

Climate change:

Guide to the Kyoto Protocol project mechanisms

SECOND EDITION

VOLUME

B



# The Clean Development Mechanism (CDM)



MINISTÈRE DE L'ÉCONOMIE,  
DES FINANCES ET DE L'INDUSTRIE

MISSION INTERMINISTÉRIELLE  
DE L'EFFET DE SERRE

FONDS FRANÇAIS POUR  
L'ENVIRONNEMENT MONDIAL

These documents were produced using the information available at the time of publishing. This information is liable to undergo developments. The authors and the French Administration shall have no liability for any error, omission or change. The content of the documents do not necessarily reflect the views of each of the contributing experts.

To obtain the official documents of the United Nations Framework Convention on Climate Change, the Kyoto Protocol and The Bonn and Marrakesh Agreements, please contact the Climate Change Secretariat:

[secretariat@unfccc.int](mailto:secretariat@unfccc.int)

<http://www.unfccc.int>

Climate change:

Guide to the Kyoto Protocol  
project mechanisms

SECOND EDITION

VOLUME **B**

# The Clean Development Mechanism (CDM)



MINISTÈRE DE L'ÉCONOMIE,  
DES FINANCES ET DE L'INDUSTRIE

MISSION INTERMINISTÉRIELLE  
DE L'EFFET DE SERRE

FONDS FRANÇAIS POUR  
L'ENVIRONNEMENT MONDIAL



# Introduction

To take action against the global phenomenon of climate change, two major agreements have been adopted by the international community: the **United Nations Framework Convention on Climate Change**, adopted in 1992 in Rio, and the Kyoto Protocol adopted in 1997. The latter sets quantified commitments for the limitation or reduction of anthropogenic greenhouse gas (GHG) emissions for 39 industrialized countries and countries in transition to a market economy, for the period 2008-2012. The European Union, as such, is a Party to the Kyoto Protocol.

In order for each country to fulfill its commitments, regional or national policies are progressively implemented. In addition to these national policies and measures, three market mechanisms, known as **flexible mechanisms**, were set up: firstly, international emissions trading, and secondly, two project mechanisms: Joint Implementation (JI) and the Clean Development Mechanism (CDM), which both enable two Parties to reduce or avoid GHG emissions cooperatively.

The purpose of the **Clean Development Mechanism** is to encourage efforts aimed at fighting climate change in two ways: firstly, through the implementation of efficient activities, technologies and techniques emitting less GHGs in southern countries; and, secondly, through the possibility for the entities subjected to GHG emission objectives to make additional emission reductions, at less economic cost. The advantages of Clean Development Mechanism projects are threefold:

- An **environmental advantage**, on both a **local** and **global** level, from the reduction in GHG emissions resulting from the project;
- A **development advantage**, both economic and social, **for the host country**, which benefits from the location of the project and the transfer of technology;
- An **economic advantage** due to the improved financial viability of low GHG emission technologies, which favors their application, and, for entities with GHG emission reduction commitments, the possibility of satisfying these commitments at less cost.

The commitments made by developed countries and their operators as well as countries in transition to a market economy have resulted in the progressive internalization of the “carbon” component of their strategic production choices. This process, with respect to the CDM, is therefore likely to have a significant impact on investment in the developing countries, in such varied sectors as energy, industry, transport, construction, waste disposal, agriculture or forestry.

The CDM is an innovative tool which encourages the transfer of technologies. Its appeal should increase upon consolidation of the international price of carbon. It offers a promising partnership framework, where together investors and host countries can define more sustainable methods of investment.

Further to the first volume (“Guide to The Kyoto Protocol Project Mechanisms – Overview of the project mechanisms”) that introduces the key issues associated with GHG emission reductions, this guide provides practical guidance to the set-up of projects. It is mainly aimed at operators, but may also be used by other players, from both the private and public sector, seeking to improve their management of the operational components of the CDM.

# Table of contents

## Part One

<b>What is the Clean Development Mechanism?</b> .....	9
<b>1. What is the “Clean Development Mechanism”?</b> .....	11
An innovative mechanism invented by the countries of the South .....	11
Project additionality and the advantages for the host country in terms of sustainable development: the two major parameters of the CDM .....	11
Many different sectors are concerned .....	12
<b>2. What are the advantages for the host country and for the investor?</b> .....	13
Participation in the sustainable development of the host country .....	13
Economic benefits for the project developer .....	13
Advantages of a longer-term strategy .....	14
<b>3. Is my project eligible for the CDM?</b> .....	15
What are the environmental eligibility conditions? .....	15
Mandatory approval by the host country .....	15
Other eligibility criteria .....	16
Eligibility test .....	16
<b>4. Does the CDM project under consideration merit further development?</b> .....	19
What direct and indirect benefits can a developer expect from a CDM project? .....	19
What are the specific restrictions, in terms of costs and deadlines, of a CDM project? .....	20
Preliminary screening can quickly determine whether a project merits further development as part of the CDM .....	21
<b>5. Where can I find help?</b> .....	24
Contacts in the host country .....	24
Partnership agreements .....	24

## Part Two

<b>Formalizing CDM projects</b> .....	25
<b>1. What is involved in the preparation of a CDM project?</b> .....	27
What is included in the preparation cycle of a CDM project? .....	27
Who are the main participants in the CDM projects? .....	27
<b>2. What is a PDD and how is it prepared?</b> .....	30
General description of project activity .....	30
Assessment method for additionality .....	31

Duration of the project's activity, accounting period .....	33
Monitoring plan .....	33
Environmental impact .....	34
Comments of local stakeholders .....	34
Fast-tracking procedure for small-scale projects .....	35
<b>3. The three key steps for CDM project approval .....</b>	<b>38</b>
Approval by the host country .....	38
Validation by the Operational Entity .....	38
Registration with the Executive Board .....	40
<b>4. How are certified emission reductions obtained? .....</b>	<b>40</b>
Verification by the Operational Entity .....	40
Obtaining the corresponding emission reduction certificates .....	40

### Part Three

<b>The methodological phase of a CDM project .....</b>	<b>43</b>
<b>1. Building up the baseline .....</b>	<b>45</b>
What is the purpose of the baseline .....	45
What are the rules to be applied in establishing the baseline? .....	46
<b>2. Assessing project additionality .....</b>	<b>50</b>
A tool is already available .....	50
Limitations of the tool .....	51
<b>3. Assessing emission reductions .....</b>	<b>53</b>
Baseline calculation .....	53
Project emission calculation .....	53
Net emission reductions .....	54
<b>4. Setting up a monitoring plan .....</b>	<b>55</b>
What are the criteria for the monitoring plan? .....	55
Content of the monitoring plan .....	55

### Part Four

<b>The contractual and legal phase of the CDM project .....</b>	<b>57</b>
<b>1. Negotiations for credit sharing .....</b>	<b>59</b>

<b>2. Using “carbon credits”</b> .....	59
<b>3. Setting up an emission reduction purchase agreement</b> .....	60
<b>4. Terms of payment: the various options</b> .....	60
Firm purchase .....	60
Call option (Payment on delivery) .....	61
Recourse to the market .....	61
<b>5. Risks and uncertainties surrounding the volume and price of credits</b> .....	61
<b>To conclude</b> .....	63

## Annexes

<b>1. English-French Lexicon</b> .....	66
<b>2. Reference texts</b> .....	68
<b>3. List of Parties included in Annex 1 to the UNFCCC</b> .....	72
<b>4. Least Developed Countries (LDC)</b> .....	73
<b>5. CDM methodologies approved by the Executive Board and their application to date</b> .....	74
<b>6. Examples of CDM methodologies submitted to the Executive Board</b> .....	77
<b>7. Conversion tables</b> .....	81
<b>8. Project Design Document (PDD)</b> .....	82

## Table of Diagrams

Diagram 1	The two phases of the CDM component of an investment project .....	19
Diagram 2	CDM project cycle .....	29
Diagram 3	Baseline and additionality .....	32
Diagram 4	Breakdown of responsibilities .....	41
Diagram 5	Decision tree for the preparation of a project methodology .....	45
Diagram 6	Components of a project methodology .....	45
Diagram 7	Illustration of the three baseline approaches .....	46
Diagram 8	Emissions within a project boundary .....	48
Diagram 9	Emissions within the Tremembé biogas project boundary .....	49
Diagram 10	Stages in demonstrating the additionality of the project .....	51
Diagram 11	Design of the Tremembé biogas project baseline .....	54
Diagram 12	Tremembé biogas project annual emission reductions .....	55

## Tables

Table 1	Estimation of additional costs for a CDM project .....	20
Table 2	Simplified example of costs and revenues associated with CDM projects .....	22
Table 3	Impact of the carbon component on the Internal Rate of Return (IRR) .....	23
Table 4	Classification of small-scale CDM projects .....	36
Table 5	Example of an emission reduction calculation table .....	53
Table 6	Components of the Tremembé biogas project monitoring plan .....	56
Table 7	Comparison of the various terms and conditions of payment .....	61



VOLUME

B



## Part One

**What is  
the Clean  
Development  
Mechanism?**



# What is the Clean Development Mechanism?

## In brief

**T**he Clean Development Mechanism (CDM) is a mechanism defined by the Kyoto Protocol, whereby projects with a component that induces the reduction or sequestration of greenhouse gas (GHG) emissions are implemented. The CDM is the only mechanism in the Kyoto Protocol that involves **non-Annex 1 countries**, by enabling them to host emission reduction projects on their territory. One of the objectives of the CDM is to foster sustainable development in these countries, as part of a **partnership between the host country and the project developer**.

In order to be eligible for the CDM, a project must, in particular, be:

- developed in compliance with the **domestic policies and strategies of the host country**, and in a wider context, its **sustainable development policies**;
- additional, i.e. the **emission reductions** of the project must be **in addition** to those that would have occurred had the project not been implemented.

This means that CDM projects must first and foremost be part of a global approach to climate change issues, while respecting the development strategies adopted by the host countries.

Conversely, for the project developer, the benefits of a CDM project are essentially economic. Firstly, the sale of Certified Emission Reductions (CERs), also known as “**carbon credits**,” represents an **additional source of project income**. Secondly, the CDM may be a solution for the reduction and diversification

of risks, which is likely to interest companies or groups faced with domestic GHG emission reduction objectives, particularly in the immediate term, as part of the European Union Emissions Trading Scheme (EU ETS).

The implementation of CDM projects may also be part of the company’s wider-reaching strategy in the host country and abroad, by enhancing both its global competitiveness and image.

On the downside, the development of a CDM project generates **additional costs for the project developer**, also known as “transaction costs.” These costs are related to the formalization and validation of the CDM project, as well as the monitoring and verification of the emission reductions. They can vary significantly from one sector to another, but are generally not dependent on the size of the project in terms of emission reduction volumes. Therefore, projects with significant emission reductions are generally favored. However, the transaction costs, often significant for the first CDM project due to the training necessary, are generally reduced considerably for the development of subsequent projects. Furthermore, this necessary training is part of the company’s effort to **progressively master the “carbon constraint,”** at its own scale.

Accordingly, a quick preliminary screening of the **eligibility** and **profitability** of the CDM component of the investment project is a crucial step before adopting a more in-depth approach.

## 1. What is the “Clean Development Mechanism”?

The Clean Development Mechanism (CDM) is a mechanism defined by the Kyoto Protocol, based on projects aiming to reduce or sequester greenhouse gas emissions.

### › AN INNOVATIVE MECHANISM INVENTED BY THE COUNTRIES OF THE SOUTH

The CDM meets the demand of a number of countries of the South looking to use this new mechanism to gain easier access to financing for GHG emission reduction projects. This position was particularly defended by Brazil, the host country of the Rio Summit in 1992.

The CDM was then defined by the Kyoto Protocol, and its rules and conditions were made more specific in the Marrakesh Accords in November 2001. The CDM supervisory body, the Executive Board (EB), has been operational since that time, meaning that some CDM projects can already be undertaken and registered. The valuation of associated “carbon credits” will become possible in the very near future, with the now imminent ratification of the Kyoto Protocol by the Russian Federation, which will authorise its entry into force in early 2005.

The CDM is the only mechanism in the Kyoto Protocol that involves southern countries,<sup>1</sup> by enabling them to host emission reduction projects on their territory.

### › PROJECT ADDITIONALITY AND ADVANTAGES FOR THE HOST COUNTRY IN TERMS OF SUSTAINABLE DEVELOPMENT: THE TWO MAJOR PARAMETERS OF THE CDM

CDM projects must be implemented in countries not included in Annex 1 and only as part of a partnership with an Annex 1 country.<sup>2</sup> Indeed, the countries not included in Annex 1 do not have any emission reduction obligations, which is a crucial point.

<sup>1</sup> More specifically countries known as “Parties not included in Annex 1,” which were not cited in Annex 1 of the United Nations Framework Convention on Climate Change (UNFCCC).

<sup>2</sup> Certain southern countries, however, defend the idea of “unilateral projects” that only involve entities from countries not included in Annex 1.

The purpose of the CDM is to encourage efforts to act against climate change in two ways:

- Firstly, through the implementation of efficient activities, technologies and techniques emitting less GHGs in the countries not included in Annex 1, thereby contributing to their sustainable development. The host country is responsible for the definition of priority sustainable development issues and the way the CDM projects can contribute.
- Secondly, through the possibility for the Annex 1 countries to reduce GHG emissions beyond their borders. The CDM projects can, under certain conditions, generate emission reduction credits, allocated partially or in full to Annex 1 operators.

Although both public and private entities are eligible to develop CDM projects, the CDM is mainly intended for the private sector. Participation in the CDM is voluntary and CDM investments must comply with market regulations, just like conventional projects.

The procedures and rules governing the implementation of the CDM were established by the Kyoto Protocol and specified in the Marrakech Agreements. Since then, the CDM Executive Board has facilitated the preparation of CDM projects by validating a wide range of methodologies applying to the different economic sectors and by defining standard formats for project applications.

#### Additionality

A number of main criteria must be met for a project to be approved as a CDM project. The most important criterion is undoubtedly that of additionality: the project must result in a reduction of emissions that would not have occurred in the project's absence, i.e. a comparison with a “Business as Usual” scenario. The following is necessary to demonstrate additionality:

- An evaluation of the political, legal, economic and financial context in which the project is to be undertaken. This means demonstrating either that the project is not, when compared to alternative projects, the most attractive in financial or economic terms, or that there are significant obstacles to its implementation, and that the CDM is capable either of increasing its attractiveness or of overcoming these obstacles.
- A mainly quantitative analysis of the difference between GHG emissions in a normal situation with no GHG emission reduction efforts and the project's GHG emissions. A project is additional, in terms of emission reductions, if it produces measurable, verifiable and sustainable GHG emission reductions.



**It must be stressed that demonstrating additionality is a major step in the development of the CDM project.**

For more information on this subject, please refer to the chapter “The methodological phase of the CDM project.”

### » MANY DIFFERENT SECTORS ARE CONCERNED

The Kyoto Protocol does not explicitly indicate the project categories that are eligible for the CDM. However, under the Marrakech Agreements, land use, land use change and forestry projects (other than afforestation<sup>3</sup> and reforestation<sup>4</sup>) are not eligible during the first period of commitment (2008-2012). Rules of CDM eligibility for afforestation and reforestation projects were specified by the 9th Conference of Parties (COP9) held in Milan in December 2003.

Some examples of project categories potentially eligible for the CDM are given below:

#### » Energy sector

- Substitution of high carbon-content fuels (such as coal and oil) with lower carbon-content fuels (natural gas or renewable energies), with restrictions regarding nuclear energy. Fuel switching also includes the replacement of energy-producing equipment. Fuel switching projects include the improvement of existent technology, or the set-up of new facilities;
- Cogeneration: combined generation of electricity and heat, producing a very high energy yield;
- Capture and recovery of methane leakage<sup>5</sup> from transport or flaring in the oil or gas industry.

#### » Waste management sector

- Capture of biogases produced by municipal waste stored in controlled landfill sites (capture and combustion with or without energy recovery from the methane produced);
- Capture and recycling of biogas from sewage treatment.

#### » Industrial sector

- Any changes in industrial processes resulting in a reduction in GHG emissions, e.g. conversion in a cement works from a wet process kiln to a dry process kiln; incorporation of ash and blast furnace slag in the clinker; use of energy efficient ovens for glass production; capture of nitrous oxide<sup>6</sup> generated by the production of fertilizer;

- Capture and use of methane produced by industrial waste water treatment equipment;
- Improved energy efficiency in industrial projects.

#### » Housing and Tertiary sectors

- Improved energy efficiency in residential or tertiary buildings (offices, shopping malls, etc.).

#### » Transport sector

- Improved energy efficiency of vehicles;
- Vehicle fuel substitution, e.g. substitution of gasoline or diesel with liquefied petroleum gas (LPG) or natural gas for vehicles (NGV);
- Substitution of high energy consumption means of transport with low GHG emission means of transport, e.g. replacement of individual means of transport (cars) by buses or trains.

#### » Agriculture sector

- Improved energy efficiency or use of low GHG emission energy sources to drive irrigation pumps;
- Reduced methane emissions produced by rice crops;
- Reduced animal waste or capture and use of methane generated by animal waste.

#### » Forestry sector

- Afforestation;
- Reforestation;
- Increased use of timber in construction, to replace other materials that produce GHGs during manufacture;
- Use of fuel wood (woodchip, carpentry or felling waste, etc.), to replace fossil fuels.

This is not a full list, and any project that satisfies the eligibility criteria may be developed under the CDM. Annex 6 gives a good idea of the variety of sectors concerned in CDM projects already submitted to the CDM Executive Board.

<sup>3</sup> Afforestation consists of planting trees in areas that have not had forests in the last 50 years.

<sup>4</sup> Reforestation consists of planting trees in sectors that have not had forests since 12/31/89.

<sup>5</sup> The Global Warming Potential (GWP) of methane is 21, meaning that the emission of one ton of methane is equivalent to twenty-one tons of CO<sub>2</sub>. Methane capture and combustion projects are therefore of great interest in terms of action against climate change.

