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Guidebook to Markets and Commercialization of Forestry CDM projects

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Presentation

The Clean Development Mechanism (CDM) defined in Article 12 of the Kyoto Protocol (KP) allows industrialized countries (Annex 1 Parties) to acquire Certified Emission Reductions (CERs) from project activities implement in developing countries (non-Annex 1Parties). The CERs generated by such project activities can be used by Annex 1 Parties to help meet their emissions reduction targets under the Kyoto Protocol. CDM project activities are also to assist developing countries in achieving sustainable development and in contributing to the ultimate objective of the United Nation Framework Convention on Climate Change (UNFCCC).

Forestry activities, limited to afforestation and reforestation (AR), are eligible for the CDM. They may include afforestation or reforestation of degraded lands, conversion of agricultural land to agro-forestry systems, and commercial plantations, among others. AR-CDM project activities are subject to the specific modalities and procedures of the CDM. They have the potential of improving livelihoods and the environment in impoverished rural areas of developing countries by leveraging investments in the forestry sector that would not occur in absence of the possibility of selling CERs.

For the last two years, more than US$18 billion have been traded in the international carbon market, corresponding to more than 992 million tons of carbon dioxide equivalent (CO2e). Currently, almost 500 projects activities have been registered under the CDM, having traded already more than 421 million CERs, representing nearly 20 % of transactions in the carbon market.

Due to various reasons stemming from the political negotiation of the KP as well as delays experienced in the definition of the modalities and procedures and the inherent technical issues faced in developing afforestation and reforestation CDM project activities, only one forestry project has been successfully registered in the CDM. Nevertheless, 2006 was an important year because an initial set of baseline and monitoring methodologies for CDM forestry projects was approved, launching a renewed interest of AR project developers for the CDM.

Given the little experience gained on trading CERs from forestry projects, this guide aims at providing information to project developers about markets and commercialization of CERs from forestry projects. The guide takes the reader through the development stages of a CDM forestry project; the specific characteristics of forestry CERs and the demand for this type of credits.

This guide has been prepared by the FORMA project, which is an initiative of a consortium of research institutions pursuing the objective of strengthening CDM capacities in Latin America in the forestry and bioenergy sectors. FORMA has provided technical and financial assistance to project developers and is publishing a set of tools and technical guides aimed at facilitating the preparation of CDM project activities in the two abovementioned sectors.

FORMA acknowledges the authors of the present guide, Till Neeff and Sabine Henders from Ecosecurities, who worked as consultants for the FORMA Project.

Lucio Pedroni, Ph.D.

Head of the Global Change Group

CATIE

Table of Contents

1 Preliminaries

1.1 Target group, objectives and outline of the guidebook

This guidebook is directed towards the developer of afforestation and reforestation project activities under the Clean Development Mechanism (CDM). The CDM is defined by Article 12 of the Kyoto Protocol to the United Nations Framework Convention on Climate Change (UNFCCC) to assist developed countries in meeting their binding greenhouse gas (GHG) emission reduction targets under the Kyoto Protocol while at the same time assisting developing countries in meeting their sustainable development goals. With the emergence of a GHG or carbon market parallel to the negotiations leading to the approval of the Kyoto Protocol, which finally entered into force in February 2005, and the existence of a currency (namely, t CO2-e) with a price emission reduction or GHG removal activities can generate new, additional revenue streams through mechanisms such as the CDM. Forestry activities are well positioned to contribute to the twofold objective of the CDM, and to ultimately foster sustainable rural development. This potential will only materialize if projects are able to access the carbon markets where their carbon removals can be transformed into revenues streams. The carbon markets for forestry projects are a niche market and are still emerging, and presently there is little clarity among the forestry community as to their dynamics, their rules and their structures. This guidebook intends to provide project developers with the necessary information for developing forestry project's potential to generate revenues from commercialization of carbon credits.

This guidebook provides an overview of forestry CDM projects, a description of the carbon markets, and it gives recommendations to the project developer. The information contained in this guidebook is based on EcoSecurities experience as a major market player, in-depth interviews with other key market actors, a review of secondary information, and on a survey among market actors. The next section lists minimum requirements that CDM forestry projects need to meet, outlines steps of the CDM project cycle, gives an overview of risks, looks at forestry CDM projects from a financial viewpoint, and discusses quality standards. The third section outlines the present state of the markets and describes some of the mechanics and policy processes underlying them. The fourth section is dedicated to the procedures for commercialization of carbon credits and analyzes buyers' preferences, and project success criteria. Finally, EcoSecurities recommends strategies for carbon credit commercialization. The project developer is provided with a check-list to checking concrete initiatives against the data and the insights that this guidebook compiles.

1.2 Context of climate change, forestry and the Clean Development Mechanism

Growing concern over the impact on the atmosphere and the world's climate of anthropogenic GHG emissions has prompted the world community to address this pressing environmental problem. The atmospheric concentration of CO2 has increased from 280 ppm in pre-industrial times to more than 380 ppm in 2005 (Earth System Research Laboratory 2006). The world climate has a large impact on plants and animals in the natural environment, on oceans, and on human beings and human activities, such as agriculture, water supplies, and heating and cooling. The severity and time span of the effects of climate change are still under discussion.

One thing is certain; if no actions are taken in the short term to reduce emissions, the effects (how severe they may be) can not be avoided.

The UNFCCC, signed in 1992, represents an international agreement to stabilize GHG concentrations in the atmosphere at 1990 levels. In 1997, the Kyoto Protocol, adopted by industrialized and developing nations (Annex I and non-Annex I countries), sets binding emission targets for Annex I countries for the period 2008 – 2012 for a number of potent GHGs. The protocol, which entered into force in February 2005, establishes “flexibility mechanisms” to allow industries and countries to have more and cost-effective options for reducing emissions.

The CDM is one of those mechanisms that allow for the purchase of Certified Emission Reductions (CERs) by Annex I Parties from sustainable development projects in non-Annex I countries as a means of complying with binding emission reduction targets. The projects generating the carbon credits can be carried out in a number of technology sectors (e.g., renewable energy, energy efficiency, land use and forestry). Up to the end of 2006 around 400 projects have been registered with UNFCCC.

This guidebook specifically describes markets for carbon credits issued from projects in the land use, land-use change and forestry sector (LULUCF).

2 Forestry Projects under the CDM and Finance

This section provides background information on the mechanics of forestry CDM that has implications on the commercialization of projects. This section does not address small-scale projects, because these are governed by different financial principles. Going beyond the CDM, there is also a brief discussion of the risk profile and financial characteristics of forestry projects. The later sections frequently refer to the information provided here.

2.1 Mechanics of forestry projects under the CDM

2.1.1 Prerequisites for participation of projects in the CDM

In the first commitment period of the Kyoto Protocol (2008-2012), the scope of activities eligible for the CDM is limited to afforestation and reforestation projects. Either category concerns the conversion of land to forest that was not covered by forest before or on December 31st, 1989. Projects must demonstrate that the land within the project boundary was not covered by forests in 1990, and that the sites are not covered by forest at project start.

The demonstration of compliance with the definition of afforestation and reforestation relies on the host-country's national definition for forests under the CDM. The national forest definition for the CDM is established by the host government and reported to the CDM's Executive Board. Countries may choose threshold values defining a Kyoto forest from the following ranges:

- Minimum crown cover: 10-30%
- Minimum height at maturity of vegetation: 2-5 m
- Minimum area: 0.05-1 ha

In some countries, proof of the state of vegetation since 1990 is not straightforward due to limited availability of historical land-cover data. Therefore, the EB clarified that the proof of forest absence in 1990 could rely on:

- aerial photographs or satellite imagery; or
- ground-based surveys; or
- if these options are not available/applicable a participatory rural appraisal.

2.1.2 The project cycle in forestry CDM

The relevant decisions of the Parties to the Kyoto Protocol established a regulatory framework for CDM projects, which the EB oversees. According to these regulations, CDM projects undergo a typical project cycle, through a number of steps from their initial conception through registration (Figure 1).

2.1.2.1 Initial documentation: Project Idea Note, Letter of Endorsement, and Letter of Intention

The project cycle usually initiates with the elaboration of a preliminary Project Idea Note (PIN) that summarizes a first concept and project structure. Some host country authorities use this to issue a Letter of Endorsement (LoE) or letter of no objection for this project concept, issuing

a first confirmation to continue with the project development based on the outlined design. From some potential credit buyers, it is possible to obtain a Letter of Intention (LoI) to purchase credits based on the PIN.

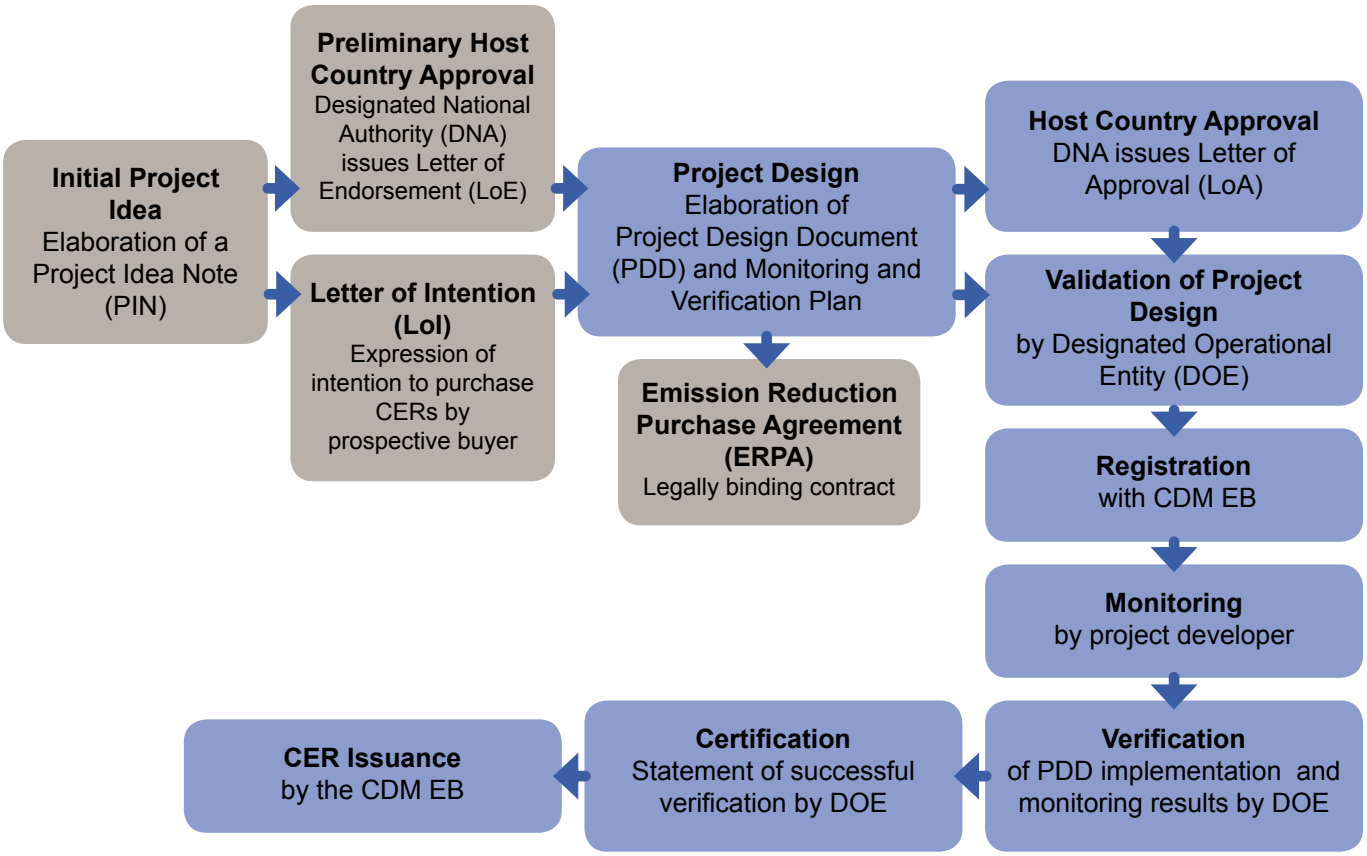

Figure 1: Overview of the CDM forestry project cycle. Blue boxes are officially required steps, and grey boxes correspond to common, but not mandatory activities.

2.1.2.2 Project design and Project Design Document

The project design phase is the process of defining the concept of the project, estimating the GHG mitigation potential of the project, undertaking the feasibility analysis, identifying the various project partners and developing a working plan. Projects consolidate their design often only after elaboration and preliminary endorsement of a PIN. The project design will be fixed and consolidated in the Project Design Document (PDD), which needs to be submitted to the CDM authorities in a specified format, and that includes information on the following:

- Description of project activities, including location, technical details and any relevant background information.
- Parties involved in the project, with addresses and contact details.
- Rationale for eligibility as a CDM project, considering among others the eligibility of lands.
- Estimation of GHG mitigation potential, based on an analysis of project and baseline carbon flows. This estimate needs to be developed using a baseline methodology that is approved by the EB. Projects can either use approved methodologies or submit their own specific methodologies for approval.

