

CDM INVESTMENT NEWSLETTER

Nr. 3/2004 A joint initiative of BEA International and the Climate Business Network

Carbon Sequestration

Copyright © 2004

Table of contents

EDITORIAL	2
AGROFORESTRY IN THE CDM: AN OPPORTUNITY FOR SYNERGY BETWEEN MITIGATION AND ADAPTATION, BY LOUIS VERCHOT, WORLD AGROFORESTRY CENTRE (ICRAF)	3
HOW CAN CARBON CREDITS FROM CDM AFFORESTATION AND REFORESTATION PROJECTS BE USED BY ANNEX I GOVERNMENTS AND COMPANIES? B. SCHLAMADINGER (JOANNEUM RESEARCH, AUSTRIA), M. DUTSCHKE (GFA ENVEST, GERMANY) AND I. M. EMMER (FACE FOUNDATION, NETHERLANDS).....	4
MODALITIES FOR SMALL-SCALE AFFORESTATION AND REFORESTATION PROJECTS UNDER THE CLEAN DEVELOPMENT MECHANISM, BY JENS MACKENSEN, UN ENVIRONMENT PROGRAMME (UNEP) AND LOU VERCHOT, WORLD AGROFORESTRY CENTRE (ICRAF).....	8
A&R ACTIVITIES IN MALAYSIA IN THE CONTEXT OF THE CDM, BY SALLEH MOHD. NOR AND MICHAEL V. GALANTE, TROPBIO CARBON EXCHANGE SDN. BHD.	12
A CARBON SEQUESTRATION INITIATIVE THROUGH LOCAL COMMUNITY PARTICIPATION IN NATURAL RESOURCE MANAGEMENT AND SUSTAINABLE DEVELOPMENT, BY PATRICK KARANI, BEA INTERNATIONAL.....	14

Editorial

THIS ISSUE OF THE NEWSLETTER HAS CARBON SEQUESTRATION AS ITS FOCUS—given the ‘freshness’ of the topic in international Kyoto discussions, not an easy theme and one that continues to raise many questions and strong arguments from various camps.

However, the issue has now received a partial blessing in the form of Decision 19/CP.9 (*‘Modalities and procedures for afforestation and reforestation project activities under the clean development mechanism in the first commitment period of the Kyoto Protocol’*) adopted at COP9 last December in Milan, Italy. This decision started a round of activities preparing for discussions during the forthcoming Subsidiary Body for Scientific and Technological Advice (SBSTA) that will, in turn, be in preparation for COP10. For instance:

- Parties and accredited observers were invited to submit their views on simplified modalities and procedures as well as on how to facilitate the implementation for small-scale afforestation and reforestation projects;
- Project participants were encouraged to use the IPCC *‘Good Practice Guidance for Land Use, Land-Use Change and Forestry’*;
- The secretariat was requested to prepare a technical paper on simplified modalities;
- SBSTA was requested to recommend a draft decision on simplified modalities and procedures and another on measures to facilitate their implementation;
- A draft decision was prepared for the Conference of the Parties serving as the meeting of

The CDM Investment Newsletter is a facilitating initiative. The Editors do not accept responsibility for any errors, inaccuracies, omissions or any loss that may result directly or indirectly from reliance on information in the articles in the Newsletter. However, the Editors do strive for high quality content and therefore reserve the right to accept or refuse to include any article or other information offered for inclusion in future issues. Views presented/positions taken in articles do not necessarily reflect those of the Editors on the issues presented.

Subscription

This Newsletter has been formatted for viewing on-line (Adobe Acrobat PDF), not for printing. As the Newsletter is only available to registered recipients, it is prohibited for current subscribers to make copies (whether hard- or soft-copy) and/or pass them on to a third party. If you think a third party would be interested to receive the Newsletter, please ask them to register with us (listserv-admin@climatebusiness.net) for inclusion on our automatic mailing list.

In order to help offset the costs of production & distribution, the editorial panel welcomes contributions from sponsors and will also, selectively, accept advertisements

the Parties to the Kyoto Protocol, at its first session, (Draft decision -/CMP.1); and, more recently

- The UNFCCC has called for experts for an afforestation / reforestation working group/panel.

The Newsletter is pleased to be able to bring the results of some of these deliberations to its readers in this issue. Given that some leading practitioners and researchers in the field have prepared the articles, we will not say any more but allow the authors to take the floor. Good reading!

Agroforestry in the CDM: An Opportunity for Synergy between Mitigation and Adaptation, by Louis Verchot, World Agroforestry Centre (ICRAF)

THE CLEAN DEVELOPMENT MECHANISM WAS DESIGNED TO FAVOUR THE TRANSFER OF CLEAN ENERGY TECHNOLOGIES to developing countries and lead to cleaner development pathways. As the debate has progressed, much attention has been given to the opportunities to store carbon through a variety of land management activities. This has been, and continues to be, a controversial issue in the international debates. Many countries and NGOs have opposed these types of projects because they felt that such activities would let developed countries off the hook of reducing their emissions and allow them to continue to pollute while funding carbon offset projects. On the other side of the debate have been arguments about finding the lowest cost solutions to atmospheric build-up of greenhouse gases and the need to provide development funds so that countries that suffer most from the negative impacts of climate change could receive some assistance.

At the sixth Conference of the Parties (COP-6) in Marrakech, Morocco, limits were placed on the nature of activities that could be undertaken and the amount of carbon credits that could be generated through land-use change and forestry activities. These limits excluded all activities associated with management of natural forests and agricultural lands. Only activities that could be characterized as reforestation or afforestation were deemed eligible for the first commitment period (2008-2012) of the Kyoto Protocol. At the recent COP-9 meeting in Milan, Italy, the rules for afforestation and reforestation projects under the CDM were finalized. These rules specify how projects are to set baselines, treat off-site impacts, and show that they are truly having additional impacts on the atmosphere over and above what would have happened without the CDM.

THE DEBATE ON ADAPTATION TO CLIMATE CHANGE IS JUST HEATING UP as the one on mitigation of the atmospheric build-up of greenhouse gases is drawing to a close. There are calls for CDM funds to be targeted at those who are likely to be most negatively affected by climate change – poor rural farmers. More studies are showing that climate change will have severe impacts on developing countries and on the agricultural sector in these countries in particular. For example, climate change is likely to result in a 10% decrease in maize production globally, with countries in West and southern Africa being hit particularly hard. Rice production in the tropical lowlands is also threatened, as temperatures above 32°C at flowering lower grain production by 5% for every degree increase. This means that rice production is threatened in many regions of South Asia and West Africa.