<sup>6</sup> Certain GHGs such as N<sub>2</sub>O, SF<sub>6</sub> and halocarbons have a high Global Warming Potential, meaning that the capture of these GHGs, even at low tonnage volumes, may generate significant reduction emissions.

## 2. What are the advantages for the host country and for the investor?

The appeal of the CDM lies in the fact that it combines an incentive mechanism, particularly for operators in Annex 1 countries who have committed to emission reductions under the Kyoto Protocol, and an advantage for host countries which can promote environmentally friendly development projects. This section provides a brief overview of the advantages for a project developer or host country of becoming involved in a CDM project.

### > PARTICIPATION IN THE SUSTAINABLE DEVELOPMENT OF THE HOST COUNTRY

**The prime objective of the CDM is to contribute to the sustainable development objectives of the non-Annex 1 countries.**

Taking into account the fact that the investments provided for in the CDM will be made in developing countries and that they will generally be financed by countries ("Parties," or authorized legal entities, within the meaning of the Protocol) subject to the Protocol. This innovative mechanism can be considered as a new source of funding for projects.

The role of the CDM is to favor projects that can:

- **Contribute positively to the local environment** (waste, urban pollution, etc.);
- **Contribute positively to the economy in parallel**, and generate positive social impacts (access to decentralized energy, forestry development, etc.);
- **Encourage Foreign Direct Investment (FDI)** in new low emission technologies and technology transfers: energy efficiency, industrial processes, sustainable forestry, land restoration, etc.;
- Provide an additional financial contribution to **render a project financially viable** by lowering the cost of its implementation and operation.

Accordingly, the appeal of this new mechanism for host countries is that it can set up structures, in an increasing number of developing countries, for the promotion, accompaniment and validation of these projects. This new dynamic will largely depend on trends in the price of carbon.

### > ECONOMIC BENEFITS FOR THE PROJECT DEVELOPER

For businesses, a CDM project offers two advantages:

**An additional source of income for the project from the generation and sale of Certified Emission Reductions (CERs), more generally referred to as "carbon credits."**

For example, an electricity supply project may generate income from the sale of "carbon credits" as well as from the sale of electricity. These "carbon credit" sales are of particular interest to companies with no objectives to meet under the EU ETS, or which are net sellers. They can offer their "carbon credits" for sale to entities or countries that have made commitments to reduce their emissions, in which case the latter become net buyers.

#### Advantages are often substantial

For certain renewable energy projects, and even with a highly conservative CO<sub>2</sub> price (€ 3/metric ton of CO<sub>2</sub> equivalent), income from the sale of CERs can represent 5 to 15% of the project investment costs. For methane emission reduction projects, the income from the sale of "carbon credits" to a third party may represent up to 70% of the additional investment costs to recover the methane.

**An option to reduce and diversify risks is likely to interest companies with domestic GHG emission reduction objectives under the EU ETS.**

For a company with emission volume restrictions, one of the options available to facilitate commitment compliance is the acquisition of additional "carbon credits," either by buying them from a third party, or by generating them directly *via* a CDM project. French companies or groups with activities or subsidiaries in countries not included in Annex 1 are therefore in a good position to assess emission reduction opportunities.

Another advantage is the positive impact of an anticipated Emission Reduction Purchase Agreement on the completion of a project's financing plan, due to the resulting additional revenues.

**Who purchases “carbon credits” today?**

At present, the main buyers<sup>a</sup> of “carbon credits” are private enterprises, especially Japanese, and public bodies such as:

- The “Prototype Carbon Fund,” a “state/private” fund set up by the World Bank, involving around thirty companies and governments;
- Annex 1 country governments, such as the Dutch, Austrian and Danish governments.

In the short-to-medium term, it can be expected that entities involved in the European Union Emissions Trading Scheme will account for the majority of market demand for CDM credits.

<sup>a</sup> See Volume A.

The main objectives of current carbon market players are:

- **To anticipate the risk of not respecting commitments**, which could result in severe penalties particularly at the European Union level. Current penalties amount to € 40/metric ton of CO<sub>2</sub> equivalent until December 31, 2007, and € 100/metric ton of CO<sub>2</sub> equivalent as from January 1, 2008;<sup>7</sup>
- **To anticipate the market price:** current CER market prices are very low in comparison to prices resulting from several simulations.

› **ADVANTAGES OF A LONGER-TERM STRATEGY**

The CDM is also likely to provide further benefits for project developers, particularly in terms of image and social and environmental responsibility.

In certain cases, these commercial benefits will be the main motivation for project developers. Using the CDM may, for example:

- **Enable projects of better quality to be proposed, involving more advanced environmentally friendly technologies** and/or less costly technologies if emission reductions can be recovered on the market, thereby generating a reduction in the price of goods and services<sup>8</sup> and enhancing the competitive positioning of the operator;
- **Conversely, avoid marginalization of the supply-side offer.** If the price of carbon was to increase substantially, not incorporating this revenue could gradually become a factor for disqualification in certain sectors; e.g., in the waste treatment sector, the valuation of emission reductions may generate

a significant difference in the rate of return on the project investment. Accordingly, the current familiarization and training phase would appear essential. Indeed, committing to the development of Kyoto projects today, at a relatively early stage in their operational implementation, will secure a competitive edge tomorrow;

- **Facilitate penetration of new GHG emission reducing technologies.** As this is the only mechanism enabling the financial valuation of emission reductions in non-Annex 1 countries, the CDM may facilitate the expansion and development of markets for these new technologies. Accelerated amortization of the development programs for these resulting new technologies will enhance their international competitiveness;
- **Image enhancement, at the local level, of the company developing the project**, whether with respect to the host country, its clients or the populations concerned. This aspect may strengthen and facilitate the communication process and therefore the acceptability of certain complex projects such as mass urban transport projects (tramway, subway) or urban heating projects (installation of individual meters, etc.);
- **Materialization of the company’s environmental and social responsibility policies**, using CDM projects that contribute to both sustainable development of the host country and protection of the global environment.

The CDM may therefore be used as an additional instrument to enhance the competitiveness of the company. It is precisely the instrument’s incentive nature that is of interest to many companies with respect to both innovation and the transfer of technology to developing countries, which, ultimately, are the main beneficiaries of these mechanisms.

<sup>7</sup> Furthermore, these penalties will not relieve the non-compliant entity of its obligations to cover its remaining emissions with allowances.

<sup>8</sup> Particularly when bidding for tenders.

### 3. Is my project eligible for the CDM?

This section provides a guide to help project developers assess the acceptability of projects proposed under the CDM, by performing a preliminary screening of their project, to determine whether the project is likely to be registered as a CDM project by the CDM Executive Board.

The Marrakesh Accords define a certain number of eligibility criteria. Compliance with these criteria, set forth below and developed in more detail throughout the document, shall be established by the project developer prior to the completion of the Project Design Document<sup>9</sup> (PDD), which is the key document of the international validation process carried out by the CDM Executive Board.

The Marrakesh criteria are broken down between the environmental aspects of the project, host country approval and other criteria.

#### › WHAT ARE THE ENVIRONMENTAL ELIGIBILITY CONDITIONS?

**The project's emission reductions must first of all be additional to the reductions that would have been achieved without the project.**

The CDM is not intended as an accompaniment for projects that would have been implemented in any case. Additionality is therefore the fundamental concept, and will be analysed in detail in Part Three on "Methodological aspects of CDM projects."

There are six eligible GHGs: carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), hydrofluorocarbon (HFC), perfluorocarbon (PFC) and sulphur hexafluoride (SF<sub>6</sub>). A project can only be eligible if emissions of one or more of these GHGs are reduced.

**The project should have no significant harmful impacts on the environment.**

If significant impacts are expected, an Environmental Impact Study (EIS) will normally be required. The project developer should study host country regulations to determine whether an EIS is necessary.

<sup>9</sup> The Project Design Document is given in Annex 7.

#### The "baseline" concept

An example of potential additionality would be a project for recovering and burning biogas from a landfill to supply energy. Let us suppose that the situation in the host country satisfies the following criteria:

- Marginal nature of this type of project in the host country;
- No standard or national legislation imposing the capture and burning of biogas;

Without the CDM, the most likely scenario would have been continued release of biogas into the atmosphere. This scenario is known as the "baseline."

The emissions concerned in the project are those arising from the conversion of methane into CO<sub>2</sub> by combustion as a flare. The difference between methane emissions (measured in CO<sub>2</sub> equivalents) outside the CDM project and the CO<sub>2</sub> emissions associated with it corresponds to the reduction in atmospheric emissions that is described as additional.

Let us now suppose that the recovery of biogas for energy purposes is mandatory under the regulations. The baseline would then be the use of the methane to produce energy, and the emission reductions would no longer be additional.

#### › MANDATORY APPROVAL BY THE HOST COUNTRY

It is the responsibility of the host country government to accept or refuse the project proposed under the CDM. The host country must in particular:

- Provide an opinion on the contribution of the project to the sustainable development of the country;
- Determine whether the project is acceptable to the host country as a CDM project.

**To qualify as a CDM project, the project must be developed in compliance with the domestic policies and strategies of the host country.**

The project must be acceptable to the host country, and meet the country's own CDM requirements. Accordingly, certain host country governments have drawn up "positive" project lists, i.e. lists of projects that they wish to encourage. Therefore, certain projects may not be acceptable to certain host countries.

The project must contribute to the sustainable development objectives of the host country, and a CDM project must obtain the formal approval of the host country. Several governments have drawn up lists of sustainable development criteria.

As far as possible, the project must generate transfers of technology and know-how.

For more information on these criteria, please refer to the chapter on “CDM project documentation.”

**In order for a project to be approved and registered as a CDM project, the host country must set up a specific institutional framework.**

The following requirements must have been satisfied by the host country:

- Ratification of the UNFCCC;<sup>10</sup>
- Ratification of the Kyoto Protocol; however, a project developer can still decide to develop a CDM project, if having not already done so, the host country indicates that it is set to ratify the Kyoto Protocol in the short term;
- Designation of a focal point, i.e. a correspondent, who, on behalf of the country, is designated to participate in international negotiations on the implementation of the UNFCCC and the Kyoto Protocol;
- Establishment of a Designated National Authority (DNA) for the CDM.

The majority of non-Annex 1 countries have ratified the Kyoto Protocol. However, this does not imply that all these countries have set up the institutions, guidelines and procedures required to approve a CDM project, which needs both personnel and expertise. This will take place gradually as requests for CDM projects grow in number. As an example, over 50 non-Annex 1 countries had already designated a DNA by November 2004.

<sup>10</sup> Most countries have ratified the UNFCCC.

### The role of the Designated National Authority (DNA)

The DNA is responsible for overseeing the approval procedure in the host country, for approving or rejecting CDM projects, for ensuring that the different projects meet the country's sustainable development objectives and for publicising rejected project categories, so that project developers can focus on sectors that are open to investments under the CDM.

The list of DNAs is available at: <http://cdm.unfccc.int/DNA>.

## OTHER ELIGIBILITY CRITERIA

- The project must not result in the diversion of Official Development Assistance (ODA). Indeed, the Marrakesh Accords state that “public funding for clean development mechanism projects from Parties included in Annex 1 is not to result in the diversion of official development assistance and is to be separate from and not counted towards the financial obligations of Parties included in Annex 1.” We stress that the interpretation of this highly complex text and its implementation is still subject to discussion, particularly within the Development Assistance Committee (DAC) of the OECD;
- It should be noted that the CDM is already operational and that certain projects which have been running as from 2000 are potentially eligible for the CDM. This could be the case for certain projects developed as part of Activities Implemented Jointly (AIJ).

## ELIGIBILITY TEST

**The eligibility test detailed below is designed for developers to make a rapid assessment of their project's eligibility for the CDM. Given that CDM rules are by no means stable as yet, a conservative and cautious approach is recommended.**

By way of example, two potential projects are tested below for eligibility.

**In the remaining pages of this guide, we will be using, amongst others, a recurrent example based on a real project: recovery of biogas from a controlled solid-waste landfill in Brazil, which we refer to as the “Tremembé project.”**

### Is my project likely to be eligible for the CDM?

#### 1 Does the host country meet the following conditions?

- It has ratified the Kyoto Protocol;<sup>a</sup>
- It has designated a National Authority (focal point) for the UNFCCC;
- It has expressed its desire to support CDM projects;
- It has set up or is currently setting up a CDM bureau (Designated National Authority).<sup>b</sup>

#### 2 Is the project a GHG emission reduction or sequestration project? By way of example, typical CDM projects are developed in the following sectors:

- Energy;
- Waste;
- Changes in industrial processes;
- Transport;
- Agriculture;
- Forestry, afforestation or reforestation (current stage of international negotiations).

#### 3 Does the project comply with the sustainable development policy of the host country?

#### 4 Does the technology used satisfy the following conditions?

- Established and commercially usable technology;
- Technology which may be reproduced and effectively transferred with respect to the host country.

#### 5 Is the project “additional”? Does it generate additional GHG emission reductions which are verifiable and certifiable with respect to the normal situation without the project (“Business as Usual”)?

For example, a renewable energy source (with zero or very low GHG emissions) which would replace fossil energy and generate additional emission reductions that would have not occurred without the project.

It is advised that a preliminary and purely technical estimate be made of the emission reductions that may arise from the project. For a preliminary estimate, the GHG emission factors presented in Annex 6 may be consulted.

#### 6 Does the project have unacceptable negative impacts on the environment? For significant impacts on the environment, a specific impact study must be performed in accordance with the standards and procedures of the host country.

#### 7 If the project is financed by public funds, it must be demonstrated that these funds do not result in the diversion of Official Development Assistance (ODA) of the Annex 1 countries. In this case, a letter of confirmation must be obtained from the institutional backer concerned, certifying the non-diversion of the ODA.

<sup>a</sup> If the host country has not ratified the Kyoto Protocol, the project may still be developed in anticipation of future ratification. See section “Approval by the host country” for further information.

<sup>b</sup> As the focal point involved in the UNFCCC negotiations, the DNA has a very specific role in the monitoring and approval of CDM projects.

### Is my project likely to be eligible for the CDM?

#### Example 1: A small-scale hydroelectricity project in Latin America

A French company seeks to invest in small hydroelectric power stations in a Latin American country; accordingly, it wishes to build and commission a small 12 MW hydroelectric power station to be connected to the host country's national power grid. This renewable energy project, with a maximum capacity of less than 15 MW, can benefit from a simplified CDM procedure for “small-scale” project.

The baseline adopted corresponds to the power utility's lowest cost national electricity expansion program. In the local context, this small hydroelectric project, despite its innovative nature, would not have been approved because of its relatively high cost per KW.

#### 1. What is the position of the host country with respect to the CDM?

The project developer sees from the webpage <http://unfccc.int/resource/kpstats.pdf> that the host country signed the Kyoto Protocol and ratified it in 2002. The National Commission on Climate Change, within the Ministry of the Environment, is responsible for the implementation of the UNFCCC and the Kyoto Protocol. The Ministry of the Environment is the focal point for the UNFCCC, and has a Designated National Authority.

At present, one CDM project has already been approved by the host country. The government has signed a letter of approval for this project, thereby demonstrating its willingness to support CDM projects.

#### 2. Can the project be included in the category of projects to be developed under the CDM?

Yes, the project is a renewable energy source (small-scale hydroelectricity).

#### 3. Does the project comply with the host country's sustainable development policy?

The scheduled CDM project does comply with the domestic policies implemented with respect to the energy and

environmental policies of the host country. This point is subject to written confirmation by the host country authorities.

#### 4. Does the technology adopted meet all of the required conditions?

Yes, hydroelectricity is a proven technology, which is established and used for commercial purposes; it can be reproduced and effectively transferred to the host country.

#### 5. Is the project “additional”? Does it generate additional, verifiable and certifiable, GHG emission reductions in comparison to the situation had the project not been implemented?

The hydroelectric project is to be connected to the network, and will therefore “replace” electricity with a higher carbon content. According to the GHG Protocol energy statistics (<http://www.ghgprotocol.org>), the average emission factor per electrical unit for the host country was approximately 0.4 metric ton CO<sub>2</sub> equivalent / MWh in 2000. The project developer estimates that the project will generate approximately 50,000 MWh per year, and that the GHG emissions attributable to the project are negligible. A preliminary estimate would therefore value the effective GHG emission reduction at 20,000 metric tons of CO<sub>2</sub> equivalent per year, an additional reduction in the sense that it would not have occurred in the project's absence.

#### 6. Does the project generate unacceptable negative impacts on the environment?

The project developer does not expect any significant impact on the environment. However, an environmental impact study is obligatory in accordance with local legislation.

#### 7. Is the project financed using public funds?

The developer will not use public funds to finance the project.

### Is my project likely to be eligible for the CDM?

#### Example 2: A biogas collection and recovery project on a controlled landfill site

A French company wants to set up a project for the collection of landfill biogas and the recovery of the energy produced on one of its sites in Brazil.<sup>a</sup>

The baseline adopted corresponds to the current local regulations that require the installation of passive biogas wells in order to limit the risks of explosion but do not impose treatment of the biogas.

The project has two phases. During the first phase, a degassing and sink network must be set up with extraction pumps and the biogas recovered must be used to:

- Evaporate and incinerate the leachates on site;
- Generate electricity to power the site.

The second phase may require a feasibility study. It will consist of connecting the on-site electric generators to the local power grid.

#### 1. What is the position of the host country with respect to the CDM?

The project developer sees from the site <http://unfccc.int/resource/kpstats.pdf> that Brazil signed the Kyoto Protocol and ratified it in August 2002. Furthermore, Brazil was the host country of the UNFCCC in 1992, and was one of the pioneer countries behind the CDM.

#### 2. Can the project be included in the category of projects to be developed under the CDM?

Yes, it is a project for the reduction of methane emissions from waste.

#### 3. Does the project comply with the host country's sustainable development policy?

One of the objectives of the Brazilian Agenda 21 is to “further the use of the UNFCCC and Kyoto Protocol, and above all the Clean Development Mechanism, in order for micro, small and medium-sized enterprises to benefit from the resources provided by GHG emission reduction and carbon sequestration projects.”

