GUIDEBOOK

FOR THE FORMULATION OF AFFORESTATION / REFORESTATION AND BIOENERGY PROJECTS IN THE REGULATORY CARBON MARKET

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This Guidebook is a modified version of one produced for ITTO (entitled “Guidebook For The Formulation Of Afforestation And Reforestation Projects Under The Clean Development Mechanism”, Technical Series 25. The main modification is the addition of material related to bio-energy and biofuel projects.

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INTRODUCTION

The purpose of this guidebook is to serve as guidance for those interested in developing a land-use change and forestry projects and bioenergy projects under the Clean Development Mechanism (CDM) of the Kyoto Protocol. It also provides material on the voluntary markets at the end as Annex G. The guidebook has been created by Winrock International and has been modified from the original version produced for and in collaboration with the International Tropical Timber Organization. The main modification is the addition of material on bio-energy projects and an Annex on the voluntary markets.

The guidebook is presented in three parts:

Part I is an introduction to the Kyoto Protocol and the CDM. The key terms and concepts required to understand the remainder of the guidebook are explained here.
Part II describes the conceptual and procedural details for formulation a land-use change and forestry CDM project. The structural and technical units of the United Nations Framework Convention on Climate Change that manage and oversee the CDM project approval process within the Kyoto Protocol framework are introduced. A step-by-step guide to project development is also outlined.
Part III explores the financing of CDM projects. Discussions include an overview of the global carbon market and potential sources of project financing, including those for project development.
References and resources are given in the **Annexes**. Annex F contains the Project Development Document for land-use change and forestry projects under the CDM and guidance on its completion. Annex G provides additional information of the voluntary markets, with a comparison of the CDM and VCS, as well as a project document template for the VCS.
Guidance is not given on measuring or monitoring project benefits, nor on how to calculate project carbon benefits. This guidance is available elsewhere, and links and references are provided in the Annexes.

PART I: CDM AFFORESTATION AND REFORESTATION PROJECTS

1.1 Policy Background

1.1.1 The United Nations Framework Convention on Climate Change

In 1992, most countries joined the United Nations Framework Convention on Climate Change (UNFCCC[1]) to begin considering what could be done to reduce global warming and how to cope with whatever temperature increases might result. A major accomplishment of the Convention, which is general and flexible in character, is that it recognized there was a problem – a significant accomplishment in 1994 when the UNFCCC was ratified by 189 countries, because at that time less scientific evidence was available.

The UNFCCC sets an ultimate objective of stabilizing greenhouse gas emissions "at a level that would prevent dangerous anthropogenic (human induced) interference with the climate system". It states that "such a level should be achieved within a time-frame sufficient to allow ecosystems to adapt naturally to climate change, to ensure that food production is not threatened, and to enable economic development to proceed in a sustainable manner".

Countries that have ratified the UNFCCC – called "Parties to the Convention" – agree to take climate change into account in matters such as agriculture, industry, energy, natural resources and activities involving sea coasts. They have also agreed to develop national programmes to slow climate change on a voluntary basis. The Convention places the heaviest burden for halting climate change on industrialised nations because they are the source of most past and current greenhouse gas emissions.

The first step in solving a problem is to know its dimensions. To address this issue, the Parties of the "developed nations" and nations with "economies in transition" (called Annex I countries because they are listed in the first annex to the Convention) are required to report updated inventories of greenhouse gas emissions on a regular basis. With a few exceptions, the "base year" for tabulating greenhouse gas emissions has been set as 1990. Developing countries (also referred to as non-Annex I countries) also are encouraged to compile greenhouse gas inventories.

The UNFCCC is recognised as a "framework" document – that is, something to be amended or augmented over time so that efforts to deal with global warming and climate change can be focused and made more effective. The first addition to the Convention, the Kyoto Protocol, which contains more powerful (and legally binding) measures, was adopted in 1997.

1.1.2 The Kyoto Protocol

Under the UNFCCC, Parties agreed to annual meetings called Conferences of the Parties (COP 2). At the Third COP in Kyoto, Japan, in 1997, a protocol was agreed that set greenhouse gas emission reduction targets for industrialised countries and countries with economies in transition. Annex I countries committed to reducing their emissions by an average of 5 percent below 1990 levels in the period 2008-2012. The Kyoto Protocol came into force on the 16 February 2005. To date, 163 states have ratified (or acceded to) the Kyoto Protocol, including 35 Annex I countries (whose emissions represent 61.6 percent of total Annex I Party emissions).

[1] http://unfccc.int/essential_background/convention/background/items/1349.php

Three market-based "flexible mechanisms" were included under the Kyoto Protocol to help reduce the cost of implementation. These mechanisms allow industrialised countries to reduce emissions outside their national boundaries and to count these reductions towards their national target. The mechanisms are:

International Emissions Trading (Article 17), which allows Annex I Parties to trade part of their assigned cap

Joint Implementation (Article 6), which functions at the sub-national level so that project activities can be sponsored and implemented in one Annex I country to meet reduction requirements in a second Annex I country

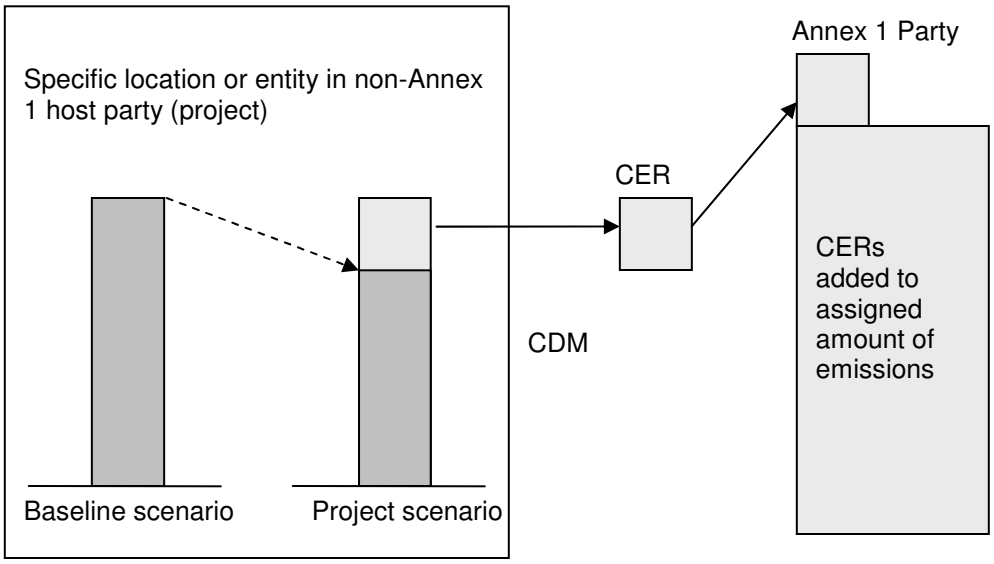
The Clean Development Mechanism (Article 12), which allows the sponsorship and implementation of project activities in non-Annex I Parties and is the focus of this guidebook.

The Clean Development Mechanism (CDM)

The CDM, like Joint Implementation, is a project-based mechanism. However, unlike Joint Implementation and International Emissions Trading, the CDM involves host Parties that do not themselves have an emissions cap or emissions reduction target. The CDM, as detailed under Article 12 of the Protocol, states:

"The purpose of the clean development mechanism shall be to assist … [non-Annex I Parties] … in achieving sustainable development and … to assist … [Annex I Parties] in achieving compliance with their quantified … commitments …".

The figure below explains CDM project emission trading. A CDM project activity is undertaken at a specific location in a non-Annex I host country where CDM financing – or the prospect of CDM financing – leads to either a reduction in emissions or an increase in sequestration. The difference in quantity of emissions or sequestrations between what occurs with the project and what would have occurred without the project is tradable. Once verified, this difference becomes x tonnes of Certified Emissions Reductions (or CERs, the CDM trading unit) which, when purchased by an Annex I Party, is added to that Party's assigned emissions and permits the Annex I Party to emit an additional quantity of carbon dioxide (CO2) or non-CO2 gases equal to the verified CER.



As trading under the CDM takes place with non-capped hosts, the CDM leads to an increase in the total amount of the emissions cap of Annex I countries. The CDM effectively grants a license to emit up to the total emissions savings secured by project activities in non-Annex I host countries – that is, countries are trading emission offsets. The CDM, as its name implies, is supposed to stimulate clean development for the populations of non-Annex I countries.

There are 15 categories of eligible CDM project activities:

1. Energy industries (renewable/non-renewable sources);
2. Energy distribution;
3. Energy demand;
4. Manufacturing industries;
5. Chemical industries;
6. Construction;
7. Transport;
8. Mining/mineral production;
9. Metal production;
10. Fugitive emissions from fuels (solid, oil and gas);
11. Fugitive emissions from production and consumption of halocarbons and sulphur hexafluoride;
12. Solvent use;
13. Waste handling and disposal;
14. Afforestation and reforestation; and
15. Agriculture.

The primary focus of this project formulation manual is category 14 – afforestation and reforestation. 'Afforestation and reforestation' is the sole eligible LULUCF (land use, land use change and forestry) activity under the current phase of the CDM. Bionergy projects are also recognized as another project type within the project manual that can fit within category 14 and also within others such as category 1 – energy industry (renewable sources).

1.1.3 Land Use, Land-Use Change and Forestry Projects

LULUCF projects form a special category under the Kyoto Protocol, as growing trees lead to the sequestration of CO_2 rather than the avoidance of greenhouse gas emissions. Trees can also be cut down at any time, potentially releasing the stored carbon – that is, the carbon stored is not necessarily permanent. (With energy, by contrast, once an emission has been avoided it is effectively permanent.) In the context of the CDM, LULUCF projects have an added value. Trees can be grown in most areas of the world, providing benefit to the poorest people in the poorest areas. Potential energy project locations are more limited, which partially accounts for why less than three percent of the registered CDM projects (as of March 2006) are located in Africa. LULUCF projects also tend to have a large number of "co-benefits", such as erosion prevention, watershed protection, enhanced biodiversity, provision of forest resources for local people, and many more.

There are cases where LULUCF projects can encompass emissions avoidance – such as the avoidance of deforestation, reduction in fire risks or changes in forest harvesting (for example, changing from conventional logging to reducedimpact logging). However, it was determined at the Seventh COP (COP-7[2]) in Marrakesh,

[2] Referred to as the Marrakesh Accords; FCCC/CP/2001/13/Add.2; 17/CP.7. Modalities and procedures for a clean development mechanism, as defined in Article 12 of the Kyoto Protocol

Morocco, in 2001, that, at least for the first commitment period, LULUCF projects under the CDM should be limited to afforestation and reforestation.

Afforestation was defined as replanting with trees areas that had been without forest for at least 50 years; reforestation was defined as replanting with trees areas that had been without forest since at least 31 December 1989. Under CDM regulations, afforestation and reforestation are practically treated in the same way.

At COP-7, it was decided LULUCF projects could not represent more than one percent of the assigned emissions amount of any country for each of the five years of the first commitment period (2008-2012), to a total of 137 million tons CO_2-equivalent (t CO_2-e) per year. To put the size of allowable CDM offsets in perspective, 137 million t CO_2-e per year is equivalent to 4,500 afforestation/reforestation projects with an average area of 3,000 hectares and a mean annual sequestration of 10 t CO_2-e per hectare per year.

1.1.4 Bioenergy projects

Bioenergy is a general term used to describe energy derived from recently living matter such as plant matter, forest and agricultural residues etc. Bioenergy projects can take the form of solid, liquid or gaseous biomass for use as energy for heat, power or transport fuel.

Bioenergy projects are well established under the CDM and have largely been associated with renewable evergy projects in which a switch from a carbon-intensive fuel (the baseline) to a biomass system reduced GHG emissions. Co-benefits of bioenergy projects can include contributions to sustainable development through rural electrification and acess to energy (which underpins many of the Millenium Development Goals.)

The table below illustrates the various sub-categorles of biomass energy and the number of registered projects. Of the total of 771 biomass energy CDM projects either registered or in the pipeline as of July 2009, only 15 were in Africa (compared to 469 projects in Asia and the Pacific). Only 3 biomass energy projects are actually registered in Africa under the CDM and they fall under bagasse power and forest residues sub-categories.

Bioenergy sub-types used in CDM	**Number of registered projects**
Bagasse power	77
Palm oil solid waste	20
Agricultural residues; other kinds	71
Agricultural residues; rice husk	50
Agricultural residues; mustard crop	5
Agricultural residues; poultry litter	3
Black liquor	7
Forest residues; sawmill waste	11
Forest residues; other	8
Forest biomass	1
Industrial waste	1
Gasification of biomass	1
Biodiesel	0
Ethanol	0

Projects that promote household level use of bioenergy such as biogas for providing clean cooking fuel under the CDM were constrained until recently by the lack of methodologies that would allow consideration of unsustainable or non-renewable biomass in the baseline i.e. the use of firewood or charcoal for cooking. Suitable methodologies are now in place (AMS I.C., AMS I.E. and AMS II.G), but establishing the baseline and verifying the percentage of unsustainable biomass substituted by the project requires extensive forestry data that require substantial resources to collect. These limitations have largely resulted in such projects being found on the voluntary market rather than the CDM market.

1.2 Afforestation and Reforestation Projects under the CDM

1.2.1 CDM Projects

A CDM project is an activity undertaken in a non-Annex I country that results in reduced emissions of greenhouse gases or increased sequestration. In the case of forestry projects, growing trees fix (or sequestrate) CO_2 from the atmosphere into stable living material. CDM projects must be registered with the Executive Board of the CDM. This is achieved through the validation of a Project Design Document by an official auditing organisation known as a Designated Operational Entity.

In *Part II*, the steps to creating and registering a CDM project are outlined, while the finances required for the project development and sources of funding are discussed in *Part III*.

To prove there is an atmospheric benefit to a project activity, it is necessary to show the project is doing more than "business as usual" – in the case of afforestation and reforestation projects, increasing sequestration above that which was occurring before the start of project activities. The project must also be "additional", which means there must be certainty that the activity would not have occurred without the CDM incentive – that is, that CDM money was the critical catalyst. Finally, the project must also not lead to a displacement of emissions or "leakage", which would lead to a loss of the greenhouse gas benefits of the activity.

1.2.2 Relevant Afforestation and Reforestation Activities under the CDM

Despite the limitations to afforestation and reforestation, LULUCF project activities can still be relatively diverse and cover activities such as:

- native forest restoration;
- timber plantations;
- agroforests/multi-purpose trees including bioenergy crops; and
- recuperation of barren areas.

Examples of two projects are given in Boxes A and B. Afforestation and reforestation activities can also be paired with energy projects – an example of such a project is given in Box C and D.

Box A: Pearl River Watershed Management, China

This project proposes to alleviate local poverty and reduce threats to forests by afforesting 4,000 hectares in the Guangxi Zhuang Autonomous Region, including half of the Pearl River basin. The sites to be planted are: shrub land, grassland and open tree land with tree cover below 20 percent so as to meet the Kyoto Protocol rule for China. Seventy-five percent of the species planted will be native, including Pinus massoniana mixed, Liquidambar formosana, Cunninghamia lanceolata, Schima superba, Quercus griffithii and Quercus acutissima. Eucalyptus will make up the bulk of the exotics.

The restoration of the forests along the middle and upper reaches of the Pearl River will help demonstrate models for watershed management. The use of the carbon sequestered by a plantation as a "virtual" cash crop will generate income for local communities. As the first life-size LULUCF project in China, the project will also test how afforestation activities can generate high-quality emission reductions in greenhouse gases that can be measured, monitored and certified.

Finally, the project will work within the confines of the larger Guangxi Integrated Forestry Development and Conservation Project (GIFDCP) umbrella that addresses closely inter-linked threats to Guangxi's natural forests, watersheds and biodiversity through an integrated approach to managing these natural resources at the landscape level.

The project is expected to sequester around 0.34 million t CO2-e by 2012 and around 0.46 million t CO2-e by 2017. It will connect fragments of forest adjacent to nature reserves, providing corridors and habitats for wildlife and increasing biodiversity conservation.

Other environmental benefits include the reduction of soil erosion, improvement of the regulation of hydrological flows, leading to reduced flooding and drought risks, and provision of incentives for people to invest in sustainable land use. The reforestation is additional in the project areas because it is not economically feasible without the additional income from the carbon sales for managing the reforested lands as multiple-use plantations. The project will provide benefits to farmers and communities ranging from direct income supplements to broader social benefits.

Project implementation will create about 5 million person-days of temporary employment and 40 long-term positions for local farmers. About 5,000 households are expected to see their incomes increase through the sale of carbon, timber and non-timber forest products. The project will identify potential environmental or social risks and work to mitigate them. Local forestry agencies, in particular, will provide technical support and training to the local communities for designing, implementing and monitoring the project, and will monitor the environmental and social benefits, including carbon sequestration. Community involvement will reduce the risk of nonpermanence and any potential leakage.

The project will be financed by the Government of the Guangxi Zhuang Autonomous Region, farmer co operatives, the Kangyuan and Fuyuan forest farms, the Luhuan Forestry Development Company, the World Bank through its loan to the GIFDCP and a local agricultural bank. The forestry farms and companies are the private afforestation and timber production enterprises, which will implement and finance the project.

Text courtesy of the World Bank BioCarbon Fund

Box B: Pico Bonito Forest Restoration, Honduras

This project will assist small-scale farmers in the Pico Bonito National Park buffer zone to introduce agroforestry production techniques. More specifically, community pilot projects will be implemented for sustainable forestry management of native species and the following activities: (1) agroforestry for small-scale producers; (2) reforestation for conservation; and (3) reforestation for sustainable commercial forestry, with the establishment of a commercial-grade plantation. The project will cover 2,600 hectares and benefit 20 villages living in this zone. Pico Bonito, the third largest national park in Honduras, is home to many endangered and threatened species and provides essential connectivity for the Meso-American Biological Corridor. Its natural resources have been seriously degraded due to marginal agriculture and cattle grazing. The project is expected to sequester around 0.34 million t CO2-e by 2012 and around 0.63 million t CO2-e by 2017.

The income provided by carbon sequestration is key to the realization of the project. The combined reforestation efforts will greatly enhance the park's ability to sustain threatened biodiversity in addition to improving the integrity of headwaters for several rivers that originate in the park and its buffer zone. More specifically, the project seeks to provide several environmental benefits, including improved slope stability, reduced soil erosion on steep slopes and enhanced upland watershed integrity for freshwater production.

The project will employ hundreds of local people to establish a commercial-grade plantation certified by the Forest Stewardship Council, as well as to reforest degraded lands in the park's buffer zone for conservation. It will also integrate social benefits to the villages in the zone through on-farm technical assistance, sustainable
forestry management training, establishment of sustainable livelihoods and permanent sharing of profits for community investment. The project will monitor potential leakage stemming from the increased protection of the park, which will also reduce the risk of nonpermanence of the carbon sequestration.

The project has been developed by EcoLogic (www.ecologic.org), a non-governmental organisation (NGO) with a mandate to protect Latin American wildlife and wildlands by advancing communitybased economic development and natural resource management. Together with sponsors and community representatives, they will create a for-profit company, Pico Bonito Inc., to manage the project and own the CERs. Fundación Parque Nacional Pico Bonito, a Honduran NGO dedicated to the sustainable management of Pico Bonito National Park since 1994, will be subcontracted to handle the agroforestry and conservation components of the project. The
World Bank's BioCarbon Fund funding is a small percentage of the overall funding needs for this project. OPIC has issued a letter of support for a long-term loan contingent upon meeting debt ratios. Other investors include Corporación Hondureña de Desarrollo Forestal (www.cohdefor.hn), Honduran and international investors and lenders, and various private landholders in the region.