It is clear that activities taken as a result of the Kyoto Protocol will not be sufficient to halt the atmospheric build-up of greenhouse gases and that climate change is inevitable. Yet, in the face of changing climates, developing countries must increase agricultural productivity as a necessary step in starting the economic engine that will lead to food security and poverty reduction. All of this must happen while populations grow at rates of 3% or more per year. Over the next 30 years, there will be 2 to 3 billion more mouths to feed in the tropics. Agricultural productivity must meet these demands in ways that ensure environmental integrity and that facilitate poverty alleviation.

AGROFORESTRY OFFERS POTENTIAL SOLUTIONS TO BOTH THE MITIGATION OF AND ADAPTATION TO CLIMATE CHANGE. Agroforestry is a collective name for a family of land-use practices that involve trees. Put simply, agroforestry is any land-use system that incorporates trees

into the agricultural landscape as part of the production system. Agroforestry practices range from rotational improved fallows where trees remain on the land for as little as 9 months to 2 years, to production systems with permanent tree cover such as shade coffee, jungle rubber agroforests, and associations of trees and food crops such as the pine-coffee-banana system of eastern Java.

The IPCC report on Land-Use, Land-Use Change and Forestry offered new estimates on how much carbon could be stored in different land use systems. The report showed that conversion of unproductive croplands and grasslands to agroforestry have the greatest potential to absorb excess atmospheric carbon dioxide. A more recent estimate by ICRAF scientists suggests that the IPCC value was an overestimate, but that the potential for carbon sequestration of agroforestry is still high. Whatever the ultimate potential of agroforestry to contribute to reducing atmospheric greenhouse gas loads, it is clear that agroforestry has an important role to play in the CDM. Many agroforestry systems meet the requirements for afforestation and reforestation activities and will qualify for carbon credits under CDM rules.

In addition to contributing to climate change mitigation, there is good reason to believe that agroforestry systems can offer interesting adaptation options to farmers who will be affected by climate change. Trees can better withstand floods than cereal crops and thus provide stability in the production system during disaster years. Trees are deeper rooted than crops and can explore a larger volume of soil in search of water to maintain productivity in drought years. Trees also modify the soil, making it more porous. Thus, in low rainfall years, more of the water that falls on a field will infiltrate into the soil where it can be used by plants, rather than running off the surface of the field. The evidence is far from complete, but in several instances in trials that we are running in southern and eastern Africa, we see that agroforestry test plots produce good grain yields in dry years, when control plots produce poorly or fail to produce.

THE SCIENCE TO DEFINE THE POTENTIAL ROLES OF TREES IN HELPING FARMERS ADAPT TO CLIMATE CHANGE IS FAR FROM COMPLETE. But we know that the ability of farmers to adapt to changing conditions is dependent upon the availability of options. Agroforestry systems diversify the options available to farmers to help them remain more agile and able to adapt to changing climatic conditions and the vagaries of more variable climates.

So, while this is a new area of inquiry for scientists at ICRAF and in national agricultural research services, there are good reasons to look at agroforestry as a potential win-win option that merits attention in the CDM. Agroforestry offers the potential for synergistic activities in the CDM that meet both development goals (the 'D' in CDM does stand for development, after all) and climate change mitigation goals.

How Can Carbon Credits from CDM Afforestation and Reforestation Projects be Used by Annex I Governments and Companies? B. Schlamadinger (Joanneum Research, Austria), M. Dutschke (GFA invest, Germany) and I. M. Emmer (Face Foundation, Netherlands)

THE NEW "CARBON CURRENCIES" ADOPTED AT COP9 are tCERs (temporary CERs) and ICERs (long-term CERs), in summary referred to here as "expiring CERs". Expiring CERs differ from a "normal" CER in the following three areas: 1) they expire should there be an unplanned release of the carbon stocks, once certified; 2) they expire at the end of the project period (30 years, or up to 3 x 20 years); and 3) expiring CERs cannot be banked into future commitment periods. These limitations will lead to significant price discounts for credits from CDM afforestation and reforestation (AR). Depending on future carbon price expectations, these conditions may be major obstacles for the implementation of AR projects.

Why, therefore, should this project type be of interest if the credits are worth much less? Afforestation and reforestation can help developing countries' sustainable development aspirations in many ways, for example by mitigating soil erosion, providing a sustainable source of fuelwood, reducing imports of timber and fossil fuel, improving local employment, and enhancing biodiversity.

How can the restrictions of expiring CERs be addressed when governments or companies want to use them for their compliance with emissions caps? In order to encourage sustainable CDM afforestation and reforestation activities, the authors of this article propose options for making ICERs fungible with other “carbon currencies”.

The decision on expiring CERs was motivated by environmental integrity concerns on the one hand and by land-use sovereignty concerns in the project host countries on the other. It was argued that carbon stored in vegetation can be released back into the atmosphere at any time in the future, that therefore the resulting carbon credits should embody the associated liability, and that the credits should thus not have the same value as those from non-reversible emission reductions - such as from replacing fossil fuels. Developing countries, on the other hand, feared that “Kyoto lands” would remain blocked forever. Besides structural sovereignty concerns, they feared that future opportunity costs could turn out to be much higher than carbon benefits from the respective land areas. The solution to this dilemma has partly over-compensated for the real risks of AR projects, because projects that go according to plan will lead to permanent climate benefits well beyond the crediting period, but the associated credits expire nevertheless.

THE AUTHORS CONSIDER ICERS TO BE SUPERIOR TO tCERS. Compared to tCERs, ICERs have no obvious disadvantages; on the contrary, ICERs bring the added benefit of deferring due replacement to the end of the crediting period (up to 60 years). Theoretically the same effect could be reached through a chain of tCERs, however, with a higher degree of legal uncertainty and possibly higher transaction costs. Therefore, our argument will concentrate upon ICERs.

There are two main types of potential buyers for ICERs: governments interested in using them for compliance with their Kyoto Protocol targets; and/or companies that are subject to domestic emission limits (e.g., as part of a national emissions trading system).