#### 4. Does the technology adopted meet all of the required conditions?

Yes, the technology to be implemented by the developer to recover the biogas is an approved and established technology that can be reproduced and transferred to the host country. It consists of setting up a degassing and sink network, as well as extraction pumps and flare stacks. The biogas recovered will also be used onsite to evaporate and incinerate leachates and generate electricity.

#### 5. Is the project “additional”? Does it generate additional, verifiable and certifiable, GHG emission reductions in comparison to the situation had the project not been implemented?

Yes. Brazilian regulations do not impose burning of biogas. The GHG emission reductions result from the conversion of methane into CO<sub>2</sub> by combustion. These reductions would not have occurred without the project.

Over 10 years, 35,000 tons of methane should be recovered. As the GWP of methane is 21, the planned emission reductions will be approximately 700,000 metric tons of CO<sub>2</sub> equivalent over the period.

#### 6. Does the project generate unacceptable negative impacts on the environment?

Based on his experience, the project developer considers that the environmental impacts of the project are low. Furthermore, under Brazilian law, an environmental impact study is not mandatory for biogas energy recovery projects of less than 10 MW.

#### 7. Is the project financed using public funds?

The developer will not use public funds to finance the project.

<sup>a</sup> Source: Onyx, Veolia Environment group, biogas recovery project on a controlled landfill site in Brazil.

If the answers to the questions above are positive, the project is likely to be eligible, and the project developer can assess prospects for developing the project under the CDM.

The project developer should then consider if the potential emission reduction volumes of the project justify the transaction costs,<sup>11</sup> before developing full project documentation.

<sup>11</sup> The additional costs of developing the project under of JI or the CDM are known as “transaction costs.” These costs are related to the documentation and validation of the CDM project, and the monitoring and verification of emission reductions.

## 4. Does the CDM project under consideration merit further development?

### › WHAT DIRECT AND INDIRECT BENEFITS CAN A DEVELOPER EXPECT FROM A CDM PROJECT?

#### ›› Generation of “carbon credits”

An analysis of transactions concluded from January to May 2004<sup>12</sup> shows that prices ranged from € 2.50 to € 5.50 per teqCO<sub>2</sub> for carbon credits arising from CDM or JI projects. Price variations within this range were largely a function of the degree of risk borne by the buyer (see Part Four for details on these aspects). For purposes of comparison, the penalties stipulated by the EU Directive on trade in emission quotas amount to € 40 per teqCO<sub>2</sub> before 2008 and € 100 thereafter (NB: these penalties do not release the non-compliant entity from its obligation to cover its surplus emissions with emission quotas). It should be remembered that the carbon market is still in its infancy and that CO<sub>2</sub> prices are likely to change considerably in the future.

A project developer can secure “carbon income” through an Emission Reduction Purchase Agreement. The purchase agreement must, in particular, specify the quantity of CERs produced per year, the price per CER, and the term or crediting period over which the CERs will be generated.

#### Accounting period

Under the terms of the Marrakesh Accords, the project developer can choose between a period of 10 years without renewal and a period of 7 years that may be renewed twice, i.e. a maximum of 21 years. This decision is made on a per-case basis and depends, in particular, on the expected performance of the project, its lifetime, the supporting financial structure and changes in the baseline.

In all cases, (whether there is a credit purchase agreement or own use of the credits generated), the project developer shall define the crediting period in the PDD. This choice is described in more detail in the chapter on “CDM project documentation.”

In any case (whether the credits generated are traded or reserved for own use), the project developer must define the accounting period in the PDD. Options are described in more detail in Part Two on “Formalising CDM projects.”

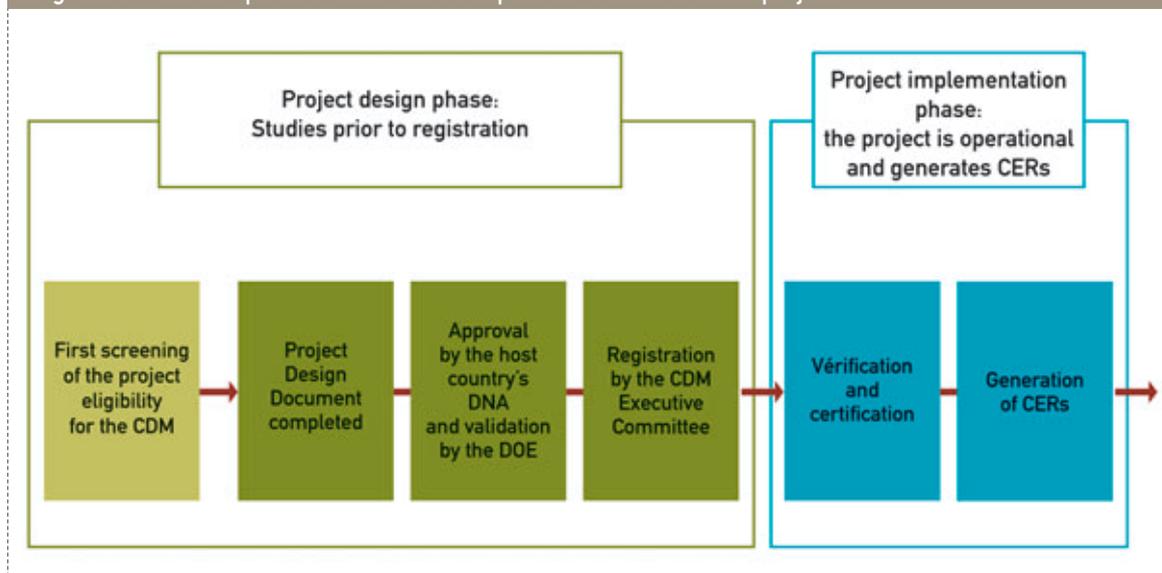
It is always in the interest of all Parties, primarily project developers, that the price of “carbon credits” remain above a certain level so as not to jeopardize the financial viability of projects that are marginal to the main investment cash flows.

#### ›› Additional benefits

The potential gains in terms of company image are significant, although more difficult to quantify.

<sup>12</sup> Franck Lecocq (World Bank), 2004, *State and Trends of the Carbon Market 2004*.

Diagram 1 – The two phases of the CDM component of an investment project



A company may use its CDM projects for different purposes:

- To reduce its GHG emissions and protection of the global environment;
- To transfer GHG emission reducing technology to the developing countries hosting the projects, and contribute to their sustainable development.

The framework of the CDM project may also support local communication in the host country with respect to the authorities, local communities and public opinion for certain more complex projects (collective transport, sanitation, energy efficiency in the home, etc.).

As these projects attract more media coverage, they will of course also be more closely scrutinized by the public. Certain types of project are also the subject of active NGO debates on these topics. It is advised that their point of view be known in advance.

### › WHAT ARE THE SPECIFIC RESTRICTIONS, IN TERMS OF COSTS AND DEADLINES, OF A CDM PROJECT?

#### » Transaction costs

For a project developer, it is important to have an idea of the additional costs associated with the project's development under the CDM, known as "transaction costs." These costs are related to the documentation and validation of the CDM project, and the monitoring and verification of emission

reductions. Certain transaction costs, such as project documentation costs, are entry costs. Other costs such as verification costs, are deferred until the project is running and has begun to generate income.

Table 1 presents indicative transaction costs for the CDM, according to the experience of the Prototype Carbon Fund of the World Bank, the Dutch CERUPT program and two documents on transaction costs for JI and CDM projects.<sup>13/14</sup>

**Transaction costs generally do not depend on the size of the project in terms of emission reduction volumes, but may vary significantly according to sector. Large projects in terms of emission reduction volumes are therefore favored, but simplified procedures have been set up for "small-scale" projects (see section "The PDD for small-scale projects").**

Furthermore, costs are particularly high for the first CDM project because of the training required. Subsequent costs directly linked to the development of a CDM project will be significantly lower for similar projects, particularly if the first project was developed internally. Finally, it must be noted that the know-how developed for a CDM project

<sup>13</sup> *EcoSecurities, 2000, Financing and financing mechanisms for joint implementation (JI) projects in the electricity sector.*

<sup>14</sup> *OECD, 2001, Fast-tracking Small CDM Projects: Implications for the electricity sector.*

Table 1 – Estimation of additional costs for a CDM project

Conventional project phases	Additional steps for a CDM project	Additional costs
<b>Project preparation phase</b>		
CDM feasibility study	Project documentation: baseline, monitoring plan, information research to draft the PDD	From € 5,000 to € 40,000
Project preparation	Completion of the PDD; application for host country approval	From € 20,000 to € 60,000
Project approval	Validation by the Operational Entity	From € 15,000 to € 40,000
Negotiation of a purchase agreement or equivalent (optional)	Development of a CER sales agreement	The budget may range from € 10,000 to € 40,000
Registration	Cost of registration with the CDM Executive Board	From € 5,000 to € 30,000
<b>Total</b>		<b>From € 45,000 to € 170,000 (excluding purchase agreement negotiation costs)</b>
<b>Project operational phase</b>		
Production / operations, maintenance, management	Monitoring and verification	From € 3,000 to € 15,000 per year or every two years
	Sale of CERs (optional)	If brokers are used, success fee between 3 and 15% of the value of the CERs
Registration	"Share of Proceeds": registration with Executive Board	Percentage of the CERs or their value to be determined
Contribution	Adaptation funds	2% of the CERs
<b>Total</b>		<b>Will depend on the lifetime of the project</b>

facilitates the training necessary to manage the “carbon constraint” which the company will gradually need to address, particularly with respect to the European Union Emissions Trading Scheme.

#### » Breakdown of the registration costs

In accordance with the Marrakesh Accords, the CDM Executive Board stipulates the funding of its operating expenses as part of the project registration procedures. While remaining subject to approval, registration fees should vary according to project size.<sup>15</sup>

Furthermore, 2% of the CERs generated will be deducted by the Executive Board in respect of adaptation for the Least Developed Countries (LDCs). This payment shall be used to finance programs to help the LDCs adapt to the impacts of climate changes. CDM projects implemented in the LDCs will naturally be exempt from this payment. More generally, small-scale CDM projects should also be exempt from these costs, but the decision is yet to be made by the Conference of the Parties.

#### » Completion times may be slightly longer

The development of a project under the CDM also implies additional deadlines which are either mandatory or induced by the time spent on developing the new carbon component.

**It is important to note that most of these additional steps occur prior to the project’s implementation. Consequently, effective management ensures the simultaneous development of the project and its “carbon” component.**

The mandatory deadlines prior to implementation of the project are:

- A 30-day period during which time the PDD is made available for public comment by the Operational Entity; then
- An 8-week period at the end of which, the Executive Board, if it has no reservations, will register the project as a CDM project.

Furthermore, once the emission reductions have been certified by an Operational Entity, the Execu-

tive Board has a stipulated period of 15 days to issue the CERs.

These additional mandatory deadlines are generally considered reasonable with respect to the usual project development period. In particular, the project developer must also schedule additional time and budget resources to develop the project’s carbon component, especially if the development of CDM projects under the Kyoto Protocol is a new experience.

#### » PRELIMINARY SCREENING CAN QUICKLY DETERMINE WHETHER A PROJECT MERITS FURTHER DEVELOPMENT AS PART OF THE CDM

A project developer will have to calculate the development costs of a CDM project and the potential income (“carbon” income and additional benefits) of the project to determine whether it merits development as part of the CDM.

**Based on a prudent estimate of approximately € 3 per metric ton of CO<sub>2</sub> equivalent, it can be estimated that:**

- A project is “of interest” if it produces emission reductions of more than 50,000 metric tons of CO<sub>2</sub> equivalent per year;
- For projects generating between 30,000 and 50,000 metric tons of CO<sub>2</sub> equivalent per year in emission reductions, the project may be considered “of interest” but a more in-depth study may be necessary before proceeding further;
- For projects generating less than 30,000 metric tons of CO<sub>2</sub> equivalent in emission reductions per year, there is a strong probability that the preparation costs of the CDM project will be too high with respect to the expected “carbon” income. In this case, the project may well be eligible for fast-tracking under the “small-scale projects” procedure.<sup>16</sup>

It should be noted that this clearly simplistic classification is merely indicative. Projects must obviously be assessed on a per-case basis.<sup>17</sup> Furthermore, if the prices of the CERs were to increase, as suggested by several studies, the viability threshold would be lower.

Table 2 demonstrates the importance of preliminary screening in the decision-making process for the

<sup>15</sup> The registration fees should be replaced, as from 2005, by a “deduction” (“share of proceeds”) from the CERs generated by the project. Projects that will have already paid registration fees will not be exempt from this deduction; however, the registration fees already paid will be deducted. It must be noted that these costs will only be paid if the project is registered; accordingly, they should be considered more as a “success fee.”

<sup>16</sup> For more information on this procedure, see section «The PDD for small-scale projects.»

<sup>17</sup> Several similar projects may, for example, be combined (“bundling”), which reduces the unit transaction costs.

launch of a project's CDM component, by comparing the investments, costs and revenues associated with three relatively different CDM projects. The data is only given for indicative purposes. In practice, this data may vary significantly according to the market value of the CERs generated, the nature of the project, the host country, the developer's internal resources and the CER accounting period (one period of 10 years, or 3 periods of 7 years with revision of the baseline in years 7 and 14).

The table has three limitations: (i) for simplification purposes, costs and revenues have not been updated over the lifetime of the project; (ii) the table assumes that the investor benefits fully from all CERs generated. In reality, the host country

may wish to share this income, especially if it also incurs significant expenses to prepare the CDM files; (iii) finally, in addition to their economic benefits, these CDM projects generate significant environmental benefits, which are difficult to quantify, and not taken into account in the calculation.

Despite these limitations, the table shows the importance of preliminary screening in the decision-making process of CDM project development. Based on our assumptions, it is clear that CDM projects 1 and 3 generate significant surpluses, whereas project 2, a small-scale project, generates a smaller positive margin. To date, the simplified procedure scheduled, among others, for small proj-

Table 2 – Simplified example of costs and revenues associated with CDM projects

Conventional project phases	Additional steps for a CDM project	Project 1 Development of a 20 MW wind farm	Project 2 Installation of 20,000 domestic solar systems	Project 3 70 MW Bagasse-Coal power station
<b>Investment cost (excluding CDM-related costs)</b>		€ 20,000,000	€ 16,000,000	€ 100,000,000
<b>Emission reductions generated by the project (CERs)</b>		40,000 metric tons of CO <sub>2</sub> equivalent/year	8,000 metric tons of CO <sub>2</sub> equivalent/year	130,000 metric tons of CO <sub>2</sub> equivalent/year
<b>Gross income generated by the sale of CERs over 10 years (assumption: 1 metric ton of CO<sub>2</sub> equivalent = € 5)</b>		€ 2,000,000	€ 400,000	€ 6,500,000
<b>Costs – Project preparation phase</b>				
Feasibility study	Project documentation: baseline, monitoring plan, information research to draft the PDD	€ 5,000	€ 5,000	€ 15,000
Project preparation	Completion of the PDD: discussions with the host country	€ 30,000	€ 20,000	€ 60,000
Project approval	Validation by the Operational Entity	€ 15,000	€ 15,000	€ 30,000
Negotiation of a purchase agreement	Development of an Emission Reduction Purchase Agreement	The cost is borne by the buyer of the CERs	The cost is borne by the buyer of the CERs	The cost is borne by the buyer of the CERs
Registration	Cost of registration by the CDM Executive Board	€ 15,000	€ 5,000	€ 15,000
<b>Total</b>		<b>€ 65,000</b>	<b>€ 45,000</b>	<b>€ 120,000</b>
<b>Costs - Project operational phase</b>				
Production/operations, maintenance, management	Monitoring and verification	Internal cost of monitoring: € 5,000 every 2 years for verification, over 10 years, i.e. € 25,000	Internal cost of monitoring: € 10,000 every 2 years for verification, over 10 years, i.e. € 50,000	Internal cost of monitoring: € 10,000 every 2 years for verification, over 10 years, i.e. € 50,000
CER sales costs		€ 35,000 over 10 years	€ 20,000 over 10 years	€ 70,000 over 10 years
Contribution	Payment to Adaptation Fund	2% of CERs, i.e. € 40,000 over 10 years	Not applicable to LDCs	2% of CERs, i.e. € 130,000
<b>Total</b>		<b>€ 100,000 over 10 years</b>	<b>€ 70,000 over 10 years</b>	<b>€ 250,000 over 10 years</b>
<b>Impact of the CDM on the “viability” of the project</b>				
Net income from the sale of CERs/ Total project investment in % (not updated)		10%	1.8%	6.5%
Interest of the CDM component		Very high	Average for the present case, which may increase by combining similar projects	High

**Overall, is the Tremembé biogas project of interest to the project developer?**

*Significant emission reductions*

The example of the biogas recovery project in a controlled landfill site in Brazil demonstrates the particular interest of biogas emission reductions. The “carbon” income generated due to the high Global Warming Potential of methane enables the project to be developed. The number of CERs generated by the project throughout its lifetime was initially estimated at 700,000 metric tons of CO<sub>2</sub> equivalent, with a purchase price of € 3.30. The contribution of the “carbon” component to the financing of the project should therefore total € 2.3 million.

*Other important aspects*

Other elements were taken into account in the group’s decision as project developer:

- In terms of **image**, the group is present in every environment sector, therefore it has to be proactive with respect

to reducing its GHG emissions, which is an essential part of its sustainable development policy;

- In terms of **training**, the project enables the different divisions of the group to work together and communicate, as well as familiarize themselves with projects set-up under the Kyoto Protocol.

The Tremembé project therefore breaks even, particularly because of its carbon contribution; the carbon component was able to finance part of the technology transfer. The additional benefits, although more difficult to quantify, are important on several levels: for the project developer, host country and the communities concerned.

Accordingly, the decision was made to go ahead with Tremembé project as part of the CDM.

