. These, too, are priced differently.

Prices vary between contracts, depending on the balance of risks between buyer and seller. For example, a seller who guarantees to deliver GHG emission reductions, irrespective of the performance of their project, will attract a significantly higher price.

Voluntary market participants typically buy and hold emissions reductions as a hedge against future regulation. There is almost no resale activity, because there is

no agreed commodity instrument. However, the UK, through its national emissions trading scheme (which formally commenced in April 2002) does provide this. A UK emissions allowance is a legislatively defined commodity that gives the holder the right to emit one tonne CO₂eq of GHG. The creation of a commodity brings increased liquidity and, therefore, better enables companies to flexibly hedge their compliance position.

Preparations are key to market participation

These emerging national and regional trading schemes will begin to link up, and will provide a patchwork of trading schemes that will underpin the global GHG market. By 2012, the global GHG market will look something like the bond

market today, with a large number of similar, but subtly different, financial instruments, each with their own characteristics, risks and pricing.

Companies participating in the voluntary market have seen advantages in using external emissions reductions to meet voluntary reduction targets. In addition, companies are learning about emissions trading both through participating in simulated trading workshops, such as CO₂e.com Trading Simulations, and through trading ahead of their competitors. They recognize that delays in market participation increase corporate risk, not decrease it.

For more information on the GHG market, please contact Steve Drummond at: sdrummond@CO2e.com.

The Climate Trust and the early success of Oregon's carbon dioxide standard

By Mike Burnett and Michael Ashford, The Climate Trust

The Oregon Standard and the role of The Climate Trust

The Climate Trust (the Trust) plays a key role in implementing Oregon's innovative carbon dioxide (CO₂) standard which, in 1997, became the first legislation to regulate greenhouse gases (GHG) in the United States (US). The Trust's offset portfolio for this programme involves 12 projects, totalling US\$7 million and 3.5 million metric tons of CO₂. The average portfolio purchase price is about US\$2.00 per metric ton, despite high-quality standards.

The Oregon standard requires new energy facilities to offset a significant portion of their CO₂ emissions. It applies to power plants with a capacity greater than 25 megawatts, and to certain other energy facilities. A new power plant must meet a net emissions rate of 0.675 pounds of CO₂ per kilowatt-hour. This rate is adjusted over time to a level 17 per cent below the most CO₂-efficient power plant operating commercially in the United States. A developer may meet this requirement by making a one-time, lump-sum payment to the Trust, which covers offsets for the life of

its power plant. The monetary path rate is currently US\$0.85 per short ton (US\$0.94 per metric ton) of CO₂. The Trust uses the funds to acquire and to manage contracts for offset projects. The tons acquired are retired. The Oregon standard currently adds less than 0.4% to the life-cycle cost of a new power plant.

The Climate Trust's process for acquiring offsets

Oregon's standard requires the Trust to acquire CO₂ offsets (not other Kyoto gases) from projects to be implemented in the future. Projects must meet an additionality test, which the Trust defines as emissions benefits not likely to occur without offset funding. Offsets must be quantifiable, monitored and verified. A wide variety of offset projects is eligible, including: renewable energy; energy efficiency; energy system decarbonization; and carbon sequestration. Projects can be located anywhere, with a preference for Oregon projects.

The Trust uses a two-phase request for proposal process in order to identify and select offset projects. A broadly distributed

solicitation invites short-form Phase 1 proposals, which are limited to ten pages of text, with budget and carbon spreadsheets. Selected projects are invited to submit detailed Phase 2 proposals. During both phases, proposals are subject to extensive review by staff, outside experts and the Trust's Offset Committee, with selections made by the Trust's Board of Directors. Cost effectiveness, in terms of cost per ton of reasonably assured, additional CO₂ benefit, is the primary selection factor. Other selection factors include: reliability of the project concept; reliability of the project partner; monitoring and verification; permanence; guarantees; location; portfolio diversity; replicability; expandability; and co-benefits. The Trust uses a two-phase negotiating process which involves agreement to a detailed term sheet prior to developing contract language.

2000: initial offset portfolio

In 2000, the Trust's first solicitation drew 60 short-form Phase 1 proposals from 14 states and 15 countries. Eight projects were invited to submit detailed Phase 2



proposals. Using funding from the Klamath Cogeneration Project (PacifiCorp), the Trust contracted for five offset projects, totalling 850,000 metric tons at an average cost of US\$1.41 per metric ton. These projects include: two renewable energy projects (landfill gas electric generation with CO₂ recovery and marketing; and innovative financing to stimulate Oregon wind power); one transportation efficiency project (Internet-based carpool matching in Oregon); and two permanent forest sequestration projects.

2001 offset batch

In 2001, the Trust solicited some US\$5.75 million of offsets, with funding mostly provided by two Oregon power plants: Hermiston Power Project (Calpine) and Coyote Springs 2 (Avista). Almost 80 short-form Phase 1 proposals were submitted by high-quality organizations, involving a wide range of mitigation technology types. Approximately 20 proposers were invited to submit detailed Phase 2 proposals. Term sheets are nearly complete for seven projects selected for negotiation. The project types include: cogeneration; distributed generation; transportation

and building efficiency; forest sequestration; and material substitution.

The Trust's partnership programme: acquiring offsets for other organizations

In addition to operating this core Oregon power plant offset programme, the Trust has established a partnership programme to assist business, government and non-profit-making enterprises in meeting their offset goals. This efficient programme allows other organizations to take advantage of the Trust's expertise, high quality standards and ongoing processes. The revenues it provides during core programme lulls are important to the Trust, and the Trust places a high priority on expanding this programme.