SHOULD A GOVERNMENT PURCHASE ICERS FOR COMPLIANCE WITH ITS KYOTO PROTOCOL TARGET, it retains the liability due to the risks of unplanned release and it is liable for replacing the credits at the end of the project’s crediting period, even if the carbon stocks stored in the project remain intact (case 1, see Table 1). In essence, using ICERs is similar to borrowing emission credits from the commitment period in which the project-crediting period ends. The purchasing government can hedge against the risk of project failure through insurance (case 2). It may, however, turn out to be costly to internalize ICER replacement costs at the end of the project-crediting period, depending upon expectations of future market development. If, over the entire crediting period for example, allowance prices were expected to rise faster than the discount rate, expiring CERs would not be economically attractive.

As the Kyoto Protocol is an agreement between governments, individual companies only enter the picture under the provisions of domestic policies. For example, the EU has established an emissions trading system (ETS) that will start operating on January 1st, 2005. The ETS puts a ceiling on the emissions of several thousand companies (energy activities, production and processing of ferrous metals, mineral industry, pulp and paper industries). Companies can either reduce emissions themselves or purchase emission credits from other companies; they can also invest in CDM or JI projects (the latter only from 2008) to obtain credits. Credits from CDM AR projects will be included in the system from 2008 onward and the European Commission, will establish modalities for the “linking” of AR credits in the second EU trading period in its 2006 review of the scheme. One of the main reasons for excluding sinks credits in the first ETS trading period (2005 - 2007) was the perceived incompatibility of expiring CERs with other CERs and EU allowances, due to their limited lifetime.

AT THE DOMESTIC LEVEL, THERE ARE NOW SEVERAL POSSIBILITIES OF ASSIGNING THE RISK AND LIABILITY OF ICER CREDIT EXPIRY. These have emerged due to concerns that if a national government were to allow companies to use ICERs towards their compliance, then at the same time, the government would have to include them in its national Kyoto accounts, i.e., the government would accept liability at the international level. These possibilities are:

- Case 1: The government assumes liability upon project failure as well as project termination. Having the liability of project failure covered like this, however, fail to provide incentives for good project design and implementation;
- Case 2: The government assumes liability upon project termination, but leaves liability for project failure to the company. In this case, project managers will look for ways to increase the projects’ *inherent permanence*. For example, engaging the local community in project

design and implementation and creating local benefits can minimize the risks of project failure. Only once such safeguards have been taken, will financial risk management come in. Here, a government guarantee for credit replacement in the case of successful termination of the crediting period could be perceived as a premium for sustainable management of the project. This guarantee could also be financed through ODA, as it does not directly create ICERs;

Table 1: Options for addressing non-permanence and credit expiry at project termination. Two main cases are distinguished (ICER purchase by government or company)

		Who carries liability of non-permanence?	Who takes debits for expiry?
Government purchase	Case 1: no additional measures	Government	Government
	Case 2: Insurance against non-permanence	Insurance	Government
Company purchase	Case 1: ICERs can be converted into local currency, e.g., EUAs, without additional measures	Government	Government
	Case 2: ICERs can be converted into local currency if company insures against non-permanence	Insurance	Government
	Case 3: ICERs can be converted into local currency if company insures against non-permanence and has futures credits for the time of project termination	Insurance	Company (has to buy future credits)
	Case 4: The government exchanges each ICER against a discounted amount of x (e.g. 0.6) "local currency" (e.g. EUAs). For each ICER the government uses for Kyoto compliance, it banks $(1 - x)$ AAUs into future commitment periods in order to protect against future risks of the project. This approach works better if applied to a whole portfolio of projects funded by companies within a country	Risk is internalized into the price of EUAs by means of discounting	Government, but only up to the "risk free" share of every ICER

- Case 3: The government assumes no liability, as the company is held liable for both project failure and termination. However, because the company may have ceased to operate when the crediting period ends, the government would probably require a life-insurance type of contract or an allowance purchase option for the end of the crediting period. Essentially, the risk of project failure and the cost of future replacement will be internalized in the present value of the credit, adding to its cost. In this case, the cost of the credit used by the company to comply with the domestic emissions trading system will consist of the price of the ICER, the price of insuring against non-permanence, and the present value of the future credit to replace the ICER. For that replacement one may consider purchasing the later, unused part of the credit stream of "non AR" CDM projects;
- Case 4: The government discounts the ICERs based upon an estimation of their risks, taking into account host country, project type, fire frequency and other considerations. In such a case it would be helpful to procure a portfolio of projects, as individual projects might be subject to complete failure, and a portfolio would mitigate such a risk. The government would, for example, allow a conversion of an ICER into 0.6 EUAs, if 60 percent of the projects' certificates were considered "risk free".

Nevertheless, a government can still use the full amount of ICERs from CDM afforestation and reforestation projects for compliance with their Kyoto target, so that they have a surplus in that commitment period. This surplus can be banked into the next and subsequent commitment periods in the form of AAUs and the banked amount would increase from one commitment period to another, as more carbon is stored; this would serve as an "insurance buffer" in case there is an unplanned release of carbon from the project. At the end of the crediting period all the remaining ICERs must be replaced. If the project has gone according to plan, there will be an amount of banked AAUs available, so

that the ultimate debit to the government would only be as high as the amount of risk-free carbon sequestered by the project. If the project has produced only the risk-free portion of carbon sequestration, then part of the ICERs will already have been retired (or will never have been produced in the first place) with only the remainder due to be retired at the end of the crediting period; there will be no AAUs left so that the net result will be the same.

In all the above cases, AR ICERs can be freely converted into EU Emission Allowances (EUA) but it is the responsibility of the government undertaking the conversion to decide upon its risk management strategy, i.e., which option to choose.

IN CONCLUSION, there are a number of options to use ICERs generated by CDM afforestation / reforestation projects. In this article we have proposed several options to internalize the risk of premature release of carbon stocks and thus of project failure before the end of the project's crediting period. However, replacing the expiring ICERs at the end of the project can only take place if the investor government takes responsibility or if the money is set aside (e.g. in a life-insurance type of model). The mandatory expiry of ICERs could pose a major barrier to implementation of AR projects. We show that expiring credits, as currently foreseen, partially over-compensate real risks faced by afforestation and reforestation projects. To step back from the replacement duty at the end of the crediting period of successful activity types (e.g. high-quality AR or small-scale projects below 8,000 tons CO₂ per year - see recent submissions by World Bank and HWWA <http://unfccc.int/resource/webdocs/2004/02.pdf>) will not create significant additional risks for the integrity of the system. Once a project has succeeded in keeping carbon stocks in place for 20 years or more, it can be assumed that the sustainable development benefits have created enough incentives for the local population so that chances of long-term permanence are enhanced.