**Table 3 – Impact of the carbon component on the Internal Rate of Return (IRR)**

Country	Technology	% IRR without carbon	% IRR with carbon	Increase in IRR
Costa Rica	Wind	9.7	10.6	9%
Jamaica	Wind	17.0	18.0	6%
Morocco	Wind	12.7	14.0	10%
Chile	Hydro	9.2	10.4	13%
Costa Rica	Hydro	7.1	9.7	37%
Guyana	Bagasse	7.2	7.7	7%
Nicaragua	Bagasse	14.6	18.2	25%
Brazil	Biomass	8.3	13.5	63%
India	Methane	13.8	18.7	36%

Source: World Bank, July 2001

ects of less than 15 MW is still largely untested. However, major efforts are being made to reduce the transaction costs associated with these small projects as far as possible using relatively standardized methodologies and a combination of projects (“bundling”) to reduce the transaction unit costs. These efforts should facilitate the formulation of small-scale CDM projects in developing countries.

Table 3, taken from a World Bank PCF memorandum, illustrates the impact of a project’s carbon income on the Return On Investment, for PCF projects.

At this stage, the project developer may also wish to anticipate and take into account the wishes of potential CER buyers. The project developers can

present information on their project to one or more potential CER buyers to assess their level of interest in the project. The potential buyers will examine the information generally provided in Project Idea Note (PIN) format, with respect to the prevailing CDM rules and their own investment criteria.

**For further information:**

PIN template format defined by the PCF:  
<http://carbonfinance.org/pcf/router.cfm?Page=Operations>

## 5. Where can I find help?

### › CONTACTS IN THE HOST COUNTRY

Various ministries may be involved in the development of a CDM project:

- Environment;
- Energy and Industry;
- Agriculture;
- Economy and Finance;
- Transport and Infrastructure;
- Foreign Affairs.

**In this context, with many players involved at different levels, the Marrakesh Accords oblige the host countries to appoint a Designated National Authority (DNA), to take charge of the validation of CDM projects, before they are submitted for registration by the CDM Executive Board.**

This DNA may be within a particular ministry, but can also be an interdepartmental body. Once the DNA is designated, the host country must inform the Secretariat of the UNFCCC, which will publish the information on its Internet site.

The example below indicates the importance of a DNA for host country approval.

Ultimately, all countries must set up a Designated National Authority and internal procedures to validate the projects. If a host country has not set up a DNA, this does not mean that it cannot host CDM projects, insofar as the CDM Executive Board can initially accept a “provisional DNA,” appointed by the national authorities.

### › PARTNERSHIP AGREEMENTS

The signature of an agreement or of a Memorandum of Understanding (MoU) between an investor country and a host country may reduce the perception of country risk for potential investors. Its main aim is to state the general cooperation objectives of the two countries concerned, and reassure potential investors as to the host country’s willingness to validate the projects and resolve the problem of CER sharing.

These agreements are not a prerequisite for the implementation of projects by Annex 1 entities; they merely facilitate project implementation.

The agreements may be relatively general or, conversely, more detailed by specifying, for example, the following points:

- The parties concerned by the agreement;
- The voluntary nature of the process;

### Institutions set up in Morocco

The Kingdom of Morocco is one of the French-speaking countries which has moved the furthest ahead with the CDM. Morocco hosted the COP7 of the UNFCCC in Marrakech at an early stage (November 2001), and already understands the potential importance of the CDM with respect to its sustainable development strategy, in that it can accelerate the transformation of the Moroccan economy by attracting new foreign funds and encouraging the transfer of modern and more environmentally compatible technologies (urban waste treatment, wind farms, solar power, energy savings in the cement and phosphate industries etc.).

To move towards an operational CDM, Morocco established the necessary institutions early on, with a Designated National Authority (DNA) representing the State in all contacts with national organisations and operators acting or involved in the CDM, and with international organisations in charge of the CDM, especially its Executive Board. The DNA delivers the written approval that confirms that the project is voluntary, that it complies with national criteria and that it contributes to sustainable development in the country.

Morocco’s DNA comprises:

- A National CDM Council representing most of Morocco’s ministries and public agencies;
- A Permanent Secretariat which establishes regulations and evaluation and approval procedures for CDM projects and also promotes national capacity building and marketing capacities.

National criteria for objective evaluations of the impact of CDM projects on the sustainability of development have already been developed and published. Since its creation and with the support of multilateral and bilateral cooperation programmes, the Permanent Secretariat has already gained a very positive track record, with a large portfolio of CDM projects covering a wide range of economic sectors, networks of Moroccan CDM experts set up or developed and the creation of a particularly well-designed web site (<http://www.mdp-maroc.com>).

Morocco has also signed several bilateral cooperation agreements for CDM promotion, including one with France.

Altogether, the Kingdom of Morocco has made considerable investments in the CDM instrument, vindicating its early ambitions with several major transactions already well on the way to completion.

- A host country’s commitment to facilitate the project approval process, CER transfer, etc.

To date, France has signed six agreements, with Argentina, Chile, Colombia, China, Morocco and Mexico, while others are under discussion. The objective of these agreements is not to purchase carbon credits using public money, but rather to promote the involvement of French operators in the development of CDM projects in host countries.

VOLUME

B



## Part Two

### Formalising CDM Projects





# Formalising CDM Projects

## In brief

In order for a project to be registered by the Executive Board as a CDM project and generate certified emission reductions, it must follow a specific preparation procedure or cycle. **All potential CDM projects must meet the same criteria and follow the same process, regardless of their size.** However, for “small-scale” projects, the CDM rules and procedures are currently being standardised for simplification purposes.

The difference in the set-up of a project with a CDM component is essentially due to the fact that the local authorities of the **host country**, and an **independent third party** accredited by the United Nations Framework Convention on Climate Change, the Designated Operational Entity, must guarantee that the project satisfies the **eligibility conditions**.

The document used as the framework for project development under the Kyoto Protocol is the **Project Design Document (PDD)**; this requires documentation of the project context and objectives, as well as the argumentation of the principles underlying the demonstration of project additionality and the assessment and monitoring of the associated emission reductions. Once the PDD has been completed, the project, after being made available for public comment (in the broad sense), is **approved** by the host country, **validated** by the Designated Operational Entity, and then **registered** by the Executive Board.

The emission reductions generated by the project are then **verified** and **certified** by another Designated Operational Entity, and **certified emission reductions** will be issued by the Executive Board throughout the implementation of the project.

This chapter presents the different steps that a project developer must follow for the project to be registered by the Executive Board as a CDM project and receive the CERs. All potential CDM projects must meet the same criteria and follow the same procedure, regardless of their size. However, for “small-scale” projects, the CDM rules and proce-

dures have been standardized and simplified, and are covered in a specific section: “The PDD for small-scale projects.”

The process to be followed to develop a project as part of the CDM, otherwise known as the “preparation cycle of a CDM project,” is described in detail below.

## 1. What is involved in the preparation of a CDM project?

Firstly, a project developer assesses the eligibility of a project for the CDM. If this assessment is positive, the project developer begins to prepare the documentation required. The final step is the registration of the project by the CDM Executive Board, and then, where applicable, the signature by the project developer of an Emission Reduction Purchase Agreement for the future CERs generated by the project.

### › WHAT IS INCLUDED IN THE PREPARATION CYCLE OF A CDM PROJECT?

The preparation cycle of a CDM project is comprised of the following steps:

- Project identification;
- Preliminary assessment of the project’s eligibility and its capacity for self-financing;
- Where necessary, negotiations for the sharing of credits between the different partners involved in the project;
- Where necessary, contact with potential buyers to measure the level of interest raised by the CERs to be generated by the project;
- Preparation of the Project Design Document (PDD) including, in particular, study of the baseline and requirements of the monitoring plan;
- Request for the host country’s formal approval;
- Validation of the project by the Operational Entity;
- Presentation of the project for registration with the CDM Executive Board;
- Possible drafting of the Emission Reduction Purchase Agreements.

It must be noted that certain steps of the preparation cycle, such as the formulation of the business plan and the search for financing, may be implemented during the conventional project development phases.

### › WHO ARE THE MAIN PARTICIPANTS IN CDM PROJECTS?

The following sections present the various participants in the development of a CDM project.

#### ›› The host country

**The host country has a key role on several levels: it must be eligible and capable of performing the validation procedure. Furthermore, it must provide the project developer with a letter of approval indicating that it approves the project and that it meets its sustainable development objectives.**

The Marrakesh Accords stipulates that the signature and ratification of the Kyoto Protocol by the country, which thereby becomes Party to the Protocol, are mandatory in order to be able to host a CDM project. Although these conditions do not directly concern the project developers, the status of a host country must be studied in full during the assessment of the project’s eligibility; projects hosted by a country that has not ratified the Protocol are not eligible under the CDM.

#### For further information:

An up-to-date list of the countries that have ratified the Kyoto Protocol is available at: <http://unfccc.int/resource/kpstats.pdf>

It should be noted that ratification of the Kyoto Protocol is not the only requirement to be met by a country for it to be authorized to host CDM projects. In addition to ratification, host countries must appoint a Designated National Authority (DNA) responsible for expressing the country’s interest in participating in the CDM and approving the CDM projects.

The host country must individually approve each CDM project and ensure that it meets the national sustainable development objectives. It is the responsibility of the project developer to obtain host country approval.

**What can legally be expected from the host country?**

The host countries can actively support the development of CDM projects. However, a distinction must be made between the tasks that are legally considered as incumbent to the host country, arising mainly from the Marrakesh Accords, and the non-mandatory tasks intended to favor the implementation of CDM projects. The tasks that must legally be performed by the host countries are as follows:

- Ratify the Kyoto Protocol;
- Appoint a Designated National Authority;
- Draw up guidelines for project approval;
- Establish the criteria for compatibility with their sustainable development strategies;
- Ensure, where required by local legislation, that the impact studies were performed in full;
- Give its formal approval for the presentation of projects to the CDM Executive Board.

It is strongly urged that assurance be obtained from the host country that it intends, if it has not already done so, to ratify the Kyoto Protocol in the very near future before continuing project development as part of the CDM.

**What else can be expected from the host country?**

- The countries that are already involved in the implementation of the Kyoto Protocol can speed up the development of CDM projects in their own countries by:
- Drafting and communicating recommendations or guides to develop and submit the CDM projects for DNA approval;
- Informing potential project developers of any opportunities;
- Providing support to the project developers during the preparation of the project (baseline development, validation);
- Receiving and processing project applications as quickly as possible.

The support offered to the project developers will depend on the context. However, it is in the interest of the host country to reduce the risk for project developers by drawing up a clear project validation process, and supporting the project during the key steps. The risk of project failure at the national level, after more or less significant investments in terms of time and money, is reduced by close dialogue between the project developers and the DNA throughout the entire development process. The potential obstacles to obtaining approval by the DNA may be identified and resolved well in advance.

In all cases, the host country authorities cannot be expected to complete the PDD, pay for the validation or verification, or help monitor the implementation of the project. This is the responsibility of the project developer.

The CDM guidelines suggest that many entities could potentially develop CDM projects and acquire CERs. For example, among the project developers, the following entities could, in theory, be included: private or state companies, financial institutions, local communities, ministries, foundations and NGOs. The bodies acting as intermediaries for any of the above entities can, on behalf of the project developer, also submit projects to the Executive Board. In practice, most project developers are companies.

» **The Operational Entity**

**Designated Operational Entities (DOEs) are national or international bodies which have been accredited by the CDM Executive Board. The DOEs are responsible for the essential steps of the CDM project preparation cycle.**

Their responsibilities include:

- Validation of project activities with respect to the CDM;
- Ensuring public access to the project design and development documents;
- Gathering public comments on the project documents and taking these comments into account;
- Verification of emission reductions and their certification.

More than twenty verification companies are currently undergoing accreditation by the CDM Executive Board. Four of these have already been accredited and provisionally given Designated Operational Entity (DOE) status for validation activities in specific sectors (Japan Quality Assurance Organisation, Det Norske Veritas Certification Ltd., TÜV Industrie Service GmbH SUD GRUPPE and Société Générale de Surveillance). Readers may refer to the web site indicated below to obtain an up to date list of these DOEs with their areas of activity. Where verification and certification are concerned, no DOE has yet received accreditation from the CDM Executive Board.

**For further information:**

**On the Designated Operational Entities:**  
<http://cdm.unfccc.int/DOE>

» **The project developer**

**The project developer is the entity which is responsible for operations.<sup>18</sup>**

<sup>18</sup> Often significantly involved in the financing of the project activities, the project developer is also known as the “investor,” in contrast to the “carbon investor” who exclusively finances the carbon component of the project.

» The CDM Executive Board

The CDM Executive Board supervises the CDM. Its role is to approve projects and it is responsible for several transversal missions.

The Board is composed of ten members and ten alternate members, reflecting a concern for balance between the different UNFCCC Parties.<sup>19</sup>

Specifically, the Executive Board is responsible for the following activities:

- Approval of new methodologies related to base-lines, monitoring plans and project boundaries;
- Accreditation and suspension of Operational Entities;
- Making available to the public data on the proposed CDM activities and all the procedures relative to the development of a CDM project;
- Development and maintenance of a CDM registry;
- Review of project validation and verification reports; and
- Creation of certified emission reduction units in the CDM registry.

» The “carbon credits” investor

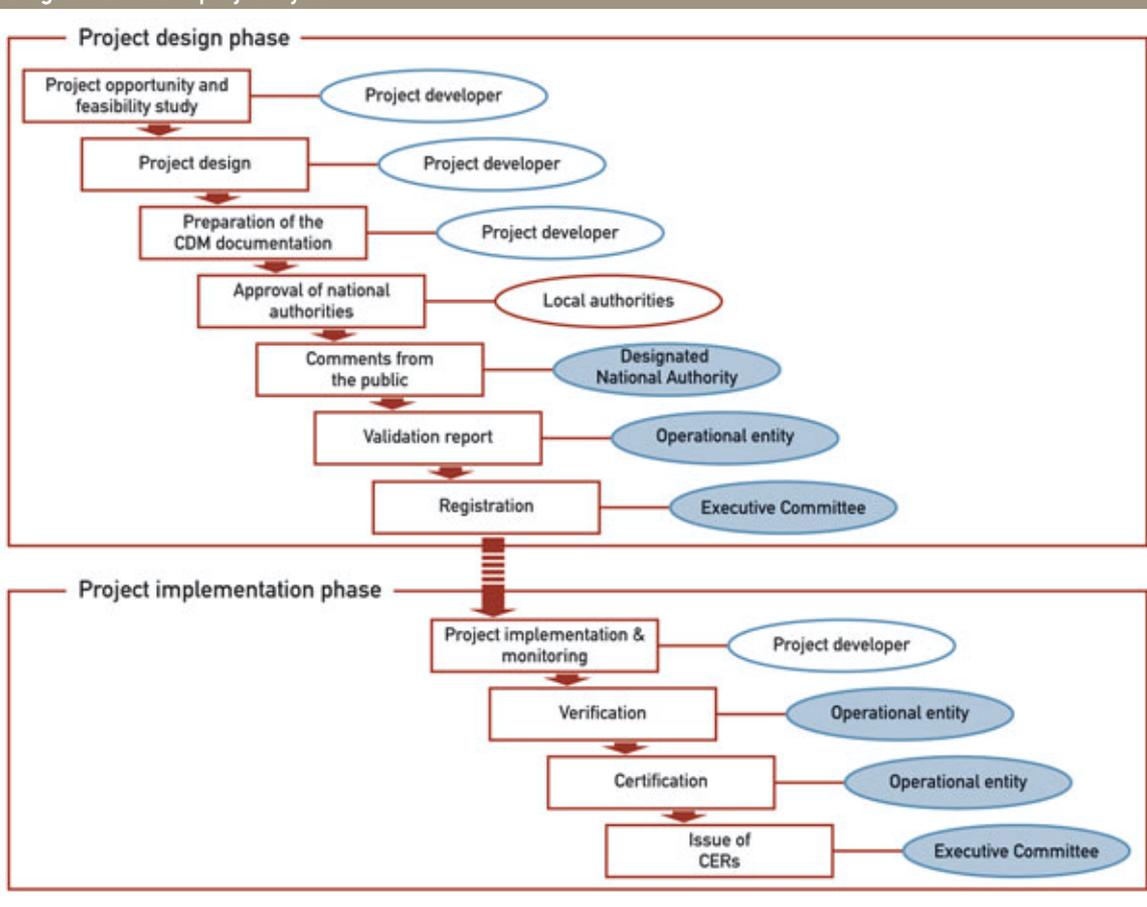
With respect to a CDM project, a “carbon credits” investor is an entity that purchases all or a portion of CERs generated by the project.

The carbon credits investor is mandated by, or falls under the responsibility of, one or more Annex 1 countries. The investor can be a private or public organization, a private company or an NGO. There can be several “carbon credits” investors involved in the same project, as well as several types of “carbon credits” investors.<sup>20</sup>

<sup>19</sup> To illustrate this point, at the time of writing (October 2004), the CDM Executive Board had ten members representing the UNFCCC Parties: one member from each of the five UN regional groups, two members from the Annex 1 Parties, two other members from Parties not included in Annex 1 and one representative from the Small Island States. The pattern is the same for the ten alternate members. Overall, the Executive Board represents widely diverse geographical areas. The current composition of the Executive Board is available at: <http://cdm.unfccc.int/EB/Members>.

<sup>20</sup> The “carbon investor” can commit funds to the project upstream (source of financing), or downstream (source of revenue).

Diagram 2 – CDM project cycle



## 2. What is a PDD and how is it prepared?

After a project's eligibility is confirmed by a preliminary assessment, a more detailed analysis must be performed. This section will outline, with respect to CDM projects, the information to be provided by the project developer and formalized in the project design document (PDD). As illustrated in Diagram 2, the PDD is submitted to an Operational Entity for validation, following which it is submitted to the Executive Board for the project's registration. A model of the most recent PDD approved by the Executive Board and effective as of the publication date of this guide is provided in the annexes. Updated versions can be found on the UNFCCC website dedicated to the CDM: <http://cdm.unfccc.int/Projects/pac/Reference/Documents>.