The Trust's initial partnership with the city of Seattle has been an outstanding success. Seattle is committed to eliminating the CO₂ emissions from its municipal electric utility. The Trust's 2001 offset solicitation requested 247,000 metric tons for Seattle, and Seattle participated in and shared the cost of the offset evaluation, selection and contracting processes. The Trust is transferring to Seattle 40 per cent more offsets than they requested, while coming in 25 per cent below their budget.

Seattle's tons are derived from three of the seven projects the Trust is acquiring from this offset batch. Seattle has indicated interest in a longer-term relationship with the Trust at a level that may reach 600,000 metric tons per year.

In 2001, the Trust also established an innovative 'donate and retire' mechanism for funding offsets. Organizations can donate money into a restricted fund of the Trust, and can take a tax write-off for the non-profit donation. The Trust acquires incremental offsets with the funding, and holds the offsets in perpetuity for the benefit of the environment. A variant of this cost-efficient and user-friendly approach is used to transfer high-quality offsets to a purchaser, without the donation and tax advantages aspects.

A successful model

The Oregon standard is the most aggressive CO₂ regulation in the US, and the trust model is a proving to be a success. The Trust has established effective offset acquisition and contracting processes, and is now a significant purchaser of offsets on the world market. The Trust's efficient, cost-effective partnership programme builds on this core programme, and is attracting considerable participation.

The CDM is dead, long live the CDM

By Matthew Varilek and Neil Cohn, Natsource LLC

Following the rejection by the United States (US) of the Kyoto Protocol in March 2001, some observers proclaimed the treaty's demise. Months later, however, an inspired flurry of diplomacy, spearheaded by the European Union, led to a compromise among remaining Parties to the Protocol, which revived its prospects for eventual entry into force. In light of this development, some of the pessimists have modified their views, arguing that, although the treaty may survive, the reduction in demand for greenhouse gas (GHG)

emissions permits resulting from the absence of the US may obviate the need for Parties to invest in emissions-reducing projects in developing countries via the Clean Development Mechanism (CDM). If existing permit supply is sufficient to meet developed countries' demand without much additional abatement, the real casualty of the US' departure would be the CDM, rather than the treaty itself. However, we believe that this obituary, like that of the Protocol, is premature. In this article, we explain why emissions abatement projects

in developing countries will remain attractive to international investors.

The CDM is dead?

At first glance, the CDM's prospects do not look good. Several recent attempts to quantify the impacts of the US' departure from the Protocol show projected GHG permit prices falling from a range of US\$13 to US\$35 per ton of carbon dioxide equivalent (CO₂e) with the US, to as little as US\$0 to US\$5 without the US¹. While the absolute level of such predictions is

¹ Holtsmark, B. and C. Hagem, 2001, *From Small to Insignificant: Climate Impact of the Kyoto Protocol with and without U.S.* Oslo: Centre for International Climate and Environment Research, <http://www.cicero.uio.no/media/1315.pdf>; Manne, A. and R. Richels, 2001, *U.S. Rejection of the Kyoto Protocol: The Impact on Compliance Costs and CO₂ Emissions*. Washington, D.C.: AEI-Brookings Joint Centre for Regulatory Studies; Blanchard, O., Criqui, P. and A. Kitous, 2002, *After the Hague, Bonn, and Marrakech: The Future International Market for Emissions Permits and the Issue of Hot Air*. Grenoble: Institut d'Economie et de Politique de l'Energie; Böhringer, C., 2001, *Climate Politics from Kyoto to Bonn: From Little to Nothing?* Mannheim: Centre for European Economic Research



debatable², the qualitative impact of the US' departure is clear. Most of these analyses show that surplus allocations of emissions permits to some central and eastern European countries, such as Russia and Ukraine, could nearly, if not entirely, meet remaining permit demand. In this situation, buyers would have little need of additional abatement projects in developing countries. Moreover, with its relatively onerous certification procedures, the CDM may involve higher transaction costs than the Protocol's other emissions trading mechanisms, international emissions trading (IET) and joint implementation (JI). Considering also the higher perceived risk of projects in developing countries, the outlook for the CDM is grim indeed.

Long live the CDM

Nevertheless, the preceding narrative does not tell the whole story. Several factors suggest that developing countries may yet enjoy significant CDM investment. First, despite its unwillingness to participate in the Kyoto Protocol, the US may generate demand for emissions reductions produced in developing countries. Many observers expect that the US will eventually develop its own emissions trading system, which will operate in parallel to the Kyoto system. If such a programme were developed, it would almost certainly allow for the purchase of reductions generated abroad, via some mechanism analogous to the CDM. Whereas countries with binding emissions reduction obligations might be reluctant to sell to the US, for fear of putting their Kyoto compliance in jeopardy, developing countries would have no such concern. Instead, they would stand to benefit from complementary sources of demand for reductions generated in their countries.

In addition, central and eastern European countries with generous permit allocations are unlikely to liquidate their entire surplus allocations in the Kyoto Protocol's first commitment period. Of course, given the economic situation in

those countries, there will be some temptation to generate a quick windfall by selling reductions quickly. But they may be prevented from selling their entire surpluses if buyer countries concerned about environmental integrity opt not to buy permits that do not result in 'additional' emissions abatement. At present, questions remain about the quality of emissions inventories in Russia and some other supplier countries, which may prevent or delay these countries' eligibility for trading. Further, even if they are eligible to trade, countries with surplus allocations may seek to maximize the value of their permits over time by liquidating only a portion of their surplus in the first commitment period, and banking the rest for later use. Under any of these scenarios, a reduction in available supply from countries with generous allocations would be expected to raise the international GHG price, making low-cost GHG abatement projects in developing countries a more attractive option.