The authors can be reached by e-mail at bernhard.schlamadinger@joanneum.at. The work underlying this text has been supported by the EC funded Projects ENCOFOR (www.joanneum.at/encofor) – Contract B7-6200/2002/069-203/TPS, INSEA – Contract SSP1-CT-2003-503614 - INSEA, and the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety, Contract AG Z III 6.

CDM Project Bazaar

(current content)

******volume ca. 1.5Mt/yr (total 24.6Mt)******

Projects have already been received from CBNet partners in: China, Georgia, India, Indonesia, Morocco, Nigeria, Senegal, Vietnam, and Zambia. More are under preparation.

PINs & concepts available cover: renewable energy (SHP, wind, biomass, biogas), energy efficiency, energy distribution efficiency (NG & electricity), cogeneration, fuel switching, landfill gas, transport, and district heating.

If you would like to include your CDM projects in the Bazaar, please write to us for details.

N.B. *while the Bazaar <http://bazaar.climatebusiness.net/>, has a general news page, available to all, access beyond this point is only permitted for corporate members. Interested CDM project investors are encouraged to contact the Bazaar Administrator (bazaar@climatebusiness.net) for further details.*

Readers that are interested in presenting their experience or activities are requested to submit an outline to the editors (info@climatebusiness.net); details on type of content and the publication schedule can be found on our Web site <http://www.climatebusiness.net/newsletter.htm>. Please note that articles should not exceed 2,000 words!

Forthcoming issue: financing (end September)

The Listserve of the Climate Business Network (CBNet) (listserv@climatebusiness.net) is available for electronic discussions and presentation of views that can be submitted/answered to by e-mail for those readers that have registered for soft copies (mail: listserv-admin@climatebusiness.net). For readers that receive a hard copy, letters or faxes may be sent to the editors via BEA International.

Modalities for Small-scale Afforestation and Reforestation Projects under the Clean Development Mechanism, by Jens Mackensen, UN Environment Programme (UNEP) and Lou Verchot, World Agroforestry Centre (ICRAF)

ALTHOUGH, THE ISSUE OF SIMPLIFIED MODALITIES AND PROCEDURES FOR SMALL-SCALE PROJECTS was not initially discussed in the context of Land Use, Land Use Change and Forestry (LULUCF) Clean Development Mechanism (CDM) projects it however received interest particularly from countries in Africa and Central America. The SBSTA decision on forest CDM projects at COP9 now includes reference to small-scale projects.

Small-scale projects are defined as follows (UNFCCC decision 19/CP.9):

“Small-scale afforestation and reforestation project activities under the CDM are those that are expected to result in net anthropogenic greenhouse gas removals by sinks of less than 8 kilotonnes of CO₂ per year and are developed or implemented by low-income communities and individuals as determined by the host Party. If a small-scale afforestation and reforestation project activity under the CDM results in net anthropogenic greenhouse gas removals by sinks greater than 8 kilotonnes of CO₂ per year, the excess removal will not be eligible for the issuance of Certified Emission Reductions (tCERs) and ICERs”

Based on average growth rates it is estimated that small-scale CDM forest projects may cover 100-200 ha in most moist tropical conditions. This calculation is based on the assumption of 400 trees ha⁻¹ with 1cm annual diameter increment for fast-growing species such as Neem and a 20-year cycle¹. According to available studies, the minimum size for economically feasible CDM forest projects under specific circumstances is estimated to be at least 2,300 ha (annex 1).

The objective of formulating simplified modalities for small-scale projects is to reduce the project transaction costs (annex 2). However, there are very few LULUCF projects on the ground for which reliable cost estimates are available and most seem to be based on the AIJ-project phase or the experience of the Prototype Carbon Fund. Michaelowa & Stronzik (2002) point out that projects with an annual emission reduction of less than 50 kilotonnes CO₂ equivalent are unlikely to be economically viable with current world market price assumptions for greenhouse gas emission permits: for micro projects (<200 t CO₂e/year), transaction costs can reach up to several hundred Euro/tCO₂e and for small-scale projects (2-20 kilotonnes CO₂e/year) up to 10 Euro/tCO₂e.

THE FOLLOWING ARE OPTIONS FOR SIMPLIFIED MODALITIES AND PROCEDURES compiled for discussion with UNFCCC national focal points from Latin America, Africa and Asia during a UNEP-IUCN-FAO technical workshop held together with the Government of Peru (1-3 March 2003 Lima, Peru)

A. Applying the simplified modalities and procedures for small-scale CDM energy projects

The CDM Executive Board concluded key procedures for investments in small-scale energy projects in early 2003². The procedures determine that small-scale energy projects have to follow all stages of the project cycle as specified in the modalities and procedures for the CDM (see annex to decision 17/CP.7). In order to reduce transaction costs for energy small-scale projects, however, simplified modalities and procedures include the following:

- Project activities may be bundled, but total size of bundle should not exceed limits stipulated in paragraph 1 (i) of annex to decision -/CP.9—this would mainly allow for saving transaction costs related to PDD validation and project monitoring plan (pl. refer to paragraph 19 of small-scale modalities for energy projects).
- Requirements for PDD are reduced—as in the case of small-scale energy CDM projects; requirements for the PDD should be reduced for small-scale A&R projects in order to allow for lowered transaction costs and administrative burden.

- Baselines methodologies and monitoring plans are simplified—Michaelowa & Stronzik (2002) estimate that the minimum fixed costs for any CDM project amounts to 150,000 Euro, of which costs for baseline determination and monitoring represent approximately 30%. Savings through simplified modalities might therefore amount to an estimated 10-20% of total transaction costs.

For small-scale energy projects simplified baseline and monitoring plans are provided for selected project types (in accordance with paragraph 6c of decision 17/CP.7) and project categories. Hence, in order to derive simplified baseline methodologies and monitoring plans these would have to relate to certain project categories. These might be defined in broad clusters according to the nature of the A/R activity such as:

- Small block plantations for wood production;
- Agroforests (tree-based agricultural systems, e.g. pine-banana-coffee systems of Sumatra, cacao systems of West Africa, jungle rubber systems of Sumatra and Java, etc.);
- Rotational systems, where trees are grown alternately with crops (e.g. improved fallow systems of southern Africa, rotational woodlots of Tanzania).

Or they may be defined according to the overall objectives of the project:

- Commercial plantations;
- Rural development.