The PDD is the main technical document to be submitted to the Operational Entities for a project's assessment. It must include the following:

- Description of the project;
- Methodology for the baseline and the additional-ity assessment;
- Accounting period;
- Monitoring plan;
- Estimation of GHG emissions by source;
- Social and environmental impacts;
- Comments from stakeholders on the project's design.

The following sections provide further detail.

### › GENERAL DESCRIPTION OF PROJECT ACTIVITY

This section contains recommendations on the information the project developer should include in the PDD.

The information should include at least the following:

- Title of the activity planned;
- Description of the project;
- List of project participants;
- A technical description of the project, including location, category, the technology used and a brief description of how GHG emissions are to be reduced;
- If public funds from the Annex 1 country are to be used, evidence must be provided to show that they are not being diverted from other uses.

In addition to the above information, the following issues should be covered for a better understanding of the project:

- Project context;
- Problems and difficulties addressed in connection with the project;
- Project planning and schedule;
- Description of the project's key points and major development stages;
- Any other pertinent information, bearing in mind that bulky documents are not processed with greater care.

Generally, a large portion of the information to be included in this section can be drawn directly from a business plan.

#### Description of the Tremembé biogas project

The project involves the recovery of biogas from a controlled landfill and on-site conversion into energy. There are two phases.

**The first phase** comprises the following:

- Expansion of the existing biogas recovery network to the entire controlled landfill site;
- Drilling of additional biogas extraction wells;
- Interconnexion of horizontal wells;
- Increase in burning capacity;
- Modification of the generator to operate using biogas and generate electricity on site;
- Feasibility study to assess the opportunity of exporting surplus electricity to the grid.

Under the operating procedure for the controlled landfill, cells that are filled can be closed in several stages. Biogas extraction systems will thus be gradually installed to increase extraction capacity.

**The second phase** would be implemented in the event of positive results from the feasibility study, in which case the following elements would be involved:

- Phased-in installation of electric generators fuelled by biogas;
- Connection to the grid.

### Official Development Assistance (ODA) and CDM projects: awaiting full clarification

If public funding from an Annex 1 country is called upon, the project developer must demonstrate that these funds will not be diverted from ODA. In addition, the project developer must prove that the financing of a CDM project is not credited to the financial obligations of a donor. The Marrakesh Accords stipulate that “public funding for clean development mechanism projects from Parties in Annex 1 is not to result in the diversion of official development assistance and is to be separate from and not counted towards the financial obligations of Parties included in Annex 1.”

To date (i.e. late October 2004), the interpretation of this clause has not been definitively finalized, and the Executive Board has not taken a stance on the issue. The position of the OECD Development Assistance Committee (DAC) with regard to the use and accounting of official development assistance for CDM projects has likewise to be determined. We thus strongly urge developers whose projects benefit from such financing to verify whether new measures have been specified in the interim by the DAC or during Kyoto Protocol Conferences of the Parties.

In practice, there is every indication that official development assistance can only be used to facilitate initial project stages, such as feasibility studies or support activities for CDM implementation in the host country (preliminary training of potential project investors, procedural information seminars, support for the establishment of official development assistance, etc.). The status of the financing in itself for all or a portion of the project and the fate of the credits likely to be generated remain an open issue.

In terms of procedure, the developer must list all public financing received from Annex 1 countries and invested in the project, in addition to public financing requested by the developer.

Should the project developer receive public financing from an Annex 1 country he must, in accordance with the Marrakesh Accords, obtain an attestation from each Annex 1 government participating in the CDM project financing that such financing does not divert official development assistance, is dissociated from the financial obligations of Annex 1 Parties and is accounted for separately.

There is a possibility, although it is not stipulated under the Marrakesh Agreements, that a letter from the host country declaring that it is not opposed to the inclusion of public funding in the proposed CDM project would also be useful, pending more formal clarification of the rules governing the use of ODA.

## » ASSESSMENT METHOD FOR ADDITIONALITY

### » Additivity, the baseline and calculating reductions: the three key points of the methodology are closely interlinked

To ensure that the project is acceptable for the CDM, a developer must be able to demonstrate that the choices made in connection with the project are additional in relation to the baseline.

To do so, the developer must either use a methodology that has already been approved by the Executive Board (see section on “The different methodologies available”), or propose a new methodology which:

- Indicates and justifies the chosen baseline;
- Demonstrates that the project differs from the baseline;
- Estimates anticipated emission reductions by evaluating the reference level (emissions in the baseline) and emissions in the “project scenario.” If the project is additional, the difference between the two will be positive;
- Proposes a methodology for monitoring emission reductions (see next section).

**The Marrakesh Accords define the baseline of a CDM project activity as the “scenario that reasonably represents the anthropogenic emissions by sources of greenhouse gases that would occur in the absence of the proposed project activity” [COP7, Article 12, Section G, Paragraph 44].**

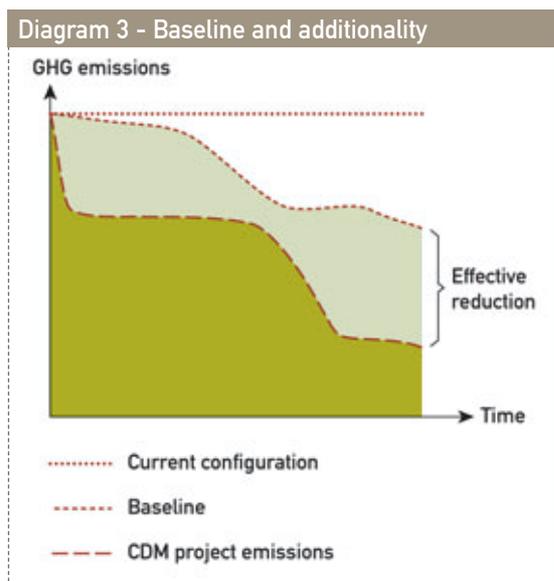
As mentioned, “a CDM project activity is additional if anthropogenic emissions of greenhouse gases by sources are reduced below those that would have occurred in the absence of the registered CDM project activity” [COP7, Article 12, Section G, Paragraph 43].

**Additivity is assessed by measuring the difference between the estimated emission levels associated with the baseline (“Business as Usual”) and the emissions expected from the project. Demonstrating a project’s additivity is equivalent to proving that its activities are not included in the baseline.**

Sections B and E of the current PDD cover the analysis of baselines, calculations by sources of GHG emissions, and additivity.

### » A decisive and delicate phase in the CDM project

This phase is among the most delicate in the structuring of a CDM project. The emissions that would have occurred in the project’s absence cannot of



course be directly observed. This means that the emission differential remains a theoretical calculation, based on assumptions that are open to debate and challenge. Certain projects that would appear to have positive effects in terms of GHG emissions are not additional, particularly those consisting in the simple application of existing regulatory requirements.

We therefore recommend great prudence in the formulation, inasmuch as the developer's demonstration of his project's additionality will be verified by a third party. The baseline issue is covered in greater detail in the chapter entitled "The methodological phase of the CDM project."

In this context, the Executive Board has created an approval process for methodologies, so that the methods developed can be reproduced.

Before pursuing a methodological strategy, it is strongly recommended that the Executive Board be consulted to verify the methodologies that have already been accepted for different types of projects. The first methodologies have recently been validated by the Executive Board and can be obtained by project developers (see "Available Methodologies" below).

If none of the site's methodologies are relevant to the new project, or if the developer wishes to propose an alternative, he will have to prepare a new methodology and submit it to the Executive Board. The procedure for approval of a new methodology takes four months as from its date of publication by the UNFCCC.

For a given project activity, it should also be determined whether the host country wishes to apply a specific methodology or whether a predefined baseline exists. If an emission baseline is available, its

### Approved, formalised and consolidated methodologies

When a new methodology for a conventional project is submitted to the Executive Board for approval, it is given an identification code made up of two letters and four figures, as in NMxxxx.<sup>a</sup> Once it has been approved, the methodology is formalised<sup>b</sup> and given a new identification code with two letter and four figures, as in AMyyyy, the figures being attributed in the order in which the methodologies were approved.<sup>c</sup> Finally, the Executive Committee may decide, if there are enough similar approved methodologies for a given sector, to consolidate them. In this case, the consolidated methodology is identified by a code with three letters and four figures, as in ACMzzzz. Project developers can then either use the consolidated methodology or one of the approved methodologies to secure project validation from a Designated Operational Entity.

For small projects, the methodologies approved by the Executive Board are identified by a code with three letters, one Roman numeral and one letter, as in AMS-Yy, where the last two identify the project type and sector.

<sup>a</sup> For example, the 7th methodology submitted to the Executive Board for approval was identified as NM0007.

<sup>b</sup> Formalising a methodology means removing the elements that are specific to the project for which it was developed.

<sup>c</sup> The proposed methodology coded NM0007 was the first to receive approval, and was then given the code AM0001.

applicability to the proposed project's activity should be verified with the competent authorities, such as the host country stakeholders, an Operational Entity, or the Executive Board.

### » Available methodologies

Since July 2003, when the first methodology was approved, the "toolbox" available to project developers has expanded considerably overall, and uncertainties as to project formalisation and methodological aspects are diminishing.

As of November 2004, there were 18 approved methodologies available for conventional projects in various sectors, of which 16 have been formalised, as well as two consolidated methodologies for the energy production and waste management sectors.<sup>21</sup> Some steps in a project, especially for demonstrating its additionality, are much more easily to follow now that tools are available. Furthermore, the approved and consolidated methodologies are directly applicable, which considerably lessens project costs, completion times and the difficulties involved in the development of specific methodologies.

<sup>21</sup> The full list of approved and consolidated methodologies, with their use by sector, is available in Annex 5 and at <http://cdm.unfccc.int/methodologies/PAmethodologies/approved.htm>.

## › DURATION OF THE PROJECT'S ACTIVITY, ACCOUNTING PERIOD

The accounting period is a determining factor for the volume of emission reductions that can be generated by a CDM project. It defines the period during which emission reductions generated by the project can be credited to create CERs. The accounting period thus has a direct and determining impact on the valuation of the project in regard to the CDM.

The accounting period can differ from the lifetime of a project. The lifetime is defined by technical or economic considerations and is generally longer than the period during which the reduction credits can be legitimately generated. Under the Marrakesh Accords, CDM project developers have two options when determining the accounting period:

- An accounting period for a maximum of seven years, which can be renewed twice at most; in which case the baseline must be updated, if necessary, at the term of each 7-year period; or
- An accounting period of a maximum of ten years without possibility of renewal.

One of the key aspects in selecting an accounting period is the definition of the term during which the baseline, determined and agreed upon *ex ante*, will serve as the basis of calculation for the emission reductions generated. An example of the accounting period impact is presented herunder:

### Impact of the crediting period selected – the case of a wind farm

The lifetime of this project, launched in 2003, was estimated at 20 years. The baseline was established for the period 2003-2023. The baseline analysis estimates that the project will reduce GHG emissions by approximately 4.5 million metric tons of CO<sub>2</sub> equivalent over 20 years. Application of the accounting period rules and definitions, stemming from the Marrakesh Accords, has the following consequences:

- By selecting an accounting period of 10 years, the baseline remains identical until 2013. Accordingly, the planned emission reductions are limited to approximately 2 million metric tons of CO<sub>2</sub> equivalent. The emission reductions subsequently generated will not qualify as CERs.
- By selecting an accounting period of 7 years, the baseline is initially set until 2009. The project developer can then renew the accounting period twice for a 7-year period. However, this entails a re-examination of the baseline and thus a revaluation of the project's additionality and the volume of reductions generated. Accordingly, this option can generate 1.4 to 4.5 million CERs. On the other hand, the developer takes the risk that the adjusted baseline will be far less appealing for years 8 to 10; indeed, any additional generation of credits may even be prohibited (for example, should the government institute in the meantime a regulation imposing the technology used by the developer).

## › MONITORING PLAN

The project developer must set up and formulate an emission reductions monitoring plan, the mechanisms of which are to be described in a dedicated section of the PDD. The data generated by the monitoring plan will ultimately be sent to a third party, the Operational Entity, which will be responsible for verification throughout the crediting period.

The monitoring plan must detail the rules for collecting data generated by the project once it is operational, and must cover and track all aspects of the expected GHG emission reductions. This necessitates continuous supervision of activities to verify that the project's operational performance is in line with the estimates, and that the expected emission reductions have in fact been attained. Consequently, the monitoring plan must provide for the collection and archiving of all data necessary to estimate and measure the activity emissions within the project boundaries and throughout the accounting period defined.

In order to limit expenses in the project's operational phase, it is important to develop monitoring plan so that future verification is as simple – and thus cost-effective – as possible.

The following list provides recommendations on the type of information required in the monitoring plan:

- *How were the project boundaries defined (include a justification for the boundaries selected)?* The project boundaries must be defined so as to include all significant emission sources that are reasonably attributable to the proposed activities under the control of the project developer;
- *How was the data used to develop the baseline collected (rules, frequency, etc.) and how is it archived?*
- *How will all the data be assembled and archived to estimate GHG emissions resulting from implementation of the proposed activities?* The frequency of data col-

lection should also be described. The monitoring data should be kept for two years following the most recent creation of CERs;

- *How is leakage accounted for?* The measurement of possible leakage requires the identification and characterization potentially significant GHG emission sources that occur outside the project's defined boundaries. Those which are deemed significant can vary considerably depending on the type of project and over its lifetime. It is up to the project developer to define which emissions are significant. For any leakage considered significant, the monitoring plan should indicate how the emission data stemming from these activities will be collected, at what frequency, and how it will be archived;
- *What are the procedures for calculating emission reductions resulting from the proposed project activity?* The monitoring plan should include all formulae and/or algorithms used to calculate emission reductions;
- *What are the quality assurance/quality control procedures?*
- *How is environmental impact data collected and archived?*
- *How was the choice of monitoring methodology justified?*

Other information relative to the monitoring plan can be useful:

- Characteristics of the planned verification work;
- Measurement and calibration methods;
- Management method for missing data, if relevant;
- Length of time for the measurements;
- Person(s) responsible for the collection of monitoring data;
- Person(s) responsible for the archiving of monitoring data;
- Back-up process for data collection;
- Who has ultimate responsibility for the monitoring process?

The data generated by the implementation of the monitoring plan will serve as the basis for verification of emission reductions generated by the CDM project's activities.

These aspects will be covered in greater detail in the chapter "Methodological aspects of the CDM project."

### › ENVIRONMENTAL IMPACT

The PDD must include an analysis of the project's environmental impact.

This analysis is mandatory and should include, for example:

- Biodiversity: e.g. ecosystems or species preserved or endangered by the project;
- Air quality: e.g. project impact on air pollutant emissions other than GHGs (SO<sub>x</sub>, NO<sub>x</sub>, CO, hydrocarbons, dust, etc.);
- Availability of water resources: e.g. impact on the relative water shortage, when the resource is limited;
- Quality of the water resource: e.g. project impact on water pollution;
- Soil: e.g. project impact on soil erosion and pollution;
- Noise level;
- Use of natural resources;
- Use and management of chemical products;
- Impact on the landscape: e.g. in the case of wind farms;
- Efficiency of waste procedures and management.

If the project's environmental impacts are considered significant, or if the host country's legislation requires an environmental assessment, an environmental impact analysis must be performed. The project developer must defend his choice, which will be reviewed at the time of the DOE validation.

Should an environmental impact analysis be required, the project developer must indicate the date it was or will be carried out. He must also indicate where a copy of the report can be obtained. Following completion of the analysis and if the competent authority, at the host country level, has approved the report, the approval can be used to demonstrate that the project's environmental impacts have been assessed and explained.

### › COMMENTS FROM LOCAL STAKEHOLDERS

The final stage of the PDD's preparation consists in inviting the local stakeholders to comment on the proposed project. Stakeholders are defined as upstream or downstream public sectors, local authorities, individuals, groups or communities affected, or likely to be affected, by the proposed CDM project activity.

The participation of stakeholders is an effective and essential means of increasing the transparency of the CDM process. It also guarantees that the project is part of the host country's sustainable development. The PDD must include a description of the process followed in order to receive public comments.

Project developers must:

- Invite local stakeholders to comment on the activity proposed in connection with the CDM;
- Provide a description of how local stakeholders were invited to comment on the project;
- Provide a description of the comments received;
- Review the comments received and provide a report showing how they have been or will be taken into consideration;
- Submit a description of the local stakeholder consultation process and the comments review to the Designated Operational Entity (DOE) for validation.

The local stakeholder consultation process is completely separate from the international consultation of stakeholders carried out by the DOE. The idea behind the international consultation is that the international or national community, and specifically NGOs, are entitled to examine the projects proposed for the CDM.

The project developer can examine the rules to ensure a public consultation, and determine with the competent authorities a method for possibly combining this process with the invitation to comment on the PDD. In certain countries, and for certain types of projects, there are established public consultation procedures. In the opposite case, the project developer can:

- Identify all local stakeholders (individuals, groups or communities) affected, or likely to be affected, by the proposed CDM project activity;
- Design a program for local stakeholder consultation. The program can include written or verbal presentations to explain the CDM, the project and its impacts;
- Place an advertisement in a local paper and invite local stakeholders to make written comments;
- Organize a meeting with local stakeholders. The invitation should clearly state that the following information can be supplied upon request prior to the local stakeholders' meeting: information on the CDM, the PDD, and the project's probable impacts for the stakeholders concerned.

The project developer is responsible for recording all comments, whether written or made during a meeting.

A report on the consultation process should be produced by the DOE. It must include the written and verbal responses to comments, present the objections or support of local project participants and all the measures undertaken by the project developer in response to the concerns expressed by the local stakeholders.

### Consultation with stakeholders – the Tremembé biogas project

The various stakeholders were invited to make their comments during a briefing and exchange session. The first part of the meeting was devoted to explaining the Kyoto Protocol mechanisms, the second part presented the biogas project; and the third part invited comments from the local stakeholders.