Text courtesy of the World Bank BioCarbon Fund

Box C: Pairing afforestation & reforestation project activities with bioenergy projects

Afforestation and reforestation projects can produce biomass that, once harvested, can be used for generation of heat, electricity, or liquid fuels. There are already a large number of such projects in the process of validation, or even already registerd with the CDM-Executive Board (CDM-EB), that use biomass residues for heat and electricity production.

Other projects, for example for production of liquid biofuels, use special crops that are grown for this purpose. Oil palm plantations on agricultural or degraded land for example offer a carbon sequestration opportunity with potential for heat, electricity and liquid fuel production. None of the liquid biofuels methodologies based on crops have been approved yet by the CDM-EB, in part due to concern that land-use leakage may cause deforestation or forest degradation. Monitoring is also a concern. Some of these projects source their biomass from the general market, and thus make it very difficult to trace the origin of the biomass and the impacts on carbon stocks, whereas others may produce the biomass on areas that are under the control of the project participants who operate the bioenergy project.

Tools for assessing sustainability impacts and for calculating GHG emissions reductions from bioenergy and biofuels as products have been developed but not yet applied to projects to be used within the CDM framework (see Box D).

Where the biomass production component is an afforestation / reforestation project, the current rules require that the AR component must be submitted as a project that is separate from the bioenergy component . Each of the two parts needs to use its own methodology, have its own validation, monitoring etc. Each component should reference the other in its project design document (PDD), so that no additionality doubts occur.

Otherwise the possibility exists that the component that is submitted at a later time may be considered non-additional (see Section I.B.2.4), as it only makes full economic sense in combination with the already approved first part.

Ideally, however, the CDM-EB should allow integrated methodologies and PDDs for combined AR and bioenergy projects, so that the process can be simplified and transaction costs reduced. These combined projects offer the benefit of using already approved AR methods for estimating or reducing leakage, while at the same time alleviating concerns that the biomass that is used in the energy component may not be sustainably produced.

In summary, significant synergies can be achieved by combining AR and bioenergy methodologies and PDDs. An added benefit is that at times when carbon stocks in the AR projects are decreased due to harvesting, some of the shortfall can be made up by permanent credits from replacing fossil fuels in the bioenergy component.

Box D: An African example of integrating afforestation and reforestation with bioenergy activities:

The project will be implemented in the Democratic Republic of Congo on degraded savanna steppe using Jatropha curcas, a shrub species known to survive on degraded land with little input. Jatropha has also gained substantial interest from the bioenergy community for the production of biodiesel from Jatropha seeds.

The project includes two components. One, the cultivation of Jatropha on degraded land, would sequester carbon, regenerate degraded soils, empower local communities to develop sustainable agro-forestry practices and provide an alternate livelihood potential. Two, the local production of biodiesel from Jatropha seeds would replace diesel fuel which is currently used to generate electricity in the villages.

There is no long-term commercially viable business model yet in operation and breeding programs and variety selection are in their infancy. Oil yields from Jatropha are substantially lower than many other oleaginous species and careful consideration should be given to risks associated with large scale planting compared to the more effective use of Jatropha that already exists in the area perhaps as a live fence material. Other bioenergy projects e.g. in Nepal, have used existing Jatropha bushes to obtain oil to use within diesel generators to power local irrigation pumps to displace fossil diesel.

1.2.2.1 Bioenergy and GHG reductions

Bioenergy can have lower emissions in its production and consumption as an energy source than fossil fuels so it can be used to displace fossil fuels and reduce GHG emissions. The type of crops as well of methods of processing and transport influence the final GHG balance of bioenergy crops. Converting land with high carbon stocks to grow bioenergy crops may however negate the benefits of biofuel and cause increases in GHG emissions.

There is no internationally agreed methodology for assessing biofuel GHG emissions, nor any approved CDM methodology. However a number of groups and organizations have developed methodologies and tools for measuring the GHG balance of biofuels as an end product to assist project developers and policy-makers in sustainable decision-making. Some methodological choices significantly affect the results, e.g. how to treat emissions associated with the co-products from the biofuel production process. Care must be taken to identify which method is used *and* to define whether any land use changes have been taken into account.

The following list identifies a selection of the methodologies and tools for measuring the GHG balance of biofuels:.

Lead organization: Global Bioenergy Partnership
Coverage: Solid biomass and liquid biofuels
Scope: GHG Methodological framework
Accessible from: http://www.globalbioenergy.org/fileadmin/user_upload/gbep/docs/2009_events/7th_SC_NY/GBEP_GHG_report_2306.pdf

Lead organization: EU Renewable Energy Directive
Coverage: Liquid biofuels (will expand to solid biomass)
Scope: GHG Methodology and results using default data
Accessible from : http://ies.jrc.ec.europa.eu/WTW

Lead organization: UK Renewable Fuels Agency
Coverage: Liquid biofuels
Scope: Methodology, online calculator and input data
Accessible from: www.dft.gov.uk/rfa

Name of tool: GREET
Coverage: Liquid biofuels and solid biomass
Scope: Online software tool
Accessible from: http://www.transportation.anl.gov/modeling_simulation/GREET/index.html

Although there are no standard methods for assessing biofuel GHG emissions nor any approved CDM methodology, there are around 150 registered small-scale bioenergy projects and the vast majority are located in India for heat and power production using methodologies AMS.I.C. and AMS.I.D.

Other methodologies include:
AMS III.E. Avoidance of methane production from decay of biomass through controlled combustion, gasification or mechanical/thermal treatment.

There are currently 23 registered projects that use the AMS III.E. methodology, either as a single approach or coupled with another (e.g. AMS.I.D) and the majority are in Malaysia and Brazil.

One approach that uses this methodology is the development of 'green charcoal' or 'biochar'. Through the controlled combustion (pyrolysis) of agricultural residues and other biomass waste, the material produced is a fuel that has the same performance as charcoal made from wood.

In this case, the baseline equals wood charcoal use and outside burning of agricultural residues. Under the project case, agricultural residues used to produce biochar reduces pressure on deforestation from the production of wood charcoal, avoids methane emissions from wood charcoal production and abates CO2, CH4 and N2O emissions resulting from the previous burning of agricultural residues

AMS III.T. Plant oil production and use for transport applications.
This methodology is a small-scale liquid fuel methodology that is approved and currently one project in Paraguay is at the validation stage.

The baseline is the continued use of fossil diesel. The project produces and uses plant-oil (not processed into biodiesel) from sunflower and nabo (e.g. Brassica species) plants (used for regenerative purposes in soybean plantations) in farm machinery, for sale to vehicle fleets and, to a minor extent, for sale at selected fuelling stations through agreements with retailers. The methodology covers the use of plant oil in a pure form and blended.

1.2.3 Afforestation and Reforestation CDM Project Rules and Conditions

CDM projects must result in carbon credits that are effectively permanent, in addition to business as usual, and will not lead to carbon losses outside the project boundaries.[3]

1.2.3.1 Approach for addressing non-permanence

During the negotiations leading up to the Kyoto Protocol and subsequently, there was considerable concern that credits issued for carbon sequestration would be subject to a risk of re-emission due to either human action or natural events such as wildfires. This was called the permanence risk and is unique to LULUCF projects under the Protocol.

The danger is that CO2 removed from the atmosphere by trees will be re-released if the trees are cut down or fall in severe storms, or are burned by humans or in wildfires. To solve this concern, the Parties agreed at the Ninth COP (COP-9) that credits arising from afforestation/reforestation projects under the CDM should only be temporary. Although the credits are temporary, it was determined that they could be re-issued or renewed (every five years) after an independent verification deems that sufficient carbon is still sequestered within a project to account for all the credits issued.

Credit for CDM projects is given in the form of CERs. There are two forms of CERs: temporary (tCERs) and long-term (lCERs). Both types of credits basically view carbon sequestration as providing an ecosystem service that can be rented or leased over different time periods. They are defined as follows:[4]

A "tCER is a CER issued for an afforestation or reforestation project activity under the CDM, which expires at the end of the commitment period following the one during which it was issued". For example, a tCER issued at some point in the commitment period 2013-2017 would expire at the end of the next commitment period, 2022. At this time, the tCER can be reissued (if verification has occurred) either to the same Annex I buyer or another buyer. The Annex I buyer must replace the expired tCER with either a tCER or with a credit from another mechanism. At the end of the crediting period, all tCERs expire.

[3] cf. the Marakesh Accords: http://unfccc.int/resource/docs/cop7/13a02.pdf#page=2
[4] Draft Decision -/CMP.1 2003, Annex, Section A. Definitions para 1(g and h).

An "lCER is a CER issued for an afforestation or reforestation project activity under the CDM, which expires at the end of the crediting period of the afforestation or reforestation project activity under the CDM for which it was issued". It is theoretically good for up to 20 to 30 years. lCERs must be replaced as soon as verification shows that the carbon stock has decreased, or if no verification has occurred for a period of five years. At the end of the crediting period, all lCERs expire. lCERs have variable expiration periods – for example, an lCER sold in year five of a 30-year project will have a duration of 25 years, while an lCER sold in year 10 of a 30-year project will have a duration of 20 years.

The tCERs and lCERs are discussed further in *Section 2.3 Step 10*.

1.2.3.2 Leakage

Although projects will most likely successfully sequester carbon within the project area, some projects may alter activities or behaviours elsewhere. These activities may lead to reduced sequestration or increased emissions outside the project boundary, thus negating a portion of the benefits of the project. This is called leakage.

Two types of leakage are generally recognised: that caused by activity shifting and that caused by market effects. A simple example of leakage from activity shifting is a project that reforests poor-quality grazing land, but leads owners of the displaced livestock to clear land outside the project boundaries to establish new pastures. An example of leakage caused by market effects is a project that reforests large tracts of productive beef cattle grazing land. The reduction in supply of beef signals the market, causing prices to increase, and land is cleared elsewhere for producing more beef.

Most projects under the CDM are unlikely to cause leakage from market effects. Activities that might result in leakage vary with the type of projects (see Box F); both LULUCF and non-LULUCF projects are subject to leakage. Leakage can often be minimised by good project design – for example, by including improved pasture management around a new forest so that displaced livestock can be accommodated without further clearing. Substantial debate is currently taking place on the leakage caused by market effects for biofuel projects (see Box G).

Box E: Leakage Assessment: Reforesation/Afforestation of Land Currently Under Agricultural Use (AR-NM0019)

AR-NM0019 (the number assigned to this project by the CDM Executive Board) allows for the calculation of leakage from displacement of agricultural activities, livestock and fuel wood, vehicle use, and increased use of fence posts.

The method for assessing the impact of displacement of agricultural activities involves tracking a proportion of the people displaced in the five years immediately after displacement. It is necessary to track what area each person deforests (if any). If the sampled people leave the area, then a conservative deforestation estimate is applied.

For leakage through the displacement of livestock, it is necessary to track numbers of livestock for the first five years after displacement. Leakage is estimated from decreases in numbers of livestock within the project boundary after the start of project activities, in combination with an ex-ante calculation of the required grassland area per head of livestock.

Leakage due to the displacement of fuel-wood collection is estimated through the average volume collected in the project area before the start of project activities, minus the volume collected within the boundaries after activity displacement.

For leakage due to fossil fuel use, the methodology requires tracking of distance travelled by project vehicles outside the project boundaries. Leakage is calculated by applying constants for fuel consumption and fuel emission factors.

Leakage due to the increased use of fence posts compares the perimeter of fencing before and after project commencement.

Total leakage is equal to the sum of each of the leakage components. Individual forms of leakage can be excluded and not monitored if it can reasonably be shown that the project will have no influence or will lead to a decrease in emissions.

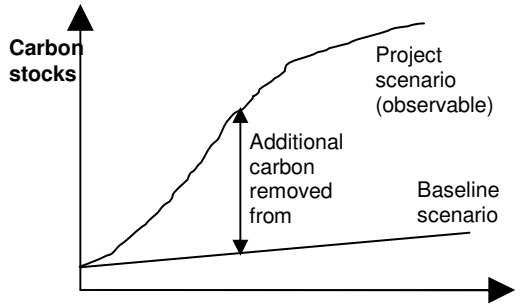
1.2.3.3 Baseline

Afforestation/reforestation CDM projects enhance greenhouse gas removals in one country to permit an equivalent quantity of greenhouse gas emissions in another country, without changing the global emission balance. Technically, the CDM is a baseline-and-credit trade mechanism, not a cap-and-trade mechanism. Therefore, enhancements of removals by afforestation/ reforestation projects must create real, measurable and longterm benefits related to the mitigation of climate change (Kyoto Protocol, Article 12.5b), and must be additional to any that would occur in the absence of the certified project activity (Article 12.5c). The in-the-absence scenario is also referred to as the baseline or 'business-as-usual' scenario. The purpose of baseline analysis is to provide a transparent picture of what would have happened in the absence of the proposed project.

A baseline scenario must be derived using a baseline methodology approved by the CDM Executive Board. The scenario should be established in a transparent and conservative manner regarding the choices of approaches and assumptions. Every single project should define its own baseline. Advice on choosing an approved baseline methodology is given in *Part II*. In summary, the baseline must be the most likely course of action and development over time, in the absence of CDM financing.

As an example, the project scenario for most afforestation/ reforestion projects will be planting and maintaining trees that grow into forest. The baseline may be the low carbon stocks present in croplands or grazing lands, each of which will be constant through time. Equally, however, the baseline could be the abandonment of the land and subsequent natural regeneration of trees. In this case, the additional carbon removed from the atmosphere is equal to the difference between naturally regenerating and planted trees.

The figure below shows the time-path of carbon stocks in the project and the baseline scenarios



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The baseline scenario can either be estimated and validated upfront, and then "frozen" for the first phase of the crediting period (30 years, or the first 20 years of a 60-year project), or it can be monitored during the afforestation/reforestion project. However, even in the latter case, it is still necessary to establish a methodology upfront on how to select the control plots and monitor them and it is also still necessary to provide an upfront estimation of the baseline, including the associated emissions and removals of greenhouse gases (although this upfront estimation is then only for information and not used for calculating emission reductions – the results of the monitored baseline would be used). The advantage of an upfront, estimated and "frozen" baseline is that there is greater certainty about the emission reductions generated by the project. This is the option that has been used by most projects to date and all currently approved methodologies (as of June 2006) assume baseline scenarios "frozen" during the crediting period.

Examples of baseline and project scenarios are outlined in Box F.

Box F: Examples of baseline and project scenarios

San Nicolás CDM Afforestation Project
Country: Colombia
Project area: 8,730 hectares
Baseline scenario: Abandoned pastures with no current economic use and so no possibility for displacement
Baseline carbon stock: The stock of carbon in the pastures
Project: Forest and agroforest plantations

Pico Bonito National Park Reforestation
Country: Honduras
Project area: 2,600 hectares
Baseline scenario: Shifting agriculture
Baseline carbon stock: Conservatively estimated as the maximum stock recorded over the shifting agriculture cycle
Project: Reforestation with commercial plantations and natural forest restoration

1.2.3.4 Additionality

The CDM is a carbon-neutral process. It allows an Annex I country and a non Annex I country to co-operate on carrying out a project in the non-Annex I country that will sequester carbon (or reduce emissions). CERs are created through this project and transferred to the Annex I country, which is now able to emit an equivalent number of units of carbon while meeting its targets. Thus, the atmospheric concentration of greenhouse gases remains unchanged as a result of the transaction. The Annex I country is assisted in meeting its commitments cost effectively and, in well-designed projects, the non-Annex I country benefits in meeting its sustainable development goals.

If a potential project that sequesters carbon (or reduces emissions) would have taken place without the CDM transaction, then the emission reductions are not additional and the greenhouse gases in the atmosphere would increase as a result of the transfer of CERs.[5] For example, if an area would have been reforested either through deliberate management action or natural processes, irrespective of the CDM transaction, then if the CDM transaction was erroneously allowed to take place the Annex I country would emit more greenhouse gases and the atmosphere will have a higher level of greenhouse gases than it would have without the transaction. The purpose of the additionality clause in Article 12 of the Kyoto Protocol is to prevent this from occurring.

Some confusion has arisen because the definition of additionality, as agreed to, does not fully capture the core concepts. The definition agreed to at the Ninth COP (COP- 9) in 2003 is: "The proposed afforestation or reforestation project activity under the CDM is additional if the actual net greenhouse gas removals by sinks are increased above the sum of the changes in carbon stocks in the carbon pools within the project boundary that would have occurred in the absence of the registered CDM afforestation or reforestation project activity…", which focuses more on identifying the additional component than on the project eligibility.

It must be clear that additionality is not the difference between the baseline and project greenhouse gas emissions. Further guidance from the CDM Executive Board, and the recommended steps in dealing with additionality and baselines, is outlined in *Part II*, including an additionality test devised by the Executive Board.

The essential question that must be asked of each project is: *What quantity of carbon is being sequestered as a direct result of the CDM transaction, in anticipation of selling carbon offsets?* Only this quantity of CERs can be issued. This test applies equally to LULUCF and non-LULUCF projects.

Proving additionality is discussed further in *Part II*.

1.2.3.5 Land Eligibility

There are two aspects of land eligibility that must be fulfilled by afforestation/reforestation projects.

The 31 December 1989 Rule

In practice, no distinction is made under the CDM between afforestation and reforestation. Therefore, the criterion that all projects must meet is that no land meeting the national definition of forest be present within the project boundaries between 31 December 1989 and the start of the project activity. In other words, land that is eligible for afforestation/ reforestation CDM should have been: (a) non-forest on 31 December 1989; and (b) non-forest at the time of start of project activity. For the purposes of afforestation/reforestation, non-forest would

[5] The CERs would be added to the assigned amount of the Annex I country creating an elevated total permitted level of emissions.

be any area that does not meet the national definition of forest as communicated by the host party to the CDM Executive Board. The reason for this requirement was the fear that the CDM would create an incentive for land owners to cut down trees in order to make land eligible for credits that would arise if they replanted the land with trees.

Proof that land was non-forest can be provided in the form of aerial photographs or satellite imagery from 1989 or before, or official government documentation confirming absence of forests. Where proof of these types does not exist, then multiple independent, officially witnessed statements by local community members can suffice. Evidence of the continued absence of forest since 1989 will also be needed and can take similar forms.

Proving land eligibility is discussed further in *Part II*.

Definitions of forest

The decision of what constitutes a forest has implications for which lands are available for afforestation/reforestation activities. National presiding authorities in non-Annex I countries, known as Designated National Authorities (DNAs), have been given the role of deciding for their country where to lay the thresholds from the available range determined at COP-9, namely:

- Minimum tree crown cover value between 10 and 30 percent
- Minimum land area value between 0.05 and 1 hectare
- Minimum tree height value between 2 and 5 metres

The following are examples of the implications of forest definitions:

- A high crown cover definition may exclude agroforest projects, but a low definition may make it difficult to include degraded areas with sparse tree cover in the baseline.
- A high value for minimum land area encourages areas with real environmental and biodiversity benefits, but excludes typical community forests and agroforests around dwellings.
- A high tree height value may allow fruit trees as a baseline for reforestation, but could exclude agroforests or other low stature trees in the project scenario.

1.2.4 Added value to projects

For projects seeking to have a greater positive socio-economic and environmental impact, it is possible to register with one or more programmes that will give certification if criteria are met. Two notable programmes exist – the CDM Gold Standard (www.cdmgoldstandard.org) and the Climate, Community and Biodiversity (CCB) Standards (www.climatestandards.org).

In both cases, the Designated Operational Entity certifies that the enhanced standards are being met, at the same time as validating and verifying the project and the project certified emission reductions. Additional documentation will be required for certification. The standards may also be used at the project design stage to ensure positive socio-economic and environmental impacts. The project would then be able to decide at a later stage whether to follow through with actual certification.