In the absence of defined categories the following are some general considerations:

- Measurement of certain C pools and other GHG fluxes (e.g. N₂O) for both baseline establishment and monitoring is expensive;
 - Small-scale projects may consider applying default values for soil C and below-ground biomass pools;
 - Default values should be chosen initially from IPCC, but if there is appropriate peer-reviewed literature that suggests different default values in the project area, alternative values may be chosen and properly documented. Under certain circumstances regional default values may be applied for given land use types;
 - Baseline methodologies established for certain project categories (e.g. agroforestry) might be applied by other projects, hence saving development costs.
- The same operational entity may undertake validation, verification and certification—it is not really clear how much might be saved through such a measure. However, given that there are only a few Designated Operational Entities so far, this provision may be a practical solution for developing countries.
 - The CDM Executive Board may accept a lower share of proceeds to cover administrative costs and registration fees, but so far there is no indication of the expected share of proceeds and possible discounts.

B. Neglecting leakage for small-scale CDM forest projects

Given the problems with attribution of project leakage and considering the size and the developmental objective of small-scale CDM forest projects, no leakage assessment should be conducted. This provision would require that an initial environment and socio-economic analysis does not indicate any adverse project impacts within the project boundary, which could be taken as a general indication of the absence of adverse project impacts to the outside.

C. Lower share of proceeds for UNFCCC adaptation fund

The 2% share of proceeds for CDM projects should be lowered or abandoned for small-scale CDM forest projects.

D. Allowing full ODA support during development and implementation of small-scale afforestation and reforestation CDM projects

Full ODA support should be eligible for the development and implementation of small-scale CDM forest projects following existing ODA priorities and/or policies of the CDM host country, which would have to be approved by DNA. Proceeds from the carbon finance, however, would not return to the ODA funding country.

E. Institutional support for community-based CDM projects

CDM-specific methodologies may constitute an insurmountable barrier for small communities wanting to implement small-scale projects. Therefore, provisions should be made to encourage the active support of international, regional or national forest-related research institutions that could support, for example, development and implementation of baseline methodologies and provide related training at the local level.

F. Umbrella marketing of CERs derived from small-scale CDM forest projects

Marketing of small quantities of CERs may prove difficult for small communities, so provisions should be considered that encourage bona fide umbrella marketing of those derived from small-scale CDM forest projects. National institutions in the host country, such as the DNA, or project investors could support small communities by clustering CER marketing.

ANNEX 1 - MINIMUM ECONOMIC SIZE OF CDM FORESTRY PROJECTS

Locatelli and Pedroni (2003) developed a model, which accounted for the impact of various CDM forestry project parameters on the minimum size of projects. Major model parameters included *inter alia*: accounting methodology; CER price; design and validation costs; monitoring costs; verification costs; crediting period; risk discounting; discount rate; and verification interval. The total number of parameter combinations amounted to 7,776.

Key factors describing the distribution of model results according to the carbon credits accounting method (Locatelli and Pedroni, 2003)

Method	Median value	% of simulations allowing projects <500 ha to be profitable in the CDM	% of simulations allowing projects <1000 ha to be profitable in the CDM
Ton-year	11,000 ha	0%	2.8%
ACS	3,000 ha	5.1%	17.7%
TCER1	2,300 ha	13.7%	30.2%
TCER2	3,250 ha	9.7%	23.1%

Taking the median value of minimum project area under extreme conditions (Locatelli and Pedroni, 2003), TCER1 is the closest option to the recent UNFCCC SBSTA decision on modalities for afforestation and reforestation activities under the CDM, while the other accounting methods discussed in the paper are not applicable within the CDM.

The impact of extreme conditions on the required minimum size of projects (Locatelli and Pedroni, 2003)

Extreme condition	Ton-year	ACS	TCER1	TCER2
Crediting period only 10 years	275,000	14,200	3,000	50,000
CER price of only 3\$/tCO ₂	30,000	6,750	4,500	6,550
Highest transaction costs	18,550	5,650	3,700	5,000
2% risk discounting per year	11,000	5,150	2,400	3,250
CER price to increase 3% per year	11,000	3,000	14,550	30,000
Without any condition	11,000	3,000	2,300	3,250

A recent analysis of 12 LULUCF projects in mostly non-Annex I countries indicates that average project size is about 8,600 ha (median 6364 ha, n=12, OECD and IEA, 2003)

Some of the conclusions of Locatelli and Pedroni (2003) include:

- Only crediting periods longer than those agreed for energy projects (10 vs. 21 years) would provide incentives for small- and medium scale projects;
- Temporary CERs seem to be appropriate to take non-permanence into account, however, there is a significant risk for low prices of temporary credits;
- High transaction costs due to current CDM rules exclude small-sized projects from the CDM;
- Participation of small-scale projects might be encouraged should there be additional benefits such as through combination with energy production or adaptation.

ANNEX 2 - TRANSACTION COSTS FOR CDM PROJECTS

Transaction Cost Components	Description
Project based pre-implementation costs	
Search (fixed)	Incurred by investors and hosts as they seek out partners for mutually advantageous projects
Negotiation (degressive)	Related to the preparation of PDD, public consultations with key stakeholders
Baseline determination (fixed)	Development of a baseline (consultancy)
Approval (fixed)	Authorization from host country
Validation (fixed)	Review and revision of PDD by operational entity
Review	Reviewing a validation document
Registration (fixed)	Registration by UNFCCC Executive Board
Project based implementation costs	
Monitoring (fixed)	Data collection
Verification (degressive)	Hiring an operational entity and to report to the UNFCCC Executive Board
Review	Reviewing a verification
Certification (degressive)	Issuance of xCERs by UNFCCC Executive Board
Enforcement (proportional)	Administrative and legal measures incurred in the event of departure from the agreed transaction
Trading costs	
Transfer	Brokerage
Registration	For holding an account in national registry

References

Locatelli, B. and Pedroni, L. (2003). *Accounting methods for carbon credits – impacts of the minimum size of CDM forestry projects*. Working Paper, Global Change Group, CATIE, Costa Rica.

Michaelowa, A. & Stronzik, (2002). *Transaction costs of the Kyoto Mechanisms*, HWWA Discussion Paper No. 175, March 2002, 35pp.

OECD and IEA (2003). *Forestry projects – lessons learned and implications for CDM modalities*. COM/ENV/EPOC/IEA/SLT(2003)1. 49 pp.