- A monitoring and verification plan that must be developed according to an approved monitoring methodology. Projects can use a previously approved methodology or submit their own for approval.
- A summary of comments by local stakeholders and how these are taken into account in the project.
- An analysis of environmental and socio-economic impacts of the project, or an Environmental Impact Assessment report if it deemed to be necessary according to host country regulations.

2.1.2.3 Methodology approval

For the definition of baseline and monitoring schemes, projects can either use approved methodologies (see Annex 2) or submit new methodologies for approval. If projects decide to submit a new baseline and monitoring methodology, the project can only be validated based on an approved methodology. Registration of projects is therefore delayed until the methodology has been approved by the EB.

Methodologies are science based documents defining the baseline as well as monitoring scheme with focus on: applicability criteria, eligibility, boundary definition, inventory design, etc. (See Annex 3 for access information).

2.1.2.4 Emission Reduction Purchase Agreements

In any phase of the project cycle, there is the option of establishing emissions reduction purchase agreements (ERPAs) between interested credit buyers and project developers. In contrast to the LoI, the ERPA constitutes a legally binding contract (see section 4.1.2). Even though the ERPA can be signed at any stage of the project cycle, projects that depend on the CER revenues as seed capital for attracting more capital will need to sign an ERPA with a buyer at an earlier stage than those that can secure sufficient implementation capital and reach financial closure in other ways.

2.1.2.5 Host country approval

Host-country approval is an essential requirement of the CDM, it is necessary that the DOE has a Letter of Approval (LoA) from the host country's DNA before it can finish the validation of the project. The process of host country approval can vary from country to country, due to different internal procedures and agencies responsible for dealing with climate change issues. In general, however, it is expected that government agencies would like to analyze the project proposal prior to releasing a LoA, the final letter needed from the host government. For issuing the LoA, often, the DNA may require a letter from the DOE stating that the project has already been analyzed and seems to conform to the regulations of the Kyoto Protocol and the host country. For this reason, the processes of seeking host-country approval and project validation often happen in parallel.

2.1.2.6 Project validation

The next steps in the CDM project cycle are to seek validation of the project by an accredited (with the CDM EB), independent certification body. The PDD and any supporting information are sent to a Designated Operational Entity (DOE) who conducts the validation of the project. The process of validation usually addresses:

- whether the emission removals are additional to the baseline scenario and whether the baseline methodology used has been applied appropriately either to the requirements of an approved methodology or the regulations for a new one;
- whether the project conforms to the sustainable development objectives of the host country and can present the relevant DNA's Letter of Approval; and whether the comments of local and international stakeholders were invited and addressed;
- whether an assessment of socio-economic and environmental impacts has been conducted in accordance with procedures required by the Host Party, and adequate measures to address potential negative impacts are planned;
- that management plans are structured as to avoid a coincidence of verification and peaks in carbon stocks
- that non-permanence of emission removals is addressed by project participants;
- that the provisions for monitoring, verification and reporting are in accordance with Dec19 / CP9 and other relevant decisions by COP/MOP and the EB.

Since host-country approval is an essential requirement of the CDM, it is necessary that the DOE has a LoA from the host country before it can finish the process of validation of the project. Also, as part of the validation process the PDD will be made publicly available via the Internet (Global Stakeholder Process). There will be a period of 45 days to receive comments from Parties, NGOs and other stakeholders. The DOE will then make a decision as to whether the activity will receive a positive validation report.

2.1.2.7 Registration

After successful validation, the validation report is also made publicly available and then together with the PDD they are submitted to the CDM Executive Board in order to register the project. The registration process should be completed after a maximum of 8 weeks, unless one of the involved Parties or at least three members of the EB request a review. In that manner, registration of projects that come under review can be delayed by 4-5 months.

2.1.2.8 Monitoring

Once the registered project enters the implementation phase, real project achievements can be calculated based on periodical monitoring. This activity can be conducted by staff directly employed by the project, or subcontracted to external agencies specialized in forestry and carbon inventory. The monitoring needs to be carried out according to the project's Monitoring Plan.

Among other information, methodologies usually require data on the following carbon pools and flows:

- Tree growth, recruitment and mortality
- Crown and root development
- Tree mortality
- Understorey growth and amount of biomass lost through weeding
- Biomass volume in litter layer and other necromass (if applicable)
- Rate of decomposition of necromass in the forest floor (if applicable)

- Soil carbon and fluctuations during the growth cycle (with particular emphasis on the periods immediately after harvesting and thinnings) (if applicable)
- Amounts of wood thinned and harvested, as well as its final uses and losses during the manufacturing process
- Records of utilization of residues

2.1.2.9 Verification and Certification

CDM projects will need to be independently verified by a DOE before any CERs (tCER or lCER) can be issued. To put it simple, the verification is an audit of the monitoring and project implementation. For large-scale projects, this DOE has to be different from the DOE that validated the project. The project verification will need to demonstrate the following:

- The project has followed the implementation plan described in the validated PDD.
- The carbon claims of the project are based on the monitoring results and the calculation procedures used for producing these claims (using the approved baseline and monitoring methodologies).
- The data and the procedures used for data collection follow acceptable quality standards.
- The sustainable development indicators proposed in the PDD have been monitored and meet the project's targets (i.e. environmental and socio-economic impacts should be positive).

Verification of a LULUCF CDM project can only be done every five years. The first verification does not necessarily have to be at year five after the start of the project activity, the project proponent may decide when it takes place. All subsequent verifications have to be carried out in the five-year cycle. A further requirement for LULUCF projects is that verifications should not systematically coincide with peaks in carbon stocks. In other words, verifications are not allowed to be carried out consistently just before harvestings reduce the standing carbon stock. A verification report is submitted to the EB and made publicly available.

The successful output concludes in the certification of the project. This process is strictly related to verification and consists basically only of issuing a statement indicating that the project has successfully generated a given amount of carbon credits in accordance with the rules and regulations of the Kyoto Protocol.

2.1.2.10 Issuance of credits

Based on the successful verification and certification the Executive Board will then issue the corresponding amount of credits. The EB then has 15 days to issue the CERs (although a review of the project activities can be requested in some cases).

2.1.3 Transaction costs

When registering a project under the CDM, the project developer needs to cover the costs accruing during the steps of the CDM project cycle, i.e. the transaction costs. The costs for project preparation, validation and registration accrue up-front, long before any revenues from carbon credit vending can be expected. Key differences in costs may evolve, if a methodology has to be developed. Projects need to be sufficiently large in order to justify the transaction costs. On other hand, there are simplified modalities and procedures for small-scale projects

that do not exceed 8,000 CERs per year and these face lower transaction costs. For the regular large-scale projects, the most important sources of transaction costs are the following:

- Project preparation (usually by a consultancy company): The costs depend on the complexity, the scale of the project, and on the required technologies and expertise. It also depends on the extent to which local and international consultants are involved. Costs for project preparation may range at USD 60,000-180,000.
- Validation (by a DOE): estimated at USD 15,000-25,000.
- Registration fee (by the EB): For the first 15,000 CERs projects are charged US$0.10/CER, for anything above 15,000 they are charged US$0.20/CER. So, a project expecting an average of 50,000 CERs per annum would pay an upfront registration fee of 15,000 x $0.10 + 35,000 x $0.20 = $8,500.
- Monitoring costs: depending on project size and sample size needed, as well as on monitoring methods and intensity.
- On-going verification (by DOE): depending on the size and the complexity of the project USD 15-25,000 per audit.
- Issuance fee (by the EB): In accordance to the on-time registration fee scheme, every time a project requests issuance it has to pay an administrative share of proceeds (SOP-Admin). The issuance fee is as above US$0.10/CER for the first 15,000 CERs, it is US$0.20/CER for anything above 15,000 CERs. Any upfront registration fee already paid is deducted from the amount due at the first issuance.
- Adaptation levy (by the EB): Upon issuance, the EB retains 2% of the CERs generated to support adaptation in countries that will be most affected by climate change.
- Taxes (by the host country): Some countries claim a share of a project's CERs in exchange for issuing a Letter of Approval that is prerequisite to registration.

2.1.4 Characteristics of carbon credits from forestry projects

In contrast to CERs generated by energy and other emission reduction projects, CERs from LULUCF projects are of limited validity due to the non-permanent nature of vegetation as a sink. The regulations of the CDM define the credits from forestry projects as short-term credits (tCERs – "temporary Certified Emission Reductions") and long-term credits (lCERs – "long-term Certified Emission Reductions") with different durations of validity. Both tCERs and lCERs are of temporary nature and have to be replaced upon expiry. This is because non-permanence is a greater problem with LULUCF activities than with other sectors where reductions are permanent in the sense that an avoided emission will never reach the atmosphere (IPCC 2000). In contrast, forestry projects mitigate climate change as long as the carbon remains stored in the vegetation and soil. However, forest sinks are potentially reversible through disturbances such as fires or the conversion of forest land back to pasture land, for example, which causes the carbon to be released back to the atmosphere, and reverses the climate benefit (Schlamadinger et al. 2005; Locatelli and Pedroni 2004). For this reason, the rules of the CDM state that forestry projects will have to verify periodically, every five years that the carbon is still stored; in some cases credits issued initially may have to be replaced even before their validity expires, in the case an incident as those described above has taken place. The choice between tCERs and lCERs is up to the project developer, and it is important to consider the implications of the choice (see section 4.3).

Short-term credits (tCERs) are valid for one commitment period of five years, which means that credits for existing carbon stocks are re-issued after each verification event (Figure 2). If the carbon stock or part of it has been lost in the meantime, the next verification will simply yield less tCERs than before. Liability is not an issue with this system since only existing stocks are given credit. This makes it is easier to react to fluctuations in biomass as they can be caused by silvicultural interventions such as thinnings (compare Figure 2b). TCERs cannot be banked and have to be used in the commitment period in which they are issued. At expiry, a tCER has to be replaced by an AAU, a permanent CER, an ERU, a RMU or by another tCER; it cannot be replaced by an lCER. This allows for the generation of a replacement stream of tCERs over the whole project period (shown in Figure 2), if the biomass is kept in place until the end of the project's crediting period.

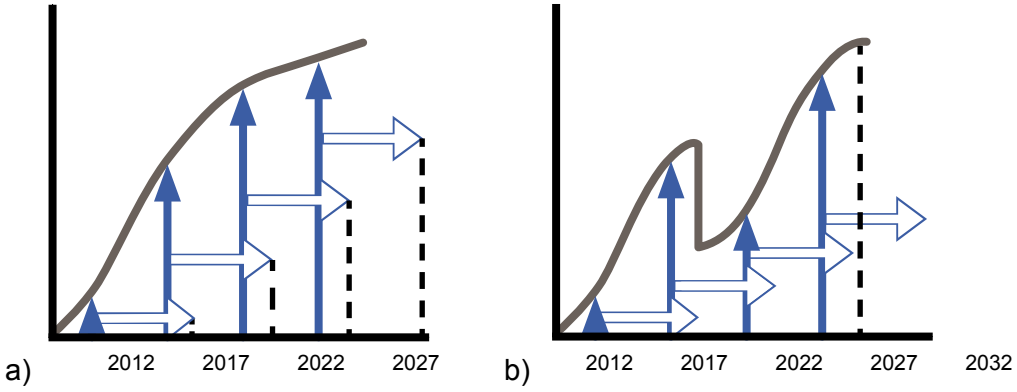

Figure 2: Project activity generating a stream of tCER, a) with increasing carbon stocks, b) at fluctuating carbon stocks. (Source: Locatelli and Pedroni 2004.)

Conversely, credits for a project generating lCERs are valid until the end of the project's crediting period. As can be seen in Figure 3, during the verification only the increment since last verification is credited, and these lCERs are valid until the end of the project's crediting period. For instance, with a crediting period of 30 years, the lCERs issued after the first verification in year 5 have a validity of 25 years, the lCERs issued after verification in year 10 are valid for 20 years, and the lCERs from the third verification are valid for 15 years, etc. At expiry, an lCER has to be replaced by an AAU, permanent CER, ERU, or a RMU. It is not possible to replace an lCER by a tCER or another lCER.