Admittedly, these scenarios will remain speculative for the near future. But as the situation unfolds in coming years, the CDM will continue to benefit from the time advantage granted by its capacity to generate Certified Emission Reductions (CERs) from 2000 onwards. Once the newly created CDM Executive Board finalizes formal CDM crediting rules, buyers will at last be able to acquire internationally fungible emissions permits, instead of having to rely entirely on contingency-laden forward contracts. Some buyers will prefer the certainty of possessing CERs now to the uncertainty of waiting for post-2007 permit delivery from non-CDM sources.

Activity in the emerging international GHG market confirms the CDM's continuing attractiveness. The World Bank's Prototype Carbon Fund (PCF) continues to announce new purchases of emissions reductions from projects in developing countries, and has recently set about securing its first formal 'validations', in accordance with the CDM project certification cycle. PCF's success

has even led to serious discussions regarding two complementary World Bank-managed funds that would mobilize further investment in developing-country GHG projects. Similarly, the government of the Netherlands is currently carrying out the CDM equivalent of its successful Emissions Reduction Unit Procurement Tender (ERUPT), which resulted in contracts for the purchase of up to US\$30 million in future emissions reductions generated through JI projects. This more recent programme, known as CERUPT, aims to generate 3 million tons of CO₂e at anticipated prices of US\$2–5 per ton. In addition, our experience as GHG brokers indicates that, far from declining, buyers' interest in purchasing reductions from CDM-style projects is on the rise. Buyers are attracted to the ability to bank reductions from CDM-type projects and to their potential usefulness both in an international GHG market framework and in emerging national trading systems.

The preceding discussion has shown that the CDM's prospects remain—like so many other aspects of climate-change policy—clouded by uncertainty. Under most circumstances, such uncertainty is rightly regarded as an impediment to the private sector's efforts to address global climate change. But for those hoping that the CDM will funnel beneficial foreign investment to developing countries, this uncertainty offers a welcome alternative to conclusive proclamations of the CDM's demise. While it remains to be seen whether this potential flow of investment will ultimately materialize, we believe that the factors described in this article make a plausible case for optimism.

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² Varilek, M. and N. Marenzi, 2001, *Greenhouse Gas Price Scenarios for 2000 to 2012: Impact of Different Policy Regimes*. Discussion Paper No. 96, Institute for Economy and the Environment: University of St. Gallen, Switzerland, [http://www.iwoe.unisg.ch/org/iwo/web.nsf/SysWebRessources/db96/\\$FILE/DB96.pdf](http://www.iwoe.unisg.ch/org/iwo/web.nsf/SysWebRessources/db96/$FILE/DB96.pdf)

The Brazilian steel and iron sector and the CDM: examples of EcoSecurities' activities in this field

By Pedro Moura Costa and Le Chen, *EcoSecurities*

As part of the steel production process, large quantities of carbon feedstocks (thermo-reduction agents) are used. Internationally, the main source of carbon feedstock is coke, obtained from the dry distillation of coal, one the most carbon-intensive fossil fuels. The Brazilian steel sector, however, it is the only one globally that uses charcoal as a reducing agent. Given that charcoal is a renewable fuel source, the charcoal-based steel can therefore be considered 'carbon neutral'.

During the past 10 years, however, economic trends related both to industrial operations and to the forestry sector in Brazil have led to the increased utilization of imported coal, as opposed to locally produced charcoal. This, in turn, has resulted in increases in greenhouse gas (GHG) emissions. Recently, a few companies have been trying to reverse this trend by selling carbon credits through the Clean Development Mechanism (CDM).

Economic trends affecting the steel and iron sector

The charcoal-based steel and iron industry in Brazil, in parallel with the plantation forestry sector, has succeeded in developing its main source of raw fuel material. In 1967, in order to support the development of these sectors, the Brazilian government introduced the Fiset fiscal incentive programme, in order to encourage investment in afforestation for use in the pulp, paper and charcoal-based pig-iron and steel industries. By 1990, more than 6 million hectares (ha) of forest plantations had been established in Brazil under this programme. Associated investments in breeding and cloning helped to establish the Brazilian plantation forestry sector as one of the most advanced and productive worldwide. At the same time, the country grew to become the world's eighth largest producer of steel.

In 1989, however, the Fiset programme was discontinued. Following the end of the fiscal incentives, plantation

establishment decreased, while harvesting of existing plantations continued at the existing rate, leading to a reduction in the Brazilian plantation forest base, from a total of 6.5 million ha in 1990 to some 4.8 million ha in 1998. Replanting is a costly activity, and investment is not taking place for several reasons, namely: lack of access to long-term finance for investment in forestry; inherent low profitability of the forestry activity in Brazil; and the risks related to investments of long gestation in the Brazilian macro-economic context.

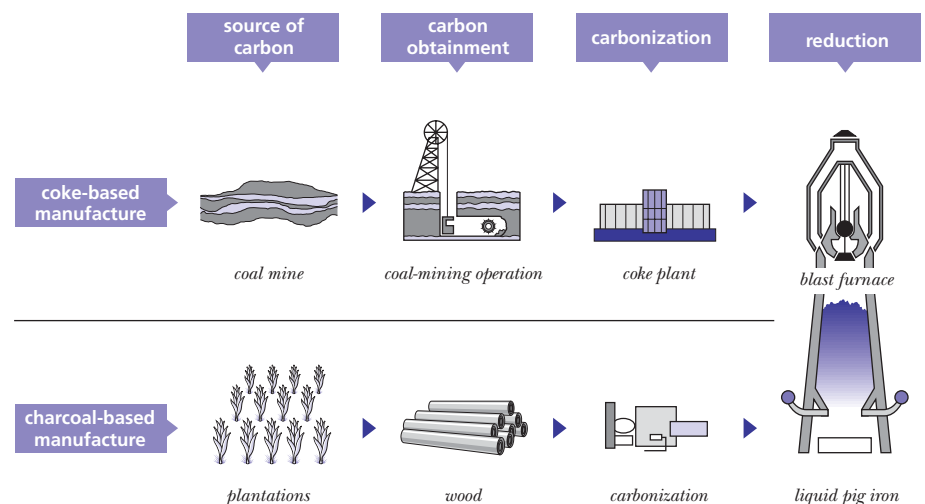
Adding to this scenario, in 1994, the Brazilian government introduced the Plano Real economic plan, which resulted in the pegging of a new Brazilian currency (the Real) to the US dollar, on an equal level (1:1). This artificially high exchange rate has made the cost of imports relatively low in relation to goods produced locally. In the steel and iron industries, it has made the use of imported coal more cost effective than the use of locally produced charcoal.