¹ Project size might be larger for semi-arid and arid areas

² Marrakech Accord in 2001 agreed in decision 17/CP.7 (FCCC/CP/2001/13/Add.2) available from <http://unfccc.int/cdm/>

A&R Activities in Malaysia in the Context of the CDM, by Salleh Mohd. Nor and Michael V. Galante, TropBio Carbon Exchange Sdn. Bhd.

ABSTRACT: THE POTENTIAL FOR THE FORESTRY SECTOR UNDER THE CLEAN DEVELOPMENT MECHANISM (CDM) IN MALAYSIA IS VAST. With the modalities recently adopted at COP 9, held in Milan, Italy, it seems that afforestation and reforestation (A&R) activities are likely to proceed. Although currently there is a greater tendency towards renewable energy activities in Malaysia, it does not mean that A&R will be sidelined but their inclusion might be slightly delayed due to the need to establish institutional mechanisms and to complement the development of Sustainable Forest Management (SFM) and Sustainable Development.

The large number and mandate of Forest Management Units (FMUs) in the country shows that forestry is of major concern to the country's resource management agenda. Through the CDM, FMUs will be able to develop and prosper with the potential to become a model for achieving sustainable development, especially within the tropics. Malaysian forestry offers many advantages for investors as it provides a long-term investment now supplemented by the additional opportunities from the CDM, thus making forestry more attractive to a wider audience.

MALAYSIA HAS ENDEAVOURED TO RESTORE BALANCE TO THE GOALS OF SOCIO-ECONOMIC DEVELOPMENT AND THE MAINTENANCE OF SUSTAINABLE ENVIRONMENTAL CONDITIONS since the 1970s by introducing a variety of regulatory and non-regulatory measures. These objectives, derived from the third Malaysian Development Plan (1976-1980), have been reaffirmed in subsequent development plans (8th Malaysian Plan and the Malaysian Vision 2020). Among the strategies for natural resource management that are continuously being adopted and promoted are: prevention and control of pollution and other forms of environmental degradation; land-use planning based on land suitability, capability and carrying capacity; and integrated project planning and implementation whereby environmental considerations are given heightened emphasis.

Malaysia signed the UNFCCC on 9 June 1993 and ratified it on 17 July 1994. This was followed by ratification of the Kyoto Protocol in September 2002. Subsequently, the government established the National Climate Committee (NCC), to help meet its obligations under the Convention, that consists of representatives from relevant sectors with the former Ministry of Science, Technology and the Environment (MOSTE) as Chair (the newly-established Ministry of Natural Resources and Environment will probably take over MOSTE's responsibility).

There are two technical committees under the NCC: the Technical Committee for Energy facilitated by the Malaysian Energy Centre; and the Technical Committee for Forestry facilitated by the Forest Research Institute Malaysia (FRIM).

Malaysia is a very complex and diverse coastal nation rich in biodiversity and natural resources. Covering an area of 329,733 km², Malaysia is divided into two regions, separated by approximately 644 km by the South China Sea. Malaysia consists of thirteen states, eleven on the Malayan Peninsula and two, Sabah and Sarawak, on the island of Borneo. The country is situated in the equatorial region lying between latitudes 1°N and 7°N and longitudes 90.5°E and 120°E.

THE SUSTAINABILITY OF FORESTRY PRACTICES IS NOW BEING SERIOUSLY QUESTIONED, especially with regards to tropical forestry. According to an International Tropical Timber Organization (ITTO) study, less than one tenth percent of tropical forests are managed on a sustainable basis. Due to the endless season of perfect growing temperatures and rainfall, it would seem most *unlikely* that forestry in the tropics could ever become unsustainable. Truly, if sustainable practices are in place, then the issue of depletion and degradation should not arise. However, it has been shown that, in some regions, there were unsustainable practices in the past that still continue today. If correct and sustainable management of tropical forests is not taken seriously enough, it may soon be too late and the damage could take an immeasurable amount of time to repair.

There are two important issues to consider when assessing the impact of climate change on forestry. Firstly, forests are an essential component of the global carbon cycle acting as a reservoir

for storing carbon. Secondly, forest ecosystems are integral parts of the global biological system that constantly reacts to variations of the climate. Trees and plants can modify their own physiological functions if the situation requires, and animals are just as adaptive as they are constantly shifting areas in which to reside.

However, tropical forests are more vulnerable to land use change than to climatic changes, so the amount of forest that is left will be the result of a balance between land conversion for economic activities and sustainable forest management practices that are imposed. Recognizing that many tropical countries are still relatively dependent on their natural resource activities both as a source of foreign exchange as well as for survival, it is critical that the forests are managed in a sustainable manner in perpetuity. In this respect, the issue of plantations may be worth discussion; they can provide a superior source of supply for the timber industry and provide maximum utilisation of the logged-over/ degraded land, which is in abundance in Malaysia and in many parts of the tropical world.

UNFORTUNATELY, THE CONVERSION OF NATURAL FORESTS TO AGRICULTURE OR PLANTATIONS is often considered as the only means to increase the economic well being of local communities. However, this practice has resulted in mixed results in terms of land use and sustainability depending upon the model of land conversion and the economic and political system present. In Malaysia, under organized land conversion systems, forests have given way to acacia and rubber plantations, all of which have provided excellent income and employment opportunities. Forest plantations also provide additional non-wood forest products (NWFP) from planted trees to other elements of the ecosystem that they create and support. They contribute to social, economic and physical development of areas, which increase the livelihoods of the stakeholders along with the country's overall growth. Furthermore, they also contribute to combating desertification by protecting soil and water and, if planned properly, can contribute to the rural landscape and the maintenance of biodiversity.

Plantation development is not a new concept; rather it is one that ***must be enhanced in its delivery***, as there are still vast areas of forest that have been harvested without any degree of regeneration taking place. In addition, with forests being exploited and/or converted to agricultural use, forestry has been relegated to the hills, which yield lower quality timber and present more management problems. Subsequently, there has been a switch from the traditional concentration on yield management towards a greater concern for biodiversity, socio-economic issues and environmental protection. This has led to a controversy, escalating to a global scale with a fundamental question now being asked, *"How can we fix this problem and what timeline can we forecast for its completion?"*

There is a significant amount of degraded land left over in Malaysia from harvesting, shifting agriculture and forest fires. According to a baseline study conducted by FRIM and the Forestry Office Peninsular Malaysia, there is approximately 2.8 million *ha* of land that is suitable for conversion to forest plantations and that would help reduce the pressure of logging on natural forests.