The higher level certification will potentially make projects more attractive to investors eliciting a higher value for emission reduction or sequestration credits.

Certification schemes for bioenergy feedstocks are also growing in popularity. At present there are few operational feedstock standards, and these were originally developed for the food industry, but there are now many more in development. The standards address environmental, social and economic issues and may assist in providing confidence in the project's wider sustainability credentials in addition to GHG emission reductions.

- The Roundtable on Sustainable Palm Oil www.rspo.org
- The Roundtable on Responsible Soy www.responsiblesoy.org
- The Roundtable on Sustainable Biofuels (which includes a jatropha working group) http://cgse.epfl.ch/page79928.html
- The Better Sugarcane Initiative www.bettersugarcane.org
- The Council for Sustainable Biomass Production www.cspb.org

1.3 The ITTO Afforestation/Reforestation CDM Capacity-Building Initiative

The ITTO is an inter-governmental organisation comprising 59 member states that seeks to promote international trade in tropical timber as well as the conservation and the sustainable management and use of tropical forests. It develops internationally agreed policies to promote sustainable forest management and assists member countries to adapt and implement them in the field through projects.

In the area of rehabilitating forest lands, the ITTO recognizes that forest degradation in the tropics has an adverse impact on the availability of forest resources, including timber and other forest resources used by local communities. Degradation also reduces biodiversity and forest cover, which critically impact upon climate change. Therefore, it is important to rehabilitate degraded forest lands in order to restore forest resources and maintain the flow of goods and services delivered by forests. Rehabilitation is also relevant to efforts for poverty alleviation and the improvement of the livelihood of communities living around and within forests.

The ITTO is concentrating its efforts on the implementation of the "*ITTO Guidelines for the Restoration, Management and Rehabilitation of Degraded and Secondary Tropical Forests*", which, *inter alia*, recommends the development of strategies and approaches to promote the role of degraded-forest restoration and secondary forest management for the international carbon trade, carbon sequestration and as carbon sinks.

In the relatively new field of CDM, the ITTO has promoted CDM forestry projects in a number of ways. Through its project programme, ITTO is providing fora on climate change and the tropical forest sector. For example, the ITTO *International Workshop on Climate Change and Forest Sector: Clean Development Mechanism in Tropical Countries* was organised in Seoul, Korea, in September 2004 by the Seoul National University in co-operation with the Korea Forest Research Institute, the Center for International Forestry Research and Swiss Interco-operation. This workshop identified two main obstacles hindering the development of afforestation/reforestation CDM projects. Firstly, the limited (or, in some cases, complete lack of) capacity on the side of project developers in non-Annex I countries to identify, formulate and develop sustainable forestry projects under the CDM. Secondly, the inability of developers to attract the necessary finances for the implementation of these projects.

A new phase of the ITTO's capacity-building project was initiated in late 2005 under project PD 359/05 Rev.1 (F), *"Building Capacity to Develop and Implement Afforestation and Reforestation Projects under the Clean Development Mechanism (A/R CDM) of the Kyoto Protocol in Tropical Forestry Sector"*. The general objective of this new project is to promote understanding of the rules and procedures for afforestation/reforestation CDM projects and to encourage country-level initiatives in promoting afforestation/reforestation CDM project activities. Specifically, the project intends to:

- enhance general knowledge about afforestation/reforestation CDM projects, including rules and regulations, the
- Project Design Document, and baseline and monitoring methodologies development;
- improve the capacity of project proponents to collect the data and information necessary for preparing an afforestation/ reforestation CDM Project Design Document;

- promote the exchange of experiences in the development of afforestation/reforestation CDM projects;
- identify financial and investment issues relating to afforestation/reforestation CDM projects; and
- assist in raising finances for implementation of feasible afforestation/reforestation CDM projects through publicprivate partnerships that link host Parties with potential investor countries.

Box G: ITTO Afforestation/Reforestation CDM Project Financing

In the area of forestry, climate change and the CDM, the ITTO has funded the pre-project, "Promotion of the CDM in the Framework of Sustainable Forest Management with Local Communities Involvement" (PPD 47/02 (F)), in Indonesia. This pre-project was submitted by the Government of Indonesia and implemented by the Association of Indonesian Forest Concession Holders (AHPI). It collected baseline data and information for the development of strategies and the formulation of a project proposal to promote CDM in the framework of sustainable forest management, with the involvement of local communities.

Another project funded by the ITTO is "Alternative Financing Model for Sustainable Forest Management in San Nicolas" (PD 54/99 Rev.1 (F)), which is currently entering its second phase (PD 240/03 Rev.1 (F)). CORNARE (Regional Autonomous Corporation of Rio Negro – Nare), the co-executing Swiss agency EMPA (Swiss Federal Institute for Materials and Technology Research and Testing), and the Valles de San Nicolas community in Colombia developed the pilot project in the San Nicolas region, with the objective of testing an innovative financing method that combines sustainable management of tropical forests with the potential that the CDM of the Kyoto Protocol offers the forest sector.

In addition, the ITTO also recognises the need to explore ways in which it can contribute to the development of an international policy framework relating to CDM forestry projects. Toward this end, an international workshop on CDM – Opportunities and Challenges for the Forest Industry Sector in Sub-Saharan Tropical Africa will be convened in Ghana in October 2006 under project PD 337/05 Rev.3 (F). This workshop will contribute to the deliberation of CDM forestry issues, including reducing emissions from deforestation. The ITTO will continue to encourage members to develop projects that provide a fora to address CDM forestry projects and the post-2012 climate change regime relating to deforestation issues, at both the national and regional levels.

PART II: A STEP-BY-STEP GUIDE TO DEVELOPING AFFORESTATION AND REFORESTATION CDM PROJECTS

2.1 Overview of the CDM Project Cycle

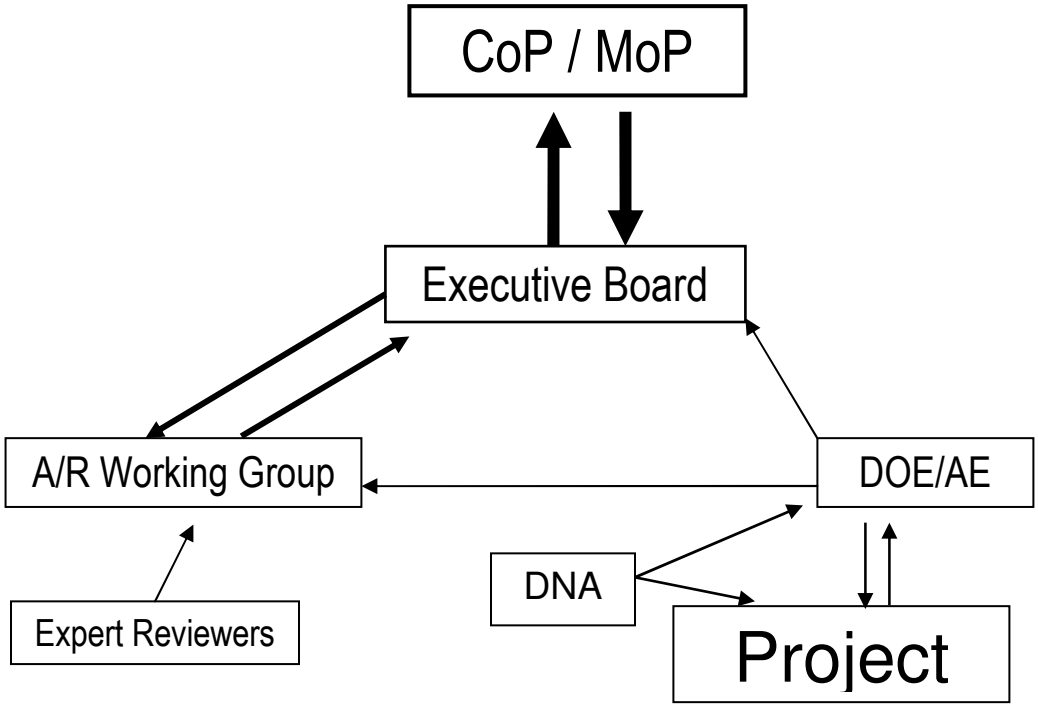
The ultimate governing body of the CDM is the Conference of the Parties/Meeting of the Parties to the Kyoto Protocol (COP/MOP). The COP/MOP is the annual meeting of the signatories to the Kyoto Protocol and is responsible for managing the CDM Executive Board and for overseeing its work.

The Executive Board supervises the CDM process under the authority and guidance of the COP/MOP; it is fully accountable to the COP/MOP. The Board decides on rules for the implementation of the CDM, as well as making the final decisions about acceptance of methodologies, registration of projects and issuance of CERs. The Board is composed of 10 members and 10 alternates.

The CDM Executive Board created an A/R Working Group to specifically oversee LULUCF under the CDM. The A/R Working Group provides guidance to LULUCF project developers and, using expert reviewers, makes recommendations on acceptance or rejection of LULUCF methodologies.

Designated Operational Entities, or DOEs, function as auditors for the CDM process. Designated Operational Entities are a domestic or international legal entity, accredited and designated by the Executive Board. They have two key functions: 1) to validate CDM projects prior to project implementation, and 2) to verify and certify emissions reductions after project implementation. An Applicant Entity (AE) is an entity undergoing the approval process to become a Designated Operational Entity. A list of Designated Operational Entities and Applicant Entities can be found on the UNFCCC CDM website (http://cdm.unfccc.int/DOE).

Along with approval and registration by the CDM Executive Board, projects must also be approved by the country in which the project is taking place. The government of each country that is signatory of the Convention will have assigned, or be in the process of assigning, a Designated National Authority or DNA (the UNFCCC National Focal Point takes on this role). The purpose of the Designated National Authority is to review projects and ensure they are in line with the country's development objectives and national laws. A "host country letter of approval" from the Designated National Authority is required for project registration. Each country may also have its own regulations that must be met to obtain a letter of approval. A list of the Designated National



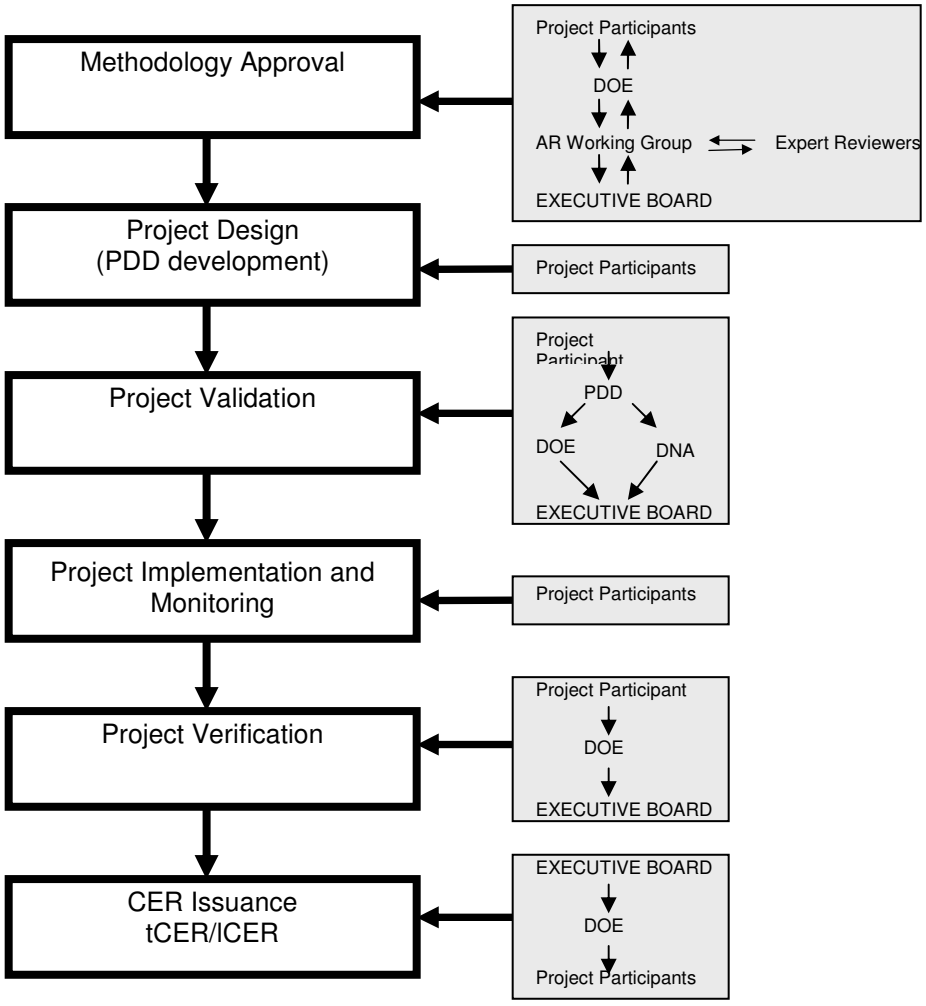
Authorities can be found on the UNFCCC CDM website (http://cdm.unfccc.int/DNA/).

The core of any CDM project is the Project Design Document. The Project Design Document defines the project in terms of activity, length, eligibility, crediting choices, impact and chosen methodology. Creating the Project Design Document is the focus of *Section 2.3*.

The Project Design Document is prepared by the project participants and submitted to a Designated Operational Entity for validation. Validation is the focus of *Section 2.4*. Once validated by the Designated Operational Entity (providing there are no objections from the CDM Executive Board), the project is registered and can begin to compile CERs.

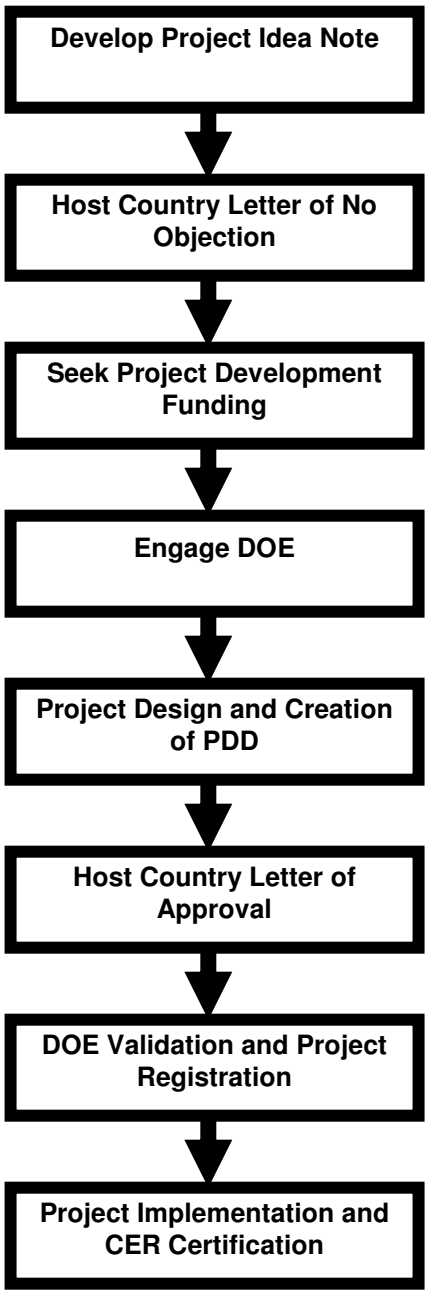
The methods described in the Project Design Document and implemented by project participants during the project establishment and monitoring are prescribed under the CDM. A project must apply a methodology that has already been approved by the Executive Board. If no suitable methodology exists, the project is obliged to submit its own methodology for approval. This is a long and costly procedure and should be avoided if possible.

Verification of sequestered carbon is also the responsibility of the Designated Operational Entity. Upon verification, the Executive Board can issue tCERs or lCERs. The following diagram illustrates the steps for, and players involved in, project registration and the issuance of CERs.



2.2 Critical Steps for Project Approval

There are eight critical steps in afforestation/reforestation project development and approval, which will be discussed in *Section 2.3* and are as follows



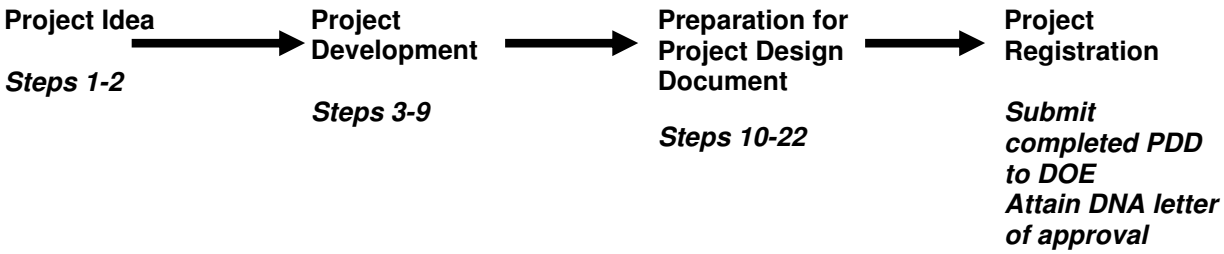
Attaining the host country letter of no objection at this early stage informs the DNA of your plans and prevents future unpleasant surprises

Entering into an early dialogue with the DOE is advantageous as they can advise on choice of methodology and potential future pitfalls

The letter of approval is critical. Without this the project can not be registered

2.3 Project Design and Development

2.3.1 Steps in Identification and Preparation of the Project



PROJECT IDEA

Step 1: Identify goals of project activity

To help ensure a successful project, the CDM project developer should determine the goals of the project activity.

Determine if the primary goal is:

- Financial profit;
- Providing income for disadvantaged communities;
- Environmental; or
- Greenhouse gas reductions.

The project developer should also determine whether the project location has been fixed prior to the start of project planning or whether it can be chosen to maximise the primary goal.

Each of the goals has merit, especially as they each will, in most cases, be intrinsically linked. However, it is important to identify the primary goal as this will strongly drive decision-making.

Financial profit

Financial profit has often been a strong driver for CDM projects to date, particularly for investors. LULUCF projects can, theoretically, be profitable. If profit is the motivation, developers should seek sites with minimal risk of leakage, but with relatively easy access and low costs of labour. Profitable projects will typically involve large-scale timber plantations.

Providing income for disadvantaged communities

Sustainable development was envisaged as a central component of all CDM projects and all well-designed projects should positively impact communities – at a minimum providing work and income. Other impacts could be slowing erosion and degradation, protecting critical water supplies, providing a source of wood fuels and providing alternative livelihoods. Projects with the highest impact are likely to be in areas where significant populations exist. Consequently, such projects present an elevated risk for permanence and leakage. Agroforests will usually form a component in community development projects.

Environmental

Environmental impacts can overlap with community impacts – for example, where watersheds are improved and/or erosion and degradation are halted. However, the projects with perhaps the greatest environmental impact will involve reforesting with native tree species, restoring historic forests and enhancing biodiversity.

Such projects are unlikely to be profitable and, beyond the labour for forest establishment, will provide little direct financial benefit to local communities.

Greenhouse gas reductions
Greenhouse gas reduction benefits will often overlap with profit, in that maximising carbon credits is likely to maximize profits. However if profit is the motivation, then the destination of wood products will not be considered and the long-term status of the site beyond the crediting periods will not be an important consideration for the developer. Without these considerations, the sequestered carbon will likely be returned to the atmosphere.

For projects with an explicit community or environmental purpose, it may be advantageous to consider certification under the CDM Gold Standard (www.cdmgoldstandard.com) or the CCB Standards (www.climate-standards.org), as this can increase the attractiveness of the project to investors.

Step 2: Develop Project Idea Note (PIN) or project proposal

Although not a required document, developing a project proposal or Project Idea Note will help solidify the proposed components of the CDM project. Having an established Project Idea Note may also assist project participants in securing investment funding for the project and in discussions with the Designated National Authority and potential regional and local stakeholders.