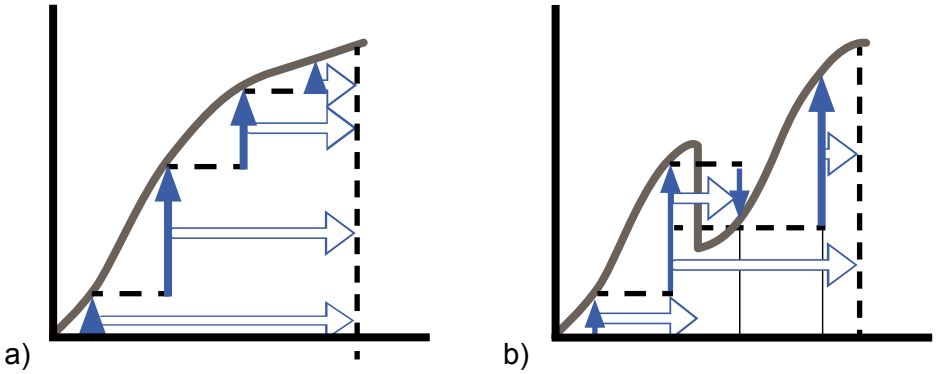

Figure 3: Project activity generating lCER, a) under steadily increasing carbon stocks, b) at fluctuating carbon stocks. (Source: Locatelli and Pedroni 2004.)

An important feature of lCERs is that they cause liability (see section 4.3) - unlike tCERs, they have to be substituted in the case of loss, i.e. when in a verification a lower amount of biomass is found than has been measured and credited in the last verification. Activities like thinnings (compare Figure 3b) which decrease the biomass temporarily, have to be taken into account when calculating the amount of lCERs that can be sold without liability problems, otherwise the portion of credits lost has to be replaced. Abiotic influences like fire, storm or pest attacks mean an incalculable risk in this case (see section 2.2).

2.2 Identification of risks associated with forestry CDM projects

It is essential to assess risks that investment in a CDM forestry project represents. Forestry CDM projects are exposed to risks inherent to any 'normal' forestry projects and on top of this face certain CDM-specific risks. Regarding to the CDM-specific risks, firstly, there are risks in registering a forestry initiative under the CDM. Secondly, projects need to assure permanence of the carbon removals in the different carbon pools. Thirdly, the CDM infrastructure is still being constructed.

Any forestry project bears some risk that relate to whether its business case will be able to perform in the projected way. Uncertainty as to project performance generates uncertainty as to whether the project will be able to realize the projected carbon removals potential, and whether the removals are permanent. There are biotic risks (pests, etc.), abiotic risks (wind, fire, etc.) and anthropogenic risks (illegal encroachment of plantations by local population, illegal fuel-wood collection, etc.). The occurrence of forestry performance risks is connected to the application of good practice in designing and operating the forestry project.

When assessing the risks of CDM projects, there are a number of sources of uncertainty that need to be taken into account on top of general business risk:

- CDM-specific registration risk entails the uncertainties whether the project would be able to gain all necessary approvals: host country approval, validation, registration, investor country approval, review of CER issuance. These approvals are related to the steps of the project cycle (see section 2.1.2).
- International CER transfer risks relate to the infrastructure that transactions require to be carried out. The buyer country needs to have a valid account for CERs, and many country's registries are still under development. The international registries and the international transaction log need to be finalized by end of 2008. Moreover, there are a number of formal requirements for eligibility to transfer CERs, even though most countries are expected to gain approval.
- Post 2012-risk expresses the uncertainty that there will be any regime for generating carbon-removal credits after the expiry of the Kyoto Protocol's first commitment period in 2012. If no follow-up agreement comes into place, no further carbon revenues could be expected.

A project can potentially hedge against some of these CDM-related risks. In the context of hedging against risks, standards for good practice in forestry and CDM deserve attention (e.g., the Climate, Community and Biodiversity Standards – see sections 2.3). Moreover, the procedures for CER transactions that the pertaining agreements contain (see section 4.1) can be designed to protect both the buyer and the seller of the carbon credits from risks. There is an account for options to hedge against risks in section 3.3.2.

General observation of CER market developments demonstrate that risks bear on the prices of the pertaining transactions. Projects that have advanced further in the project cycle sell at better prices, because the risk is lower that the project would not achieve registration. ERPAs sell CERs at higher prices if the project owner is able to sustain liabilities that would protect the buyer from the delivery risks. Also, projects that are amenable to quality standards or have gained certification by institutions like the FSC claim higher prices for the CERs (see section 3.3).

2.3 Standards for premium forestry credits

The Climate, Community and Biodiversity Project Design Standards (CCB Standards) evaluate land-based carbon mitigation projects in the early stages of development. The CCB Standards help:

- identify projects that simultaneously address climate change;
- support local communities;
- conserve biodiversity;
- promote excellence and innovation in project design; and
- mitigate risk for investors.

The development of the Climate, Community & Biodiversity Standards was spearheaded by the Climate, Community & Biodiversity Alliance (CCBA) – a partnership among research institutions, corporations and environmental groups, including Conservation International, the Hamburg Institute of International Economics, The Nature Conservancy, Pelangi (Indonesia), BP, GFA, Intel, SC Johnson, Weyerhaeuser, CATIE, CIFOR and ICRAF.

The standards, released in May 2005, are the result of an intensive development process, including: outside input from academia, business, environmental organizations, and development groups; field testing on four continents; and an independent peer review.

The CCB Standards require projects to comply with fifteen criteria to demonstrate compelling net benefits for mitigating climate change, conserving biodiversity, and improving socio-economic conditions for local communities. Independent auditors will use the criteria to determine whether projects can demonstrate they yield truly additional benefits, in other words, benefits that would not have occurred without the project. The mandatory criteria also ensure, among other things, that monitoring programs are in place, no carbon credits will be earned from genetically modified trees, and that communities are appropriately involved in the design of the project. Exceptional projects can earn Silver or Gold Status depending on how many optional criteria are met. Optional criteria cover issues such as native species use, climate change adaptation, water and soil resource enhancement, and community involvement. CCB compliance can be validated and verified on a stand a lone basis or as an add-on to the audit of regular Kyoto compliance.

2.4 Financial characteristics of forestry projects and impact of carbon finance

Most CDM projects are financed through a combination of equity and debt finance, with carbon sales providing a 'plus' to the internal rate of return, thus acting as a sweetener to an investment proposition that can nearly stand on its own. The problem with land use projects with environmental and social components is that they are often not profitable enough to attract the other sources of finance required to kick start the project cycle. So, while once implemented these projects may provide carbon credits at very competitive rates, they cannot attract pre-operational private sector capital in order to go through the various project cycle steps.

The forestry business (regardless of the CDM) bears some particular characteristics that pose limitations to investors:

- High upfront investment: Most projects need to raise upfront finance for implementation (i.e., for securing lands and for planting trees). Land-use project developers, however, have limited access to finance, seed capital, international exposure or technical capacity, credit rating, or access to insurance, to develop a project. Many projects are not able to attract financing for project implementation.
- Delayed returns of investment: The high upfront investment into forestry projects only delivers returns after a long delay. Projects generate the first substantial income when harvesting commences, and it is only then that cash flow becomes positive. Depending on the species, the ecological region and the management plan the delay can amount to more than a decade.
- Low rates of return: When comparing investment into forestry to investment into some other industry sectors, rates of return are comparably low. Investments into forestry projects that are designed to deliver environmental and socio-economic co-benefits (as the CDM requires) will be even less profitable.
- High perceived risks: The success of forestry businesses depend on the surrounding ecological conditions, as well as on the markets for their products and on interaction with a series of project stakeholders and local population. These uncertainty factors that influence projects constitute risks.
- Investment decisions for reasons beyond business: Some forestry activities as well as the corresponding investment decisions not only follow business reasoning, but both public and private sector sometimes engage into forestry for reasons beyond business. Public sector forestry activities very often aim to contribute to foster environmental services and improve livelihoods of local population. The private sector, in turn, is sometimes obliged to engage in forestry activities by law, for instance for the regeneration of mining sites, or for greening along infrastructure developments. In other cases, the private sector could invest into forestry for reasons of public relations. Assessing such activities would not only draw on a standard investment appraisal but also consider other factors.

Carbon finance is designed to provide a complementary cash-flow to projects whose investment decision also bases on other sources of cash flow or on reasons beyond business. In some cases, vending of carbon credits provides an additional bit of return that project investments need in order to be profitable. The projected return rates on investment including carbon finance exceed the rates of return without carbon credits by several percent (see Table 1). In other cases, carbon finance contributes to improving the cash-flow of projects that are not conceived as profitable projects. The additional revenues that projects can realize through selling of CERs do not justify investment, but they improve the profitability of forestry business endeavors.

Project name	IRR w/o CERs	IRR w/ CERs	considered CER price	considered time frame
Moldova Soil Conservation Project	4.2%	5.8%	US$ 3.5	100 years
Facilitating reforestation for Guangxi watershed management in Pearl River Basin, China	8.4%	15.8%	US$ 3	20 years
The Mountain Pine Ridge Reforestation Project	< 15%	> 15%	NA	NA
'Treinta y Tres' afforestation combined with livestock intensification	10.8%	NA	NA	30 years
Rio Adquidaban Reforestation Project (RA)	8%	11.5%	US$ 15	24 years
Kikonda Forest Reserve Reforestation Project	7.6%	14%	US$ 5	24 years
"Los Eucaliptus" afforestation project	8.4%	10.%	US$ 3.5	52 years
Mexico Seawater Forestry Project	11.9%	12.9%	US$ 3	20 years
Afforestation for Combating Desertification in Aohan County, Northern China	4.1%	13.8%	US$ 3	20 years
Carbon Sequestration in Small and Medium Farms in the Brunca Region, Costa Rica (COOPEAGRI Project)	14.4%	21%	US$ 3.8	20 years
Treinta y tres afforestation on grassland	10.3%	12.5%	NA	20 years
Reforestation on degraded land for sustainable wood production of woodchips in the eastern coast of the Democratic Republic of Madagascar	5.1%	10%	US$ 10	30 years

Table 1: Internal rates of return from selected draft PDDs submitted along with proposed new methodologies (source: UNFCCC).

3 The International Markets for Forestry CERs

The third section outlines the historical developments of the carbon markets and describes some of the mechanics and policy processes underlying them. Possible future developments are outlined with a view on key developments for forestry CDM. This section also describes the present state of markets for carbon credits from forestry CDM and it gives account of buyers' preferences and attainable prices.

3.1 Relevant historical developments in the Kyoto policy framework

During the last fifteen years, forestry-based carbon offsets have evolved from a theoretical idea towards being a market-based instrument for accomplishing the global environmental objective of the Climate Change Convention. The first transactions for CO2 emission mitigation took place in the early 1990s. These were voluntary in nature, since there were few legislative requirements for polluters to reduce GHG emissions. Projects were established in anticipation of changes in environmental legislation, while capitalizing on the public relations value of environmental stewardship. This voluntary aspect was somewhat reflected in the assumed price paid for carbon sequestration, which averaged US$ 0.19 per t C

In July 1992, the United Nations Framework Convention on Climate Change (UNFCCC) was launched, including a voluntary commitment by industrialized countries to reduce their emissions to the levels of 1990 by the year 2000, as well as the concept of jointly implemented activities between countries to collectively reduce GHG emissions or promote the absorption of atmospheric CO2. The commitments and mechanisms proposed at Rio led to an increase in the level of investment in carbon offset projects, also in the forestry sector.

At the First Conference of Parties to the UNFCCC (CoP 1) in Berlin, March of 1995, the Activities Implemented Jointly (AIJ) Pilot Phase was initiated, during which projects were to be conducted with the objective to establish protocols and experiences, but without allowing carbon crediting between developed and developing countries. Then, in December 1997, the Kyoto Protocol was proposed during the CoP 3, with the introduction of binding commitments to emissions reductions as well as the use of "flexibility mechanisms" for facilitating the achievement of these GHG emission reduction targets. The establishment of binding commitments led to a more substantial demand for offsets, resulting in an immediate rise in the level of investment, and in the price paid for carbon credits, which reached up to US$ 20-25 per t C.

Despite the initial certainty offered by Kyoto, the period running up to CoP 6 in the Hague in 2000 and the resumed meeting held in Bonn (CoP 6, resumed, July 2001), on the forestry side was dominated by the debate over whether or not forestry should be included in the CDM and if so, which activities would be allowed. As a result of the divergence of opinions between policy makers and influencers this issue constituted a strong uncertainty for both project developers and investors. Eventually, at CoP7 in Marrakech, November 2001, it was decided that only afforestation and reforestation activities were allowed under the CDM, but no other rules were established for projects in the forestry sector. Conversely, for emission reduction projects a complete set of rules and modalities was established, which allowed projects in the energy,

energy efficiency, methane capture and other sectors to advance much faster than forestry projects. Rules and modalities for CDM afforestation and reforestation projects were not agreed upon until CoP 9 in Milan, December 2003.