The combination of these factors has led a series of steel manufacturers to move away from charcoal back to coal, leading to a substantial increase in GHG emissions. Examples of this economic trend abound.

A recent study by the Brazilian Steel Institute shows that the consumption of charcoal has been reduced from 8 million tonnes in 1993 to 4.2 million tonnes in 1999. Since 1999, the number of small independent pig iron producers (who sell this raw material to the larger steel producers) has halved, and it is expected that more firms in this market sector may be forced out of business. Others are moving to the Amazon states, where charcoal production is based on the unsustainable exploitation of natural forests, with negative environmental implications. In parallel, large steel manufacturers are selling their plantation forest assets. Since 1996, Acesita (the only Brazilian producer of stainless steel) has reduced its forest assets from 250,000 ha to 101,500 ha, and has invested some US\$ 650 million to adapt one of its furnaces to operate on coke alone. Companhia Belgo-Mineira, the second largest producer of steel in Brazil, has recently completed its total conversion to coal, with an investment of US\$150 million in a coke-fuelled blast furnace, and has already started slowing down its forestry operations.

A general feeling among experts in this industry is that, unless incentives are

Figure 1: Comparison of coke-based and charcoal-based pig iron manufacture (Source: Biodiversitas 2001)





put in place to support either the forestry sector or the use of charcoal, the current trend of substitution to coal will persist. This will lead to a significant increase in GHG emissions in Brazil, associated with the use of coke used for iron and steel production, as well as during the coking process (that is, the transformation of coal to coke, through a dry distillation process).

New initiatives involving carbon trading

Within this context, the international GHG advisory firm EcoSecurities is involved in three projects which are making use of carbon finance through the Clean Development Mechanism (CDM), in order to tilt the balance towards the use of charcoal. The extra income derived from the sale of carbon credits will increase the profitability of charcoal-based pig iron and steel production, avoiding the decline of this industry.

The Plantar project consists of the maintenance of charcoal-based production of pig iron in its mills in Minas Gerais, Brazil, funded through the sale of carbon credits. This is the first investment of the World Bank PCF in Brazil, which retained EcoSecurities to determine the potential GHG emission reductions to be generated by the project. The project involves planting more than 23,000 ha with sustainably managed (certified to the Forest Stewardship Council standards) forests of high-yielding clonal eucalyptus trees. Additionally, Plantar will initiate a pilot project of landscape-scale management of biodiversity, based on the regeneration of native vegetation in an area previously covered with plantation forests. It was estimated that the project has the capacity to generate 12 million tonnes of CO₂ emission reduction equivalents over a 28-year time frame. The PCF is particularly interested in the replicability of this investment, and its effect on the iron and steel sector as a whole. The project is currently being independently verified by DNV, prior to completion of the deal.

EcoSecurities is also assisting two other companies with similar initiatives. One of them is being developed by V&M Tubes do



Left: Pig iron mill in Minas Gerais, Brazil; right: eucalyptus plantations for charcoal production



Brazil (a joint venture between the French group Vallourec and the German company Mannesmannrohren-Werke). V&M Tubes is the only steel pipe manufacturer in the world to use 100% renewable energy for the production of pig iron and steel. Its forestry division, V&M Florestal, is responsible for the production of all charcoal required by its mills, from its 120,000 ha of plantation forests (certified as sustainably managed according to the standards of the Forest Stewardship Council). The project consists of investments to ensure the use of sustainably produced charcoal for steel manufacture in Brazil, avoiding the use of coal. It is estimated that this will result in the reduction of 45 million tonnes of CO₂ emissions during the next 27 years.

A third project has been developed by Cosipar, a Brazilian private company producing 330,000 million tonnes of pig iron in the state of Pará, in Northern Brazil. Cosipar's objective is to establish plantation forests to produce its charcoal needs, as opposed to other companies in the Amazon region, which are either using charcoal from the unsustainable degradation of natural rainforests, or are moving to coke. Being a leader in the region, and an important member of the association of pig iron producers, Cosipar hopes to catalyse change by providing an example of a new source of financing for the sector. It was estimated that the project has the capacity to generate more than 1.8 million tonnes of CO₂ credits during its lifetime.

A secondary benefit from all these projects relates to the production process

of charcoal. Traditionally, the charcoal kilns in Brazil generate a substantial amount of methane in the carbonization process. At least 90 per cent of charcoal produced in Brazil is obtained from beehive-type masonry kilns with low caloric efficiency, and whose methane emissions are significant. Both the Plantar and the V&M Tubes projects plan to adapt their existing carbonization kilns to incorporate best-available technology, in order to avoid the emissions of methane and particulates.

These projects illustrate how CDM funding can promote potential changes in industrial sectors in developing countries.

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Le Chen is Head Administrator of EcoSecurities.

EcoSecurities Ltd is an established environmental finance company which specializes in advising on strategy regarding global warming issues. With offices in five countries, the company, to date, has worked in more than 60 countries, in addition to providing advice to various United Nations agencies, national governments, project developers and major corporations on scientific, policy and commercial issues related to climate change. This article describes some projects in which EcoSecurities is involved in the steel and iron sector in Brazil, which have interesting GHG mitigation potential.