The Project Idea Note should describe the general goals of the project, what activities will take place to achieve those goals, who potential project participants and stakeholders are, the potential project location, the length of the project, other socio-economic and/or environmental benefits, and, if possible, a very broad first estimate of potential CERs. A good Project Idea Note would comprise approximately five pages.

A Project Idea Note will serve as the first form of contact with potential buyers, and will allow project developers the benefit of receiving early feedback on whether the project is of interest to buyers. A critical early step in the preparation of a Project Idea Note is to examine the feasibility of a specific project in the chosen region. This would involve an examination of potential financing and potential sequestration.

Checklist for the Project Idea

1. Determine the primary goal of the project:
A. financial;
B. developmental;
C. environmental; or
D. greenhouse gas reductions.

2. Based on this goal, determine the most appropriate afforestation/reforestation activity.

3. Locate a region in which the greatest impact can occur at a cost that is not prohibitive.

4. Prepare Project Idea Note (about five pages).

PROJECT DEVELOPMENT

Step 3: Secure project financing sources

For a CDM project, start-up costs will amount to tens of thousands of dollars. This money is necessary to design the project, gain approval from the host country and achieve validation from a Designated Operational Entity.

Therefore, project financing will be required well in advance of the expected pay-outs resulting from the sale of CERs.

These start-up funds may be provided by upfront payments for credits, however this form of financing is rare as it is unlikely that an investor will be willing to take on the project risks. Instead, in most cases, funds must be found from grants or loans.

Financing should be researched in the following order:

• Countries, companies or organisations that will pay upfront for credits;
• Grants for project development from overseas governments, charitable organisations or charitable arms of companies;
• Loans from international, national or local banks.

See *Part III* for more information on CDM financing.

Step 4: Design project management structure

The next critical step in project development is determining the project management structure. No successful project, particularly in LULUCF, can be solely driven from a distant, industrialised country. It is very important to have motivation and capacity in the project host country. Projects that are designed top-down are doomed to struggle, whereas bottomup projects will be driven locally at the site where the impacts will be felt and where the required information and data will be derived. On the ground, host country capacity is required in both the understanding of forestry and forestry techniques and in English, which is the sole working language of the CDM Executive Board (although the Project Design Document is available in all six UN official languages). Shapefile – Load data from a Shapefile. Assumes data is projected in the projection specified at File=>Set Projection.

Step 5: Determine local, regional and national requirements for project development

It is strongly advised to investigate local, regional and national requirements for the anticipated project activities prior to committing substantial resources to project development. These requirements could be specific to the activity, such as regulations governing forest establishment or forest management, as well as CDM-specific regulations.

Step 6: Obtain a "letter of no objection" from the Designated National Authority

An important project partner will be the UNFCCC National Focal Point in the host country, which is also the Designated National Authority. The Designated National Authority can prevent a project from being registered if it has any objections, therefore it is important to find out all requirements of the Authority for CDM projects. The Project Idea Note can be used to introduce the Designated National Authority to the project and to assist in obtaining the host country letter of no objection at this early stage. This step will also inform the Designated National Authority of project plans and may help prevent future unpleasant surprises.

Step 7: Select an appropriate methodology

Whenever possible, project developers are strongly advised to use to apply an existing approved CDM methodology, as submitting a new methodology to the CDM Executive Board has very large time and financial requirements, and requires a very high level of technical capacity. In addition, it is likely that by the end of 2006 there will be in excess of seven approved afforestation/reforestation methodologies, which should cover most

project scenarios. Guidance is therefore given here on how to select from the existing list of approved methodologies to apply to a project. If, however, your project is not eligible to use any of the approved methodologies, it is advised you contact a consultant organisation. The approved methodologies can be downloaded from the UNFCCC CDM website (http://cdm.unfccc.int/methodologies/ARmethodologies/approved_ar.html).

Entering into an early dialogue with the Designated Operational Entity is advantageous, as they can advise on choice of methodology and potential future pitfalls. The Designated Operational Entity can also inform the project developer of exactly what documentation will be required during the certification process.

The first step when considering methodologies is to examine the applicability conditions. These can be found in Section I.3 of each approved methodology document. The applicability conditions must fit your project exactly. If every applicability condition is not satisfied, then that methodology cannot be used.

Project developers should also consider the following:

Advantages and disadvantages of small-scale project activities

Afforestation/reforestation

The first choice is whether or not to use a small scale methodology. Electing to be “small scale” limits the project to a sequestration of no more than 8,000 t CO2-e per year. Depending on the species, planting density and climatic conditions, this could be a project of between 200 and 1000 hectares.

Currently, there is one approved simplified baseline and monitoring methodology for selected small-scale afforestation and reforestation project activities under the CDM, which can be found at: http://cdm.unfccc.int/methodologies/ ARmethodologies/AR_SSC_Annex_II.pdf.

The limitation in annual sequestration potentially limits the profitability of small-scale projects. There are significant start-up costs, even for small-scale projects, and it is harder to justify these with the resulting small scale of sequestration. However, the methodologies used for small-scale afforestation/ reforestation projects represent some significant simplifications over the requirements for large-scale projects. For example, methodologies for baseline setting, proving additionality and calculating leakage are simplified.

It is allowable for an organisation(s) to aggregate or bundle multiple small-scale projects together to maximise efficiency and minimise transaction costs (especially in validation and verification). However, the bundled, small-scale projects cannot be merely a debundled, large-scale project. At a minimum, the boundaries of the small-scale projects should be separated by at least 1km or have different participants (aside from the bundling organisation and the host country).

Bioenergy

There are simplified baseline and monitoring methodologies for CDM projects that are small in size (below 15 MW for renewable energy) a number of which are suitable for bioenergy projects. The list of approved methodologies can be found at:
http://cdm.unfccc.int/methodologies/SSCmethodologies/approved.html

Potential for leakage

For afforestation/reforestation projects that are not small scale, a significant factor in determining which methodology is most applicable is whether or not there is a significant risk of leakage through activity shifting. Any activity due to the project which will potentially cause greenhouse gas emissions outside the project area

must be monitored to assess leakage. Common activities that will need to be monitored include grazing, firewood collection and agriculture. Projects with no activity shifting include projects with no activities currently taking place on the project lands, or projects in which any current activities are not shifted outside of the project boundary. As an applicability condition, the first approved afforestation/reforestation methodologies (AR-AM0001 and AR-AM0002) require no activities to be shifted outside the project boundary. AR-AM0003 monitors displacement of livestock grazing and agricultural activities, fuelwood collection activities and increased consumption of wood posts for fencing.

Box H: Bioenergy and market-induced leakage

Bioenergy and biofuel policy in particular has been scrutinized and criticized for causing indirect consequences or 'market-induced leakage'. The discussion is usually called the 'indirect land use change debate'. The proposed consequence of such policies is that increasing biofuel production diverts existing crops to biofuels that in turn induces a land-use change somewhere else in the world to 'fill the gap' in the original demand for the crop. The resulting GHG emissions from this land use change are attributed to the biofuel and are so large they negate any fossil displacement benefit. Regulators such as the US Environmental Protection Agency, California Air Resources Board and European Commission are currently attempting to quantify these impacts in order to inform policy decisions.

There is therefore no existing tool available for project developers to use to quantify the market-induced effect for leakage. However, strategies to mitigate this risk are currently under discussion such as a) increasing yields and productivity of land compared to the baseline scenario in order to mitigate displacement risks b) use underutilized, abandoned or degraded land for bioenergy crops to reduce pressure of displacement. Project developers' ability to prove either is likely to mitigate any potential risk of regulators introducing any future GHG 'penalties' for indirect land use effects of biofuels.

Legislation in the European Parliament defines a set of sustainability criteria that biofuels must meet in order to be eligible to meet targets. A GHG bonus of 29gCO2eq/MJ is provided for biofuel grown on degraded land and guidelines for eligibility are under development.

Choice of pools

Another important choice in determining which methodology to apply is the selection of carbon pools for measurement. Pool choices include: above-ground biomass, belowground biomass, dead wood, forest floor (litter) and soil organic carbon.

At COP-9, it was determined that "project participants may choose not to account for one or more carbon pools…subject to the provision of transparent and verifiable information that the choice will not increase the expected net anthropogenic greenhouse gas removals by sinks". Therefore, project developers can choose to exclude carbon pools listed in a methodology as long as it can reasonably be shown that the pool will not be smaller in the project than in the baseline.

Trees will form the dominant carbon pool and are relatively simple to measure. Below-ground biomass is typically calculated, rather than measured, and so there is little reason to exclude it. Therefore, all projects should include above and below-ground components of trees. The decision whether to include other pools will be up to each project and the methodology chosen. If any pool will be subject to a loss in the project, then it must be measured. For example, where grasses are replaced by trees, there is a risk in some parts of the world of a loss in soil organic carbon.

The potential CERs from the inclusion of a pool need to be compared against the cost of measuring and monitoring that pool with the needed precision. In most projects with a duration of between 20 to 60 years, it is

unlikely that sufficient carbon will be sequestered in dead wood, forest floor or soil organic carbon to justify the expense of monitoring.

Each methodology has a defined list of selected pools in Section I of the methodology. If a developer is intending to include pools in a project that are not included in the CDM methodology, then the project will not be eligible to use that methodology. For example, AR-AM0001, ARAM0003 and the small-scale afforestation/reforestation methodology include only above- and below-ground carbon pools. Thus, if a project chose to monitor soil organic carbon, then it could not use any of these methodologies.[6] In contrast, as noted above, if it is decided to omit a carbon pool listed in the methodology for a CDM project, this is allowed as long as it can be documented that the pool will not be smaller in the project than in the baseline. ARAM0002 includes all pools: above-ground, below-ground, forest floor, deadwood and soil organic carbon.

Step 8: Determine project location

If the project location has not been fixed prior to the start of project design, then there is the opportunity to make a project location selection that maximises potential carbon sequestration and minimises start-up costs. To do so, take the following five steps when making the exact project location selection:

1. Assess sequestration potential;
2. Assess eligibility requirements;
3. Assess additionality requirements;
4. Assess environmental and socio-economic impacts; and
5. Assess ability to minimise leakage.

Assess sequestration potential

Physical and human factors will impact the potential sequestration at a project site. Consideration should be given to planting species, topography, slope, elevation, soil fertility, soil water availability, threat of fire, threat of strong winds, threat of poaching of wood stocks and threat of livestock encroachment.

Assess eligibility requirements

The project location should not be chosen without obtaining prior knowledge of the eligibility of the land. If the area was deforested within the last 20 years, then the entire site might be ineligible. Complex satellite analysis will be required to show the fragments of the land that are, and are not, eligible. The project developer should conduct a simple analysis of imagery from the late 1980s and select deforested areas from that imagery for the choice of project location. Documentation will also be needed to show the land has not been covered by forest at any time since 1990. This can take the form of imagery or other documentation.

Eligibility also considers whether the site is below the national thresholds that define a forest. Even if the site does not currently represent your image of a forest, it may still not be eligible because it does not meet the thresholds determined by project host country. The existence of fruit trees or natural regeneration should be warning flags to any project developer that proving eligibility of the site could be a challenge. See *Step 14* for further considerations on proving eligibility

Assess additionality requirements

The additionality of the afforestation/reforestation activity should also be considered when selecting project location. For example, additionality may be a problem if there are national, regional or local government

[6] Projects have the option of creating an amendment to the methodology. However, such an amendment would have to go through the methodology approval process with the required costs, both in terms of time and finances.

requirements for reforestation in the project area (that have been in place since before 11 November 2001[7]) or if, in the area, timber plantations (such as are being planned for the project) are being established without CDM funding. Without a straightforward additionality argument, a project will not be validated and registered. See Step 13 for further details on proving additionality.

Box I: Bioenergy and additionality

Proving additionality can be challenging for bioenergy projects and more specifically, biofuel projects. Carbon credits from large-scale liquid biofuel projects are unlikely to alter the project internal rate of return (IRR) by anymore than a couple of percentage points which a) does not mitigate any price risk from oil and b) does not assist in proving financial additionality. In addition, many countries are now introducing biofuel mandates which makes proving additionality even more challenging.

Smaller-scale projects may have a greater potential to prove additionality as CDM revenues represent a larger part of the overall project returns.

Assess environmental and social-economic impacts

Any possible negative and positive environmental and/or socioeconomic impacts that the project may have on the surrounding area should be considered. Environmental impacts include erosion, impacts on water quality and water supply, impacts from fire and disease risk, and biodiversity impacts. Socio-economic impacts include impacts on local community employment and livelihoods and access to socio-economically valuable resources. It may be possible to alter the location of the project to minimise any possible negative impacts and to maximise positive impacts.

At this stage, it is also important to involve the local community and ensure there are no local objections to the project. Local support will greatly aid project validation and if there are objections, it is important to deal with them immediately.

Assess leakage potential

The extent of possible leakage in the proposed project location should be examined. For example, the extent of pre-project activities taking place on the land should be assessed. Additionally, assess the availability of surrounding lands in which potential leakage-prevention measures could take place, and the area and type of land cover on lands where pre-project activities could potentially be displaced.

Step 9: Engage Designated Operational Entity

Begin contract negotiations with the Designated Operational Entity, using the Project Idea Note to familiarize them with the project. Entering into an early dialogue with the Designated Operational Entity is advantageous, as they can advise on choice of methodologies and the types of documentation that will be required during project validation and registration.

[7] http://cdm.unfccc.int/Panels/ar/ARWG07_repan07_National_policies.pdf

Checklist for Project Development

1. Establish project finance. Research in the following order:
   A. Countries, companies or organisations that will pay upfront for credits;
   B. Grants for project development from overseas governments, charitable organisations or charitable arms of companies;
   C. Loans from international, national or local banks.

2. Design project management structure. Ensure:
   A. A division of responsibility for both management- and decision-making;
   B. Adequate expertise in forestry and forestry techniques;
   C. High capacity in writing and speaking English.

3. Investigate local requirements:
   A. Designated National Authority requirements for CDM projects; obtain "Letter of No Objection" from Designated National Authority;
   B. Local, regional and national laws and regulations for LULUCF.

4. Select approved CDM methodology with the following considerations:
   A. Determine if project is large- or small-scale. For A/R projects, consider a project composed of bundled small-scale projects if sites are located at least 1km apart.
   B. Examine existing approved CDM methodologies and, in particular, applicability conditions to see if they apply to your project. In particular, consider the carbon pools selected and the potential for leakage.
   C. Engage Designated Operational Entity and discuss methodology selection.

5. Determine project location taking into consideration:
   A. Sequestration potential;
   B. Land eligibility (that the area was indisputably not forested in 1990);
   C. Additionality (that the activity would not have occurred without the potential for carbon credits);
   D. Environmental and socio-economic impact;
   E. Potential for leakage.

Preparation of project design documents

Step 10: Choose tCERs or lCERs

In response to the permanence issue for LULUCF projects, two types of CERs were created – temporary (tCER) and long-term (lCER) (Section 1.2.3.1). For both types, there is a choice between a single crediting period (to a maximum of 30 years) or a period of 20 years, with the possibility of renewing twice (for a total of 60 years).

Once a CER crediting period is over, the Annex I country must replace this carbon either by purchasing another CER or through the use of Joint Implementation or International Emissions Trading mechanisms. When either type of CER is retired (that is, not sold again), the CDM regulations on that tCER or lCER will cease and the developer is free to harvest the trees if desired. LULUCF tCERs and lCERs cannot be interchanged with CERs issued from energy or industrial sectors and, due to their temporary nature, will be sold at a lower price.

The tCERs

- Expire at end of following commitment period;
- Can be reissued (after verification);
- Must be replaced by buyer when expired with another tCER or an alternative credit;
- Have fees charged for issuance every five years;
- Expire at end of crediting period;

- Provide freedom for project operators, who can retire credits if they choose to harvest or discontinue an area.

The lCERs

- Expire at end of crediting period (20 or 30 years);
- Must be replaced as soon as verification shows carbon stock has decreased, or if there is no verification;
- Are of variable lengths (e.g., an lCER sold after five years might have a duration of 25 years, while one sold
- after 10 years could last 20 years, etc.);
- Will vary in price based on duration of credit;
- Will have higher prices if long-duration credits, with the benefit of bringing income to project in initial years.

Therefore, lCERs will likely receive a higher price, but commit the carbon for the length of the crediting period. This gives less freedom to the project operator and increases the risks from natural events (lCERs will immediately expire if verification is unsuccessful). Consequently, the default choice for most projects will be tCERs.

Step 11: Decide project duration

Multiple choices exist for project duration, although no project is eligible for crediting for more than 60 years. After initial validation, projects can continue to accumulate CERs for 20 to 30 years without the need for revalidation. If 30 years is selected as the project duration, revalidation is not an option and the project will end at this point. If 20 years is selected, revalidation can occur up to twice to give a total possible project length of 60 years. If the renewable crediting period is selected, then at 20 years (and 40 years), a Designated Operational Entity must determine that the original baseline is still valid.

Uncertainties in the climate system are large and it is unlikely that in 60 years, or even 40, that the CDM will still be functioning under current regulations. An argument can therefore be made for the selection of the single, fixed, 30-year period, which removes the cost and potential risks of revalidating after 20 years.

Step 12: Define project boundary

When the project site, baseline and monitoring methodology have been selected, the next step is to define the project boundary. The project boundary should geographically delineate all sequestrations and emissions that are significant, can be attributed to the project and are under the control of the project participants. Under control typically means that the project operator financially controls the emission or sequestration activity. For example, the project operator will control the growth of trees and use of fertiliser (with the associated emissions) to enhance growth. However, he or she does not control the emissions caused by people physically displaced from the project site by the project activity.

The project boundary can include one, or more than one, discrete area(s) of land or parcel. For afforestation/reforestation projects, the boundary is typically simpler than for many energy projects where supply- and delivery-side emissions are complications. In reality, it is often advised to make the perimeter of the areas that will be planted with trees the boundary of afforestation/reforestation projects. Consideration must also be given to the Designated National Authority's definition of forest in the host country; no one discrete project parcel can be smaller than the minimum area for forest definition.[8] Project developers should delineate the boundaries of the project ideally using a global positioning system (GPS), or alternatively on a map or georeferenced remote sensing image, prior to submitting the Project Design Document to the Designated Operational Entity for validation. Depending on the methodology used, it may be possible to add in

[8] Contact the DNA to verify the national definitions of forest

additional areas after the time of validation (e.g., allowed under AR-AM0003).

Step 13: Apply additionality tool

The A/R Working Group, together with the CDM Executive Board, prepared a tool to demonstrate the additionality of projects specifically for the LULUCF sector. The A/R Working Group recommends using the Additionality Tool, although it is not required.[9] The tool can be found at: http://cdm.unfccc.int/EB/Meetings/021/eb21repan16. pdf. A summary of the tool is also included in *Annex E*.

At the heart of the tool is the choice to prove additionality through either a financial test or a barriers test, or both. The financial test shows that the project activity is economically less desirable than alternative land uses. The barriers test shows there are barriers[10] to the implementation of the project activity that can only be overcome with CDM finances, and that are not present for at least one alternative land use. The financial test is simple to pass for native forest restoration, but could be more difficult for timber plantations and agroforests. The barriers test will apply to most projects, particularly those with a large social impact.

It is not advised to select both the financial test and the barriers test, or to select multiple barriers, as proof will be required at validation by the Designated Operational Entity for all tests included in the Project Design Document.

The approved methodology chosen by the project will state whether the approved additionality tool or an alternative method must be used to prove additionality. It is unlikely that any will fail to propose the afforestation/reforestation Additionality Tool. However, if an alternative approach is required, this must be followed. If additionality cannot be proven, the project cannot go ahead under the CDM.