A year later, in October 2004, the CDM Executive Board (EB) made the first call for the submission of afforestation and reforestation baseline and monitoring methodologies. These methodologies, once approved by the Executive Board after an arduous and strict reviewing process, must be used to establish the project's baseline, to calculate the emission removal potential of the project, and to formulate a monitoring plan. The first methodologies that were submitted were all rejected, and it took until late 2005 to approve the first methodologies, for a project in China. To date, there are four approved methodologies for large-scale CDM forestry projects.

Early in 2000, the World Bank launched its Prototype Carbon Fund, with an initial capitalization of US$ 130 million, which intended to include some forestry projects. In the following years, the World Bank had launched two additional carbon funds that include land use based activities: the BioCarbon Fund (BCF) and the Community Development Carbon Fund (CDCF). The former is a specific forestry based carbon fund that provides opportunities for the sale of forestry-based offsets, with two windows, the first of which is restricted to Kyoto compliant credits and the second is for broader land based activities. The CDCF focuses specifically on buying carbon offsets from projects working with rural communities in developing countries. Both the CDCF and BCF are now operational, but it took the BCF until May 2006 to announce the first CER transaction contracts. This was mainly due to the great uncertainties that kept the CDM forestry sector captive until the development of baseline and monitoring methodologies. As of October 2006,, the BCF has signed ERPAs with 7 CDM reforestation projects, totaling 2.5m carbon credits.

For a long time the World Bank funds were the only lights on the horizon for LULUCF projects, being the only ones that specifically announced that they intended to buy forestry credits. Recently, however, a clear increase in the interest in purchasing these credits can be detected. Particularly public and private sector buyers from Southern Europe and Japan are getting increasingly interested. They seem prepared to start buying forestry credits as soon as the first credits will be on the market.

After the Kyoto Protocol entered into force and the European Emissions Trading Scheme (EU ETS) started, both in early 2005, the carbon markets gained momentum. For CERs from existing CDM projects, in early 2006, the UNEP Risoe reported a total of 818 Mt CO2e to be potentially issued until the end of the first commitment period, only to correct their numbers in early March to of 836 Mt CO2e, and again as soon as in early April to a total of 909 Mt CO2e until 2012 (UNEP 2006). The trading of EU Allowances (EUA) in the framework of the EU ETS reached ever-increasing prices that constantly ranged above EUR 26 in 2005 and the first months of 2006. Through the so-called Linking Directive, permanent CERs may be traded into the EU ETS. However, this linkage does not (yet) exist for expiring CERs. A review of the so-called 'Linking Directive' in 2006 or early 2007 will decide whether or not this exclusion of AR projects will be maintained for the second trading period of the scheme, 2008-2012.

The recent market developments indicate that there will also be a substantial market potential for CERs from forestry CDM projects. As of yet, the market for forestry CERs is dormant but is expected to speed up, with the first four projects being under validation at present (October 2006). These projects are expected to be validated by the end of 2006. An additional reason, apart from the exclusion, until now, from the EU ETS, is that many potential buyers still struggle with policy uncertainties regarding temporary CERs. For example, some European governments are still considering how and if they should deal with the potential liability that the purchase of temporary

CERs could pose them with, considering that these CERs have to be replaced upon expiry. Similarly, Japanese industry buyers do not know yet how the Japanese government will deal with temporary CERs in the voluntary Japanese trading system.

3.2 The demand side for forestry CERs

3.2.1 Potential buyers

The users of carbon credits are companies and country governments that have emission reduction targets. Companies and governments that cannot easily attain their targets in their own operations turn to markets in order to buy carbon credits. The project developers of CDM projects are one type of primary providers of carbon credits. Compliance with emission targets is the ultimate goal of the users of carbon credits. While users can buy carbon credits directly from the primary providers of carbon credits, intermediary organizations of different kinds have evolved as well that provide compliance products to the users of carbon credits.

Carbon-credit buyers can be distinguished between those buyers that want to use the compliance product themselves and those buyers that buy on behalf of others. There are buyers that are also users, carbon funds (including carbon facilities), and traders. Brokers may act as intermediaries between providers and all types of buyers. Buyers for carbon-credit products can be categorized as shown in Figure 4.

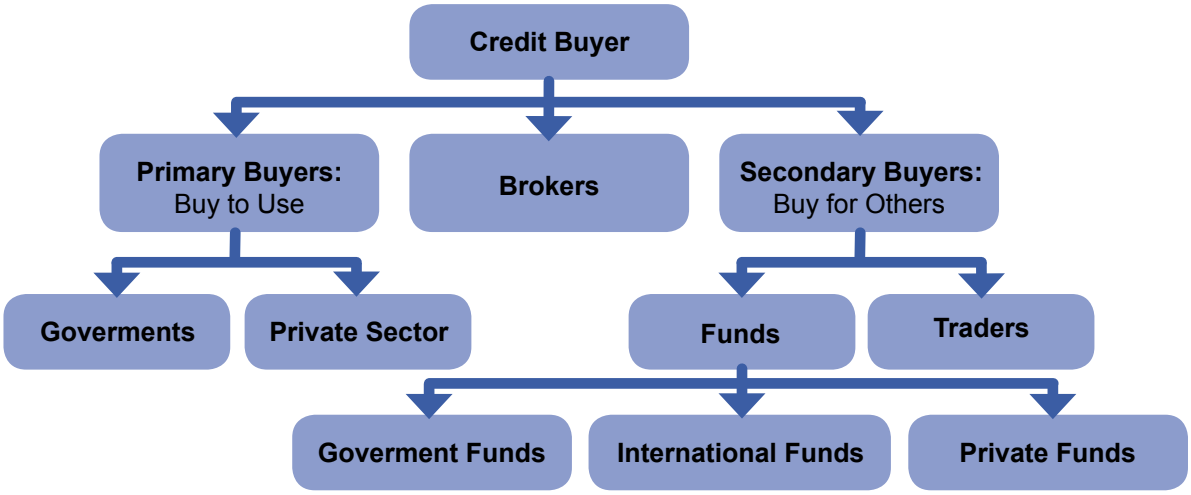

Figure 4: Types of buyers for carbon-credit products.

A carbon fund is a public and transparent tender process, designed to build a project portfolio that is expected to deliver a certain volume of carbon credits. The first funds that were established and administered by The World Bank (e.g., the Prototype Carbon Fund, the Community Development Carbon Fund, and the BioCarbon Fund), as well as some country government funds (e.g., CERUPT and ERUPT) have played an important role in developing carbon markets at their early stages and were able to accept the higher risks of a nascent market. Conversely, the private carbon funds are solely concerned with shareholder value. None of the government funds or private funds currently includes forestry CDM.

Buyers that have compliance targets buy carbon credits for their own use. The most important users of credits from forestry CDM projects are not part of the European Emission Trading System, but include the governments of countries that are parties to the Kyoto Protocol (European governments, Canada and Japan), and the Japanese and Canadian private sector. For private companies and also governments with compliance targets, the barriers to engaging into carbon-credit transactions directly with CDM project developers can be high. The project developers are usually based in geographical regions that are far apart, come from different cultural backgrounds, speak different languages and belong to a different business environment. Intermediary buyers that want to resell carbon credits can bridge between the user of carbon credits and the primary provider of CDM credits. Intermediary organizations (for instance funds or specialized traders) are able to build and maintain the technical expertise that is necessary to engage into business with forestry projects.

Major trading companies are buying carbon credits from forestry CDM projects. At present, there are at least two major trading companies that currently buy carbon credits from forestry CDM projects. Given the trader's experience with dynamics and mechanics of carbon markets, their initial engagement into forestry CDM suggests a great potential that those markets bear. Private trading companies buy carbon credits from diverse sources, also including forestry CDM projects and bundle these in a portfolio. The portfolio allows offering a standardized compliance product to buyers that has a low risk profile. The large volume of carbon credits involved, and specialized technical expertise for project due diligence turns trading companies into an interface to the users that project owners of forestry CDM credits can use to gain market access.

Some funds and also private traders (but not usually the compliance buyers) engage with projects at early stages of project developments. It is possible to sell carbon credits only based on an initial project idea. For instance, even before planting starts and only based on a Project Idea Note, forestry CDM credits could be sold (see section 2.1.2). Prices involved in early-stage transactions are much lower than prices for registered projects or even for issued credits, because of the risk that credits may never be issued. Early-stage purchase transactions can help the project developers to reach financial closure for projects; however, carbon credits are usually only paid for on delivery of issued carbon credits (see section 3.2.4). Some buyers make limited upfront payments after financial, technical and CDM-related project due diligence. If buyers engage at very early stages in a CDM project, they often support the process towards registration of the CDM project. The facility model for carbon funds pre-finances the development of a project's CDM component. Correspondingly, some private buyers develop CDM projects free of charge or cover the costs of the CDM project development if binding emission-reduction purchase agreements are in place.

3.2.2 Buyer's strategies to cover emissions-reduction obligations

Annex-I countries have taken different approaches to comply with their emission reduction obligations under the Kyoto Protocol. While some countries, like Japan or Canada, have developed national mandatory or voluntary emission allowance trading systems, others such as the EU have joined forces and created an international marketplace in order to achieve cost-effective emission reductions.

Japan is expected to satisfy a great part of its emission reduction obligations in the first commitment period from credits generated elsewhere through the Kyoto Protocol's flexible mechanisms. This is due to the fact that the country has a voluntary energy efficiency strategy in place, which is expected to yield effects on domestic emission reductions only in the long term. The targets defined in this strategy have been set in a self-commitment by the Japanese industry federation (Keidanren), and their achievement relies on self-commitment, rather than penalties. In addition to the long-term

strategy, Japan has a national emission trading scheme that targets at subsidising investment in emissions reduction technologies in new installations and involves 34 companies that have been invited by the government to participate in the scheme that terminates in March 2007. Overall reductions expected from this system are expected to cover only a small part of Japan's obligations. A simple calculation estimates Japan to be an annual 222m carbon credits short on its Kyoto obligations until 2012. This estimation is based on Japan's BAU projection (based on a 1% growth rate), then deducts the reductions from the Keidanren voluntary action plan, the RMUs that Japan is entitled to under Annex Z, and finally the volume purchasable under its currently estimated procurement funds. Other studies have estimated Japan to be 725m carbon credits short until 2012 (MorganStanley 2005). Therefore, the country's approach to achieve its emission-reduction target for the first commitment period heavily relies on the acquisition of allowances and CERs. The Japanese government, as well as Japanese industry are potential buyers that may exert large demand for carbon credits, also comprising credits from forestry CDM.

Canada's mandatory emission reduction system for large final emitters is called Plan Green and will become effective in 2008. The system sets very low caps which can be met through technological reduction measures, trade of emission allowances among installations within the frame of Plan Green, and through the use of credits from the Kyoto Protocol's flexible mechanisms. Canada is expected to fall short in compliance with its Kyoto emission reduction obligations in spite of Plan Green, so that the country can be regarded as potential buyer on the global carbon market. Canada's emission-reduction gap has been estimated at 1b carbon credits until 2012 (MorganStanley 2005). However, a recent change of government has put all relevant developments in this field on hold and currently there are uncertainties as to how the country will proceed in its emission reduction strategy. In direct communication with EcoSecurities, some reservations were indicated as to engaging into international emission-reduction activities. Some advocate that the Canadian government should limit to domestic activities for achieving emission-reduction commitments. It is therefore uncertain to which extent Canada counts among the potential buyer countries for forestry CDM credits.

The European countries will meet 40% of their emission-reduction obligations in a joint effort through the European Emission Trading Scheme (EU ETS). The participating countries elaborate national allocation plans, which allocate a certain amount of emission allowances (EUA) to major industrial emitters. Depending on the capacity of emitters to use more or less of their allocated allowances, they will be either short or long of allowances, and can refer to the ETS to sell excess amounts or purchase credits. The scheme allows trade with EUAs and import of credits from the Kyoto Protocol's flexible mechanisms through the Linking Directive. However, the first phase of EU ETS does not allow the use of forestry credits for compliance. A decision on how this will be handled in the second phase (2008-2012) will be taken later this year (see section 3.4). In addition to the EU ETS, the countries have to achieve 60% of their emission reductions by other means. While countries like, for instance, Germany and the United Kingdom mainly rely on energy efficiency strategies and other policies and measures for domestic reductions, other countries like, for instance, Italy or Spain will not be able to fulfil their obligations with domestic actions only, and will also rely on the use of credits from the flexible mechanisms. Thus, European governments can be considered to count among the potential buyers for forestry credits.

In personal communications, EcoSecurities received signals that some of countries are closely considering buying credits from CDM forestry projects. Based on such personal

communications as well as the long-term observation of market trends, rather than official decisions EcoSecurities expects some countries to refrain from forestry CDM, whereas it is quite likely that other countries would purchase credits from forestry CDM once the markets gain speed (Table 2).