Chicago Climate Exchange progress report (follow-up feature)

By Richard Sandor

The Chicago Climate Exchange (CCX), a 20-month-old project with the goal of designing and implementing a voluntary cap-and-trade market for greenhouse gases (GHG), began its first sectoral meetings in January 2002.

These meetings—coming after 15 months of research, which included site visits to virtually all the participants—represent the beginning of a new stage of research, which will continue to build consensus among CCX members and to finalize the design of the exchange. Three

main sectors were identified: electric power, manufacturing and agriculture. CCX concluded that a set of common analytical tools could be applied across sectors. The electric power and agricultural sectors have a special set of dynamics, which warranted their own specific treatments. The manufacturing sector has a subset which deals with offsets that can be generated by its activities, specifically the forest products and landfill management sectors. The CCX is considering two categories of offsets: those generated domestically (forestry-

based, methane destruction); and those offsets created in Brazil (for example, forestry-based, fuel switching).

The CCX was initially funded by Chicago-based Joyce Foundation through a special Millennium Initiative grant to the Kellogg Graduate School of Management at Northwestern University. New funding was granted eight months ago, when the success of the exchange was deemed to be likely.

Since the CCX's last article in May 2001, 25 new entities have agreed to participate in the design process. Table 1 contains the current full list of participants.

The new participants are of interest for three reasons:

- there is increased penetration of existing sectors in both the United States (US) and Canada, as well as the addition of new European Union-based companies with operations in North America;
- there are new participants in Mexico and Brazil; and
- there is a completely new sector: municipalities.

Six new US companies have been joined the CCX from the energy sector, including three of the top ten utility companies. This sector now accounts for 180,000 megawatts of capacity, representing 20 percent of US generation. Additionally, two new Canadian companies from the energy sector—OPG and Manitoba Hydro—have become CCX members. In Europe, participation by NUON and by Finland-based Stora Enso (the second largest forest products company in the world) increases CCX design capabilities. Baxter, one of the world's major pharmaceutical companies, has also joined recently.

CCX has been joined by a Brazilian company for the first time: Cataguazes-Leopoldina, a leading generator of electricity, based in the state of Minas Gerais. Cemex, the largest Mexican cement company and the second largest US cement company, and Grupo IMSA de Mexico, a leading diversified steel and manufacturing

Table 1: Current list of CCX participants

Energy

Alliant Energy
American Electric Power
BP
Calpine
Cinergy
CMS Generation
DTE
Exelon
FirstEnergy
Manitoba Hydro
Midwest Generation
NiSource
Ontario Power Generation (OPG)
PG&E National Energy Group
Pinnacle West Corporation (APS)
Suncor Energy
TXU Energy Trading
Wisconsin Energy

Industry

Baxter
Cemex
DuPont
Ford Motor Company
Grupo IMSA de Mexico
ST Microelectronics
Waste Management Inc.

Municipalities

City of Chicago
Mexico City

Offset providers

Agriliance
Cataguazes-Leopoldina
Conservación Mexico
Ducks Unlimited
Growmark
Iowa Farm Bureau Federation
National Council of Farmer Cooperatives
Navitas Energy
Nuon
Ormat
Pronatura Noreste
The Carbon Fund
The Nature Conservancy

Service providers

American Agrisurance
Det Norsk Veritas
Edelman PR Worldwide
IT Group
SCS Engineers
Swiss Re
Carr Futures/Crédit Agricole
University of São Paulo

Forest products companies

International Paper
Temple-Inland
MeadWestvaco
Stora Enso

Names in italic denote an addition since May 2001



group, have also agreed to participate. Two major Mexican conservation groups, Pronatura Noreste and Conservación Mexico, are also joining the CCX.

Another exciting new development has been the addition to the CCX of two major municipalities in North America: Chicago and Mexico City. The commitment of these two municipalities provides the CCX with the expertise needed to deal with GHG emissions from transportation systems, as well as from city-operated buildings and power systems. Cities also manage landfills, offering opportunities for the capture and destruction of methane, a major GHG.

The advisory group of the CCX also continues to expand. The addition of Mary Schapiro, President of NASD, and Robert Wilmouth, President of the National Futures Association, provides the CCX with acknowledged leaders among US-based self-regulatory organizations. The CCX is devoted to market architecture that will emphasize transparency and oversight. And finally, the Honorable Richard M. Daley, mayor of the City of Chicago, has agreed to become the Honorary Chairman of CCX. His energy plan, released this past November, emphasized the role of financial institutions in facilitating the

city's goal of becoming the 'greenest city' in the US.

The cornerstone of the CCX design is the creation of a set of common standards to facilitate the operation of a market. An apt analogy might come from monetary policy theory. Policy makers are often faced, when setting a monetary regime, with the choice of following a rules- or a discretion-based approach. It is our belief that the CCX should strive to be as much of a rules-based system as possible. Our experience as professional market inventors and participants is that a system that makes use of common practices and a set of standard rules has a greater chance of being viable.

Insights from the Prototype Carbon Fund on Emission Reduction Transactions (follow-up feature)

By Veronique Bishop, Principal Financial Specialist, PCF (World Bank)

The Prototype Carbon Fund (PCF) is a public-private partnership aimed at catalysing the market for greenhouse gas emission reductions (ERs). Funded by six governments and 17 multinationals (with a total capitalization of US\$145m), and managed by the World Bank, PCF is pioneering ER purchase transactions under the emerging rules of the Clean Development Mechanism (CDM) and Joint Implementation (JI). PCF demonstrates how such transactions can lower the cost of compliance with the Kyoto Protocol, and shares its practical experience with decision-makers, host countries and market players.