The local stakeholders invited were:

- A local environmental NGO;
- Two local municipal schools;
- The tourism office, representing the municipality;
- The state environmental agency;
- The ministry of the Environment;
- The local university;
- Three local philanthropical associations: a senior citizens association, a specialized education organization for children, and a children's association;
- An association of residents adjacent to the controlled landfill;
- Representatives of the local church.

## › FAST-TRACKING PROCEDURE FOR SMALL-SCALE PROJECTS

After the CDM was launched in Marrakesh, it became clear that a simplified procedure to fast-track small CDM projects on renewable energy and energy savings was required. It soon became obvious that small CDM projects differed from large ones and that it was both necessary and important to facilitate the development of the former, which are of particular interest to developing countries, especially in Africa. The essential difference between small and large-scale projects is the latter's capacity for bearing the associated transaction costs, insofar as these are much the same whatever the size of the project. The CDM Executive Board has responded to this challenge by progressively defining simplified methodologies and standard rules, in order to reduce preparation and monitoring costs for small projects (for references, please refer to the CDM Executive Board's web site).

### » Classification of small-scale CDM projects

Small CDM projects are of three types: projects on renewable energy sources, on energy efficiency and other activities (under the heading "other projects") which are detailed in Table 4 below. As shown in the table, ceilings are set for rated power output and emission reduction capacities or potential.

## » Simplified rules and procedures<sup>22</sup>

The key points concerning the rules and procedures for small-scale CDM project activities are as follows:

- **“Bundling”**: (« bundling ») : project activities may be grouped together at different stages in the project cycle (PDD, validation, registration, monitoring, verification and certification) in order to reduce transaction costs per project. However, bundling should not result in a total of more than 15 MW or equivalent amount.
- **Single DOE**: a single designated operational entity may validate, verify and certify the activities of a small-scale project or “bundle” of small-scale projects.
- **Simplified PDD**: Developers of small-scale CDM projects should use a simplified PDD that may be

downloaded from the CDM Executive Board’s web site. *NB*: independent studies for the reference level and monitoring plan are not required, which can produce appreciable savings.

- **Simplified methodologies**: Small-scale projects can use a set of simplified methodologies to determine the level of reference and define the monitoring plan. These methodologies (also downloadable from the Executive Board’s web site) provide detailed instructions for each of the thirteen categories of project activities shown in Table 4 above. Areas of simplification include:

- ❖ *The reference level*: precise instructions provide a standard level of reference for each project category;
- ❖ *Monitoring*: monitoring procedures are simplified to reduce their costs. “Bundled” projects may be monitored by sampling methods;
- ❖ *Additionality*: project developers should use a predefined list of obstacles to demonstrate

<sup>22</sup> Sources: UNFCCC and Carbon Finance Unit, 2003.

Project types	Categories	Examples of small CDM projects
<b>I - Energy production from renewable sources, with rated or nominal power output below 15 MW</b>	I-A Electricity supply for users	Photovoltaic solar programmes, micro or mini hydroelectric power stations, on-site electricity production from biomass for on-site use
	I-B Mechanical energy for users	Wind-powered pumps, water mills
	I-C Heat supply for users	Individual or district solar water heating, heating from biomass to replace coal-fired installations
	I-D Renewable electricity production for the grid	Wind farms, mini hydro-power stations, biomass-fired power stations
<b>II - Improvement of energy efficiency generating savings of less than 15 GWh</b>	II-A Improving supply-side energy efficiency: energy transfer and distribution	Reducing power losses from transformers, improving distribution networks
	II-B Improving supply-side energy efficiency: energy production	Modifying oil, coal or hydro power stations to improve energy yields or annual productible
	II-C Reducing energy consumption through specific technologies	Programmes to replace filament light-bulbs with fluorescent lighting
	II-D Demand-side energy efficiency based on specific technologies	Heat insulation for buildings and replacing coal-fired heating with gas
	II-E Energy efficiency and fuel switching in industry	Improving efficiency of boilers, electric motors, pumps, etc., switching from oil or coal to gas or biomass
	II-F Energy efficiency and fuel switching in agriculture	Switching from diesel to ethanol for tractors, new cultivation techniques requiring less tractor power or fewer tractors, less irrigation and thus fewer pumping needs
<b>III - Other project activities where emissions reductions are below 15,000 teqCO<sub>2</sub>/year</b>	III-A Agriculture	New cultivation techniques requiring less energy or emitting fewer GHGs (rice, fertiliser use, etc.)
	III-B Switching fossil fuels (for existing installations)	Using natural gas instead of more polluting fuels
	III-C Reducing GHG emissions from vehicles	Promoting low-consumption vehicles and gas-driven vehicles
	III-D Recovering / avoiding methane emissions	Capture and use of methane from municipal landfills, sewage treatment or agricultural waste

that their project would not otherwise be able to proceed:

- *Investment obstacles*: a more cost-effective solution would lead to higher emissions from project activities;
  - *Technological obstacles*: an alternative solution using less advanced technology than the option proposed for the activity carries fewer risks of uncertainty as to the performance of the new technology and its level of penetration, but would generate higher GHG emissions;
  - *Obstacles linked to usual practice*: usual practice or existing regulations or policies would lead to the use of a technology generating higher emissions;
  - *Other obstacles*: without the project activity, for other specific reasons (to be identified: e.g. institutional barriers, missing information, lack of management or organisational capacities, financial resources or capacity for absorbing new technologies), emissions would be higher;
- ❖ *Project boundary*: the project boundary is limited to the project's physical activity;
  - ❖ *Leakage*: requirements for calculating leakage are simplified and specified for each project category;
  - ❖ *Lower charges*: the Executive Board should propose a reduction in charges for small-scale projects as and when CERs are generated (usually 2% for the Adaptation Fund) as well as lower registration charges.

### » Lower transaction costs

The World Bank's Community Development Carbon Fund (CDCF) estimates that average transaction costs up until the sale of CERs from a "small-scale" project could be reduced by a factor of 2.5 compared to "conventional" projects, to around US\$ 110,000.

### » Maximum sizes for small projects are already quite high

The maximum sizes for small-scale projects (15 MW or 15 GWh or 15,000 teqCO<sub>2</sub>) are quite high and enable even fairly large projects, with varied and current applications, to apply for "fast-tracking." The maximum for small-scale CDM projects may correspond, for example, to an energy-saving project for 75,000 refrigerators saving 200 kWh/year each, to a programme for 15,000 solar water heaters saving 1,000 kWh/year each, to a rural electrification programme for 150,000 solar battery kits generating up to 100 W or, finally, to a 15 MW

cogeneration plant using bagasse in a sugar mill or palm husks in an African oil mill.

### » CER trading for small-scale CDM projects

Although no small-scale CDM projects have yet been submitted to the CDM Executive Board, many are in the definition phase, often with support from multilateral funding agencies (CDCF, European Commission, UNEP, UNDP) or bilateral agencies (France, Germany, Italy, Denmark, Finland, Switzerland, Japan) with a concern to accompany economic and social development activities in developing countries through the CDM.

These projects are highly varied. The CDCF has reported projects for small-scale manufacture of sugar loaves in Colombia using bagasse instead of fuelwood, for brickworks using ash, lime and gypsum, for a modernised biomass-fired tea roasting plant in Kenya, the modernisation of 40 heating networks in apartment blocks in Mongolia, the development of biogas digesters to produce domestic energy and fertiliser in Nepal, a wind farm and hydropower plant with a combined output of 12 MW in South Africa and a biogas programme for livestock breeding in Vietnam.

In French-speaking Africa, there are significant prospects for small-scale CDM projects, especially in the recovery of agro-waste, conventional or decentralised electricity supplies, solid and liquid municipal waste, cement and other construction materials and in the mining and fossil fuel sectors.

Altogether, although the emergence of small-scale CDM projects is currently more problematical in developing countries, the context is looking more favourable with the imminent entry into force of the Kyoto Protocol, the adoption of the EU Directive on the use of emission credits generated by Kyoto-type projects and the high level of awareness of the new instrument among funding agencies and industries, which may contribute significantly to sustainable development in host countries.

#### For further information:

Simplified PDD model for small-scale CDM projects:

[http://cdm.unfccc.int/Reference/Documents/SSC\\_PDD/English/SCCPDD\\_en.pdf](http://cdm.unfccc.int/Reference/Documents/SSC_PDD/English/SCCPDD_en.pdf)

CDM Executive Board simplified methodologies to determine reference levels and monitoring:

<http://cdm.unfccc.int/Reference/Documents/AnnexII/English/annexII.pdf>

Recommendations on "unbundling":

<http://cdm.unfccc.int/Projects/pac/ssclistmeth.pdf>

### 3. The three key steps for CDM project approval

This chapter presents the steps that a potential CDM project must successfully complete to be approved by the Executive Board and generate CERs. All potential CDM projects must meet the same criteria and complete the same steps regardless of their size. However, for small-scale projects, the rules and procedures have been standardized and simplified. The key steps that a project developer must complete under the CDM are described below.

#### › APPROVAL BY THE HOST COUNTRY

When a CDM project is developed, the host country is essential for at least three reasons:

- The project is implemented in the host country and must therefore comply with the laws and regulations in force nationally and locally;
- The project must meet the sustainable development objectives of the host country;
- Under the CDM, the project must be officially approved by the host country to be presented to the CDM Executive Board. The host country must have ratified the Kyoto Protocol.

The organization responsible for approving the project on behalf of the host country is the Designated National Authority (DNA). The project developer must contact this organization as soon as possible.

**Contacting the host country as soon as possible enables it to be fully associated with the project's development, thus facilitating official approval.**

The information needed for the project's submission varies from country to country. However, the DNA will generally require:

- A correctly completed PDD;
- An assessment of the project's environmental impacts;
- A demonstration of the project's contribution to the host country's sustainable development;
- A description of how the local stakeholders were consulted.

Once the host country has endorsed the project, it will issue a letter of approval stipulating that it:

- Accepts submission of project to the Executive Board for registration as a CDM project;
- Recognizes the project's contribution to the country's sustainable development.

The host country may request a portion of the credits that will be generated by the project. As credits

are distributed on a contractual basis, this issue should be discussed with the host country as soon as possible, as there will be repercussions for the project's financing.

#### › VALIDATION BY THE OPERATIONAL ENTITY

##### ›› What is validation?

Validation is the process of assessment, by an independent third party, of the appropriateness of the proposed CDM project's activity with regard to CDM conditions. The project developer is responsible for initiating the validation; he must contact an organization authorized to validate CDM projects, known as a Designated Operational Entity (DOE).

##### ›› The Operational Entity is responsible for validation

Only a DOE can validate a CDM project. These organizations are independent of the project developer and have been accredited by the Executive Board to perform the validation. A list of DOEs is available at: <http://cdm.unfccc.int/DOE/list>.

**The Marrakesh Accords specifically require international consultation for the validation of CDM projects. The Designated Operational Entity and the project developer will in this case share responsibilities.**

##### *The tasks of the Designated Operational Entity*

The DOE is responsible for the following tasks:

- The DOE must make the PDD public, which means it must be made available to the stakeholders and the NGOs accredited by the UNFCCC and published on the UNFCCC Website. An international consultation is specifically required for CDM project activities;
- The DOE must grant stakeholders 30 days, from the PDD's publication date, to make comments. The DOE must register the comments after they are received;
- The DOE must then report as to how the comments received were taken into account.

No decision has yet been made as to how to invite comments from stakeholders. The invitation will certainly involve the UNFCCC Website. Currently, because of the absence of an operational website, PDDs are generally published on the "Climate L" site: <http://www.iisd.ca>.

## Practical recommendations concerning the host country's approval

### What happens if the host country has not ratified the protocol?

To approve a CDM project, the host country must have ratified the Kyoto Protocol. This condition must be strictly observed, and an approval letter issued by a country that has not ratified will not be considered by the Executive Board. However, in certain cases, the project developer may wish to pursue the CDM process. To assess the risk exposure, the country's position towards the CDM should be verified. For example, the project developer could verify:

- The host country's participation in the Activities Implemented Jointly pilot phase;
- The national communication provided by the host country to the UNFCCC;
- The existence of guidelines or procedures for CDM project approval;
- The host country's climate change policy;
- The registration terms and conditions in the host country.

If it is clear that the host country is seriously planning to ratify the Kyoto Protocol in the very near future, it is possible to proceed with the project's preparation within the CDM framework. But if the host country has not yet begun the ratification process or is not involved in any of the above actions, the project's development process within the CDM framework should be postponed or cancelled.

### What is the difference between approval by the host country and registration by the Executive Board?

One must keep in mind that the roles of the host country and the Executive Board are complementary but distinct, and that approval by both is required to develop a project within the CDM framework. The host country's role is to decide whether the project contributes to the country's sustainable development, or other priority national objectives. It does not validate the project with respect to the CDM or assess the PDD, which fall within the competence of the Executive Board and the operational entities it accredits (Designated Operational Entities).

### Where can information on the host country and contacts be found?

It is recommended that the host country be contacted as soon as possible and the idea of developing the project within the CDM framework shared. The project developer will thus be able to determine whether there are specific conditions for CDM projects in the host country, as certain host countries could add criteria to the minimum eligibility requirements.

- The DNA should be contacted at once if the host country has instituted such proceedings: <http://cdm.unfccc.int/cdm/dna.html>; if no National Authority has been designated, the operator should contact the National Climate Change Focal Point: <http://unfccc.int/resource/nfp.html>.
- The Economic Department of the French Embassy can also be reached by French operators for any information on contact points or the host country's CDM policy.

Lastly, the consultation procedure conducted by the DOE is not to be confused with that led by the project developer with local stakeholders prior to validation.

### What are the required documents?

The project developer must submit the following documents to the DOE for validation:

- The PDD;
- The host country government's confirmation that the project meets to its requirements and is in line with its sustainable development strategy;
- Approval of the project by the host country.

In most cases, the operational entity will then make an on-site visit to meet the project participants and stakeholders, and verify the affirmations of the PDD. In some cases, depending on the project type and location, validation based

### Recommendations to facilitate the validation stage

When contacting a DOE, the following elements should be considered:

- Select the DOE with care. Certain operational entities may have more experience with specific project categories. By way of example, an entity may specialize in renewable energy or a specific host country. The list of DOEs is published on the UNFCCC website, but it does not specify whether a DOE has specific qualifications. The Executive Board does not recommend any particular DOE. The project developer is thus free to choose;
- When and how to contact the DOE? The DOE should be contacted as early as possible in the project development process, but not before the preliminary project examination is completed. The DOE will then draw up a schedule for the work;
- To facilitate the validation process, it is best to interact with the DOE throughout the process. For example, it might be useful to provide the DOE with outline versions of the PDD or its components, as they are drafted. In addition, sensitive issues and their handling should be discussed in advance with the DOE;
- It is preferable that the DOE carry out the validation process during the 30 days the PDD is published on the Website, so as to receive the stakeholders' comments. This will avoid waiting out the 30 days until all the comments have been received;
- The contractual arrangement with the DOE should specifically indicate which activities will be validated. The various problems that might occur should be contractually agreed upon in advance: a validation report of poor quality, a validation report refused by the Executive Board, the host country, etc.

Note that the same DOE cannot perform both the validation and the verification.<sup>a</sup>

<sup>a</sup> Except for small-scale projects.

solely on the documents may suffice, particularly for small-scale projects that use the standard UNFCCC methodologies.

Proprietary or confidential information obtained by the operational entity is not to be revealed, unless required under national law of the host country. The following information is not considered as proprietary or confidential:

- The determination of emission reduction additionality;
- The description of the baseline methodology and its application;
- The information used to prepare an environmental impact analysis.

**Based on a review of the documents and comments provided, the Designated Operational Entity will decide whether to validate the project. In the case of the CDM, the DOE must make the validation report public after submitting it to the Executive Board.**

### › REGISTRATION WITH THE EXECUTIVE BOARD

Registration with the Executive Board means that the project has been formally accepted as a CDM project activity. The request is submitted to the Executive Board by the DOE, in the form of two documents:

- The validation report;
- Approval of the host country.

**The project's registration with the Executive Board will be finalized no later than 8 weeks after the project's validation and submission, unless a review is requested.**

The DOE is responsible for the project's registration with the Executive Board. A copy of the registration request form should be obtained.

## 4. How are certified emission reductions obtained?

### › VERIFICATION BY THE OPERATIONAL ENTITY

#### ›› What is verification?

**The verification's main objective is to have an independent third party verify that the anticipated emission reductions were in fact achieved under the project. Verification is in fact a periodic and a *posteriori* review of emission reductions effectively measured, resulting in possible CERs.**

As with the validation process, the project developer must again contact a DOE, which will be responsible for the verification.

#### ›› The Operational Entity is responsible for verification

Verification is conducted by the DOE, which verifies the data collected by the developer, according to the monitoring plan's specifications. A list of Operational Entities is available at: <http://cdm.unfccc.int/DOE/list>.

The same DOE cannot conduct both verification and validation (except for small-scale projects).

#### ›› What are the documents required?

Verification is based on the data collected in accordance with the monitoring plan. Consequently, project developers must collect all the data indicated in the monitoring plan as soon as a project is operational.

#### ›› When should my project be verified?

The project should be verified periodically. There is no requirement as to frequency.

The frequency of verification audits can be influenced by the purchase agreement for certified emission reduction. Many purchase agreements are based on payment on delivery, which means that credits are not paid for until they have been verified. The purchase agreement will usually indicate the credit delivery periods, which will influence the frequency of verifications.