Step 14: Apply land eligibility tool

There is a mandatory tool for the demonstration of the eligibility of land for afforestation/reforestation projects. The tool must be applied in full in the Project Design Document. It can be found in Section A.4.5 of the Project Design Document, in Annex E and at: http://cdm.unfccc.int/ EB/Meetings/022/eb22_repan16.pdf.

The tool requires proof that the area is not currently forest, that it was not forest on 31 December 1989, and that at no intermediate time was it forested and subsequently deforested. This is to be proven either through government documents (the simplest option) or through aerial photographs or satellite imagery complemented by ground reference data. If neither government evidence nor aerial photographs or satellite imagery is available for on or before 31December 1989, then the option remains of a written testimony produced “following a rural appraisal methodology”.

In practice, satellite imagery (e.g., Landsat) is available for most of the world for the late 1980s and can incontrovertibly show lack of forest where the situation is unambiguous.[11] Analysis should be through a supervised classification. It is useful if aerial photographs or other evidence is available to reinforce the classification. Present ground reference data can be used where you have confidence of continuous deforestation beyond the imagery date.[12]

[9] It is unlikely that any project will not choose to apply the AR Additionality Tool.

[10] Barriers can include investment barriers, technological barriers, prevailing practice barriers.

[11] The imagery is unambiguous if an entire area is deforested at a given time period. Where a mosaic of forest with regeneration, shrubs and multiple use (agroforest) trees exist interpretation is more complex.

[12] If the current land use if entirely different from the land use at the time of the imagery then there can be no correlation between present day ground truthing and the historic imagery.

Typically, a second image or set of documents is required from a more recent date to show the continuous absence of forest.

Step 15: Conduct baseline assessment and estimation of project sequestration

A baseline study is required and will form the basis of Annex 3 of the Project Design Document. For the baseline study, it is necessary to follow the selected methodology. The baseline study will define the baseline strata and any emissions or sequestration under the baseline scenario.

For reforestation and afforestation projects it is also necessary to estimate the likely sequestration over the lifetime of the project. This is just an estimation, however the anticipated growth rate of the trees should be considered, along with all project emissions including leakage.

For bioenergy projects, some tools are available to determine baseline emissions e.g. estimating the baseline emissions from electricity production from fossil fuel. For liquid fuels, no baseline assessment tools are currently available but some data are available within the GHG calculators identified in section 1.2.2.1.

Step 16: Develop leakage mitigation plan

Strategies must be developed to prevent leakage from occurring in the proposed project area. If the proposed project area is currently being used by community members, alternative livelihood activities must be created or alternative lands found that minimise the amount of leakage that may take place. For these measures to be successful, they must be both implemented, and continued over the life of the project. This requires strong community support and, ideally, the measures will be positively impacting the livelihoods of the community members. The types of leakage mitigation strategies will be dependent on the pre-project activities, but may include such things as: programmes to increase income or crop yields on non-project lands, or the introduction of alternative livelihoods (e.g., bee keeping, tilapia fish farms, agroforest plantations).

Step 17: Carry out environmental and socio-economic impacts analysis and stakeholder consultations

Sections E, F and G of the Project Design Document have the goal of illustrating analysis of environmental and socioeconomic impacts and demonstrating that stakeholder consultations have occurred at the project site. Each must meet the requirements of the host country. It is good practice to state the legal requirements and how these have been met. Consult with the Designated Operational Entity on the type of documentation that project participants may be required to provide.

Environmental impacts

A formal assessment must be prepared concerning the possible project impacts on the environment. Assessed impacts should include water quality and supply, fire risk, erosion risk, air quality, nutrient/fertiliser run-off risks and endangered species. If there are any negative impacts, mitigation efforts should be carefully designed.

The Designated National Authority should be consulted to determine whether the host country requires that a formal Environmental Impact Assessment is conducted.

Socio-economic impacts

This formal assessment should include possible impacts on indigenous peoples, local employment, food production, access to cultural sites, religious sites, fuel wood and other forest products. It may be recommended to conduct a Participatory Rural Appraisal. The Designated Operational Entity may request official documentation stating that the project will not have any negative-socioeconomic impacts, therefore working with local government officials throughout the project development process will be beneficial.

Stakeholder consultations
Stakeholders must have the opportunity to comment on the Project Design Document. In addition, meetings must be held with stakeholders prior to project registration. Designated National Authority representatives should be invited to these meetings, if possible. The Project Design Document should describe the process by which stakeholders were involved with the project, how comments were invited and compiled, and a summary of the comments must be included. Documentation of stakeholder consultations should be available for the Designated Operational Entity to examine.

Step 18: Analyse risk and plan mitigation

Project participants bear the consequences of the risks to their activities. If an environmental or meteorological disaster occurs, or if human effects negatively impact stored carbon, then lCERs will be cancelled or fewer tCERs will be available for sale.

Part of risk mitigation lies in the positioning of the project. Project location will influence risk of fire or storms, the risk of leakage or other direct negative human impacts.

Risk can, however, also be ameliorated in project design. Involving the local community in the project, and providing attractive alternative livelihoods, will reduce human risks, such as poaching, vandalising etc.

Natural risks can be lowered by planting patterns, but if these risks are large then it is good practice to retain credits to act as insurance against losses.

Step 19: Create a tree-planting plan

Although not required as a document for CDM approval, a successful project should also develop a reforestation plan. This plan needs to include the management structure of the planting, the species to be planted, the source of seeds or seedlings to be used in the project (including the possible development of a nursery), site preparation methods, planting methods and a management plan for once the trees are planted.

Standard Operating Procedures (SOPs) should be developed for the each aspect of the planting and include quality assurance and quality control measures to ensure project success.

Step 20: Write Project Design Document

The final step of project development is to write the Project Design Document and submit it for validation. The Project Design Document form is included in *Annex F*. See this Annex for guidance from the A/R Working Group in writing the Project Design Document, with additional recommendations provided by Winrock International.

Step 21: Create contract with Designated Operational Entity

Develop a contract for the validation of your project documents by your chosen Designated Operational Entity.

Step 22: Obtain host country letter of approval from Designated National Authority

Without a letter of approval from the host country's Designated National Authority, the project cannot be registered.

Project Implementation

Please refer to the *Sourcebook for Land Use, Land-Use Change and Forestry* for guidance on measurement and monitoring of afforestation/reforestation projects and calculation of carbon benefits. The sourcebook is available at http://www.winrock.org/ecosystems/tools.asp.

2.4 Validation, Registration, and Certification

The roles of validation and verification are carried out by Designated Operational Entities under the CDM. Protocols, guidelines and checklists have been created that all major Designated Operational Entities use in their procedures to ensure their analyses are completed in a credible, independent, non-discriminatory and transparent manner. The CDM and Joint Implementation Validation and Verification Manual can be found at: www.vvmanual.info.

2.4.1 Validation and Registration

The validation process is split into four distinct phases:

Desk Review

On submission of the Project Design Document and accompanying documentation, the first step is a desk review by the Designated Operational Entity. During the desk review, the Designated Operational Entity will specifically examine: project design, the baseline assessment, sequestration calculations, the monitoring plan, and environmental and socio-economic impacts (including the local stakeholder consultation process). In parallel to the desk review, the Designated Operational Entity posts the Project Design Document on the UNFCCC website and invites comments over a 30-day period.

Prior to moving to the next phase, the Designated Operational Entity presents the project developer with the first list of unresolved issues.

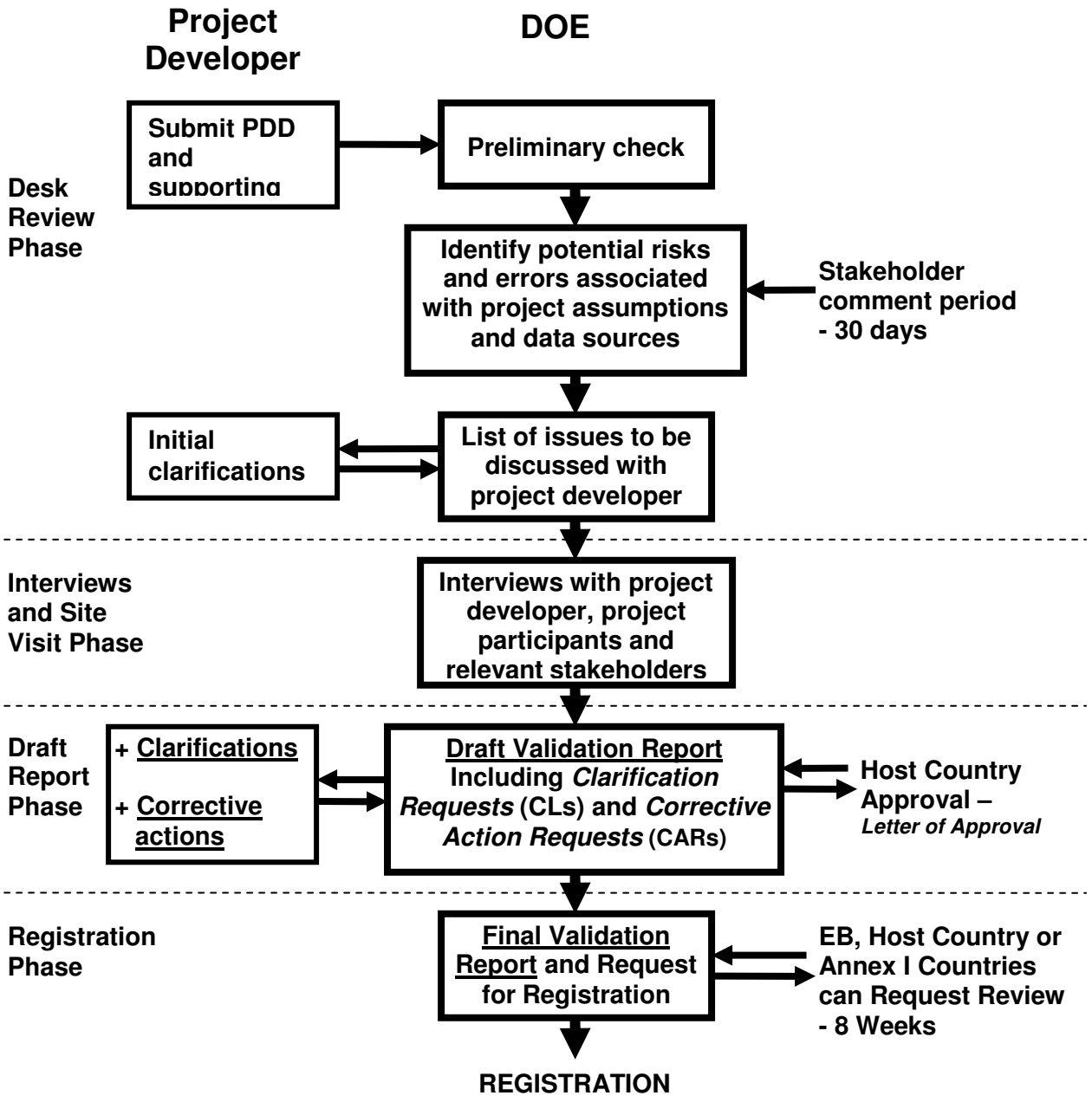
Interviews and Site Visit Phase

In the second phase, the Designated Operational Entity fields a team to visit the project site. During the site visit, the Designated Operational Entity team interviews project operators, the local community and the host country's Designated National Authority to solicit comments and clarifications. At this stage, the project developer can again review the issues and provide clarifications.

Draft Report Phase

With the release of the draft report, the project developer is issued with the official list of Clarification Requests (CLs) and the more serious Corrective Action Requests (CARs). This can be the point of greatest delay in the validation process if there is a Corrective Action Request that requires a great deal of work or time.

At the time of the draft report it is also necessary that the Designated National Authority provide the official Letter of Approval to the Designated Operational Entity. The process cannot move forward without this approval.



Final Report Phase

The final validation report is presented to the project developer and, if the validation has been successful, the Designated Operational Entity submits the project to the CDM Executive Board for registration. The registration is only deemed final if, after a period of eight weeks (four weeks for small-scale projects), there has been no request for review. Requests for review can come from either three members of the CDM Executive Board or any of the Parties involved in the project.

The validation process typically takes an average of 100 days.[13] It is very important to have a delegated project contact point who can respond quickly to requests from the Designated Operational Entity, so that delays in validation do not arise from the project itself. The desk review and site visit phases typically take from six to eight weeks. Serious delays can arise in receiving the letter of approval from the host country's Designated National Authority and from Corrective Action Requests that require significant work and/or time in response.

Commonly encountered errors[14]

Long delays

- Letter of Approval delayed or insufficient;
- Failure to comply with local, regional or national requirements, or missing evidence of compliance;
- Small-scale methodology selected for large-scale projects;
- Non-compliance with applicability conditions.

Short delays

- Lack of logic or consistency in Project Design Document;
- Insufficient information on stakeholder consultation process;
- Lack of justification for deviation from calculation methodology;
- Application of incorrect formulae;
- Project participants not clearly identified;
- Insufficient description of baseline, or lack of supporting evidence for baseline;
- Insufficient explanation of additionality;
- Insufficient proof of land eligibility;
- Major risks to baseline not described;
- Project boundaries not clearly defined;
- Start dates not clearly defined;
- Monitoring procedures not clearly defined;
- Deviations from monitoring methodology not justified.

2.4.2 Verification and Certification

Verification and certification of CERs must be carried out by a different Designated Operational Entity than the one who conducted the validation. After successful verification, the Designated Operational Entity submits a recommendation to the CDM Executive Board for certification and issuance of tCERs or lCERs.

The following list provides an example of some of the facets
of the project that may be examined at the time of verification:

- Outstanding issues from validation report;
- Check plantings are as described in Project Design Document;
- Check project boundaries are still in compliance with Project Design Document;
- Check measurement plots and records from plots;
- Examine data uncertainty and quality assurance of measurements'
- Review reporting procedures;

[13] Information on timing for the validation process derived from: "CDM PDD Guidebook: Navigating the Pitfalls. Sami Kamel (ed.). UNEP Risø Centre. November 2005.

[14] Derived from: "CDM PDD Guidebook: Navigating the Pitfalls. Sami Kamel (ed.). UNEP Risø Centre. November 2005.

- Personnel capacity – check monitoring personnel have knowledge of methodology;
- Personnel responsibility – check all tasks allocated to sufficiently qualified employees;
- Procedures to record project emissions;
- Leakage – examine leakage calculations and monitoring procedures;
- Data archiving

PART III: FINANCING AND RISKS OF AFFORESTATION/REFORESTATION CDM PROJECTS

3.1 Financing Projects

3.1.1 Costs to CDM Projects

Cost	Estimated financial requirement
Project development and establishment	$25,000 – 75,000
DOE validation	$10,000 – 15,000
CDM registration	$5,000/yr if < 15,000 t CO_2e/year with a scale up to $30,000/yr if > 200,000 t CO_2e/year
Adaptation fund	2 % of CDM project income levied for fund to help vulnerable countries adapt to climate change
Host country tax	Some countries will tax CERs either using a standard sales tax or at a CDM specific rate

3.1.2 The Objectives of Buyers

The dominant motivation of buyers of CDM credits is to meet their emissions reduction commitments. Currently, it seems that most Annex I countries will have to stretch to reach their emissions reduction goals, consequently pressure is on the demand-side rather than the supply-side. If supply were to exceed demand, then companies, entities and governments could select between International Emissions Trading (governments only), Joint Implementation and the CDM. In this case, CDM is favoured in terms of the auxiliary development benefits and, potentially, cost, but is hindered by at least a perception of enhanced risk of activities in non-Annex I countries.

For buyers of credits outside the Kyoto Protocol, the objectives may be to meet non-Kyoto Protocol mandatory emissions reductions, such as in New South Wales or in the northeast US (under the Regional Greenhouse Gas Initiative[15]). Alternatively, under voluntary markets, the motivation may be preparedness for a future mandatory programme, or public relations for customers, investors and share holders.

3.1.3 Form of Payment

To date, most projects have followed the commodity model whereby buyers purchase CERs and all risk is carried by the project developer. Very few projects have followed the investment model where payments are upfront. Upfront payments have great advantages for projects, in that project development costs can be

[15] http://www.rggi.org/about.htm, The Governors of seven Northeastern US States have agreed to *stabilize emissions* from power plants between 2009 and 2015, followed by a 10 % reduction by 2019.

covered. However, they are likely to lead to significantly lower prices for CERs as the buyer is then paying for a commodity to be received in the future and is also sharing project risk.

3.1.4 Current Buyers

The BioCarbon Fund

The multilateral funds for carbon projects are overwhelmingly dominated by the World Bank, which facilitates eight carbon funds: the Prototype Carbon Fund (www.prototypecarbonfund.org), the Italian Carbon Fund (ICF; www.carbonfinance.org), the Netherlands Clean Development Facility (www.carbonfinance.org), the Community Development Carbon Fund (CDCF; www.communitycarbonfund. org), the BioCarbon Fund (BioCF; www.biocarbonfund.org), the Netherlands European Carbon Facility(NECF; www.carbonfinance.org), the Spanish CarbonFund (SCF; www.carbonfinance.org) and the DanishCarbonFund (DCF;www.carbonfinance.org). The NECF focuses on developing Joint Implementation projects, includingpossible sinks projects, in Eastern Europe. The SCF will focus on renewable energy and energy efficiencyprojects. The DCF will not include sinks projects.

All these funds are generally based on the same model. Industrialised countries and companies provide investments (money) that are aggregated in one "pot". These funds, along with other project funding, provide cash flow to host countries and communities to develop carbon projects and produce carbon credits, as well as pre-financing for project identification and preparation activities such as capacity building, outreach and research, leading to the creation of supportive project approval systems in host countries. Funds provided during the project development stage are, for the most part, serving as a loan and are repaid when the project is implemented and carbon credits accrue. The amount of financing will be proportional to the amount of carbon credits the projects will produce, and payment will be made each year as the carbon credits are produced (about $3-$6/t CO2-e). The carbon credits, in return, will go into one "pot", thus generating a mixed portfolio. They are then provided to countries and companies, based upon the amount they invested.

The World Bank carbon-financing instruments were created to generate a portfolio of projects that provide benefits to both the host countries and projects as well as to the companies or countries that invest in them. Characteristics of the projects that benefit the host countries include: private capital flows for projects aimed at reducing poverty, investment in cleaner technologies and best practices, ongoing partnerships, and capacity building for communities and intermediaries. For the companies and governments that invest, the benefits include: acquisition of emission reduction credits for compliance, trading, and insurance; cheaper transaction costs; risk mitigation via diversification; knowledge of carbon asset creation; demonstrated social responsibility; and access to additional credits in each deal.

From a practical perspective, there are both advantages and disadvantages to having a project under the World Bank's carbon funds. The advantages include a guaranteed buyer for up to 15 or more years of the project duration at the fixed price initially negotiated; if prices decrease, the developer still receives contract price; and the funds take on much of the risk, address the issue of replacement or retirement of CERs before they expire, and provide technical capacity for designing and verifying the projects. There are very few disadvantages for a project developer to participate in the World Bank funds. A key one may be that if CER prices rise in the future because demand exceeds supply, a project in the World Bank's portfolio is subject to the initially negotiated lower price for the project duration. In addition, all projects entering World Bank-managed carbon funds must satisfy the World Bank operational policies and procedures, including environmental and social safeguard policies.[16]

[16] Noble, I., 2005. BioCarbon Fund Frequently Asked Questions. World Bank, Washington, DC. http://carbonfinance.org/biocarbon/router.cfm?Page=FAQ#7

Buyers outside the BioCarbon Fund

An alternative option is for project developers is to obtain financing independently for Kyoto-compliant project development and implementation by developing a business plan like any other venture to raise capital. The CDM Executive Board recently decided (February 2005) that non- Annex I countries can develop projects without Annex Ipartners.