PCF portfolio and pipeline

The PCF expects to purchase ERs from some 30 projects, in a range of countries and technologies, with a focus on renewable energy and energy efficiency. In the two years since its launch, PCF has completed four transactions—in Latvia, Uganda, Chile and Brazil. In addition, PCF has 12 more projects within a few months of finalizing carbon purchase negotiations, and has developed a healthy pipeline of a further 20 projects, totaling more than US\$90 million estimated ER purchase value already approved by the participants. It is actively considering projects with an additional US\$80 million ER value. The charts below

show the technology and regional distribution of the current pipeline.

Lessons learned from transactions executed so far

Each PCF transaction is providing valuable insights into how carbon finance can be used to catalyse investment in renewables and energy efficiency:

- Latvia Liepaja Landfill Gas Capture: PCF's US\$2.5 million purchase of ERs to be generated by a new sanitary landfill enabled Liepaja City to qualify for matching ODA funds for methane capture and power generation equipment.
- Uganda West Nile Hydropower: Under this first 'CDM' project in Africa, the PCF's ER purchase contract will be included in the bidding documents for a concession to provide power to this remote region, enabling the sponsor to generate US\$3.5 million of hard currency over 16 years.
- Chile Chacabuquito Hydropower: In this transaction, PCF has contracted to purchase ERs to be generated by a run-of-river hydro facility to be built in northern Chile. The contract provides for PCF's purchase of a call option, as well as a firm purchase of ERs.

Figure 1: Technology distribution

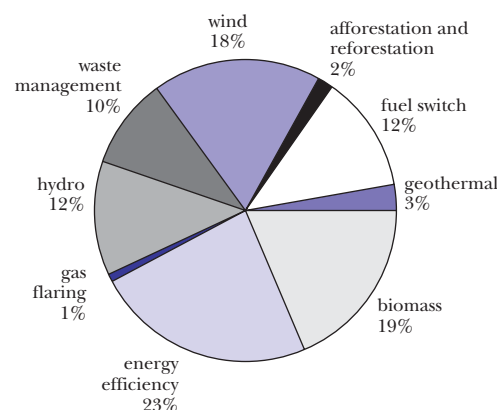
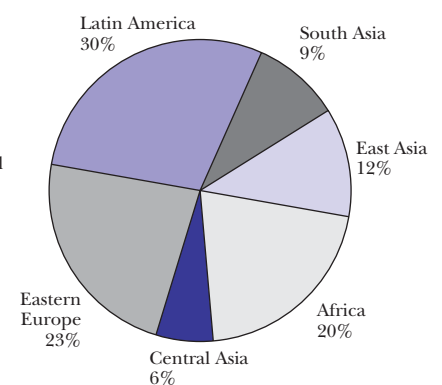


Figure 2: Regional distribution





- **Brazil Sustainable Forestry:** This project will establish fuelwood plantations on pasture land, convert the fuelwood into charcoal, and use the charcoal as a substitute for coal in the production of pig iron. PCF plans to purchase ERs generated by the sequestration of carbon dioxide in the wood and in the displacement of coal. Using the US\$5-million PCF purchase as collateral, the sponsor is contracting a loan with an amortization schedule pegged to PCF's five-year payment schedule (see Figure 3). The US\$ cash flow from PCF enabled the bank to extend the loan tenure from two years to five years, and eliminated the need for expensive country risk insurance.
- These projects have demonstrated that:
- carbon finance can have a substantial impact on the financial viability of projects, especially when methane emissions are abated, and can boost project IRRs by five percentage points or more;
 - even for traditional renewables and energy efficiency projects, the high quality of cash flows from carbon sales

can be catalytic in helping project sponsors to secure upfront financing.

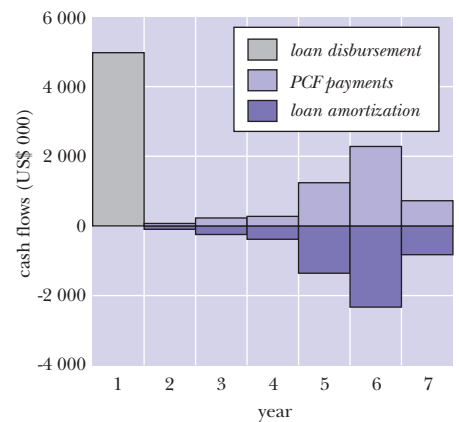
Insights on CDM/JI project development

From its experience in developing its project pipeline, PCF has developed a 'project cycle' (see Figure 4), which incorporates the emerging legal framework of the Kyoto Protocol, as well as due diligence to ensure the projects' environmental, social and financial sustainability, consistent with the World Bank Group's stringent safeguards requirements of CDM and JI, including:

- baseline studies and methodologies;
- sample monitoring plans;
- a 'validation manual' to facilitate systematic validation;
- financial due diligence procedures; and
- legal documentation supporting these transactions.

This rich source of replicable project documentation is publicly available at prototypcarbonfund.org.