### › OBTAINING THE CORRESPONDING EMISSION REDUCTION CERTIFICATES

**Certification is an Operational Entity's written assurance that during the indicated period of time, a CDM project activity did in fact achieve designated and verified GHG emission reductions, in compliance with all the relevant criteria.**

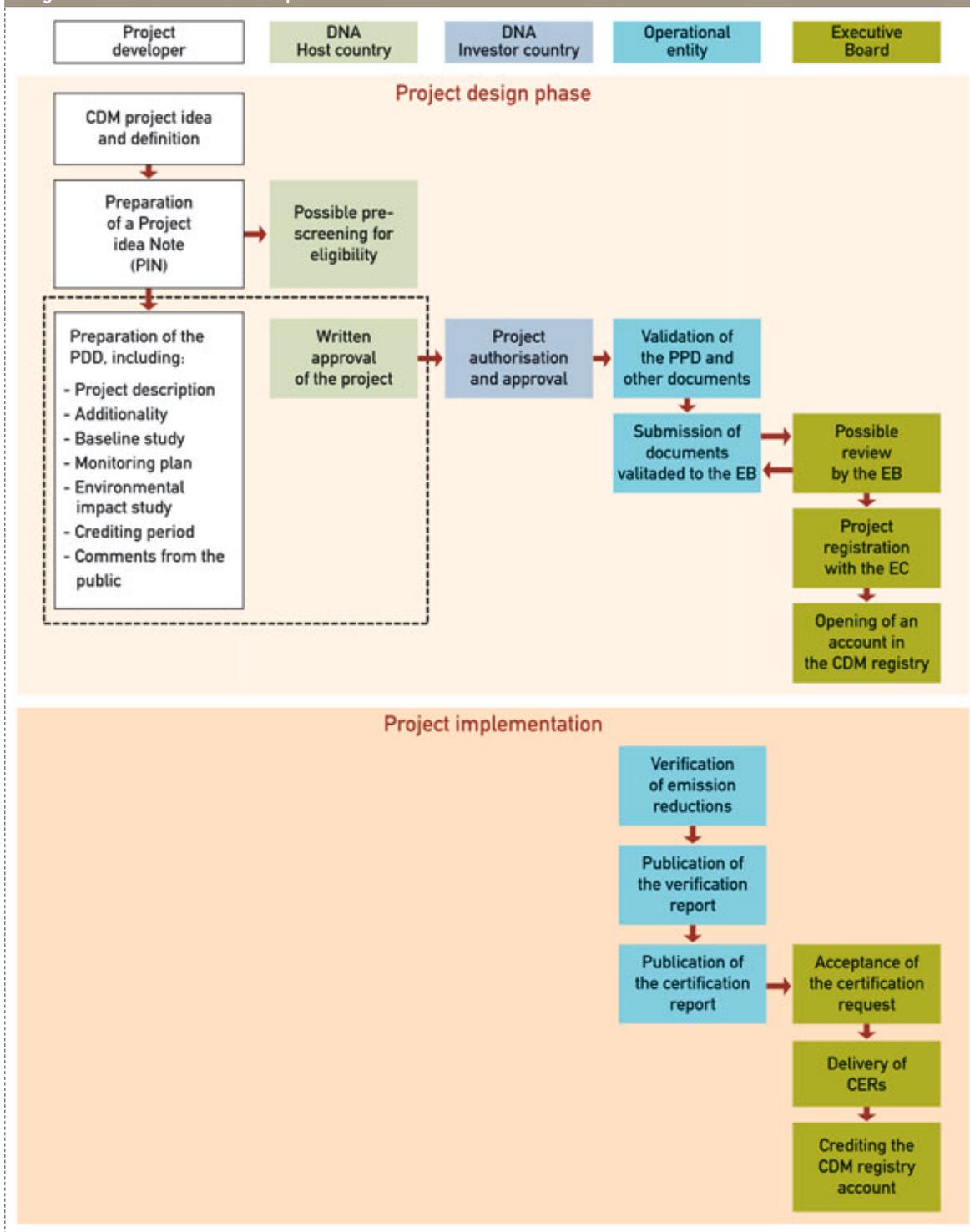
Unlike validation and verification, certification is solely the responsibility of the Operational Entity. The certification report prepared by the DOE must contain a request, addressed to the Executive Board, for the issue of a quantity of CERs corresponding to the quantity of verified emission reductions.

CERs are issued as soon as the emission reductions are certified by the Operational Entity. Once the issue of CERs has been approved by the Executive Board, the CDM registry director will credit the CERs

to the account listed in the PDD. Subsequently, according to the case, the CDM registry director may transfer ownership as a result of international obligations (contribution to the LDC fund for example), or potential contractual arrangements. This legal and technical issue has yet to be resolved.

In order to certify and issue CERs, certain key administrative procedures have to be finalized. For example, the status of Applicant Entity was recently created; the first OEs should be designated in the coming months.

Diagram 4 – Breakdown of responsibilities





VOLUME

B



## Part Three

**The methodological  
phase of a CDM  
project**





# The methodological phase of a CDM project

## In brief:

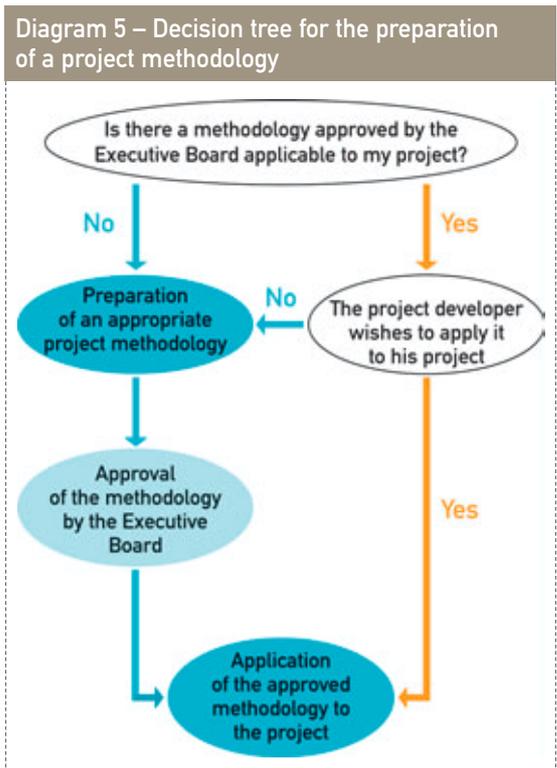
**A** CDM project methodology mainly comprises two phases: “Baseline and Additionality,” and the “Monitoring plan.” **The choice and application of a methodology and its consistency in the demonstration proposed by the operator are crucial to the project’s successful validation and registration.** The project developer can either formulate his own methodology to be approved by the Executive Board, or use a methodology that has already been approved and is applicable to his project.

The **baseline** for a CDM project activity is the scenario that reasonably represents the anthropogenic GHG emissions that would occur in the absence of the project. Demonstrating the **additionality** of the CDM project therefore means demonstrating that the project is not included in the baseline.

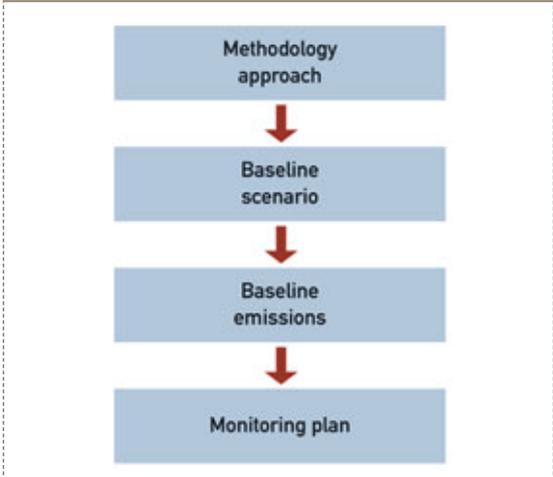
The **monitoring plan** defines a certain number of monitoring tasks to ensure that all of the GHGs emitted by the project are verified and quantified. The project must be continuously monitored to assess its **effective emission reductions** and provide the data required for their **verification** by the Designated Operational Entity (DOE).

This chapter covers project methodologies. A methodology mainly comprises two phases: baseline and additionality, and the monitoring plan.

As seen in the subsection “What is a PDD and how is it prepared?,” these subjects are at the core of the project design document. The choice of methodology and its application are one of the keys to successful project validation and registration.



**Diagram 6 – Components of a project methodology**



Before preparing a methodology, the decision tree shown in Diagram 5 should be consulted.

The preparation and approval of a project methodology requires time (particularly in terms of mandatory approval deadlines) and additional expertise in comparison to the application of an existing methodology.

The following paragraphs cover the steps in a project methodology’s preparation and application, the sequence of which is shown in Diagram 6. Consistency in overall reasoning must be maintained when substantiating the various components of the methodology.

## 1. Building up the baseline

The baseline is established with reference to a national or sectoral context including, for example, sectoral reform initiatives, local fuel availability, national power sector expansion plans, the economic situation in the project sector and previous actions.

There must be an assessment of the baseline emissions in the PDD. This chapter covers the baseline analysis and its purpose and how to complete the corresponding PDD sections. This procedure is essential and must be adhered to in a transparent manner in order to ensure the success of the project’s CDM phase.

### > WHAT IS THE PURPOSE OF THE BASELINE

**The baseline for a CDM project activity is the scenario that reasonably represents the anthropogenic GHG emissions that would occur in the absence of the project.**

The difference between baseline emissions and project emissions can be demonstrated by a simplified graph, as illustrated in Diagram 3. If the project generates net emission reductions, the project is considered as additional in terms of GHG emissions.

The development of a baseline is a relatively complex process that evolves as it proceeds, with corresponding uncertainties. The baseline being a theoretical construction, the project developer must rely on realistic assumptions to establish the most probable baseline without a project, using a variety of sources: statistics, reports, expert information, etc.

In accordance with the Marrakesh Accords, the baseline should be presented in a manner that is both:

- **Transparent:** The project developer must assess the various possible baselines in the “without project” situation. Based on all these hypothetical baselines, a specific baseline is chosen, and the choice must be justified. Formulae and calculations must also be detailed;
- **Conservative:** In the event of uncertainty concerning the values of the various parameters and variables, the values resulting in the least favorable baseline must be used.

The identified baselines should be illustrated in a graph representing each baseline emission level over time.

### › WHAT ARE THE RULES TO BE APPLIED IN ESTABLISHING THE BASELINE?

#### » Approach for developing a baseline methodology

The most important step in establishing a baseline is the choice of approach. The project

developer must elect one of the following three official approaches:

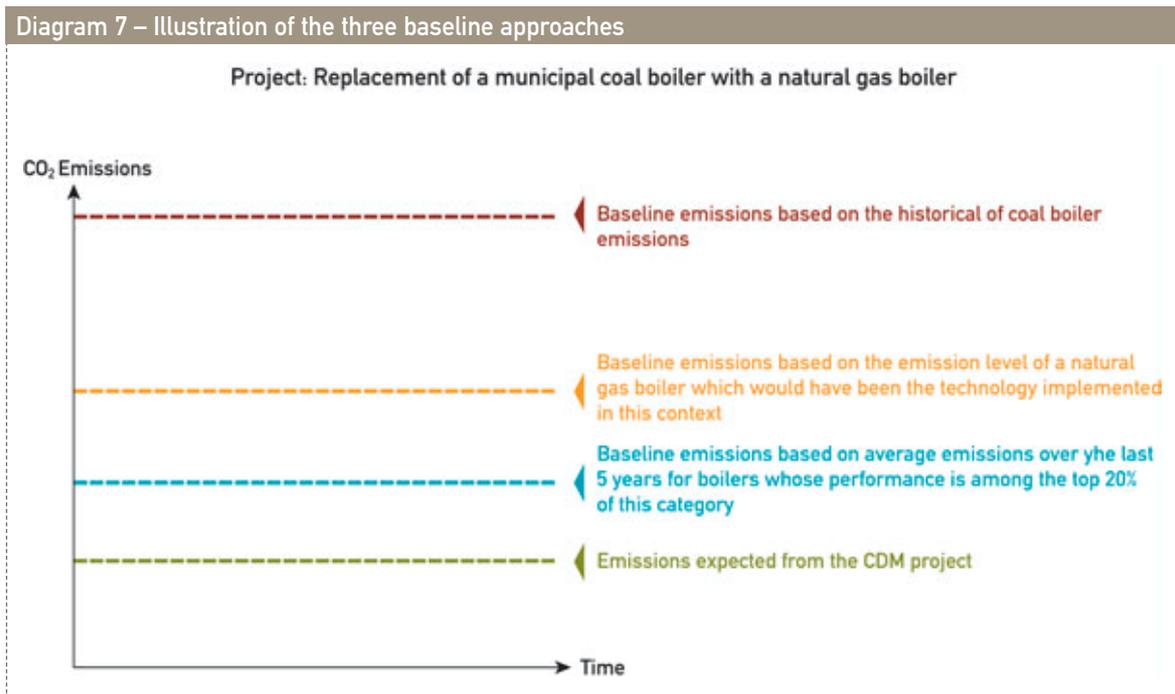
- A** Use the actual level of emissions at the time of consideration or the level of prior emissions, depending on the case;
- B** Use account the emissions thus obtained by using a technology representing an economically attractive course of action, given the investment barriers;
- C** Use average emission levels from project activities undertaken over the last five years that are comparable from a social, economic, environmental and technological perspective, and which are rated among the top 20% in their category.

A baseline methodology must be based on one of the three approaches. The methodology must describe, step by step, how the existing data was used to establish the baseline. For example, should a project developer decide to develop his baseline using the first approach, he can use the historical emission level and extrapolate it over the lifetime of the project.

The choice of approach should be justified in the PDD. In particular, the reasons why the other two approaches were not selected should be presented.

Here are some practical suggestions for developing a baseline methodology:

- All information on the methodology used for the baseline must be entered in section B of the PDD;



- A baseline methodology can be developed on a case-by-case basis. Before preparing a project baseline, the Executive Board should be consulted to determine whether approved baseline methodologies can be used directly for greater efficiency. This will avoid the preparation of a new methodology. Additional information and, specifically, a reference list of approved methodologies, can be found on the <http://unfccc.int/methodologies/PAmethodologies/approved.html> Website.
- It bears mentioning that the project developer is not obliged to use an approved methodology and is free to develop a new methodology. If such is the case, he must have it validated by the Executive Board.<sup>23</sup>
- Developers should check whether the host country has a predefined baseline or a preference in terms of applying a specific methodology.

#### Baseline assumptions – the Tremembé biogas project

The main factors considered to establish the baseline for the biogas recovery project in a controlled landfill are:

- Environmental legislation. Under Brazilian law, operators of controlled landfills are not required to burn or process biogas. The only environmental obligation is to control the biogas in order to prevent explosions. The burning of biogas, its active extraction, and the production of electricity are not mandatory in Brazil. The project developer does not anticipate any change in the law that could modify the current situation during the project's lifetime;
- “Business as Usual” for controlled landfills in Brazil, where most household waste is dumped in landfills that are largely uncontrolled. Very few facilities have biogas extraction systems, few sites have wells, and biogas is rarely burned. Unless there is a regulatory change, any volume of biogas incinerated or used as a combustible will be considered as an emission reduction source;
- The generation of electricity. According to a study published in June 2000 by the International Energy Agency, the average electricity emission factor in Brazil is between 50 and 100 metric tons of CO<sub>2</sub> equivalent/MWh, and for electricity generated using fossil fuel, the emission factor is 800 metric tons of CO<sub>2</sub> equivalent/MWh. These emission factors should not change over the project's lifetime. The impact of electricity production is nevertheless low in terms of GHG emission reductions.

<sup>23</sup> In the PDD's current version, the project developer must complete Annex 3 in order to submit a new methodology to the Executive Board.

#### » Project boundary

To determine which GHG emissions should be calculated and estimated to establish the project baseline and emissions, the project boundaries must be defined. The activities and GHG emissions included in the project boundary are:

- The activities to be included in the baseline and the emission calculations;
- The activities and GHG emissions to be monitored once the project is operational.

**The project boundary must reflect both the physical and geographical limits of the project and, in particular, the emission sources taken into account for the project's emission calculations.**

All GHG emission sources of the proposed CDM activity that are “under control” by the project developer, and which are “significant” and “reasonably attributable” to the project must be included in the project boundary.<sup>24</sup> These terms shall be interpreted as follows:<sup>25</sup>

- “What is considered ‘significant’ can be based on an absolute emissions level, relative to emission levels of other projects or total emission levels, or relative to the largest GHG impact of a project in that sector. For example, the guidelines for the Dutch ERUPT and CERUPT programmes suggest (as a rule of thumb) that emissions are significant if they are larger than 1% of the total emissions/emission reductions of the project.
- The principle of ‘under control’ implies that the project boundaries should be set in a way that they contain all relevant emission effects that can either be controlled or influenced by the project participants, and that are reasonably attributable to the project. Emissions from production, transport and distribution of primary fuels (oil, coal, natural gas) will not usually be included in the project boundary.
- Which emissions are ‘reasonably attributable’ to the project can be determined from a geographic point of view as well as from an activity point of view. Until further guidance is provided, the principle of control as described above should be used as a reference to define what can be considered reasonable.”

The project boundaries and the emission sources included and excluded therein should be repre-

<sup>24</sup> COP7 Draft decision, Article 12, Section G, Paragraph 52.

<sup>25</sup> Source: OECD, 2002, Developing Monitoring Guidance for GHG Mitigation Projects.

sented in a flowchart. There are four categories:

- **Direct on-site emissions.** These are emissions at the project site itself, including emissions from on-site fossil fuel or biomass combustion.
- **Direct off-site emissions.** This involves emissions that are directly related to the project activity but do not occur at the physical project site. “Directly related” is defined here as emissions one step upstream or downstream that are under the operator’s control. For example, this would include the sequestration of CO<sub>2</sub> in forests from which wood is extracted for the production of electricity using biomass or the prevention of fossil fuel combustion emissions in the case of improved energy efficiency.
- **Indirect on-site emissions.** These are emissions from activities taking place at the physical project site but which are only indirectly related to project activity, such as the transport of materials on site. If significant, these emissions should also be accounted for in the emission calculations. Specific attention must be paid to what is known as the “rebound effect.” This would involve, for example, an increase in production due to lower marginal production costs. The emissions due to the increased production should be included in the calculation, to take into account all project emissions.
- **Indirect off-site emissions.** These are emissions that do not occur at the physical project site and are not directly related to the project activity. If they are significant, they must be taken into account in emission calculations. By way of

example, in a renewable energy project, production of electricity avoiding fossil fuel is substantial. Examples are the emissions related to the transport of fuels to the project site, the construction of project equipment, and the extraction and production of fossil fuels used.