Country	all countries total 1990 emissions Mt CO2-e	likely to use 5% of 1990 emissions Mt CO2-e	uncertain 5% of 1990 emissions Mt CO2-e	unlikely to use 5% of 1990 emissions Mt CO2-e
Japan	1,173	59		
Spain	261	13		
Italy	429	21		
Ireland	31		2	
Finland	54	3		
Austria	59		3	
Germany	1,012			51
Belgium	113			6
Netherlands	168			8
Canada	457			23
Denmark	52		3	
Portugal	42	2		
Sweden	61	3		
Switzerland	44		2	
UK	584			29
Greece	82		4	
Total	4,623	101	13	117

Table 2: Overview of potential buyer countries with their 1990 emissions and EcoSecurities' expectations as to the inclination to buy carbon credits from forestry CDM.

3.2.3 Market volume for forestry CDM

For the Kyoto Protocol's first commitment period, the use of carbon credits from CDM forestry projects is caped and it is limited to 5% of the respective countries' 1990 emissions. The theoretical market volume therefore amounts to about approximately 231m carbon credits. Given that some countries have formulated policies refraining from the use of the CDM at all and that others will eschew forestry CDM, the markets could limit to a volume of 101m carbon credits. If about three quarters of the volume was like to be realized, more than 75m of carbon credits from forestry CDM projects could be generated and traded until 2012 (Table 2).

At the moment, The World Bank is by far the largest buyer of forestry CDM credits, with the BioCarbon Fund having compiled a portfolio of candidate projects that are estimated to deliver up to 22m carbon credits. Assuming a continuation of their past purchase strategy, it may be estimated that The World Bank will enter in purchase agreements for up to 9m carbon credits. Adjusting those projected volumes for the risk of project underperformance, it may be expected that the BioCarbon Fund can produce approximately 6m carbon credits from their portfolio. It is likely that approximately 90% of the market volume for carbon credits from forestry CDM projects remain still uncommitted. The available market volume can be filled by other potential buyers (governments and industry) once these engage more actively.

3.2.4 Time frame of transactions on markets for forestry CDM

Forestry CDM projects are only allowed to verify once every 5 years after the first verification. Consequently, carbon credits can only be issued once per commitment period. In order to allow trees to grow for as long as possible, and thus to accumulate as much carbon as possible, forestry project should conduct verification right before the end of the commitment period, i.e. in late 2012.

If this concept is applied and verification takes place in 2012 (some projects, especially retroactive ones, might verify before 2012, and others might decide to make the first verification after 2012), so will the issuance of tCERs or lCERs, and the consequent delivery of carbon credits under the Emission-Reduction Purchase Agreements (ERPAs). Only credits issued before the end of 2012 can be used to demonstrate compliance with emission-reduction targets, therefore this is the time point at which most intensive trading activity is to be expected.

Many projects do not want to wait until 2012 before commercializing their credits, and many buyers want to secure a good amount of carbon credits before the timeframe gets too tight in 2012. In forward transactions parties agree on vending and purchasing carbon credits at agreed prices and volumes even before their issuance.

Even though in many ERPAs the terms are agreed upon long before the actual transaction takes place, it is not common practice to make payments upfront. The usual practice is to pay credits upon their delivery. For forestry projects, pay-on-delivery would postpone the cash flow from carbon revenues until late 2012. Therefore and given the tight investment plans of many forestry projects (see section 2.4), many forestry CDM project developers are keen on negotiating at least partial up-front payments with buyers.

When asked about the possibility of up-front payments to projects in ERPAs, more than half of the respondents from the carbon funds replied that limited up-front payments were possible. Participants from governments and from the industry were much less willing to consider up-front payments (Figure 5). It was also stressed by the respondents that any up-front payments could only be possible once projects have reached financial closure and after a detailed due diligence as to CDM and financial criteria (see section 4.1.1).

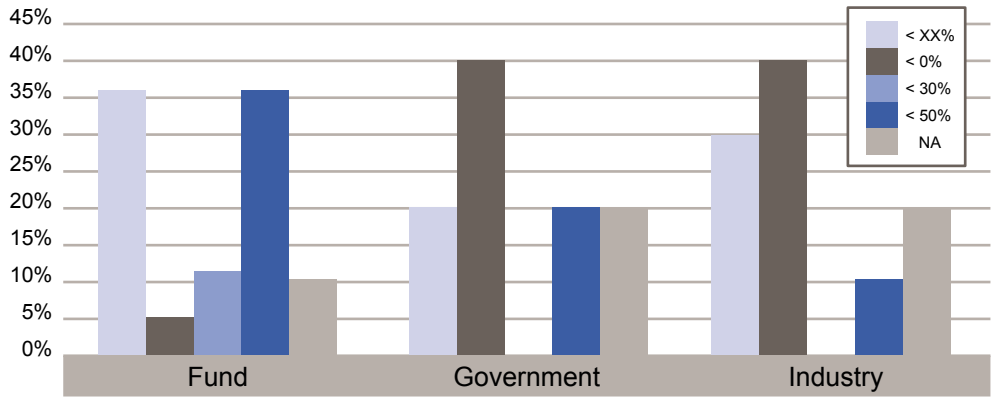

Figure 5: Buyers' willingness to provide up-front payments in ERPAs.

3.3 Estimation of prices for forestry CDM credits

Presently, The World Bank is among the few buyers of CDM forestry credits. The price ranges from ERPAs and LoCs of the World Bank project portfolio are therefore the best indication of attainable prices for forestry CDM credits. The BioCarbon Fund has bought carbon credits from forestry projects for prices of USD 3.75-4.35 per t CO2-e. These prices refer to the carbon removals in a forestry project until the end of the Kyoto Protocol's second commitment period in 2017.

These prices provide an indication, but cannot be related directly to the prices of tCERs or lCERs, because the World Bank buys carbon removals under its own particular scheme that differs from the Kyoto credits. Only later, these particular carbon credits get converted into Kyoto-compliant credits. Prices for tCERs will be lower because tCERs can be issued in 5-year intervals, which is not the case if selling to the World Bank. Hence, the World Bank includes a default price of USD 3 per t CO2-e of Kyoto credits in their templates for financial analysis of CDM forestry projects.

Prices paid by the World Bank provide an indication of attainable prices for tCERs and lCERs. As an alternative, prices for CDM forestry projects can also be related to those for projects in other technology sectors. The following sections address a) project risks, b) the replacement liability and c) discuss price expectations among market players.

3.3.1 Expiry of forestry credits and prices

Since carbon removals from reforestation are non-permanent, only expiring credits can be issued for CDM forestry project activities. Two sub-types of these expiring credits can be distinguished (see section 2.1.4): temporary Certified Emission Reductions (tCERs), and long-term Certified Emission Reductions (lCERs). Since these credits have to be replaced once they expire, their price will be lower than the one for permanent, not-expiring carbon credits (such as CERs, EUAs, ERUs, etc.).

For an investor, the effect of buying expiring credits is equivalent to postponing compliance with reduction obligations to a future commitment period. Effectively, the use of tCERs in a given commitment period increases the buyer's carbon-credit requirements for the subsequent commitment period when the tCERs expire and have to be replaced (compare Figure 6).

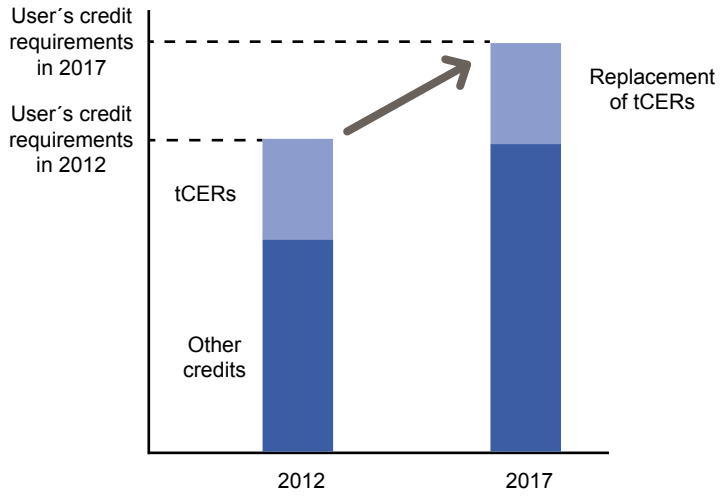

Figure 6: Postponing compliance by using temporary Certified Emission Reductions.

The decision to buy expiring CERs depends on the expected price of replacement credits. From the user's point of view, buying a permanent credit today is equivalent to buying a non-permanent credit (tCER or lCER) today and replacing it by a permanent one upon expiry (Olschewskli and Benitez, 2005). The following equation reflects this equivalence (with T being the expiring time of temporary credits, the index "0" referring to credits bought today, and d being the buyer's discount rate):

$$p_{CER_0} = p_{\mathbf{exp}iringCER_0} + \frac{p_{CER_T}}{(1+d)^T}$$

A buyer will be willing to buy an expiring credit as long as its price is smaller than the difference between the current price of a permanent reduction and the net present value of the expected price of a permanent reduction in the future (Merechal and Hecq 2005). As the following equation expresses (Bird et al. 2004), the price of expiring CERs (tCERs or lCERs) plus the net present value of the replacement cost must be less or equal to the current price of permanent CERs:

$$p_{\mathbf{exp}iringCER_0} + \frac{p_{CER_T}}{(1+d)^T} \leq p_{CER_0}$$

For instance, the maximum price of a tCER in 2012 can be obtained by subtracting the discounted cost for a permanent CER in 2017 (when it would be bought to replace the tCER) from the price of a permanent CER in 2012 (when the decision to purchase an expiring or permanent CER is taken):

$$p_{tCER_{2012}} = p_{CER_{2012}} - \frac{p_{CER_{2017}}}{(1+d)^5}$$

The conditions described in these equations entail that the prices of expiring CERs increase with higher discount rates and longer expiration times (Olschewski and Benitez 2005). However, under the assumption that CER prices are constant in time it is possible to apply different discount rates and calculate the value of non-permanent CER with different validity times. Under a discount rate of 3%, which is common for Annex-I countries, credits like tCERs that expire after 5 years have a value of only 14% of a permanent credit, whereas the maximum validity period of a lCER (25 years) leads to a value of 52%. The same credits under a discount rate of 9% reach values of 35% and 88%, respectively. Table 3 gives an overview of expected values of expiring CERs with different validity periods and under varying discount rates (also see Olschewski and Benitez 2005, Dutschke et al. 2004).

Assumed discount rate (%)	5 years	10 years	15 years	20 years	25 years	30 years	60 years
3%	14%	26%	36%	45%	52%	60%	84%
5%	22%	39%	52%	62%	70%	79%	95%
7%	29%	49%	64%	74%	82%	89%	99%
9%	35%	58%	73%	82%	88%	94%	100%

Table 3: Value of expiring CERs over time under different discount rates. The cells of the table list the relative CER value in % after the respective number of years.

The value of expiring CER is adversely correlated with the value of permanent CERs (Locatelli and Pedroni 2004; Olschewski and Benitez 2005). If prices of permanent CER decrease over time, the value of non-permanent CER would rise. Conversely, if permanent CER prices rise, the value of temporary CER would decline. If the growth rate of permanent CER prices is higher than the interest rate, non-permanent CER have no value and the whole system of trading temporary or long-term emission offsets would fail.

3.3.2 Project risks and prices

One of the most important factors determining the price both of permanent CERs and expiring CERs are the risks that CERs carry to the buyer (see section 2.2). The main risk of CDM projects is that, at the moment of purchase in a common forward contract, a CER has not yet been issued and thus is subject to severe delivery uncertainties. The lower price for CERs compared to EU Allowances (EUAs) reflect their different risk profiles (see Figure 7). EUAs are emission allowances that are allocated to European industry and energy installations, and represent the guaranteed right to emit one ton CO2. They represent a risk-free, standardized commodity that is traded within the EU Emission Trading Scheme and yields notably higher prices than CERs from CDM projects. The risk profiles of CDM projects depend on their stage in the project cycle (see section 2.1.2). The more advanced a project is in the cycle, the more likely it seems that credits will actually be issued. Projects at the design stage face notably higher risks than projects under validation, or projects awaiting verification. Hence, for projects at initial stages of the project cycle forward contracts take hefty discounts in prices.

Figure 7: The price difference between 'over-the-counter' EUAs and forward CER sales contracts can be divided into different risk categories (not drawn to scale).