The CDM Facility of the Asian Development Bank can contribute to this process (www.adb.org/CDMF/default.asp). This CDM facility was established in August 2003 to assist its developing member countries to access development opportunities made possible through the CDM. Its stated goals are to promote projects that contribute to poverty reduction, sustainable development and mitigation of greenhouse gases; lower CDM transaction costs; assist in finding competitive prices for carbon credits arising from projects; and facilitate access to finance by improving project viability. To accomplish these goals, the CDM Facility assists its members to identify CDM opportunities; develop CDM documentation (such as Project Design Documents and new methodologies); move the project through the CDM cycle until it is successfully registered with the CDM Executive Board; and build local capacity.

Some funding is available from the CDM Facility to cover upfront transaction costs that the facility only recovers if the project obtains a purchase agreement. These transaction costs include costs for CDM due diligence and regulatory and documentation requirements until the project has been registered and validated. For the first few selected projects, transaction costs will be capped at US$ 100,000.

The advantage of obtaining financing independently is that the project developers can sell tCERs or lCERs at a price the market will bear, but at present the market is uncertain. Disadvantages include: the need for a significant amount of funding upfront to develop and market the “business plan”; the market could be uncertain and risky; and the need for a high degree of capacity to manage, implement and monitor the project. Given the uncertain market, this approach may be more suited to the future when commitments will need to be higher and the market will be more mature and somewhat more predictable.

Options for non-BioCarbon Fund buyers are Annex I governments and individual corporate entities. Unfortunately, the current exclusion of LULUCF from the EU ETS limits the involvement of companies and corporations as afforestation/reforestation CDM buyers. Consequently, it is likely
that governments will be the dominant buyers of credits.

Non-Kyoto Protocol Purchases

As noted earlier, a proportion of the volume of credits traded every year is outside the Kyoto Protocol system, principally in the voluntary US market and the mandatory market in New South Wales. In the US, the voluntary nature of the market leads to low prices for traded units, typically between $1-$2 t CO2-e. This market is likely to see expansion. In Australia, the New South Wales Greenhouse Gas Abatement Scheme has placed mandatory benchmarks on NSW electricity retailers and other parties. Under this mandatory scheme, prices have averaged US$8.1 t CO2-e.

3.1.5 Sources of Funding for Project Development

Sources of funding for project development include:

- Grants and subsidies;[17]
- Upfront payments for credits;[18]

[17] An example of an applicable grant is the PHRD Fund (Policy and Human Resource Development Fund) is administered by the World Bank and can provide grants for CDM project development. The fund represents a collaboration between the Japanese Government and the World Bank, which acts as the administrator and Trustee of the Fund.

- Soft loans and loan guarantees;
- Commercial lending;
- Equity investment into companies; and
- Investment into other income-generating activities.

3.2 Risks and Uncertainties

3.2.1 Risks to Project Developer

As the project is typically paid on delivery of the temporary CERs, the dominant portion of the risk rests with the project developer (the seller). Risks to the seller refer to any event(s) that negatively effect the expected greenhouse gas (and consequently financial) benefits to the project. These
risks include:

- Natural risks: fire, disease, lower than predicted growth rates, drought, floods, damaging winds;
- Anthropogenic factors: encroachment, poaching, fire, vandalism;
- Political risks: policy changes, unstable governments;
- Economic risks: exchange rates, interest rates, lower than expected tCER/lCER prices, changes in opportunity cost of land.

Risks are particularly acute where lCERs have been selected as the form of credit – lCERs have an initial duration equal to the length of the crediting period but expire immediately if the stored carbon has diminished at the next verification.

3.2.2 Risks to CER Purchaser

As stated above, under the CDM system risk is concentrated with the seller. However, this is not the case where there has been an upfront payment for CERs or where a particular supply of credits is relied upon by the buyer to fulfil an assigned amount commitment.

3.2.3 Risk Mitigation Mechanisms

Buyers can mitigate their risk by only paying upfront for projects in which they have high confidence of successful delivery. Confidence should be attained through examining the risk mitigation activities and policies of the seller. As the greatest risk lies with the seller, the seller retains the greatest opportunity and responsibility for risk mitigation.

Beyond deciding optimal project location and planting design (as discussed in *Section 2.2*), policies can be implemented
to further mitigate risks to the project, examples include:

- “Good practice management systems” to control the occurrence of, and the response to, damaging events;
- “Self-insurance reserves”, where a portion of tCERs or lCERs is kept as reserves against a future shortfall. If damage does not occur, then the reserve can be sold at the end of the crediting period.
- Involvement of stakeholders. Retaining the involvement of stakeholders beyond the initial project design period retains good will and reduces risks of poaching or malicious damage.Stakeholders can be further incentivized through the transfer of technologies and the implementation of activities that will directly benefit the community.

[18] For example LULUCF projects have received upfront payments from for example the Government of Canada (project ARNM0012) and the Government of Italy (project ARNM0020).

ANNEX A. A GLOSSARY OF TERMS

Accuracy: How close a measure is to its true value.
Activity shifting: A form of *leakage* where activities that cause emissions are not permanently avoided, but simply displaced. For example, if one area is set aside for reforestation, cattle farmers who were farming the area might deforest an alternative area outside project boundaries to replace their lost grazing land.
Additionality: Additionality demonstrates that CDM financing has led to an increase in sequestration or a decrease in emissions.
Additionality tool: A tool developed by the CDM Executive Board (and adapted by the A/R Working Group for afforestation/reforestation projects) for the purpose of demonstrating additionality.
AR or A/R: Afforestation and reforestation
Baseline: The emissions or removals of greenhouse gases that would occur without the project.
Biomass: Organic material (above- or belowground, live or dead).
Boreal: Mean annual temperature of less than 0oC.
Carbon pool: Organic material containing carbon.
Carbon stock: Quantity of carbon in a given pool(s) per unit area.
CER : Certified Emission Reduction – the CDM trading credit. CERs are temporary for A/R projects and classified as tCERs (temporary) or lCERs (long-term). tCERs are valid for five years before expiring; lCERs are valid until end of current crediting period.
CDM : Clean Development Mechanism.
Confidence interval: A measure of the spread of data. The confidence interval gives a range of values in which there is a percentage probability (usually 95%) of the true mean occurring. Calculated by multiplying the standard error by the appropriate t-value.
CoP: Conference of the Parties to the UNFCCC.
CoP/MoP: Conference of the Parties to the UNFCCC serving as the Meeting of the Parties to the Kyoto Protocol.
Cropland: Defines any land on which non-timber crops are grown. This includes both herbaceous crops and higher carboncontent systems such as vineyards and orchards.
DN A: Designated National Authority. The UNFCCC National Focal Point takes this role.
DOE : Designated Operational Entity. The independent, approved verifying organisations of the Kyoto Protocol. Until fully accredited, known as Applicant Entities (AE).
EB: Executive Board. The governing body of the CDM.
Eligibility (land): To be eligible for an AR CDM project, land must have been deforested before 31 December 1989 and continuously without forest since that date. The Designated National Authority defines the forest.
Forests: All land with a canopy cover of greater than 10-30% (dependent upon national definition of forest). Can include natural forest, plantation, forested wetland and mangrove.
Grazing land: A very broad category that includes managed pastures, prairies, steppe and savannas. Grazing lands will often include trees, but only when the canopy cover is less than 10-30%20. Aquatic systems such as flooded grasslands and salt marshes are also included in this category.
Greenhouse gases: Gases in the atmosphere (both natural and anthropogenic) that absorb and emit radiation. This property of the gases causes the greenhouse effect. The primary gases in the earth's atmosphere are water vapour, carbon dioxide, nitrous oxide, methane and ozone
Hardwoods: Hardwoods are the botanical group of trees that have broad leaves and produce a fruit or nut.
Leakage: The loss of carbon outside the boundaries of the project as a result of project activities.
ICER : Long-term CER. See *CER*.
Market effects: A form of *leakage* that occurs when emission reductions are countered by emissions created by shifts in supply and demand of the products and services affected by the project. This is of minimal importance for farming activities, but can be important for large-scale commercial timber harvesting. For example, a stop-

logging project might decrease the supply of timber leading other practitioners to increase their rate of harvest. Market effects leakage is unlikely to be a problem for A/R projects.
Mean: Sum of observations divided by number of observations.
NM : New CDM methodology.
Permanence: A measure of the anticipated longevity of carbon sequestered as part of a CDM activity.
PIN : A project idea note. This is a document prepared early in project planning that defines the type of project, the anticipated location, cost and potential sequestration.
Precision: The repeatability of a measure, or the range of values between which the true value may lie.
Sequestration: The process of increasing the carbon stock in an ecosystem.
Softwood: Softwoods or conifers (from the Latin word meaningcone-bearing) are the group of trees with needles.
Temperate: Mean annual temperature between 0-20oC.
tCER : Temporary CER. See *CER*.
Tropical: Mean annual temperature greater than 20oC.
UNF CCC: United Nations Framework Convention on Climate Change.
Validation: The process by which a DOE approves and then requests registration of a Project Design Document and project.
Verification: The process by which claimed emission reductions or sequestration is approved and CERs are subsequently issued.
Without-project scenario: See *baseline*.

ANNEX B. TABLE OF MONITORING/BASELINE AND MONITORING METHODOLOGIES

Approved methodologies and methodologies under consideration by AR working group.

Methodol-ogy	Full Name	Approv-ed?	Small-scale?	Leakage?†	Pools*
AR-AM0001	Reforestation of degraded lands – Version 3	Yes	No	No	AG / BG
AR-AM0002	Restoration of degraded lands through afforestation/reforestation – Version 2	Yes	No	No	ALL
AR-AM0004	Reforestation or afforestation of land currently under agricultural use – Version 3	Yes	No	Yes	AG/BG
AR-AM0005	Afforestation and reforestation project activities implemented for industrial and/or commercial uses – Version 3	Yes	No	Yes	AG/BG
AR-AM0006	Afforestation/Reforestation with Trees Supported by Shrubs on Degraded Land – Version 2	Yes	No	No	AG/BG/ SOC
AR-AM0007	Afforestation and Reforestation of Land Currently Under Agricultural or Pastoral Use – Version 5	Yes	No	No	AG/BG/ DW/FF
AR-AM0008	Afforestation or reforestation on degraded land for sustainable wood production – Version 3	Yes	No	No	AG/BG
AR-AM0009	Afforestation or reforestation on degraded land allowing for silvopastoral activities – Version 4	Yes	No	No	AG / BG / DW / FF
AR-AM0010	Afforestation and reforestation project activities implemented on unmanaged grassland in reserve/protected areas – Version 3	Yes	No	No	AG/BG
AR-ACM0001	Afforestation and reforestation of degraded land	Yes	No	Yes	AG/BG/ DW/FF/ SOC
AR-ACM0002	Afforestation or reforestation of degraded land without displacement of pre-project activities – Version 1	Yes	No	No	Ag/BG
AR-NM0036	Rubber outgrowing and carbon sequestration in Ghana (ROCS-Ghana)	No	No	No	AG/BG
AR-NM0037	Afforestation/reforestation activities on degraded agricultural land subject to abandonment process	No	No	No	AG/BG/ FF/SOC

AR-AMS0001	Simplified baseline and monitoring methodologies for small-scale afforestation and reforestation project activities under the clean development mechanism implemented on grasslands or croplands – Version 5	Yes	Yes	Yes	AG / BG
AR-AMS0002	Simplified baseline and monitoring methodologies for small-scale afforestation and reforestation project activities under the CDM implemented on settlements – Version 2	Yes	Yes	Yes	AG/BG
AR-AMS0003	Simplified baseline and monitoring methodology for small scale CDM afforestation and reforestation project activities implemented on wetlands – Version 1	Yes	Yes	No	AG/BG
AR-AMS0004	Simplified baseline and monitoring methodology for small-scale agroforestry-afforestation and reforestation project activities under the clean development mechanism – Version 2	Yes	Yes	No	AG/BG/ SOC
AR-AMS0005	Simplified baseline and monitoring methodology for small-scale afforestation and reforestation project activities under the clean development mechanism implemented on lands having low inherent potential to support living biomass – Version 2	Yes	Yes	No	AG/BG/ SOC
AR-AMS0006	Simplified baseline and monitoring methodology for small-scale silvopastoral-afforestation and reforestation project activities under the clean development mechanism – Version 1	Yes	Yes	No	AG/BG/ SOC

†All projects include leakage through vehicle use outside project boundaries, a yes in the leakage column indicates consideration of leakage through activity shifting and/or market effects

* AG = trees aboveground, BG = trees belowground, DW = dead wood, FF = forest floor, SOC = soil organic carbon

ANNEX C. LINKS TO TOOLS

The following tools:

- An Excel calculator for determining required number of plots and an indication of costs using plot calculating methods from AR-AM0001 (versions in English and Chinese).
- A checklist for afforestation and reforestation CDM projects contained in the Sourcebook for Land Use Land Use Change and Forestry; and
- Monitoring methods guidelines in French and in Chinese can be found at: http://www.winrock.org/ecosystems/ tools.asp

Additional tools can also found at: http://www.joanneum.at/encofor/tools/tools.html (Under development)

The IPCC Land Use, Land-use Change and Forestry Good Practice Guidance can be found at: http://www.ipcc-nggip.iges.or.jp/public/gpglulucf/gpglulucf.htm

ANNEX D. LIST OF RELATED RESOURCES AND ORGANIZATIONS

CATIE (Tropical Agricultural Research and Higher Eductation Center, Costa Rica): http://www.catie.ac.cr/english/
CDM Executive Board: http://cdm.unfccc.int/EB
CDM A/R Working Group: http://cdm.unfccc.int/Panels/ar
Center for International Forest Research (CIFOR): http://www.cifor.cgiar.org
Conservation International Center for Environmental Leadership in Business: http://www.celb.org
Encofor (an EU-funded project for the design of sustainable CDM forestry projects): http://www.joanneum.at/Encofor/
European Commission Joint Research Centre: http://ies.jrc.cec.eu.int/fp6ccu.html
Food and Agriculture Organization (FAO): http://www.fao.org
International Tropical Timber Organization (ITTO): http://www.itto.or.jp
Joanneum Research: http://www.joanneum.at/
The Nature Conservancy: http://www.nature.org/initiatives/climatechange/
United Nations Framework Convention on Climate Change (UNFCCC): http://unfccc.int
Winrock International: .http://www.winrock.org/ecosystems/
World Agroforestry Centre (ICRAF): http://www.worldagroforestry.org/
World Bank BioCarbon Fund: http://www.biocarbonfund.org

ANNEX E. ELIGIBILITY AND ADDITIONALITY TOOLS

The Land Eligibility Tool

The CDM Executive Board developed a mandatory tool to be used to define the eligibility of lands for afforestation/ reforestation project activities.

1. Project participants shall provide evidence that the land within the planned project boundary is eligible as an afforestation/reforestation CDM project activity following the steps outlined below.

(a) Demonstrate that at the moment the project starts, the land is not a forest by providing information that:

i. The land is below the forest national thresholds (crown cover, tree height and minimum land area) for forest definition under Decisions 11/CP.7 and 19/CP.9, as communicated by the respective Designated National Authority; and

ii. The land is not temporarily unstocked as a result of human intervention such as harvesting or natural causes ,or is not covered by young natural stands or plantations which have yet to reach a crown density
or tree height in accordance with national thresholds and which have the potential to revert to forest without human intervention.

(b) Demonstrate that the activity is an afforestation/ reforestation project activity:

i. For reforestation project activities, demonstrate that on 31 December 1989, the land was below the forest national thresholds (crown cover, tree height and minimum land area) for forest definition under Decision 11/CP.7, as communicated by the respective Designated National Authority.

ii. For afforestation project activities, demonstrate that the land is below the forest national thresholds (crown cover, tree height and minimum land area) for forest definition under Decision 11/CP.7, as communicated by the respective Designated National Authority, for a period of at least 50 years.

2. In order to demonstrate steps 1(a) and 1(b), project participants shall provide one of the following forms of verifiable information:

(a) Aerial photographs or satellite imagery complemented by ground reference data; or

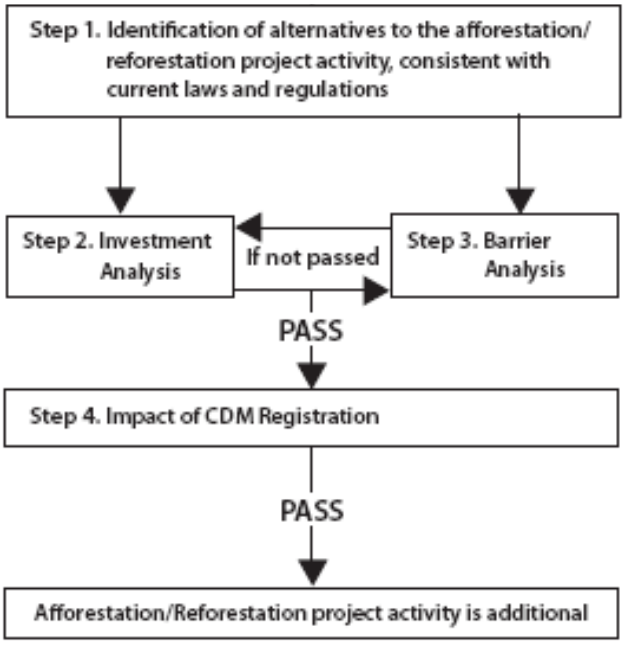
(b) Ground-based surveys (land-use permits, land-use plans or information from local registers such as cadastre, owners' register, land-use or land-management register); or

(c) If options (a) and (b) are not available/applicable, project participants shall submit a written testimony which was produced by following a participatory rural appraisal methodology.

Participatory rural appraisal is an approach to the analysis of local problems and the formulation of tentative solutions with local stakeholders. It makes use of a wide range of visualisation methods for group-based analysis to deal with spatial and temporal aspects of social and
environmental problems.

From CDM Executive Board's 22nd meeting, Annex 16

The Additionality Tool



Step 1: I dentification of alternatives to afforestation/reforestation project activity, consistent with current laws and regulations.

Realistic and credible alternative land uses must be identified, including continuation of the current situation. The applicable legal and regulatory requirements must be discussed for all alternatives. If the proposed project activity is the only alternative that is legally required, and the requirements are enforced, then the project is not additional.

The project developer may choose Step 2 or 3, or both.

Step 2: Investment analysis

Is the proposed project activity economically or financially less attractive than the other alternatives (identified in Step 1) without the revenue from the sale of carbon credits?

Step 3: Barrier analysis

Does the proposed project activity face barriers to prevent implementation? Does this barrier fail to prevent the implementation of at least one of the alternatives (identified in Step 1)?

These barriers may include:

Investment barriers, e.g. no source of funding to overcome initial costs of establishing the activity;

Technological barriers, e.g. lack of properly skilled or trained labour, lack of infrastructure to implement project;

Prevailing practice barriers, e.g. the project activity is a new practice in the country or region.

Step 4: Impact of CDM registration

An explanation is required of how the benefits and incentives of CDM registration will alleviate the economic and financial hurdles (Step 2) and/or other barriers (Step 3), enabling the project activity to be undertaken.

ANNEX F. THE CDM PROJECT DESIGN DOCUMENT TEMPLATE

Comments in grey boxes are the advice of AR working group.

Comments in green text are the advice of Winrock International.

CLEAN DEVELOPMENT MECHANISM PROJECT DESIGN DOCUMENT FORM FOR AFFORESTATION AND REFORESTATION PROJECT ACTIVITIES (CDM A/R PDD)

Version 2, in effect as of March 2006

CONTENTS

SECTION A. General description of the proposed A/R CDM project activity:

A.1. Title of the proposed A/R CDM project activity:

>>

Please indicate
- The title of the A/R CDM project activity
- The version number of the document
- The date of the document

Version number should be updated for each new revision of Project Design Document (PDD). Several versions of the PDD will be submitted to the Designated Operational Entity during validation and the numbering is important for tracking purposes.