Figure 3: Loan amortization structured to reflect carbon purchase revenues

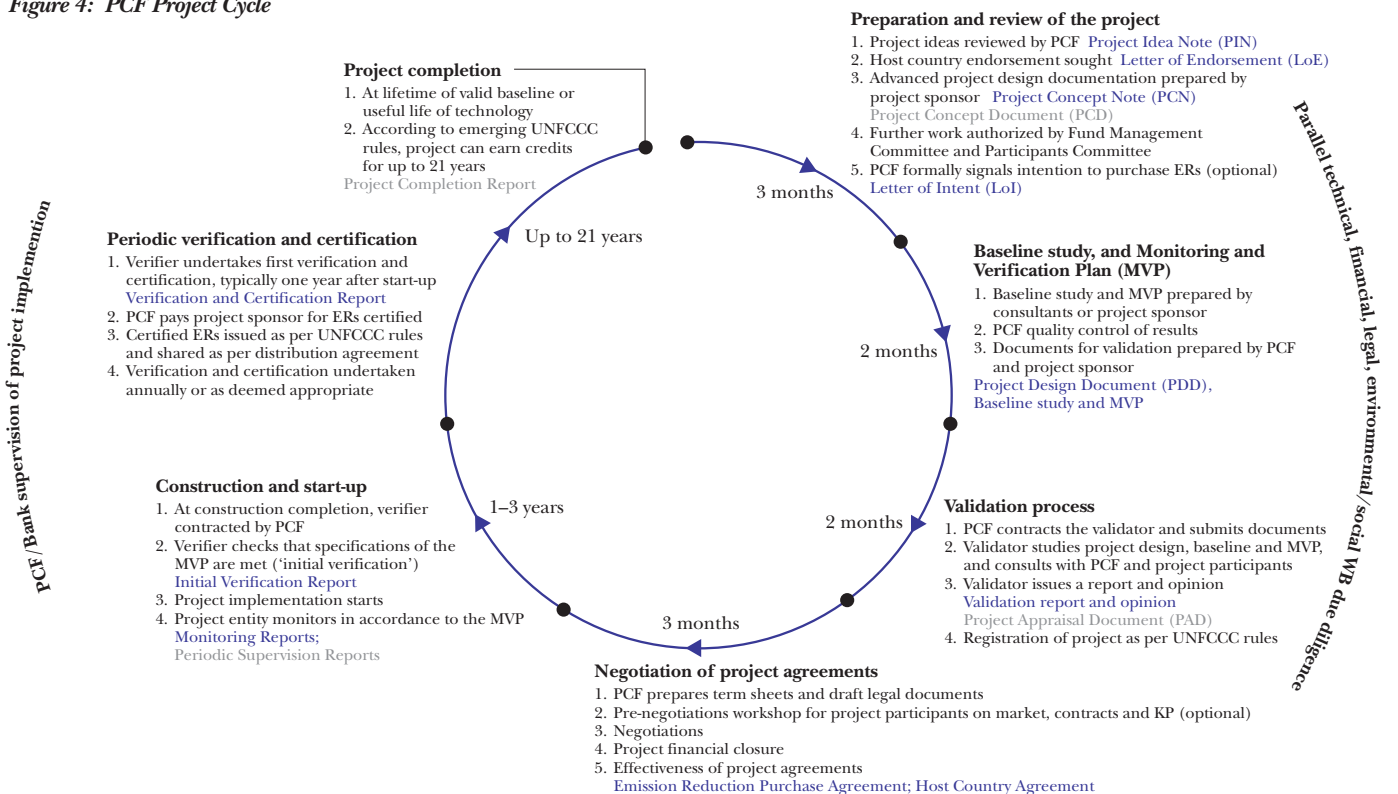


Identifying and incorporating best practice

PCF systematically monitors the emerging ER market for insights on market prices, transaction structuring and financial engineering, notably by commissioning market research on recent transactions.

PCF also 'thinks laterally', examining other exotic commodity markets, securitization transaction structures and the practices of other institutions working in emerging markets, to identify best

Figure 4: PCF Project Cycle





practices that can be applied to the carbon market. For example, in order to develop replicable models for streamlining and ‘bundling’ small transactions through a single institution, PCF is adapting a model developed for financial intermediary lending.

Sharing lessons learned

PCF’s lessons learned have been documented and shared with negotiators and participant-stakeholders in the UNFCCC process, to help to define the ‘rules of the game’ for Kyoto Protocol implementation. This has provided useful insights to negotiators, highlighting:

- the importance of fungibility and transferability of ERs in deepening the carbon market;
- the heavy burden of transaction costs, particularly on small projects—hence the need to develop streamlined procedures;
- that environmental additionality can be sufficient to establish project baselines; and
- that Kyoto Protocol-related transaction costs form only a portion of total transaction costs (typically less than half). Having identified the need to reduce the burden of transaction costs on small deals, PCF is exploring cost-reduction

measures to enable small deals to compete with high-volume, low-cost transactions—for example, by contracting with intermediaries who will bundle small projects under common baselines, validation and verification procedures, and is exploring other opportunities for streamlining baselines and monitoring. This will create replicable models that will allow smaller countries and companies to tap the carbon market. PCF will share insights from these projects to inform discussion of streamlining procedures for small-scale projects at the next round of climate change negotiations (COP8).

The Concerted Action on Tradable Emissions Permits (CATEP)

By Frank J. Convery

The Concerted Action on Tradable Emissions Permits (CATEP) is the European Research Network on emissions trading, funded by the European Commission (DG Research) and coordinated by the Environmental Institute, University College, Dublin, Ireland. Its coordinator is Frank Convery (frank.convery@ucd.ie) and its manager is Louise Dunne (louise.dunne@ucd.ie).

The full members of the network are: Environmental Institute, University College, Dublin (coordinator); the Department of Economics, University College, London; the Joint Research Centre, Instituto de Prospectiva Tecnológica, Seville; Centre International de Recherche sur l’Environnement et le Développement (CIRED), Paris; Department of Economics, Stockholm University; Fondazione Eni Enrico Mattei (FEEM), Milan; Centre d’Economie et d’Ethique pour l’Environnement et le Développement (C3ED); Climate Network Europe; UNEP Collaborating Centre; Risø National Laboratory, Denmark; Kiel Institute of World Economics, Germany; Centre for International Climate and Environmental Research (CICERO), Oslo; Foundation for International Environmental Law and Development (FIELD); Organization for Economic Cooperation and Development (OECD), Paris; and BP Amoco.