Since prices depend on risk profiles, project taking measures to hedge against risks, improve carbon-credit prices. The more risk mitigation mechanisms and guarantees a CDM project can offer in a transaction, the higher the price for CERs will be. There are several options of hedging against risks

- Insurance: Carbon insurance against project failure is a good option for projects that have sufficient capital in the background, e.g. through a credible investor company or bank. The insurance of CDM projects has recently been included in the products catalogue of the international insurers Swiss Re and Munich Re. They offer insuring projects against institutional risks including the failure or delay in project approval, in certification and/or issuance of CERs (Swiss Re 2006). Loss of carbon stocks due to natural risks like fire occurrence can be combined with conventional fire insurance for plantations.

- Portfolio approach: Risk is less of a problem for secondary-market carbon credits. The buyer aims at spreading the risk of project failure by keeping various project types in a bigger portfolio, thus avoiding the dependence on one single project or project type. Credit sales from a large portfolio such as those that mayor carbon-credit traders hold, can yield better prices because the portfolio functions as a mechanism guaranteeing delivery to a buyer (see section 3.2.1).
- Quality standards: Improved organization of the credit supply side has been advocated in order to improve the price of CERs (Locatelli and Pedroni 2004). As a part of a sound risk management, especially land-use or forestry sector projects should try to achieve high quality in terms of project operations. Following the best practices will reduce the risk of project failure. Best practices in the forest sector also carry social and environmental co-benefits which may have a positive effect on the price of expiring CERs if the investor can benefit from a positive public image. The development of project standards like those of the Climate, Community and Biodiversity Alliance indicate the existence of a market potential for such high-quality projects (see sections 2.3).

3.3.3 Price expectations in the market survey

During the survey (see Annex 1) it became clear that buyers perceive the replacement obligation of forestry credits as the main reason for lower prices than for permanent CERs. Asked for their general assessment of price tendencies for expiring credits in relation to permanent CERs, 95% of respondents expected prices for expiring CER prices to be lower than those for CERs (Figure 8).

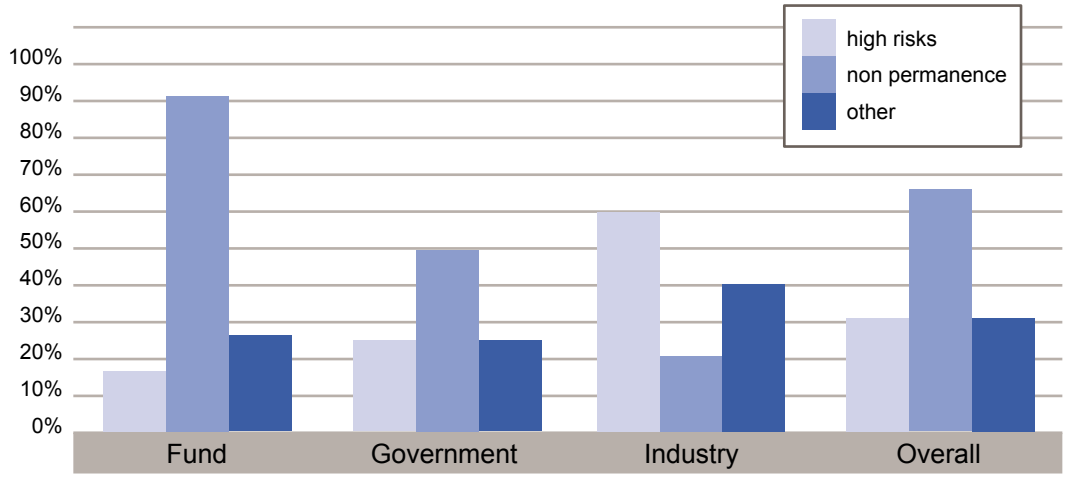

Figure 8: Respondents' assessments of reasons for lower price expectations for forestry credits. Note: these questions allowed for multiple answers and thus do not sum to 100%.

Apart from the non-permanent character of forestry carbon credits, main reasons for an expected price gap were the higher project risks that forestry activities carry. In this context, a clear differentiation of responses could be noted depending on the background of respondents: While 90% of respondents from carbon funds named non-permanence as principal reason for lower prices of expiring CERs, this relation was seen by only 20% of respondents from the industry environment but in this group 60% emphasized forestry-implicit project risks like fires or wind break as main obstacles for credit prices. This may also be attributed to a lack of awareness of the replacement obligation among respondents from the industry sector.

Conversely, 50% of government representatives saw a relation between non-permanence and lower credit prices, while 25% deemed either project risks or other factors responsible. Overall results show that a majority (over 60%) of respondents attributes their lower price expectations for forestry credits to the credit replacement obligation arising from the non-permanence of carbon removals, while increased project risks compared to other project types and other factors were seen to be equally important by 30% of respondents, respectively.

3.4 Outlook on the tendencies of forestry CERs markets

Presently, the markets for forestry CDM are still at a pioneer stage. Market demand on the buyers' side is driven by The World Bank funds that purchase carbon credits from forestry projects (see section 3.2.3). Even though there is initial interest, the European governments have not yet engaged directly in carbon transactions from forestry projects. Europe's private sector, in turn, is largely covered by the EU Emissions Trading System (EU ETS), which excludes carbon credits generated by forestry CDM projects for the time being. In Japan, a framework for using carbon credits from forestry projects has not been established yet, preventing both the private sector and the government from purchasing (see section 3.1). Before the European and Japanese governments as well the private sector in Japan can step up buying of carbon credits from forestry projects, work needs to be done at the national levels to define policies before country governments can start buying.

The EU ETS Linking Directive is the relevant regulation linking the Kyoto Mechanisms into the EU ETS and allowing for the import of carbon credits generated by CDM projects (see section 3.1). In its current form, the linking directive is valid for phase I until the end of 2007, and it excludes carbon credits from CDM forestry projects. It is the exclusion from the EU ETS that has dampened and delayed the development of markets for forestry CDM. A review of the linking directive is scheduled to be completed at the end of 2006, and an inclusion of forestry CDM in the EU ETS phase II beginning in 2008 is among the possible amendments that have been tabled. While it is impossible to predict the results of a review of the EU ETS linking directive, it is clear that the inclusion of forestry CDM would boost the markets.

As of yet, there is no certainty as to whether there will be carbon markets after 2012 when the Kyoto Protocol's first commitment period ends. The countries are discussing a possible renewal of the Kyoto Protocol with a second commitment period as well as alternative agreements. It is due to these uncertainties that virtually no buyers are presently engaging into carbon-credit transactions with a time frame beyond 2012 (except for The World Bank). Negotiations of the period post Kyoto have commenced in December 2005 to lay the foundation for carbon markets after 2012. If the post-Kyoto negotiations are successful, it is by no means clear that similar regulations will apply to project-based carbon removals from forestry activities. New regulations may be agreed upon, more countries may get involved and additional types of activities may become available for generating carbon credits. For instance, there is a vigorous discussion ongoing about the possibility to include a mechanism in future agreements to generate carbon finance from forest conservation and avoiding deforestation. Carbon markets beyond 2012 bear great potential but also great uncertainties to project developers.

4 Towards the Successful Commercialization of CDM Forestry Projects

The fourth section is dedicated to the procedures for commercialization of carbon credits. There are some details given on buyers' preferences and how projects could boost their market potential by meeting them. This section also analyzes the implications of opting for the commercialization of tCERs and lCERs.

4.1 Steps of purchase for CDM forestry projects

This section describes the typical steps that project go through towards the emission-reduction purchase agreement from the contractual point of view, it should be read together with the overview of the CDM project cycle (see section 2.1.2).

4.1.1 Initial screening

When engaging into negotiations around an emission-reductions or GHG removals transaction, the potential buyer collects data for an in-depth understanding of the project. Firstly, an assessment includes data on CDM-related issues in order to make sure that project is eligible for the CDM, fulfils the host country's approval criteria, and represents an 'additional' climatic benefit. Screening a project according to such CDM criteria provides an idea of whether the project qualifies for registration under the CDM and could thus eventually deliver carbon credits. Secondly, the proponents estimate project's potential to remove carbon and thus to generate CERs within a certain time frame. For CDM forestry projects, this involves modeling of forest growth and carbon sequestration in the accumulating biomass. Thirdly, the project needs to demonstrate its profitability. Due diligence procedures provide the buyer of the carbon credits with an understanding of the likelihood that the project could reach financial closure and actually reach implementation stage. Fourthly, some buyers put emphasis on ancillary project characteristics and will want to make sure that projects contribute to a positive public perception since CDM projects are object of public interest. The procedures and the expected results from screening of projects depend on the stage of planning and implementation that the project is at and of the agenda of the potential buyer.

4.1.2 LoI and ERPA

There are a number of legal documents that are typical steps in the process towards the purchase agreement. At the first stage, after initial negotiations, parties sign a framework agreement in a Letter of Intention (LoI, sometimes also called a Letter of Commitment – LoC). Using this document as a basis, the Emission Reduction Purchase Agreement (ERPA) can be signed later. The contractual steps include:

- LoI: The document between involved parties to clarify the interests, obligations and time frame of negotiations. It includes the basic terms of the transaction but is not a binding commitment. The LoI is usually only valid for a shorter time period and terminates when signing the ERPA.
- ERPA: The purchase agreement built on the LoI is structured as a contract, which has to be signed by all involved parties. The ERPA is a binding commitment and includes obligations and liabilities.

An emission reduction transaction (both LoI and ERPA) addresses a list of key parameters, which define the object of the transaction, together with its applicability and validity conditions. From a practical point of view, key questions include the specifications of volume and time frame of credit delivery, payment schedule, price settings and liabilities.

4.1.2.1 Conditions

It is possible to limit the applicability of contract by certain conditions that must be fulfilled. These conditions could include the successful validation or registration of the project, certification according to quality standards, host country approval and specific details of the project such as start and finalization date.

4.1.2.2 Volume and time-frame of delivery

At an early project stage when transactions are negotiated, it is not always clear how large the project's potential is to generate emission reductions. Given the uncertain quantity of CERs the seller typically wants to have some flexibility as to the volume of carbon credits and the time frame of delivery. The available options include:

- Fixed annual amount: At a certain date each year the seller agrees to deliver a number of CERs generated by the project in the previous year.
- Fixed annual amount with acceleration. The seller agrees to deliver 100% of the CERs generated by the project until an upper limit has been reached.
- Combinations: The above options can combine, e.g., by agreeing that the seller will deliver a certain amount of CERs from the project before a certain date. The seller also commits to each year deliver a certain percentage of the CERs generated the previous year.
- Treatment of additional CERs: The ERPA can include provisions for the treatment of possible excess credits, which could state that the buyer will be entitled to refuse or to purchase any excess CERs from the project. Another option is that the seller manages any excess CERs from the project and can propose the CERs to additional buyers.

4.1.2.3 Payment schedule

The viability of business endeavors suffers from a delay between an up-front investment volume, and the occurrence of returns. The long delay in returns is an important characteristic of forestry projects, and thus constitutes one of their important barriers towards implementation (see section 2.4). Some buyers have adapted their business model and provide limited up-front payments to kick-start projects that only yield carbon credits at a later time point (see section 3.2.4). In principle, payments in an emission reduction transaction could be made according to various options:

- Up-front payment means that the seller receives payment for the CERs when signing the ERPA.
- Payment on delivery means that the seller receives payment for the CERs when the agreed amount of carbon credits is delivered.
- Combination: A third possibility could be a combination of these two above mentioned options. An initial up-front payment could enable project development, while most of the carbon credits are paid only upon delivery.

4.1.2.4 Price settings

The different options for price setting involve a risk both for the seller and for the buyer. With a fixed price regardless of the market development, the price of the CERs remains the same. Such an arrangement carries the advantage that quite certain future cash-flow projections can be made. On the other hand, advantageous market developments could be missed, if committing to early to buying a fixed price. In some cases, it is preferred to connect the price of a transaction to spot markets for a commodity, e.g. the EUA. Pricing options include:

- a fixed price where the buyer agrees to pay the seller a certain amount from each delivered CER;
- a simple indexed price where the buyer agrees to pay the seller a percentage of the market price of an EUA for each delivered CER before an agreed date;
- an indexed price with a floor and a ceiling, which is basically the same strategy as the former with an upper ceiling and a lower floor on the price, irrespective the price of an EU Allowance.

4.1.2.5 Liabilities

The agreement contains a description of the liabilities and the remedies in case that either the seller of buyer fails to fulfill their contracted obligation. In a typical scenario, the buyer of carbon credits is a financially potent entity from a developed country that has therefore an emission reduction commitment to meet. Consequently, the risks that the buyer is unable to pay are minor. On the other hand, the seller can correspond to an entity from a developing country with a less certain business environment, where delivery default does not seem unlikely. Most ERPAs are designed to hedge the risk of the buyer of the credits. The liabilities for buyer and seller include a number of options:

- Delivery default: If the seller fails to deliver the agreed amount, the buyer can:
  - require the seller to provide replacement for the CERs not delivered;
  - claim damages from the seller;
  - require the seller to provide an additional amount of CERs the following year equal to the amount of delivery failure from the year before; or
  - end the contract and claim any advance payment from the seller and other outstanding costs plus interest rate.
- Payment default: In the case of a payment default, the seller can:
  - require an interest at a certain rate;
  - claim damages from the buyer;
  - recover already delivered CERs but not paid for; or
  - end the contract.