A.2. Description of the proposed A/R CDM project activity:

>>

Please include in the description:
- The purpose of the proposed A/R CDM project activity;
- The view of the project participants of the contribution of the A/R CDM project activity to sustainable development (max. one page).

Please use the list of key words available on the UNFCCC CDM website. If not suitable Key words can be identified, or if it is considered that they are insufficient, please suggest a new key word(s), being guided by relevant information on the UNFCCC web site.

This section should not exceed one page. Information included should only relate to the project, nothing should be included about any other activities conducted by the project participants nor specific information on any of the participants. Host country information should be limited to information directly related to the project site.

A.3. Project participants:

>>

Please list project participants and party(ies) involved and provide contact information in Annex 1. Information shall be indicated using the following tabular format.

Name of Party involved (*) ((host) indicates a host Party)	Private and/or public entity(ies) project participants (*) (as applicable)	Kindly indicate if the Party involved wishes to be considered as project participant (Yes/No)
Name A (host)	• Private entity A • Public entity A …	No
Name B	• None	Yes
Name C	• None	No
…	• …	…

(*) In accordance with the CDM A/R modalities and procedures, at the time of making the CDM-AR-PDD public at the stage of validation, a Party involved may or may not have provided its approval. At the time of requesting registration, the approval by the Party(ies) involved is required.

The table above should be completed in full. The "Name of the Party" column should only include the names of countries with a role in the project (host, financier etc.). Any companies or other entities involved in the project are then listed in the second column within the row of the country they are located in.

Only entities that are integral to the project should be listed (i.e. those making decisions about allocation of tCERs or lCERs). Consultants only involved in the development of the PDD should not be listed as project participants.

In the final column only put YES if the country has explicitly stated that it wants to be considered as a project participant. The default here is NO. Most countries do not want to be project participants.

A.4. Description of location and boundaries of the A/R CDM project activity:

A.4.1. Location of the proposed A/R CDM project activity:

>>

Detail here should be determined by potential for confusion. If other CDM activities exist in the area or are being planned in the area more detail should be provided.

All planting sites should be listed.

A.4.1.1. Host Party(ies):

>>

A.4.1.2. Region/State/Province etc.:

>>

A.4.1.3. City/Town/Community etc:

>>

A.4.1.4. Detail of geographical location and project boundary, including information allowing the unique identification(s) of the proposed A/R CDM project activity:

>>

The "project boundary" geographically delineates the A/R CDM project activity under the control of the project participants.
The A/R CDM project activity may contain more than one discrete area of land. If an A/R CDM project activity contains more than one discrete area of land:
- Each discrete area of land should have an unique geographical identification; and
- The boundary should be defined for each discrete area and should not include the areas in between the discrete areas of land.

The project boundary should be delineated using a GPS (global positioning system). Details of this delineation should be shown to the Designated Operational Entity at validation.

A.5. Technical description of the A/R CDM project activity:

>>

A.5.1. Description of the present environmental conditions of the area planned for the proposed A/R CDM project activity, including a concise description of climate, hydrology, soils, ecosystems (including land use):

>>

Do not make this section too long (2 – 3 pages maximum). The purpose is to inform about the project area, in particular with regard to potential risks and impacts on the project activity.

A.5.2. Description of the presence, if any, of rare or endangered species and their habitats:

>>

Do not make this section too long (about 2 pages maximum). The purpose is to inform about the project area, in particular with regard to potential risks and impacts of the project activity.

A.5.3. Species and varieties selected for the proposed A/R CDM project activity:

>>

A.5.4. Technology to be employed by the proposed A/R CDM project activity:

>>

This section should include a description of the environmentally safe and sound technologies and know-how that will be employed by the project, specifying, if any, those to be transferred to the host Party(ies).

A.5.5. Transfer of technology/know-how, if applicable:

>>

A.5.6. Proposed measures to be implemented to minimize potential leakage:

>>

A.6. Description of legal title to the land, current land tenure and rights to tCERs / lCERs issued for the proposed A/R CDM project activity:

>>

A.7. Assessment of the eligibility of the land:

>>

In order to define afforestation or reforestation, project participants shall follow the definition for "forest" selected by the host Party, which specifies:
- A single minimum tree crown cover value between 10 and 30 percent; and
- A single minimum land area value between 0.05 and 1 hectare; and
- A single minimum tree height value between 2 and 5 meters.

The definition for forest selected by each Party can be found on the Designated National Authority page on the UNFCCC CDM website.

Please specify how the project fulfils the definition of afforestation or reforestation and eligibility of the land, as provided in the glossary of terms (Annex A), using the following procedures:

1. Provide evidence that the land within the planned project boundary is eligible as an A/R CDM project activity following the steps outlined below.

(a) Demonstrate that the land at the moment the project starts is not a forest by providing information that:

i. The land is below the forest national thresholds (crown cover, tree height and minimum land area) for forest definition under Decisions 11/CP.7 and 19/CP.9, as communicated by the respective Designated National Authority; and

ii. The land is not temporarily unstocked as a result of human intervention, such as harvesting or natural causes, or is not covered by young natural stands or plantations which have yet to reach a crown density or tree height in accordance with national thresholds and which have the potential to revert to forest without human intervention.

(b) Demonstrate that the activity is a reforestation or afforestation project activity:

i. For reforestation project activities, demonstrate that on 31 December 1989, the land was below the forest national thresholds (crown cover, tree height and minimum land area) for forest definition under Decision 11/CP.7, as communicated by the respective Designated National Authority.

ii. For afforestation project activities, demonstrate that the land is below the forest national thresholds (crown cover, tree height and minimum land area) for forest definition under Decision 11/CP.7, as communicated by the respective Designated National Authority, for a period of at least 50 years.

2. In order to demonstrate steps 1 (a) and 1 (b), project participants shall provide one of the following verifiable information:

(a) Aerial photographs or satellite imagery complemented by ground reference data; or
(b) Ground based surveys (land use permits, land use plans or information from local registers such as cadastre, owners register, land use or land management register); or
(c) If options (a) and (b) are not available/applicable, project participants shall submit a written testimony which was produced by following a participatory rural appraisal methodology.

Participatory rural appraisal is an approach to the analysis of local problems and the formulation of tentative solutions with local stakeholders. It makes use of a wide range of visualisation methods for group-based analysis to deal with spatial and temporal aspects of social and environmental problems.

For more guidance, *see Sections 2.3 Step 7 and 2.3 Step 12.*

A.8. Approach for addressing non-permanence:

>>

In accordance with paragraph 38 and section K of the CDM A/R modalities and procedures, please specify which of the following approaches to address non-permanence has been selected:
• Issuance of tCERs
• Issuance of lCERs

Need only to state which of the approaches will use—nothing more needed.

A.9. Estimated amount of net anthropogenic GHG removals by sinks over the chosen crediting period:

>>

Please provide the total estimate of net anthropogenic GHG removals by sinks as well as annual estimates for the chosen crediting period. Information on the net anthropogenic GHG removals by sinks shall be indicated using the following tabular format overleaf.

Summary of results obtained in Sections C.7., D.1., and D.2.				
Year	**Estimation of baseline net GHG removals by sinks (tonnes of CO_2 e)**	**Estimation of actual net GHG removals by sinks (tonnes of CO_2 e)**	**Estimation of leakage (tonnes of CO_2 e)**	**Estimation of net anthropogenic GHG removals by sinks (tonnes of CO_2 e)**
Year A				
Year B				
Year C				
Year …				
Total (tonnes of CO2 e)				

A.10. Public funding of the proposed A/R CDM project activity:

>>

In the case where public funding from Parties included in Annex I is involved, please provide information in Annex 2 on the sources of public funding for the project activity from Parties included in Annex I, which shall provide an affirmation that such funding does not result in a diversion of official development assistance and is separate from, and is not counted towards, the financial obligations of those Parties.

If public money from an Annex I country is used to fund the project, then the relevant Ministry of the Annex I country should provide a letter confirming that there is no diversion of overseas development assistance. Details should be provided in Annex 2. If there are no public funds involved, then this should be clearly stated in this section.

SECTION B. Duration of the project activity / crediting period

B.1. Starting date of the proposed A/R CDM project activity and of the crediting period:

>>

The crediting period shall begin at the start of the A/R CDM project activity under the CDM. The starting date of a A/R CDM project activity is the date on which the implementation or real action of the project activity begins, resulting in actual net GHG removals by sinks.

At its 21st meeting, the CDM Executive Board clarified that the provisions of paragraphs 12 and 13 of Decision 17/CP.7 do not apply to CDM A/R project activities. A CDM A/R project activity starting after 1 January 2000 can also be validated and registered after 31 December 2005, as long as the first verification of the project activity occurs after the date of registration of this project activity.

Given that the crediting period starts at the same date as the starting date of the project activity, the projects starting 2000 onwards can accrue tCERs/lCERs as of the start date.

Should be specific, i.e. DD/MM/YYYY. Proof of starting date should be made available to the Designated Operational Entity.

Date should not be before the start of the project activity

B. 2. Expected operational lifetime of the proposed A/R CDM project activity:

>>

Please state the expected operational lifetime of the proposed A/R CDM project activity in years and months as appropriate.

Should equal or exceed the length of the crediting period.

B.3. Choice of crediting period:

>>

Please state whether the proposed A/R CDM project activity will use a renewable or a fixed crediting periods and complete A.4.10.3.1 or A.4.10.3.2 accordingly. A4.10.3.1 and A.4.10.3.2 are mutually exclusive- please select only one of them. At its 21st meeting, the CDM Executive Board clarified that the provisions of paragraphs 12 and 13 of Decision 17/CP.7 do not apply to CDM A/R project activities. A CDM A/R project activity starting after 1 January 2000 can also be validated and registered after 31 December 2005, as long as the first verification of the project activity occurs after the date of registration of this project activity. Given the crediting period starts at the same date as the starting date of the project activity, projects starting from 2000 onwards can accrue tCERs/lCERs as of the start date.

Select one of fixed or renewable. That is, either A.4.10.3.1 or A.4.10.3.2 should be filled in, not both.

B.3.1. Length of the renewable crediting period (in years and months), if selected:

>>

Each crediting period shall be a maximum of twenty (20) years and may be renewed at most two times, provided that, for each renewal, a Designated Operational Entity determines and informs the CDM Executive Board that the original project baseline is still valid or has been updated, taking account of new data where applicable.

Please state the length of the crediting period in years and months as appropriate.

Start date should not be before the start of the project activity

B.3.2. Length of the fixed crediting period (in years and months), if selected:

>>

Fixed crediting period shall be at most thirty (30) years. Please state the length of the crediting period in years and months. The total crediting period should not exceed the expected lifetime of the project activity.

Start date should not be before the start of the project activity

SECTION C. Application of an approved baseline and monitoring methodology

C.1. Title and reference of the approved baseline and monitoring methodology applied to the proposed A/R CDM project activity:

>>

See Table of methodologies in Annex B of this report—the list is current as of September 2009

Please refer to the UNFCCC CDM website for the title and reference list, as well as the details of approved baseline and monitoring methodologies.

Please note that the table "Baseline Information" contained in Annex 3 is to be prepared in parallel to completing the remainder of this section.

If a national or international monitoring standard has to be applied to monitor certain aspects of the proposed A/R CDM project activity, please identify this standard and provide a reference to the source where a detailed description of the standard can be found.

Please fill in the section below in accordance with the approved methodology selected.

C.2. Assessment of the applicability of the selected approved methodology to the proposed A/R CDM project activity and justification of the choice of the methodology:

>>

Please justify the choice of methodology by showing that the proposed A/R CDM project activity and its context meet the conditions under which the methodology is applicable.

Discuss every one of the applicability conditions and how your project is appropriate to these conditions. Make sure all applicability conditions are discussed.

C.3. Assessment of the selected carbon pools and emission sources of the approved methodology to the proposed CDM project activity:

>>

In calculating the baseline net GHG removals by sinks and/or actual net GHG removals by sinks, project participants may choose not to account for one or more carbon pools, and/or emissions of the GHG measured in units of CO_2 equivalents, while avoiding double counting. This is subject to the provision of transparent and verifiable information that the choice will not increase the expected net anthropogenic GHG removals by sinks. Project participants shall otherwise account for all significant changes in carbon pools and/or emissions of the GHG measured in units of CO_2 equivalents by the sources that are increased as a result of the implementation of the proposed A/R CDM project activity, while avoiding double counting.

Select the carbon pools that are considered in determining actual net GHG removals by sinks and baseline net GHG removals by sinks in the table below in accordance with the proposed new/approved methodology used. Note that the same carbon pools should be considered in the actual explanations and justifications for the choice in the table.

Carbon pools	**Selected (answer with yes or no)**	**Justification / Explanation**

Aboveground		
Belowground		
Dead wood		
Litter		
Soil organic carbon		

For more guidance, see *Section 2.3 Step 6 iii.*

Please specify the GHG that are expected to be emitted as a result of the implementation of the proposed A/R CDM project activity, for example, *inter alia*, emissions from soil preparation, from the use of machinery and from the use of fertilisers.

Identify all GHG emission sources in the project boundary using the table below in accordance with the new proposed /approved methodology used. Note that CO_2 emissions or removals resulting from changes in carbon stocks should not be included in this table. Explain whether any emissions sources are excluded in the calculation of actual net GHG removals by sinks, and if so, justify their exclusion. If possible, use the table provided below.

Sources	**Gas**	**Included / Excluded**	**Justification / Explanation**
E.g. use of fertilisers …	CO_2		
	CH_4		
	N_2O		
E.g. combustion of fossil fuels used in on-site vehicles	CO_2		
	CH_4		
	N_2O		

C.4. Description of strata identified using the *ex ante* stratification:

>>

C.5. Identification of the baseline scenario:

>>

C.5.1. Description of the application of the procedure to identify the most plausible baseline scenario (separately for each stratum defined in C.4.):

>>

C.5.2. Description of the identified baseline scenario (separately for each stratum defined in Section C.4.):

>>

C.6. Assessment and demonstration of additionality:

>>

Explanation of how and why this project is additional and therefore not the baseline scenarios in accordance with the selected baseline methodology. Include 1) a description of the baseline scenario determined by applying the methodology, 2) a description of the project scenario, and 3) an analysis showing why the baseline net GHG removals by sinks scenario would likely lie below actual net anthropogenic GHG removals by sinks in the project scenario.

Use the additionality tool. See *Section 2.3 Step 11 and Annex C.*

C.7. Estimation of the *ex ante* baseline net GHG removals by sinks:

>>

ID number[19]	Data variable	Data unit	Value applied	Data Source	Comment

Please present final results of your calculations using the following tabular format.

Year	Annual estimation of baseline net anthropogenic GHG removals by sinks in tonnes of CO_2 e
Year A	
Year B	
Year C	
Year …	
Total estimated baseline net GHG removals by sinks (tonnes of CO2 e)	
Total number of crediting years	
Annual average over the crediting period of estimated baseline net GHG removals by sinks (tonnes of CO2 e)	

Estimates should be given in units of CO_2-equivalent for each carbon pool, sources, etc.

Estimates should be derived following the methods detailed in the baseline section (Section II) of the approved methodology.

C.8. Date of completion of the baseline study and the name of person(s)/entity(ies) determining the baseline:

>>

Please attach detailed baseline information in Annex 3.

[19] Please provide ID number for cross-referencing in the PDD.

Please provide date of completion in DD/MM/YYYY format.

Please provide contact information and indicate if the person/entity is also a project participant listed in Annex I.

SECTION D. Estimation of *ex ante* actual net GHG removals by sinks, leakage and estimated amount of net anthropogenic GHG removals by sinks over the chosen crediting period

D.1. Estimate of the *ex ante* actual net GHG removals by sinks:

>>

Please provide estimated sum of verifiable changes in carbon stocks, minus the increase in emissions (measured in units of CO_2-equivalent) by the sources that are increased as an attributable result of the implementation of the proposed A/R CDM project activity within the project boundary (in units of CO_2-equivalent for each gas, pool, sources, formulae/algorithm).

Estimates should be derived following the methods detailed in the baseline section (Section II) of the approved methodology.

D.2. Estimate of the *ex ante* leakage:

>>

If none say so or give an estimate

SECTION E. Monitoring plan

This section shall provide a detailed description of the monitoring plan, including an identification of the data and its quality with regard to accuracy, comparability, completeness and validity, taking into consideration any guidance contained in the methodology. The monitoring plan is to be attached in Annex 4. The monitoring should provide detailed information related to the collection and archiving of all relevant data need to:
• estimate or measure verifiable changes in carbon stocks in the carbon pools and the emissions of GHG occurring within the project boundary;
• determine the baseline; and
• identify increased emissions outside the project boundary.

The monitoring plan should reflect good monitoring practice appropriate to the type of A/R CDM project activity. The plan should follow the instructions and steps defined in the approved monitoring methodology. Project participants shall implement the registered monitoring plan and provide data, in accordance with the plan, through their monitoring report.

Please note that data monitored and required for verification and issuance are to be kept for two years after the end of the (last) crediting period.

E.1. Monitoring of the project implementation:

>>

E.1.1. Monitoring of forest establishment and management:

>>

ID number[20]	Data variable	Data unit	Measured (m), calculated (c) estimated (e) or default (d)[21]	Recording frequency	Number of data points / Other measure of number of collected data.	Comment

E.1.2. If required by the selected approved methodology, describe or provide reference to, SOPs and quality control/quality assurance (QA/QC) procedures applied.

>>

ID number[22]	Data variable	Data unit	Measured (m), calculated (c) estimated (e) or default (d)[23]	Recording frequency	Number of data points / Other measure of number of collected data.	Comment

E.2. Sampling design and stratification

>>

Describe the sampling design that will be used in the project for the ex-post calculation of actual net GHG removals by sinks and, in case the baseline is monitored, the baseline net GHG removals by sinks. The sampling design shall describe, *inter alia*, stratification, determination of number plots, plot distribution, etc.

E.3. Monitoring of the baseline net GHG removals by sinks, if required by the selected approved methodology:

>>

ID number[24]	Data variable	Data unit	Measured (m), calculated (c) estimated (e) or default (d)[25]	Recording frequency	Number of sample plots at which the data will be monitored	Comment

E.4. Monitoring of the actual net GHG removals by sinks:

>>

[20] Please provide ID number for cross-referencing in the PDD.
[21] Please provide full reference to data source.
[22] Please provide ID number for cross-referencing in the PDD.
[23] Please provide full reference to data source.
[24] Please provide ID number for cross-referencing in the PDD.
[25] Please provide full reference to data source.

E.4.1. Data to be collected in order to monitor the verifiable changes in carbon stock in the carbon pools within the project boundary resulting from the proposed A/R CDM project activity:

>>

ID number[26]	Data variable	Data unit	Measured (m), calculated (c) estimated (e) or default (d)[27]	Recording frequency	Number of sample plots at which the data will be monitored	Comment

E.4.2. Data to be collected in order to monitor the GHG emissions by the sources, measured in units of CO_2 equivalent, that are increased as a result of the implementation of the proposed A/R CDM project activity within the project boundary:

>>

ID number[28]	Data variable	Data unit	Measured (m), calculated (c) estimated (e) or default (d)[29]	Recording frequency	Number of sample plots at which the data will be monitored	Comment

E.5. Leakage:

>>

Please indicate if leakage will be directly or indirectly monitored. If leakage is not monitored during the implementation of the proposed A/R CDM project activity, please explain rationale behind it. Please state if not applicable.