Associated with the work of CATEP are: the Centre for Policy Studies, Brussels; the Helsinki School of Economics; Centre for Environmental Economics and Environmental Management, University of Ghent; International Institute for Applied Systems Analysis, Laxenburg, Austria; WIFO; Austrian Institute for Economic Research, Austria; Faculty of Law, University of Gronigen; Resources for the Future, Washington D.C. School of International Studies; Johns Hopkins University; Scientific Pool of Environmental Economics disciplines, Oldeburg University; Kennedy School of Government, Harvard University; and the Centre for Energy and Environmental Policy Research, MIT.

CATEP has been established to fulfil two functions:

- to facilitate the collection of the latest research on emissions trading from across Europe and the world; and
- to act as an interface between the research community and those in the policy process at global, European and national levels who could benefit from knowledge about latest insights and findings.

CATEP fulfils this mission by holding a series of workshops at which the latest research findings are presented and discussed. The workshop agenda includes:

- Trading Scales: Harmonizing Industry, National and International Emission Trading Schemes. Hosted by FEEM in Venice, December 2001 (details from barbara.buchner@feem.it).
- Design and Integration of National Tradable Permit Schemes for Environmental Protection. Hosted by the Department of Economics, University College, London, March 2002 (details from r.salmons@ucl.ac.uk).
- Global Trading. Hosted by the Kiel Institute for World Economics, 8–9 July 2002 (details from gklepper@ifw.uni-kiel.de).
- International Trading and Links to CDM and Joint Implementation. Hosted by FIELD and Risø National Laboratory, 30–31 January 2003 (contact fanny.missfeldt@risoe.dk).
- Country Forum. Hosted by OECD, Paris, March 2003 (contact jan.corfeemerlot@oecd.org).
- Synthesis Workshop. Hosted in Brussels by University College, Dublin, May 2003 (contact frank.convery@ucd.ie). Papers presented will be available as working papers on the network’s website (www.emissiontradingnetwork.com), and policy briefs synthesizing key findings for those in the policy process will also be prepared.



UNCTAD-Earth Council Carbon Market Programme www.unctad.org/ghg

Exploring the trade and economic impacts of the greenhouse gas emissions market

Bringing governments, industry and civil society together to address climate change through trade and investment

The Kyoto Protocol and other measures to address climate change through the reduction of greenhouse gas (GHG) emissions have spurred the emergence of a market for carbon emissions. Domestic climate policies and the application of the Kyoto mechanisms will have trade, investment and economic impacts on both developed and developing economies. The Carbon Market Programme explores these impacts, and works to promote a fair and effective global carbon market.

Current activities

Engaging the private sector in CDM—a UNFIP-funded inter-agency project. The UNCTAD component is focused on supporting the Inter-Ministerial Commission on Climate Change and the Brazilian Climate Change Forum, to establish a public-private operational entity to facilitate CDM investments in Brazil.

Getting started with CDM in least developed countries (LDCs)—a capacity-building project aimed at prompt-starting CDM from the ground up in LDCs. Currently involves Tanzania, Uganda, Mozambique, Zambia and Malawi, in partnership with Environmental Protection and Management Services

(EPMS) in Tanzania and the Sustainable Development Promotion Centre (SDPC) in Uganda.

Supporting GHG markets in countries with economies in transition—a plan-of-action project to develop the capacity of economies in transition (starting with the Central Group 11: Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia and Slovenia) to participate in the Kyoto Protocol mechanisms, including the proposed EU emissions trading scheme.

Carbon Market E-Learning Centre (CMEC)—a prototype funded by UNFIP. The E-Learning Centre provides complementary learning opportunities to a global audience on the use of emissions trading (including trading in CDM and JI credits) as an economic instrument to implement the UNFCCC and Kyoto Protocol. The CMEC offers its own on-line courses but, more importantly, offers its 'virtual workshop' facility to other institutions so that they can effectively and conveniently implement their own courses through the e-learning facilities of the CMEC.

About the Carbon Market Programme

In 1999, the United Nations Fund for International Partnerships (UNFIP) funded the UNCTAD Emissions Trading Programme. At that time, UNCTAD's mission was to promote and develop a plurilateral GHG emissions trading

programme. In 1997, the Kyoto Protocol placed caps on emissions from developed countries and allowed the trading of emission allowances amongst them, as well as the introduction of project-based emission credits from developing and transitional countries.

Since then, the programme—at the request of client countries—now focuses on exploring the economic, trade and investment impacts of climate change in developing and transitional countries, and works to promote their effective participation in the emerging carbon market. The programme's website, www.unctad.org/ghg, offers the following facilities:

- Publications: the latest include *Greenhouse Gas Market Perspectives: Trade and Investment Implications of the Climate Change Regime*; *The Clean Development Mechanism—Building International Public-Private Partnerships under the Kyoto Protocol*; and *International Emissions Trading Manual*.
- Newsletter: published quarterly since 1997.
- Projects.
- Carbon Market Forum: reports and presentations from the first Policy Forum in 1997 to the fifth Market Forum, including links to the IISD coverage of the Rio Policy Forum.
- Information on the carbon market.

... continued from page 1

of using country teams to consider emissions trading schemes, particularly with regard to linking in with the EU emissions trading scheme.

- The CG11 supported an UNCTAD initiative to develop a project that would jump-start integrated studies on

national registries for all CG11 countries.

- The CG11 welcomed a suggestion to develop a project that would enhance coordination among CG11 countries through the development of a CG11 Secretariat, a CG11 website and publications on the state of the carbon market in accession countries.

Global Greenhouse Emissions T R A D E R

can be obtained free of charge from:

UNCTAD Secretariat
Palais des Nations, 8-14 Avenue de la Paix
1211 Geneva 10, Switzerland

Tel: (41) 22 917 5731 or 917 2116

Fax: (41) 22 917 0504

Views, comments and contributions from readers are welcome at: ghgmissionstrading@unctad.org

The views expressed in this newsletter are those of the authors and do not necessarily reflect the views of their institutions.

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