Malaysia also has a significant amount of degraded, burnt-over land (largely due to the drought and subsequent forest fires over time) and as a result, the full potential of the land is not being utilised. However, this is set to change as a massive reforestation and plantation-replanting programme is planned: logged-over/degraded areas will be utilised as production forests by investing in plantations and silviculture activities, especially enrichment planting of fast growing indigenous species; silviculture treatments will be considered, even if the results might be slower; enrichment in appropriate areas will ensure higher productivity; and this form of "intensive" natural forest management will be encouraged in logged-over and burnt forests. It is expected that this activity will be initiated as soon as feasibly possible.

THE FULL POTENTIAL OF FORESTRY CDM PROJECTS HAS NOT BEEN SUFFICIENTLY EXPLOITED in the country despite several 'inception schemes' that have brought few results to date. In an attempt towards addressing this gap, Malaysia has established a number of "Forest Management Units" (FMUs); these are long-term concessions that allow the private sector (as the owner) to incorporate and put into practice as many of the elements of SFM as possible (land in Malaysia is owned by the State). SFM encompasses the entire range of variables beyond just natural forest conservation, including biodiversity, wildlife management, plantation forests, concession forests, community development, watershed protection and the fostering of goodwill

between all parties to enable a broader choice of economic activities. This approach will lead towards a greater opportunity for all and facilitate a continuation of the activities within the area in perpetuity.

Commencing in 1998, the FMU initiative programme started with the State Government (in particular the state of Sabah) giving large "concessions" of generally logged-over forest to the private sector to undertake SFM with the first prerequisite being the development of a Forest Management Plan (FMP), the key factor in SFM. The FMP specifies areas for different activities such as harvesting, reforestation, plantation development, community forestry and conservation.

Using this concept and deploying it on a national scale takes a great deal of coordination, understanding and commitment by those involved. But, with the plans now in motion, the time has come to capitalize on the potential of the FMUs and their carbon capacity.

Providing the proper institutional infrastructure to generate and facilitate opportunities is essential for the development of the CDM industry in Malaysia. Given the current situation in the country and the new initiatives mentioned above, it is evident that there are vast opportunities in Malaysia for carbon sequestration under the CDM. Knowingly there is a shortage of credits in the European Union emissions reduction scheme, and as a result they should be more willing to utilise Kyoto's flexibility mechanisms to achieve further offset their emissions. This will contribute to the overall amount of emissions reductions and contribute towards meeting the EU target. CDM is a very logical and timely mechanism to reach these goals and the goals of sustainable development.

IN CONCLUSION, MALAYSIA HAS A LONG HISTORY OF FORESTRY, starting with exploitation but followed by efforts towards sustainable forest management that now include conservation of biodiversity and the environment. The CDM comes at an opportune time when Malaysia is seriously looking at the development of forest plantations, with a number of Forest Management Units being established especially in Sabah but with similar developments occurring in Sarawak. The opportunities are immense and the potential for the future is exciting.

¹ Malaysia experiences relative uniform temperatures throughout the year. The mean temperature in the lowlands ranges between 26°C and 28°C with little variation and normally reaches a high of 32°C in an average day. Annual variations of the daily mean temperature may be as small (about 2°C to 3°C). The diurnal variation may be as large as 12°C. Air temperatures of 38°C have rarely been recorded. Relative humidity is generally high, with an average reading of 80%. Average rainfall is between 203 cm and 254 cm per year with monsoon rains between the months of November and February on the Peninsula and June to September on Malaysian Borneo

A Carbon Sequestration Initiative through Local Community Participation in Natural Resource Management and Sustainable Development, by Patrick Karani, BEA International

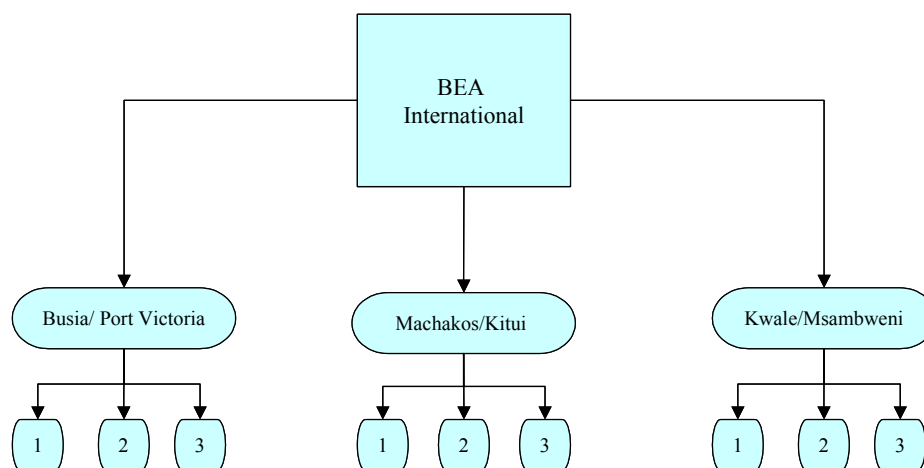
THIS ARTICLE HIGHLIGHTS AN INITIATIVE THAT ENHANCES CARBON SEQUESTRATION THROUGH LOCAL COMMUNITIES' EFFORTS IN NATURAL RESOURCE MANAGEMENT AND SUSTAINABLE DEVELOPMENT. The purpose of the initiative is to obtain benefits from the international conventions on climate change¹, biodiversity² and desertification³. These conventions have the scientific, political and financial support to reduce carbon in the form of carbon-dioxide (CO₂) accumulating in the atmosphere at a rate of about 3.5 gigatonnes (Gt) per year as a result of tropical deforestation, combustion of fossil fuel and other land use changes. Accumulation of carbon in the form of greenhouse gases in the atmosphere pose dangerous risk and interference with the climate while desertification and land degradation continue to cause poverty and also pose a threat to the biodiversity of many areas.

A number of carbon funds, established to assist with reducing emissions of greenhouse gases under the UNFCCC, target projects that also address sustainable development. Beneficiaries of these funds could be local communities dependent on biomass (about 31 % of total energy consumption is primarily from biomass sources) and the projects could also impact upon concerns of the other two conventions by reducing potential for desertification and loss of biodiversity.