E.5.1. If applicable, please describe the data and information that will be collected in order to monitor leakage of the proposed A/R CDM project activity:

>>

ID number[30]	Data variable	Data unit	Measured (m), calculated (c) estimated (e) or default (d)[31]	Recording frequency	Number of data points	Comment

[26] Please provide ID number for cross-referencing in the PDD.
[27] Please provide full reference to data source.
[28] Please provide ID number for cross-referencing in the PDD.
[29] Please provide full reference to data source.
[30] Please provide ID number for cross-referencing in the PDD.
[31] Please provide full reference to data source.

E.5.2. Specify the procedures for the periodic review of implementation of activities and measures to minimize leakage, if required by the selected approved methodology:

E.6. Provide any additional quality control (QC) and quality assurance (QA) procedures undertaken for data monitored not included in section E.1.3:

Refer to data items in tables contained in C.4 and C.5, as applicable.

Data *(Indicate ID number)*	Uncertainty level of data (High/Medium/Low)	**Explain QA/QC procedures planned for these data, or why such procedures are not necessary.**

E.7. Please describe the operational and management structure(s) that the project operator will implement in order to monitor actual GHG removals by sinks and any leakage generated by the proposed A/R CDM project activity:

E.8. Name of person(s)/entity(ies) applying the monitoring plan:

Please provide contact information and indicate if the person/entity is also a project participant listed in Annex 1 of this document.

SECTION F. Environmental impacts of the proposed A/R CDM project activity:

F.1. Documentation on the analysis of the environmental impacts, including impacts on biodiversity and natural ecosystems, and impacts outside the project boundary of the proposed A/R CDM project activity:

This analysis should include, where applicable, information on, *inter alia*, hydrology, soils, risk of fires, pests and diseases. Please attach the relevant documentation to the CDM-AR-PDD.

Include any impacts on: biodiversity, local air quality, water resource availability, water resource quality, soil contamination, soil erosion, use of natural resources, chemical usage and disposal, waste management.

F.2. If any negative impact is considered significant by the project participants or the host Party, a statement that project participants have undertaken an environmental impact assessment, in accordance with the procedures required by the host Party, including conclusions and all references to support documentation:

>>

Please attach the documentation to the CDM-AR-PDD.

F.3. Description of planned monitoring and remedial measures to address significant impacts referred to in section F.2. above:

>>

All mitigation efforts should be clearly stated.

SECTION G. Socio-economic impacts of the proposed A/R CDM project activity:

G.1. Documentation on the analysis of the major socio-economic impacts, including impacts outside the project boundary of the proposed A/R CDM project activity:

>>

This analysis should include, where applicable, information on, *inter alia*, local communities, indigenous peoples, land tenure, local employment, food production, cultural and religious sites and access to fuelwood and other forest products. Please attach the documentation to the CDM-AR-PDD.

G.2. If any negative impact is considered significant by the project participants or the host Party, a statement that project participants have undertaken a socio-economic impact assessment, in accordance with the procedures required by the host Party, including conclusions and all references to **supporting documentation:**

>>

Please attach the documentation to the CDM-AR-PDD.

G.3. Description of planned monitoring and remedial measures to address significant impacts referred to in section G.2 above:

>>

SECTION H. Stakeholders' comments:

H.1. Brief description of how comments by local stakeholders have been invited and compiled:

>>

Please describe the process by which comments by local stakeholders have been invited and complied. An invitation for comments by local stakeholders shall be made in an open and transparent manner, in a way that facilitates comments to be received from local stakeholders and allows for a reasonable time for comments to be submitted. In this regard, project participants shall describe an A/R CDM project activity in a manner which allows the local stakeholders to understand the proposed A/R CDM project activity, taking into account confidentiality provisions of the CDM modalities and procedures.

H.2. Summary of the comments received:

>>

Please identify stakeholders that have made comments and provide a summary of these comments.

H.3. Report on how due account was taken of any comments received:

>>

Please explain how due account have been taken of comments received from stakeholders.

Annex 1

CONTACT INFORMATION ON PARTICIPANTS IN THE PROPOSED A/R CDM PROJECT ACTIVITY

Organization:	
Street/P.O.Box:	
Building:	
City:	
State/Region:	
Postfix/ZIP:	
Country:	
Telephone:	
FAX:	
E-Mail:	
URL:	
Represented by:	
Title:	
Salutation:	
Last Name:	
Middle Name:	
First Name:	
Department:	
Mobile:	
Direct FAX:	
Direct tel:	
Personal E-Mail:	

Make sure all project participants listed in the second column of Table A.3. are included here and that the information is consistent between Annex 1 and Table A.3.

ANNEX 2
INFORMATION REGARDING PUBLIC FUNDING

Please provide information from Parties included in Annex I on sources of public funding for the proposed A/R CDM project activity which shall provide an affirmation that such funding does not result in a diversion of Official Development Assistance, and is separate form and is not counted towards the financial obligations of those Parties.

If public funding is included, documentation included with the PDD should include a letter from the host Party Designated National Authority stating that:

1. That there is no objection to the inclusion of the funding in the CDM project;
2. That the money is not included as Official Development Assistance and is not counted towards any development financial obligations.

ANNEX 3
BASELINE INFORMATION

Please provide a table containing the key elements used to determine the baseline for the proposed A/R CDM project activity, including elements such as variables, parameters and data sources. For approved methodologies, you may find a draft table on the UNFCCC CDM website.

ANNEX 4
MONITORING PLAN

The monitoring plan needs to provide detailed information related to the collection and archiving of all relevant data need to:

• estimate or measure verifiable changes in carbon stocks in the carbon pools and the emissions of GHGs occurring within the project boundary;
• determine the baseline; and
• identify increased emissions outside the project boundary.

The monitoring plan should reflect good monitoring practice appropriate to the type of A/R CDM project activity. The plan should follow the instructions and steps defined in the approved monitoring methodology. Project participants shall implement the registered monitoring plan and provide data, in accordance with the plan, through their monitoring report.

Please not that data monitored and required for verification and issuance are to be kept for two years after the end of the (last) crediting period.

Monitoring plan should include:
• boundaries of area that will be monitored;
• means by which data will be collected and archived;
• frequency of measurements;
• how leakage will be assessed and estimated;
• quality assurance and quality assurance plans to assure high quality of collected data;
• how non-greenhouse gas environmental impacts will be assessed; and
• measurement methods not fully detailed in body of PDD.
It is important that the plan should allow future verification to be as simple and cost-effective as possible.

- - - - -

Example History of the Document

Version	Date	Nature of revision
04	EB35, Annex 20 19 October 2007	• Restructuring of section A; • Section “Monitoring of forest establishment and management” replaces sections: “Monitoring of the project boundary”, and “Monitoring of forest management”; • Introduced a new section allowing for explicit description of SOPs and quality control/quality assurance (QA/QC) procedures if required by the selected approved methodology;

		• Change in design of the section "Monitoring of the baseline net GHG removals by sinks" allowing for more efficient presentation of data.
03	EB26, Annex 19 29 September 2006	Revisions in different sections to reflect equivalent forms used by the Meth Panel and assist in making more transparent the selection of an approved methodology for a proposed A/R CDM project activity.
02	EB23, Annex 15a/b 24 February 2006	Inclusion of a section on the assessment of the eligibility of land and the Sampling design and stratification during monitoring
01	EB15, Annex 6 03 September 2004	Initial adoption

ANNEX G. VOLUNTARY MARKETS

Operating outside of international emissions reduction regulatory schemes such as the Kyoto Protocol, voluntary carbon offset programs enable companies and individuals to purchase carbon offsets on a voluntary basis. Although the voluntary market is much smaller than the regulatory market, it is growing rapidly. In addition, voluntary markets allow a broader set of project types than the Clean Development Mechanism. The Voluntary Carbon Standard Program (VCS) and the American Carbon Registry (ACR), two leading programs for projects on the voluntary market, are described below.

Voluntary Carbon Standard

"The VCS Program provides a robust, new global standard and program for approval of credible voluntary offsets.

VCS offsets must be real (have happened), additional (beyond business-as-usual activities), measurable, permanent (not temporarily displace emissions), independently verified and unique (not used more than once to offset emissions).

- *Standardize and provide transparency and credibility to the voluntary offset market.*
- *Enhance business, consumer and government confidence in voluntary offsets.*
- *Create a trusted and tradable voluntary offset credit; the Voluntary Carbon Unit. (VCU)*
- *Stimulate additional investments in emissions reductions and low carbon solutions*
- *Experiment and stimulate innovation in emission reduction technologies and offer lessons that can be build into future regulation.*
- *Provide a clear chain of ownership over voluntary offsets that prevent them being used twice. This is achieved through multiple VCS registries and a central project database that is open to the public.*

History

Work to develop the Voluntary Carbon Standard was initiated by The Climate Group, the International Emissions Trading Association and the World Economic Forum in late 2005. Version 1 of the VCS was released on 28 March 2006 as both a consultation document and a pilot standard for use in the market. VCS version 2 was released in October 2006 as a consultation document and did not replace Version 1 as the market standard. 150 written submissions were received from carbon market stakeholders on VCS versions 1 and 2.

After the release of version 2, a 19 member Steering Committee was established to consider all of the stakeholder comments and develop the final standard. Within the Committee seven technical working groups provided advice on VCS governance, additionality, validation and verification, registries, land use change and forestry, general policy issues and performance standards.

The World Business Council for Sustainable Development joined the initiative as a founding partner in 2007. After two years of work, VCS 2007 was released on 19 November 2007."

From the VCS website

American Carbon Registry

"The American Carbon Registry® is a leading non-profit U.S. carbon market registry. As the first private voluntary greenhouse gas (GHG) registry in the U.S., the American Carbon Registry boasts time-tested integrity in high quality carbon offset registration and carbon technical services.

In 1996, market-oriented environmental experts at the Environmental Defense Fund founded the Environmental Resources Trust (ERT) and launched the GHG Registry, now known as the American Carbon Registry. The American Carbon Registry and Environmental Resources Trust joined Winrock International in 2007, expanding the Winrock team of climate change, forestry, clean energy, agriculture, and carbon market experts.

Who Trusts Us

Today, the American Carbon Registry is one of the largest and most respected online registries in the U.S. voluntary and pre-compliance carbon markets. A host of Fortune 500 companies as well as non-profit organizations and mission-driven institutions trust us with their carbon accounting and registry needs.
We work with major U.S. companies in key emitting sectors as well as with companies with corporate social responsibility objectives, providing the entire spectrum of carbon technical services for greenhouse gas accounting, protocol development, offset and corporate GHG inventory registration and over-the-counter (OTC) offset transactions and retirements.

What We Offer

The American Carbon Registry is a one-stop shop for carbon registry and technical services. We provide an electronic registry system for Members to transparently register serialized offsets as well as record the purchase, sale and retirement of project-based offsets, branded as Emission Reduction Tons ("ERTs"). One "ERT" represents the reduction or removal from the atmosphere equivalent to one metric ton of carbon dioxide. Members can also report their verified corporate GHG inventories ("carbon footprint") and corporate emissions reductions on the Registry."

From the ACR website

The table below provides a summary of how the VCS and the ACR deal with key concepts of carbon project development:

Admissible Activities	• Afforestation • Forest management • Forest conservation
Measurement Pools	All pools included: trees above and belowground, downed and standing dead wood, forest floor, non-tree woody vegetation, herbaceous vegetation, soil and harvested wood products. Pools can be omitted as long as it is conservative to do so
Measurement Requirements	Measurement required.
Baseline	Project specific or performance standard allowed
Non-CO2 gases	Required if are more than de minimis.[b] Non-biological emissions might include use of vehicles and equipment, or emissions from use of fertilizer or fire.
Leakage[b]	Assessment required
Permanence	Each project is assessed according to the risk that carbon sequestration or avoided carbon emissions are permanent. According to this risk, a proportion of credits could not be sold and must be held as a buffer

	against any reversal. Across the entire forestry portfolio, this buffer is assumed to be large enough to cover projects that fail or projects that face crises. Necessarily the higher the project's risk the larger the deduction that goes into the buffer.
Additionality	Additionality test must be passed. Projects must demonstrate either that undertaking the project activity is not profitable in the absence of carbon credits or that there are barriers in the way of the project going ahead without carbon credits. Barriers may include lack of financing or divergence from common practice in the area.
Timing	No forward crediting allowed
Third Party Certification	Required

[b]de minimis is defined as greater than 3% of total sequestration or emissions
[a] leakage refers to unintended losses of net carbon benefit as a consequence of project activities

Both the VCS and the ACR have absolute integrity with regard to the atmosphere and are likely to maintain investor confidence. The VCS is more well known than the ACR, and is beginning to dominate the voluntary market internationally. However, transaction costs for early actor projects developing and seeking approval for new methodologies under the VCS are substantial.

Pros and Cons of Voluntary Markets and the CDM

Voluntary Markets	**CDM**
Pros	**Pros**
• Validation and verification can be completed by the same entity and the two processes may be combined for efficiency • Possibility of broad participation allows project implementation in Annex I countries and countries that have not validated the Kyoto Protocol, such as the U.S. • Innovation and experimentation in project activities is possible due to greater flexibility • Retroactive crediting is allowed up to two years prior to the validation date • Credits are completely fungible; forestry credits are equal to credits in any other sector • Reverification of VCU's is not required	• Caps and mandatory exposure drive market expansion and create large scale demand • All verified credits may be sold; there is no contribution to a buffer account • A long term commitment to the project activity is not expected after tCERs expire
Cons	**Cons**
• Risk buffer contribution means less credits are sold up front • Voluntary markets are limited in potential for expansion	• Retroactive crediting is no longer allowed • Validation and verification cannot be carried out by the same party and cannot occur simultaneously slowing down the project development process • Demand for forestry credits within the CDM

	• is unknown but expected to be low due to lack of fungibility • tCERs expire after 5 years and must be reverified in order to be resold

The Voluntary Carbon Standard Project Design Template

-
-
-
- Voluntary Carbon Standard

Project Description Template

19 November 2007

[Date of the VCS PD]

[Table of Contents]

Description of Project:

Project title

Type/Category of the project

- Project category which is part of a GHG program that has been approved by the VCS Board.

- Specify here if the project is a Grouped project

Estimated amount of emission reductions over the crediting period including project size:

- Micro project: Less than 5,000 tonnes CO2 equivalent emissions reductions per year.
- Mega Project: More than 1,000,000 tonnes CO2 equivalent emissions reductions per year

A brief description of the project:

Project location including geographic and physical information allowing the unique identification and delineation of the specific extent of the project:

Include GPS project boundaries.

Duration of the project activity/crediting period:

- **Project start date: Date on which a financial commitment was made to the project and the project reached financial closure.**
- *Crediting period start date: the date the first monitoring period commenced*
  - *VCS project crediting period:* A maximum of ten years which may be renewed at most two times

Conditions prior to project initiation:

A description of how the project will achieve GHG emission reductions and/or removal enhancements:

Project technologies, products, services and the expected level of activity:

Compliance with relevant local laws and regulations related to the project:

The VCS PD shall include identification of relevant local laws and regulations related to the project and demonstration of compliance with them.

Identification of risks that may substantially affect the project's GHG emission reductions or removal enhancements:

Demonstration to confirm that the project was not implemented to create GHG emissions primarily for the purpose of its subsequent removal or destruction.

Demonstration that the project has not created another form of environmental credit (for example renewable energy certificates).

If the project has created another form of environmental credit, the proponent must provide a letter from the program operator that the credit has not been used and has been cancelled from the relevant program.

Project rejected under other GHG programs (if applicable):

Projects rejected by other GHG programs, due to procedural or eligibility requirements where the GHG program applied have been approved by the VCS Board; can be considered for VCU but project proponents for such a project shall:

- *clearly state in its VCS PD all GHG programs for which the project has applied for credits and why the project was rejected, such information shall not be deemed commercially sensitive information; and*
- *provide the VCS verifier and Registry with the actual rejection document(s) including explanation; and*
- *have the project validated against VCS program requirements.*

Project proponents roles and responsibilities, including contact information of the project proponent, other project participants:

Any information relevant for the eligibility of the project and quantification of emission reductions or removal enhancements, including legislative, technical, economic, sectoral, social, environmental, geographic, site-specific and temporal information.):

List of commercially sensitive information (if applicable):

Any commercially sensitive information that has been excluded from the public version of the VCS PD that will be displayed on the VCS Project Database shall be listed by the project proponent.

VCS Methodology:

Title and reference of the VCS methodology applied to the project activity and explanation of methodology choices:

Projects shall use one of the VCS program approved project methodologies and provide information relevant to methodology deviations or methodology revisions.

Justification of the choice of the methodology and why it is applicable to the project activity:

Identifying GHG sources, sinks and reservoirs for the baseline scenario and for the project:

Description of how the baseline scenario is identified and description of the identified baseline scenario:

The project proponent shall select the most reasonable baseline scenario for the project. This shall reflect what most likely would have occurred in the absence of the project.

Description of how the emissions of GHG by source in baseline scenario are reduced below those that would have occurred in the absence of the project activity (assessment and demonstration of additionality):

The project proponent shall in the VCS PD, in addition to describing how the project meets the VCS methodology, demonstrate that the project is additional based on one of the tests, the project test, the performance test, and technology test.

Monitoring:

Title and reference of the VCS methodology (which includes the monitoring requirements) applied to the project activity and explanation of methodology choices:

Monitoring, including estimation, modelling, measurement or calculation approaches:

- *Purpose of monitoring*
- *Types of data and information to be reported, including units of measurement*
- *Origin of the data)*
- *Monitoring, including estimation, modelling, measurement or calculation approaches*
- *Monitoring times and periods, considering the needs of intended users*
- *Monitoring roles and responsibilities*
- *Managing data quality*

Data and parameters monitored / Selecting relevant GHG sources, sinks and reservoirs for monitoring or estimating GHG emissions and removals:

Describe each data and parameter using this table.

Data / Parameter:	
Data unit:	
Description:	
Source of data to be used:	
Value of data applied for the purpose of calculating expected emission reductions	
Description of measurement methods and procedures to be applied:	
QA/QC procedures to be applied:	
Any comment:	

Description of the monitoring plan

GHG Emission Reductions:

Explanation of methodological choice:

Quantifying GHG emissions and/or removals for the baseline scenario:

Quantifying GHG emissions and/or removals for the project:

Quantifying GHG emission reductions and removal enhancements for the GHG project:

See ISO 14064-2: 5.2.k for quantifying GHG emission reductions or removal enhancements.

Environmental Impact:

A summary environmental impact assessment when such an assessment is required by applicable legislation or regulation

Stakeholders comments:

Relevant outcomes from stakeholder consultations and mechanisms for on-going communication.

Schedule:

Chronological plan for the date of initiating project activities, date of terminating the project, frequency of monitoring and reporting and the project period, including relevant project activities in each step of the GHG project cycle.

Ownership:

Proof of Title:

Provide evidence of proof of title through one of the following:

- **a legislative right;**
- **a right under local common law;**
- **Ownership of the plant, equipment and/or process generating the reductions/removals;**
- **A contractual arrangement with the owner of the plant, equipment or process that grants all reductions/removals to the proponent**

Projects that reduce GHG emissions from activities that participate in an emissions trading program (if applicable):

Project proponents of projects that reduce GHG emissions from activities that:

- are included in an emissions trading Program; or
- take place in a jurisdiction or sector in which binding limits are established on GHG emissions;

shall provide evidence that the reductions or removals generated by the project have or will not be used in the Program or jurisdiction for the purpose of demonstrating compliance. The evidence could include:

- a letter from the Program operator or designated national authority that emissions allowances (or other GHG credits used in the Program) equivalent to the reductions/removals generated by the project have been cancelled from the Program; or national cap as applicable or;
- purchase and cancellation of GHG allowances equivalent to the reductions/removals generated by the project related to the Program or national cap.