4.2 Preferences of buyers

The ultimate goal of users of carbon credits is the compliance with emission-reduction targets. Moreover, buyers can direct investment in CDM projects in a way that allows for also working towards other goals that are part of their strategy, e.g., for cementing regional influence, achieving corporate social responsibility, help public relations objectives, and fostering sustainable development. In order to achieve such goals, buyers have a mixed set of preference for selecting CDM projects.

When asked for project preferences, most buyers of carbon credits (59%) had specific policies as to the characteristics of projects they wanted to purchase from. The regional provenance of projects, the delivery of sustainability co-benefits and adherence to quality standards were named as the most important project characteristics that buyers were looking for (Figure 9).

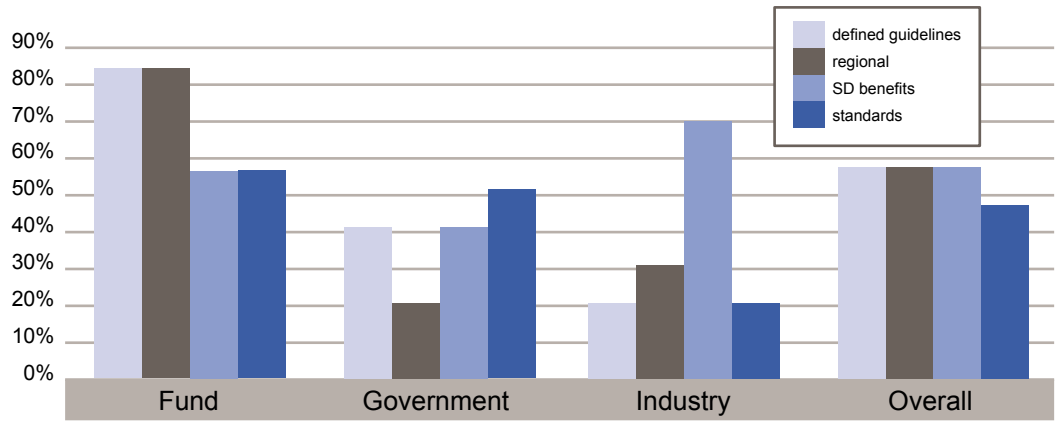

Figure 9: Purchase references of carbon-credit buyers. Participants were asked whether they gave preferences to projects according to a series of criteria, including regional origin, the potential to deliver sustainability co-benefits and the adherence to quality standards.

The regional origin of a CDM project was named by 59% of the participants to be an important criterion in project selection. Participants from international companies were interested in sourcing CDM projects close to their operations in developing countries. Some funds had a regional focus (e.g., the CAF-Spain Carbon Initiative focuses on CAF member countries only). Moreover, many funds and also some government buyers were particularly interested in projects from least-developed countries, in particular African countries. The regional preferences of buyers translate into an advantage for those projects that are able to find a buyer with particular interest in the project region.

Many buyers are looking for projects that would deliver co-benefits towards sustainable development. Among the participants of the survey, 70% of the industry representatives and 58% of the fund managers said they would give preference to projects that would also deliver credible co-benefits (Figure 9). When asked for their perception of sustainability co-benefits in forestry CDM projects, the replies were quite mixed between buyers of different provenance (Figure 10). Only 10% of industry representatives considered sustainability co-benefits an advantage of forestry CDM, but 74% and 80% of the survey participants from governments and funds did. The particular potential of forestry CDM to deliver sustainability co-benefits is being discussed extensively among those that also want to use the climate-change business to pursue development objectives (e.g., Neeff et al. 2006). The particular sustainability co-benefits of land-management projects may be less obvious to industry representatives with a different background.

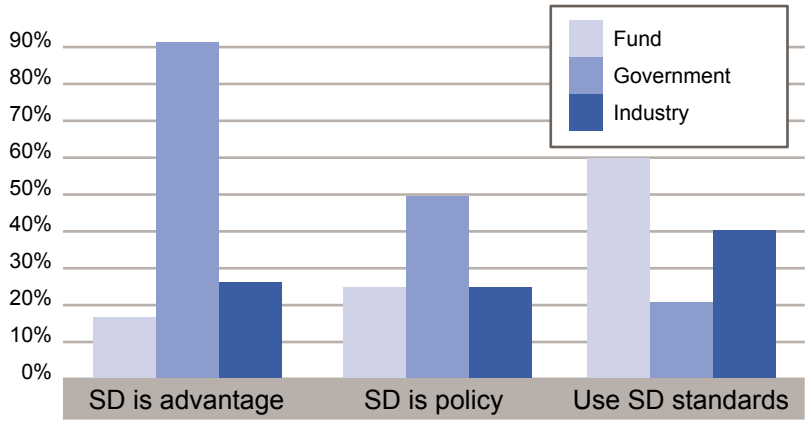

Figure 10: Sustainable development co-benefits in forestry CDM projects and buyers' approaches to using those. Participants were asked whether they believed sustainability co-benefits were an advantage of forestry projects, whether they gave preference to such projects and whether they believed that quality standards would be useful to ensure those benefits.

About 60% of the representatives from funds and governments believed that quality standards (such as the Gold Standard or the CCB Standards) (see section 2.3) are a good way to demonstrate a project's potential to deliver sustainability co-benefits (Figure 10). Conversely, only 20% of the industry representatives did so (this may be due to the fact that only 60% among them were aware of the two most important standards at all). For some buyers adherence to quality standards represents an added value.

4.3 Recommendation on the selling of tCERs or lCERs

The project proponent of reforestation projects under the CDM has a basic choice between two types of credits, namely tCERs and lCERs (compare section 2.1.4):

- tCERs: Temporary certified emission reductions refer to the total amount of carbon sequestered since project start. These credits are issued periodically (i.e. every five years) and expire at the end of the commitment period subsequent to the period in which they were issued.
- lCERs: Long-term certified emission reductions refer to the amount of carbon sequestered since the last verification. They expire at the end of the crediting period (i.e., after 5-60 years, depending on the time point of issuance) for which they were issued. If carbon is lost, lCERs must be replaced either by permanent credits or by other lCERs from the same project activity.

The differences between tCERs and lCERs have to be assessed on the grounds of a project's needs and a prospective buyer's preferences. The following gives an overview of advantages and disadvantages that tCERs and lCERs carry (Table 4).

	Temporary CERs	Long-term CERs
Financial flexibility	Very flexible due to short validity. Can be used to satisfy immediate needs and fill short-term gaps.	Less flexible due to long (and varying) time frame. Sold once at a fixed price.
Replacement liability at carbon reversal (due to management or disturbance)	Risk-free once issued and no liability for project owner. No replacement of issued credits necessary. In case of reversion of removals, tCERs are simply not re-issued at next verification.	Carry liability. Lost carbon must be replaced. LCERs expire at next verification.
Price	Higher than tCERs.	Lower than tCERs.
Credit issuance	New credits are issued for the entire carbon stock at every verification.	New credits are only issued for the increment in carbon stock since the last verification.
Timing of income	Higher at initial stages, but evenly distributed throughout the project lifetime.	Bulk of revenues at the beginning of a project.
Issuance fees (US$ 0.10-0.20 / carbon credit)	Relatively higher, because accrues when credits are issued every 5 years.	Relatively lower, because accrues only once when credits are issued in the crediting period.

Table 4: Key differences between tCERs and lCERs with a view on project commercialization.

TCERs provide an excellent opportunity as cost-effective short-term solutions for compliance with urgent commitments. Many carbon-credit users perceive tCERs as more convenient than lCERs because:

- TCERs retain greater flexibility to react to altered market conditions and to cater both short-term and long-term requirements;
- LCERs cause liabilities when carbon gets reversed due to management of plantations or due to disturbance.

One of main disadvantages of tCER projects is that they incur issuance fees every 5 years, while lCERs incur them only once.

When asked for their preferences as to credit types, all respondents said they preferred tCERs over lCERs. It must be considered, though, that most participants did not yet have a clear policy as to the preference of a credit type, and almost a quarter of all participants did not know that CDM forestry projects can only issue expiring credits (Figure 11).

4.3.1 Financial flexibility

Projects that issue tCERs can take advantage of price developments. Projects that opt for tCERs receive carbon credits in a 5-year interval after verification. Therefore, they can take advantage of price changes over time by repeated commercialization of issued tCERs, which provides the flexibility to trade these credits whenever prices are convenient (see Bird et al. 2004, Dutschke et al 2004). In contrast to this, the bulk of lCERs is sold only once at an early project stage. The obtained price can turn out to be either advantageous or disadvantageous, depending on future price developments. Projects that issue lCERs are much less flexible in terms of reacting to price developments.

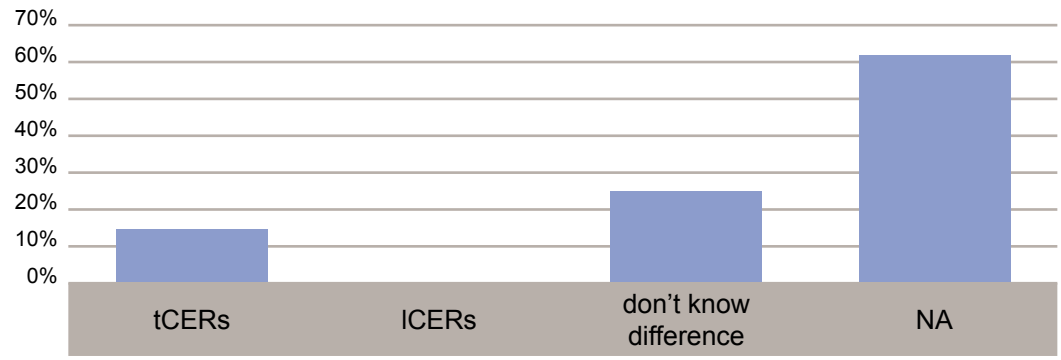

Figure 11: Survey results as to preferences between tCERs and lCERs among carbon-credit buyers.

4.3.2 Amount and timing of income

Prices for tCERs are expected to be lower than for lCERs, because tCERs buy compliance only for one commitment period, and lCERs buy compliance until the end of the crediting period (possibly for up to 55 years). For projects that require full cash income at an early project stage, lCERs have advantages, whereas in a project that generates a tCER stream, long-term incomes are more evenly distributed over project lifetime. On the other hand, an lCER project can sell credits for its carbon stock only once (but at a higher price), and a tCER project receives credits every 5 years for the same carbon stock (but sells them at a lower price). LCERs will expire only at the end of the chosen crediting period (e.g. 20 years). An additional batch of tCERs can be issued for each commitment period (5 in 5 years). Thus, tCER projects generate significant cash flow from selling carbon credits over the whole project lifetime, and lCER projects generate this income mainly at the project's initial stage.

4.3.3 Liability

Projects generating lCERs need to demonstrate for issued credits that the corresponding carbon stocks are still there. When carbon stocks decrease, e.g., after forest disturbance and also due to forest operations (thinnings, harvests, etc.), the lCERs expire. If such expiring lCERs had been traded before expiring, a liability issue occurs. TCERs do not carry those liabilities, because they simply would not get re-issued after the next verification if carbon stocks decrease. The long validity of lCERs of up to 55 years carries severe uncertainties and risks. On the technical side, it is impossible to ascertain risks of project underperformance (e.g., by disturbance) over very long time frames. On the institutional side, there is a considerable risk that an institution taking on liabilities for expiring credits may simply cease to exist over a time frame of various decades, and thus liabilities become baseless. A time frame that long exceeds usual buyers' medium to long term strategies. Credit liabilities of this long duration imply risks of unpredictable biomass loss (due to natural factors such as forest fires, storms or pests and project failure). In terms of liability tCERs are clearly favorable since they represent a risk-free commodity once they are issued. If the project fails after the first batch of credits has been issued, tCER projects keep the revenues they obtained from credit sales while lCER projects may have to compensate retrospectively for the loss. It is questionable whether carbon-credit users would want to invest into a commodity that carries such liabilities, and consequently, whether there is a significant market for lCERs.

5 Summary Guidance to Project Developers

This guidebook reviews the markets for carbon credits from forestry CDM projects. This summary section provides guidance to project developers based on the preceding review of the mechanisms of CDM forestry projects, a survey among buyers, CDM forestry project experience, and the authors' conceptual understanding of carbon markets. The guidance in this section is further distilled to a checklist for project developers.