World Utilization Rate of Primary Biomass Production	
Terrestrial	49% (770 EJ)
Hydrosphere	4% (38 EJ)
Total	31% (808 EJ)

BEA INTERNATIONAL AND PARTNERS ARE PILOTING WITH LOCAL COMMUNITY BIOMASS PROJECTS that would qualify for CDM funding and investments. Thus far, an analysis of 6 potential project sites in Kenya has been undertaken: Busia (Budalangi/Port Victoria), Bungoma (Webuye), Kisumu (Uranga and Maseno), Nakuru (Gilgil), Taita-Taveta (Kibwezi), Mombasa (Bamburi and Msambweni). Available land parcels for pilot projects in these areas are found in the mountains or hills or in non-settlement areas. The parcels have been identified and geo-referenced by Global Positioning System (GPS) in collaboration with the Regional Centre for Mapping of Resources for Development (RCMRD) and World Agroforestry (ICRAF) and data fed into a Geographical Information System (GIS) application. The GIS analysis has shown that the land parcels are not utilized for commercial, economic or settlement purposes.

Arrangements have been made with local authorities in Busia, Machakos and Kwale districts to enable local communities' access to the areas to enable and initiate pilot carbon sequestration projects. The local authorities support the initiative and fully endorse the idea of local community participation. The chart below shows the first phase of this initiative under the aegis of BEA International, World Agroforestry Center (ICRAF) and ENCOFOR (Environment and Community based framework for designing afFOREstation, reforestation and revegetation projects in the CDM: methodology development and case studies).



SOME OF THE CHALLENGES EXPERIENCED BY LOCAL COMMUNITIES in sustainable natural resource use and carbon sequestration include:

- Over-exploitation of natural resources. This is common in most rural areas that continuously experience rapid population growth and imbalanced competition for land use (agricultural expansion vs. settlement). Woodland and bushland in semi-arid areas are also under great pressure from increasing sedentariness of pastoralists and migration of people from other places. Loss of forest cover and other types of woody vegetation also lead to increasing scarcity of a wide range of forest products, environmental degradation and loss of biodiversity as well as of carbon sequestration potential. By enhancing opportunities for carbon sequestration, possibilities for achieving sustainable land use systems and socio-economic gains are provided. However, policy and legal instruments are necessary to encourage proper natural resource management and carbon sequestration;
- Competition from the market forces of supply and demand provides stresses on sustainable management of natural resources and carbon sequestration, for example:

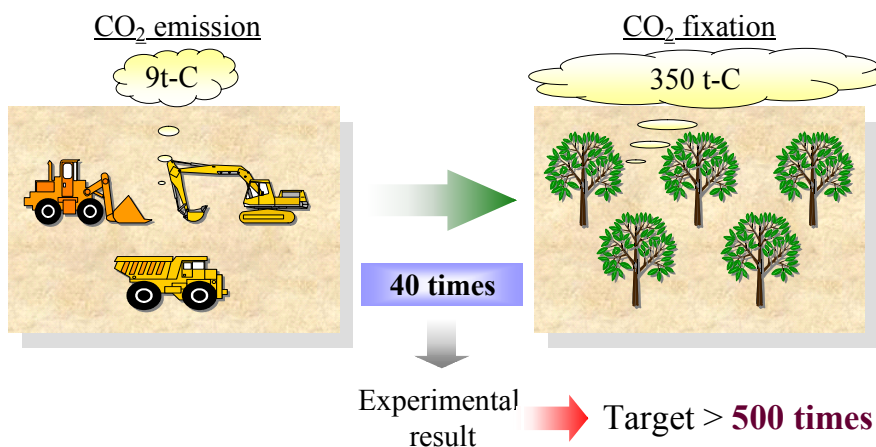
- Increasing demand for natural resources, in particular forest products in the form of fuelwood, timber, construction and fencing poles, creates gaps between supply and demand;
- Industrial demands for forest products override local communities' interests;
- As the demand continues to increase, the supply gets more stretched and local communities become more marginalized economically and socially.

Projections show that by the year 2020, demand for forest products in Kenya will be about 45 million cubic meters (M³) while the supply will be only 38 million M³ creating a deficit of 7 million M³ in supply of forest products. Local communities that dependent on fuelwood will be most affected by this deficit as a result of deforestation and further environmental degradation. This initiative aims to rehabilitate deforested and degraded areas through local community participation. Reclamation of these areas will generate carbon offsets for monetary exchange and the wood chips will be used to supplement energy sources.

THE NEED FOR A BOTTOM-UP APPROACH in managing our environment has been advocated in the three global agreements. However, instruments available under the Climate Convention, such as carbon sequestration, have not so far benefited rural communities. In this initiative, 10,000 ha land has been made available for the first phase in Machakos/Kitui/Makueni, 120 ha in Msambueni/Kwale/Mombasa and 100 ha in Busia/Budalangi/Port Victoria. The land is being prepared for forestry and local communities are responsible for managing the project on site with the assistance of the project team. At maturity, the carbon offsets will be realized as in the picture. It is estimated that 700 trees will be planted per ha of land with a potential of 500 kg of carbon fixation per tree. BEA International will undertake the analysis of carbon sequestered and match it with available market prices. It is anticipated that one project site could generate over 8,000 tonnes of carbon per year. This qualifies as a small-scale project under the CDM. The figure shows the potential of a mature tree sequestering about 0.5 tonnes and 700 trees generating 350-500 tonnes of carbon per year.

Carbon balance at Site C

Carbon fixation per a matured tree	: 500 kg-C
Number of planted trees at Site C	: 700 trees
CO ₂ emission for preparation of Site C	: 9 t-C



The aim of this initiative is to understand and promote the carbon market as an innovative mechanism that enables local communities' participation in management of natural resources while supporting sustainable development efforts.

¹ United Nations Convention on Climate Change (UNFCCC)
² United Nations Convention on Biodiversity (UNCB)
³ United Nations Convention to Combat Desertification (UNCCD)

**Bureau of
Environmental
Analysis
(BEA International)**

Nelleon Place, off Rhapta Road
P.O. Box 15953-00100
Nairobi, Kenya
Tel: 254-2-444 0426
Fax: 254-2-444 1397
Web: <http://www.beainternational.org/>
Contact info@beainternational.org

**Climate Business
Network
(CBNet)**

Janewit Pitayataratorn, DSc, M.Econ
Managing Director
janewit@climatebusiness.net
Frankenberggasse 9/10
A-1040 Vienna, Austria
T: +43 (1) 4028433 -12
F: +43 (1) 4028433 - 33
Web: <http://www.climatebusiness.net/>
General queries info@climatebusiness.net

Credits

Editorial Panel

Dr. Patrick Karani
Dr. Peter Pembleton

Layout/Design

Zuzanna Muraszkwicz