5.1 Overview of the guidebook

The report compiles a list of countries that EcoSecurities considers rather likely to purchase carbon credits from forestry CDM projects. Overall, EcoSecurities expects the market demand for forestry CDM credits to amount to at least 75m carbon credits until 2012.

Some buyers prefer projects that generate environmental or socio-economic co-benefits over other projects (see section 4.2). These preferences originate from a development agenda of buyers, and also from gauging the involvement in forestry CDM project from a public-relations point of view. Consequently, markets favor projects that involve local communities and that deliver credible benefits to the rural poor in developing countries. Also, projects may have an advantage by contributing to environmental goals, such as the restoration of biodiversity, as well as the protection of soils, and combating land degradation and desertification. Certification of the project design according to the CDM quality standards (see sections 2.3 and 4.2) is one way of demonstrating sustainability co-benefits and may thus ultimately contribute to market success.

First indications from the purchase agreements that The World Bank's entered into indicate approximately USD 3 per carbon credit as prices from CDM forestry projects. Presently, the markets are at a nascent stage, though, and it remains to be expected that the next months will see an increasing volume of transactions.

On the carbon-credit markets, prices are closely tied to the risks of project failure (see section 3.3.2). Projects are more attractive that can demonstrate high probability of success and have a convincing strategy to hedge against risks. For minimizing project risks, it is essential to follow the best practices as to forestry management and operations as well as, more in general, to the establishment of rural development projects. Adherence to best practices can be demonstrated by specialized CDM quality standards and also general forestry quality standards (CCB-Standards, FSC-criteria, etc.) (See section 2.3). Moreover, insurance schemes have been introduced as a costly, yet rather convincing strategy to hedge against project risks (see sections 2.2 and 3.3.2).

When entering a purchase agreement, the carbon-credit buyer takes two distinct types of risks of projects not delivering carbon credits: a) that a project would not achieve CDM registration, and b) that the project's business case fails. While clear compliance with CDM eligibility criteria is an obvious prerequisite for project success under the CDM (see section 2.1), carbon-credit

buyers are equally interested in confirming that a project's business and investment plan is sound (see section 2.4). During negotiations of carbon-credit purchase agreements, projects are often required to undergo a two-fold due diligence procedure as to CDM criteria and as to business criteria (see section 4.1.1).

Transformation of carbon benefits into financial streams is likely to be successful, if the project manages to secure a strong partner both for project development and for commercialization of credits. Commercialization goals should be integrated from the project's very first stages on, when the project design can still be modified to accommodate requirements of carbon-credit buyers (see section 4.2). Specialized advisors that integrate the development of the project's CDM component with the commercialization of carbon credits have a mutual interest with the project owner to work towards success of both aspects. Such partnerships may give projects access to secondary markets, where commercialization of a carbon-credit portfolio allows for other risk-management approaches (see section 3.3.2). Intermediaries have a strong market position and partnering can translate into greater security of success, rather than leaving commercialization and finding the best buyer for a project to coincidence.

5.2 Checklist of commercialization success criteria for project developers

- The project delivers socio-economic co-benefits. It creates employment and new sources of income to the rural poor. People do not need to relocate in order to clear sites for planting, or receive an appropriate compensation.
- The project contributes to other environmental goals. The tree plantations include native species that are managed at long rotation cycles. The project plants on degraded sites and thus contributes to the protection of soils. It is not necessary to clear lands that are currently covered by woody vegetation to a significant extent.
- The project achieves certification both according to the schemes of the Forest Stewardship Council (FSC) and to the criteria of the Climate, Community and Biodiversity Alliance.
- The project meets all eligibility requirements of the CDM.
- The project has secured investment, and it has reached financial closure. It is only awaiting CDM registration for operations to commence.
- The project is based on a business plan that includes detailed cash-flow projections, a comprehensive structuring according to the principles of forestry engineering and operations, as well as an approach to risk-management.
- The project has secured an insurance scheme with a major international insurance provider.
- The project receives specialist advice from the earliest stages on regarding improving project design for facilitating CDM registration and enhancing CDM commercialization.
- The project has a strong partner with access to carbon markets that could support both the development of the CDM component, and the vending of carbon credits.

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7 Annex 1
A survey among potential buyers

Between early July and mid August, EcoSecurities conducted a survey among key players of the carbon markets. Key players in the markets for forestry CDM projects comprise the carbon funds, governments of the parties to the Kyoto Protocol, industry representatives (mostly from Japan and Canada), and carbon brokers. Prospective participants were contacted by email and received a questionnaire. EcoSecurities later followed up in telephone interviews that took each about 20-45 minutes. The questionnaire comprised 17 questions relating to the participant's profile, purchase preferences and perceptions of the market environment. The data obtained in the survey provide basis for an empirical overview of the markets for carbon credits from CDM forestry projects (Figure 12).

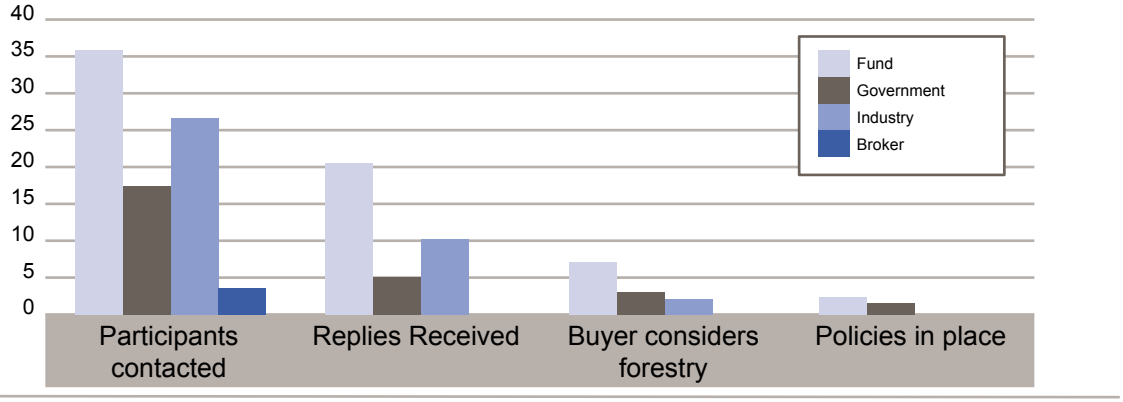

Figure 12: Overview of the participants in the survey.

It was possible to analyze responses from 34 out of 84 participants. According to their targets, the participants represent a purchase volume of 314m carbon credits from the CDM. EcoSecurities evaluated the collected data to establish intelligence on the state of the carbon markets for forestry CDM. With a view on providing recommendations to project developers, EcoSecurities tried to carve out preferences of buyers. The evaluation of the survey results are part of this document in the relevant sections on buyer characteristics and markets.

Overall, the level of information among prospective buyers of carbon credits from forestry projects is rather low. Many among the participants were not able to discuss the mechanics and policy context of forestry CDM. Based on the obtained answers, EcoSecurities estimated that about 60% among the major market actors for general CDM lack key information necessary for successful participation in the markets for forestry CDM. There is a need for increasing awareness on CDM and even more on forestry CDM among key market players.

Annex 2
Overview of approved AR-CDM methodologies

	AR-AM0001 ("China")	AR-AM0002 ("Moldova")	AR-AM0003 ("Albania")	AR-AM0004 ("Honduras")
Characteristic	Reforestation of degraded lands	Restoration of degraded lands through AR	AR of degraded land through tree planting, assisted natural regeneration and control of animal grazing	AR of land currently under agricultural use
Aplicability	Afforestation and Reforestation	Afforestation and Reforestation	Afforestation and Reforestation	Afforestation and Reforestation
	Degraded and degrading lands, Few pre-existing trees allowed	Degraded and degrading lands	Assisted natural regeneration	
			Pre-project grazing and fuel-wood collection	Pre-project grazing, fuel-wood collection, and agricultural activities
Carbon pools	Living biomass only	All five	Living biomass only	Living biomass only
Baseline	Approach 22(a)	Approach 22(a)	Approach 22(a)	Approach 22(a)
	Land remains abandoned and degraded	Land remains abandoned and degraded	Land remains used for grazing and/or fuel-wood collection	Land remains used for grazing, agricultural activities and fuel-wood collection
Project scenario	Forest plantations	Forest plantations	Forest plantations and natural regeneration	Forest plantations and agroforestry
Project emissions	Fossil fuel consumption	Fossil fuel consumption	Fossil fuel consumption	Fossil fuel consumption
	Fertilization	Fertilization	Fertilization	Fertilization
	Biomass burning	Biomass burning	Biomass burning	Biomass burning
Leakage	Fossil fuel consumption	Fossil fuel consumption	Fossil fuel consumption	Fossil fuel consumption
			Wooded posts for fencing	Wooded posts for fencing
			Activity displacement (grazing and fuel-wood collection)	Activity displacement (grazing, agricultural activities and fuel-wood collection)
Other		Use of CO2-fix allowed for ex ante estimations		

Annex 3
Sources for further reading

The CDM regulatory framework	http://cdm.unfccc.int
Methodology development for forestry CDM ARmethodologies	http://cdm.unfccc.int/methodologies/
Up-to-date market information	http://www.pointcarbon.com/
The BioCF of the World Bank	http://www.biocarbonfund.org
The Carbon-finance Unit of the World Bank	http://carbonfinance.org/
The FORMA project	http://www.proyectoforma.org
The ENCOFOR project	http://www.joanneum.at/encofor/
The Climate, Community and Biodiversity Alliance	http://www.climate-standards.org/

Annex 4
Glossary

AIJ	Activities Implemented Jointly	Mechanism governing project-level carbon credit activities between 1995 & 2000
Annex I countries		Developed countries with emission reduction commitments
ANR	Assisted Natural Regeneration	
Carbon credit		Generic term for the claimed carbon benefits arising from project-level activities
CCBA	Climate Community and Biodiversity Alliance Certification	standard for CDM forestry projects
CER	Certified Emissions Reduction	Carbon credits from CDM projects
CDM	Clean Development Mechanism	Mechanism introduced by the Kyoto Protocol governing project-level carbon credit transactions between developed and developing countries
DNA	Designated National Authority	Climate change focal point of a member country of the UNFCCC
DOE	Designated Operational Entity	International authority accredited by the EB for validating CDM projects
EB	Executive Board	International authority supervising the registration and related procedures of CDM projects
ERPA	Emission Reduction Purchase Agreement	Contractual agreement about the purchase of CERs

ET	Emissions Trading	Mechanism introduced by the KP allowing the trade of surplus emission allowances between developed countries
EUA	European Union Allowances	Carbon credits that can be traded in the EU ETS
EU ETS	European Union Emissions Trading System	Trading regime established within the European Union that EUAs can be traded in
FSC	Forest Stewardship Council	Certification standard for forestry projects
UNFCCC	UN Framework Convention on Climate Change	International legal instrument on climate change, signed in 1992
GHG	Greenhouse gas	Principally CO2, which contribute to climate change
IRR	Internal rate of return	Indicator for profitability of investment
JI	Joint Implementation	Mechanism governing project-level carbon credit activities pre-1995, and also between 2008-2012 between developed countries (these are two distinct mechanisms)
KP	Kyoto Protocol	International legal instrument on climate change containing emission reduction commitments for Annex 1 countries
lCER	long-term Certified Emission Reduction	Carbon credits from CDM forestry projects with a validity of up to 30 years
LoA	Letter of Approval	Letter issued by the DNA in the approval process of a CDM project
LoC	Letter of Commitment	Early document with a purchase agreement for CERs
LoE	Letter of Endorsement	Letter issued by the DNA with a preliminary approval of a CDM project
LoI	Letter of Intention	Early document with a purchase agreement for CERs
LULUCF	Land use, land-use change and forestry	Kyoto Protocol jargon for terrestrial carbon sink activities
Non-Annex I countries	Developing countries with no emission reduction commitments	
PDD	Project Design Document	Basic document that needs to be prepared and submitted to the Executive Board through a validator for the approval of a CDM project
tCER	temporary Certified Emission Reduction	Carbon credits from CDM forestry projects with a validity of 5 years
t CO2e	tonnes of carbon	Units for carbon calculations

The FORMA project is a joint effort by a consortium of institutions supporting the development of AR and bioenergy projects in the context of the CDM in Latin America. The project provides technical and financial assistance to help with the design of CDM projects, develops tools for facilitating technical tasks and systemizes the lessons learned from project intervention. The FORMA project is funded by INIA (Instituto nacional de Investigacion Agraria y Alimentaria, Spain) and implemented by CATIE (Tropical Agricultural Research and Higher Education Center, Costa Rica), CIFOR (Centre for International Forestry Research, Indonesia), with the participation of experts from INIA, ECOSUR (Colegio de la Frontera Sur, Mexico) and MGAP (Ministerio de Ganaderia, Agricultura y Pesca, Uruguay)

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