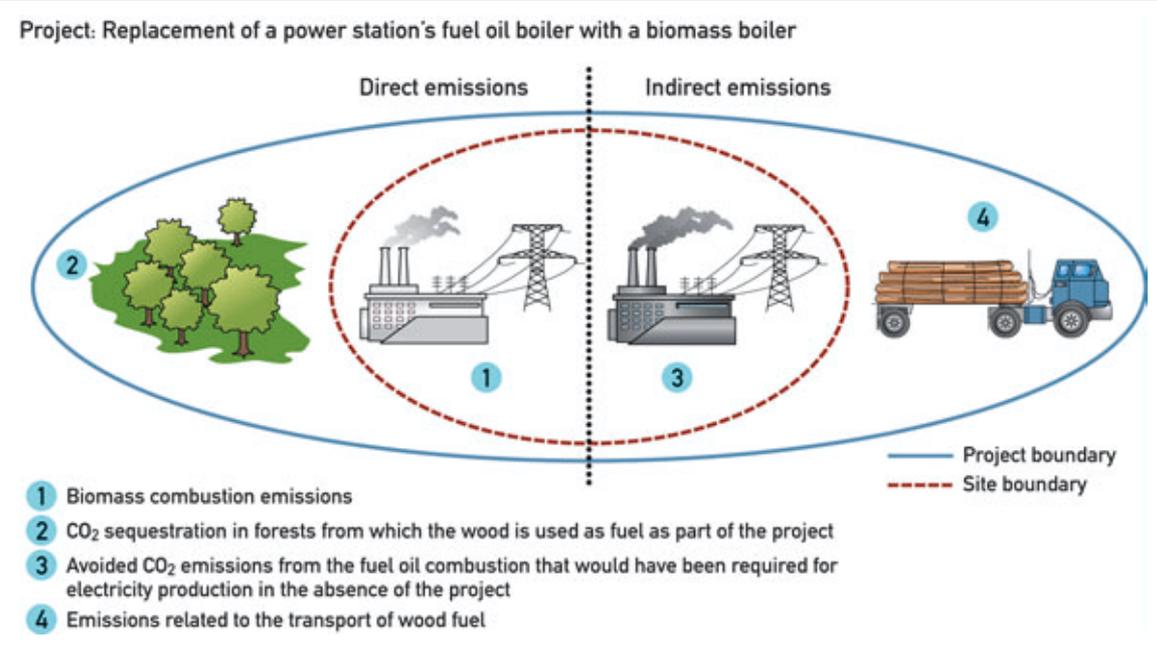
Diagram 8 and Diagram 9 illustrate two examples of projects and their boundaries.

### “Project boundary” or “System boundary”?

A frequent bone of contention is the use of the terms “project boundary” and “system boundary” in the English version of the negotiations. For an improved understanding of the Marrakesh Accords, and the various methodologies used to determine the baseline, it is important to make a distinction between these boundaries:

- The project boundary is its area of effect, where the emissions could be “reasonably attributable to the project.” For example, a project which uses biomass for electricity production would be responsible for the emissions released in the plant in addition to those relating to the recovery, transformation and transport of the biomass to the plant;
- The system boundaries for baseline analysis can in this case be much more extensive, since they must include all the potential emission sources that the project can replace or eliminate, or with which the project may compete. For the aforementioned Biomass project, the system boundary could be the national electricity grid, insofar as this new source of electricity will “displace” other more intensive sources of carbon.

Diagram 8 - Emissions within a project boundary



**Determining of project and system boundaries – the Tremembé biogas project**

*Project boundaries*

The project boundaries for a biogas recovery project in a controlled landfill are shown in Diagram 9.

The GHG emission sources identified in the project are as follows:

*Direct on-site emission sources:*

Uncaptured biogas: biogas contains methane, carbon dioxide, and traces of volatile compounds other than methane. This biogas is generated by the decomposition of household waste in a controlled landfill. The uncollected biogas gives rise to residual GHG emissions;

Biogas combustion: the combustion of biogas recovered in flare stacks or gas engines converts the methane into CO<sub>2</sub>. This is the project's primary method for reducing GHG emissions;

Use of fossil fuels: the current on-site back-up diesel engine will be replaced by a biogas engine.

*Indirect off-site emission sources:*

Electricity production: the production of electricity from biogas will subsequently generate indirect and additional emission reductions; local electricity production will avoid the production of electricity from fossil fuels.

*System boundaries*

As there is no outside involvement, the system boundaries are the project boundaries for Phase 1 of the project.

However, for Phase 2 of the project, the electricity generated from biogas will be transferred to the grid. The baseline system for indirect off-site emissions will be the local Brazilian grid.

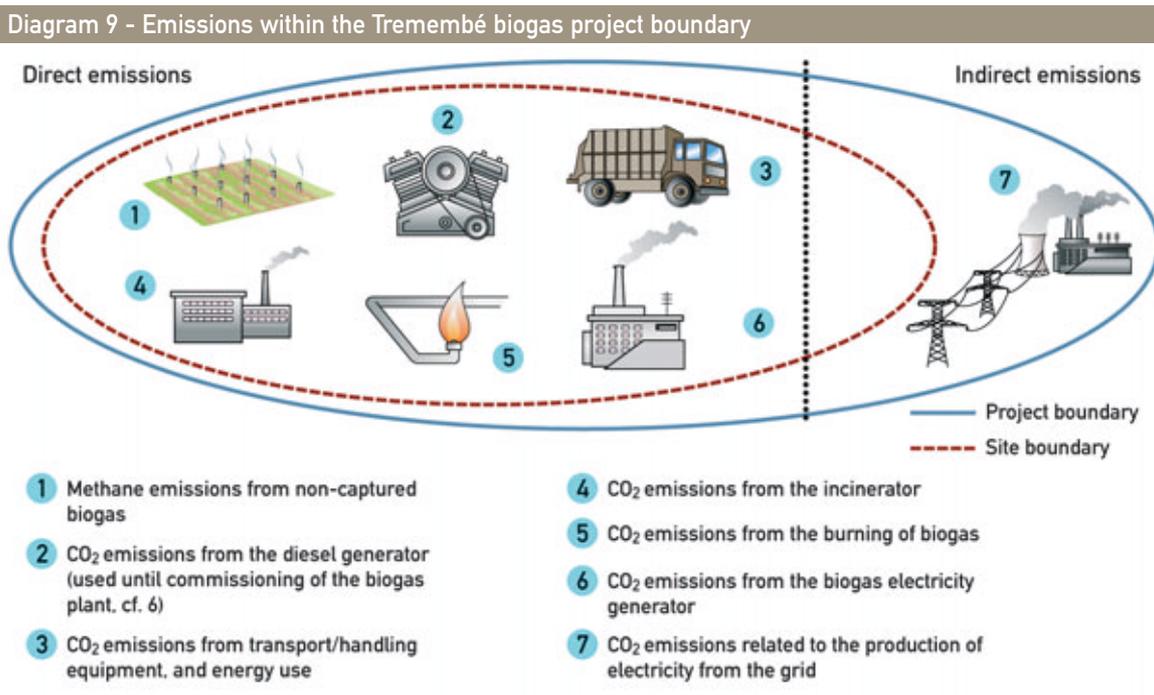
» Leakage

**Leakage is defined as the net change in anthropogenic emissions, by source of greenhouse gases (GHG), which occurs outside the project boundary, and which is measurable and attributable to the CDM project activity.**

It can be difficult to identify or control leakage since, by definition, leakage is excluded from the project boundary and is not necessarily under the control of the project developer. Nevertheless, the project developer will have to identify and assess any possible leakage, while taking into account the monitoring plan. Leakage is generally assessed in the monitoring phase and not in the project design phase, but should be identified in the design phase to be incorporated into the monitoring plan.

There are four possible causes of leakage:

- **Activity displacing.** The activities that caused GHG emissions are not permanently avoided, but simply displaced to another area. For example, a project developer sets up a power station that runs on biomass, thus replacing diesel generators. The diesel generators are sold to another entity, which uses them to produce electricity, thus emitting GHGs;
- **Outsourcing,** or the purchase or contracting of services or commodities that were previously produced or provided on-site: the emissions related to outsourced activities should be accounted for. For example, a foundry in China uses a fuel-



heated kiln and transforms it for conversion to electricity. On site, the new process will be clearly more efficient in terms of the thermal units per metric ton of cast iron; conversely, the project will require vast quantities of electricity produced by coal power stations, which emit high levels of CO<sub>2</sub>;

- **“Market” or “Outlet” effects.** Emission reductions are offset by higher emissions elsewhere due to project-induced shifts in supply and demand. These effects should be taken into account only when non-marginal. For example, the replacement of kerosene lamps by a domestic photovoltaic solar energy system may create leakage if the solar energy system users continue to use the kerosene lamps for lighting, and use the solar electricity to improve their living standards;
- **Changes in life cycle emission profiles:** changes in upstream or downstream processing as a result of the project’s implementation.

Leakage does not disqualify a project’s validity, unless projected GHG losses are potentially so substantial so as to negate a very large percent-

age of the projected GHG emission reductions from the core of the project case. In this case, all attempts should be made to formally incorporate the source of the leakage into the project boundaries and baseline.

#### For further information

For more information on establishing baselines:

International Energy Agency:

<http://www.iea.org/dbtw-wpd/textbase/papers/2002/roadtesting.pdf>

CERUPT programme:

<http://www.senter.nl/asp/page.asp?alias=erupt&id=i001003#Baselines>

PCF:

<http://carbonfinance.org/pcf/router.cfm?Page=Operations#Bas1>

Selon la méthodologie du Gold Standard :

[http://www.panda.org/downloads/climate\\_change/gspddfina120703.doc](http://www.panda.org/downloads/climate_change/gspddfina120703.doc)

## 2. Assessing project additionality

By definition, CDM projects have to “*result in a reduction in anthropogenic emissions by sources of greenhouse gases that are additional to any that would occur in the absence of the proposed project activity.*” There is still much discussion about the concept of additionality; however, it is obvious that the project developer must be able to reasonably demonstrate that the project does not constitute a likely baseline.

### › A TOOL IS ALREADY AVAILABLE

Among the first methodologies examined by the methodology panel in mid-2003, many gave rise to a request for clarification as to the difference between the project and the baseline.

In 2003, the Executive Board requested that the methodology for establishing a baseline should include general procedures that can be used by the project developer to assess whether the proposed project is additional or not. In 2004, the Executive Board, with assistance from the methodology panel, developed a tool to help project developers to demonstrate the additionality of a project by applying a 5-stage test.

To be demonstrate additionality, a project has to pass stages 1, 4 and 5, as well as either stage 2 or stage 3, as shown in Diagram 10.

**Stage 1:** Identifying alternatives to the project.

This stage is used to identify alternative scenarios to the project that are both credible and realistic, by considering the following alternatives at least:

- The proposed project outside the CDM;
- All other alternatives to the project that produce equivalent goods or services;
- Maintaining the status quo.

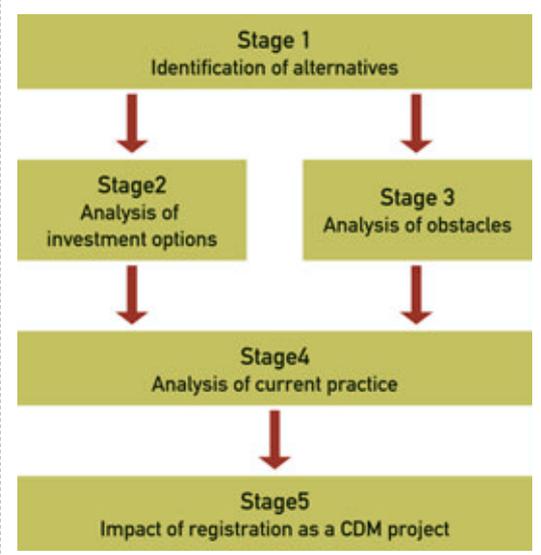
All alternative solutions have to be examined in the light of the entire legal and regulatory framework in force in the host country, even if the legislation applying to them does not aim to reduce GHG emissions. All solutions obviously have to be shown to comply with applicable legislation.

If the only alternative is the proposed project, it is not additional.

**Stage 2:** Identifying investment options.

For the developer, the aim is show that among all the scenarios identified in Stage 1, the proposed project is not the most financially or economically attractive. This may be done through:

Diagram 10 – Stages in demonstrating the additionality of the project



- A straightforward cost analysis, if CERs are the only benefits expected from the project (option I);
- If not, a comparison of financial indicators should be made:
  - Either par comparing financial indicators for the alternatives to the project proposed (option II);
  - Or with a “benchmark” test using an appropriate financial indicator to evaluate the standard value of that indicator in similar projects (option III).

Option II (comparison) and Option III (benchmarking) should be supplemented by analysing the sensitivity of the investment analysis.

#### Stage 3: Analysis of obstacles.

The project developer has to identify obstacles that a) prevent the project from going ahead if it is not registered as a CDM project, and b) allow one of the alternatives to be implemented instead. Such obstacles will include:

- Obstacles to investment: e.g. no loan can be secured, or the project does not have access to finance from international markets;
- Technological obstacles: e.g., lack of suitably qualified manpower or lack of suitable infrastructure;
- Obstacles arising from prevailing practice: e.g., no similar project is operational in the geographical zone under consideration.

#### Stage 4: Analysis of usual practice.

This stage supplements the two previous stages. First, similar projects in terms of geographical area, technology, size, access to financing, etc. have to be

identified (other CDM projects should obviously not be included). Secondly, the main differences between these projects and the project proposed for the CDM should be explained, in order to show the latter’s additionality.

#### Stage 5: Impact of project registration as part of the CDM.

The final stage is where the developer has to show how the registration of the project as part of the CDM – and thus the benefits expected from registration – will remove the obstacles identified in Stage 2 and / or Stage 3, and will therefore allow the project to go ahead. Expected benefits could include:

- Sales of CERs;
- Possibilities for attracting new investors;
- Possibilities for attracting new technologies;
- Reduced inflation and currency risks for investors.

The Executive Board has designed the structure of this analysis tool to give project developers a clear idea of the steps they need to take and the studies to be conducted upstream to demonstrate a project’s additionality. Ultimately, the tool is of significant help in removing the uncertainties associated either with the development of a new methodology or the application of an existing one.<sup>26</sup>

### ► LIMITATIONS OF THE TOOL

In some circumstances, demonstrating additionality is simple and obvious, especially when the only benefit of a project lies in obtaining CERs,<sup>27</sup> for which (i) no regulations exist or are likely to be implemented to reduce GHG emissions, (ii) project implementation requires even modest investment. Similarly, the additionality of a project using technology that has not yet been implemented in the country concerned is unlikely to raise many problems.

Nevertheless, additionality – and therefore its assessment – is still subject to different interpretations. Some parts of the assessment depend on subjective factors that are not necessarily perceived by all those concerned in the same way. This is true in particular of most projects based on approved methodologies requiring the three types of analyses described above: investment analysis, assessment of obstacles

<sup>26</sup> Executive Board 2004, *Tool for the demonstration and assessment of additionality*, available at <http://cdm.unfccc.int/EB/Meetings/016/eb16repan1.pdf>.

<sup>27</sup> It is in particular the case for HFC decomposition projects, including thermal or catalytic destruction of N<sub>2</sub>O or of recovery and burning of CH<sub>4</sub>.

preventing project implementation and assessment of current practice. Each of these types of analysis is based on qualitative or quantitative assumptions that are necessarily subjective:

- In the investment analysis (options II and III), the most relevant financial indicator, or “benchmark” (Option III): the method chosen to evaluate the standard value of the financial indicator;
- In the analysis of obstacles to project implementation, whether financial, technical or institutional: the point where an obstacle becomes significant;
- In the analysis of usual practice: the reference sample to be used to assess usual practice and the rate of penetration at which a practice is considered to be “usual.”

### Large-scale projects are given particular attention

The more significant the emission reductions generated by a project, the more stringent the requirements of the different participants (Executive Board, DNA and countries concerned, DOE, international observers) are likely to be as to rigorous preparation of project documentation. By way of example, a project called “Thermal oxidation of HFC<sub>23</sub> in Gujarat, India,” which was validated in August 2004 and submitted to the Executive Board for registration, was suspended, pending revision.<sup>a</sup> The revised version must be finalised at the latest by the time of the second meeting of the Executive Board following the request for revision.

The two main reasons given for the revision request were (i) missing documentation for the registration procedure and (ii) **GHG emissions not included in Annex A of the Kyoto Protocol were not taken into consideration.**<sup>b</sup>

#### Lack of compliance with the procedure

The documentation required for registration of a project under the CDM includes a document issued by the relevant governments authorising each of the project participants to participate in it, and written consent from each government, via their DNA, to voluntary participation in the CDM project. In the case of the Gujarat project, only the Japanese government’s authorisation to the Japanese company participating in the project was transmitted to the Executive board. The authorisations from the British, Dutch and Indian governments were not presented, and neither was a written agreement from the Dutch DNA.

#### Was leakage taken into consideration?

The PDD has to explain how leakage is taken into account in project emissions. Leakage can occur for several reasons, including “market” or “outlet” effects. Leakage of this type would occur, for example, in a project for the conversion of a fossil fuel boiler to fuelwood, if the conversion, for any particular reason, allows production - and therefore fuel consumption - to increase: the leakage would be represented by the CO<sub>2</sub> emissions from the transport of additional fuelwood and from the CO<sub>2</sub> and CH<sub>4</sub> emissions produced by its fermentation. Both CO<sub>2</sub> and CH<sub>4</sub> are included in Annex A to the Kyoto Protocol.

In the case of the Gujarat project, the production of HCFC<sub>22</sub> (CHF<sub>2</sub>CL) generates HFC<sub>23</sub> (CHF<sub>3</sub>) as a by-product. Both gases are powerful greenhouse gases,<sup>c</sup> but only HFC<sub>23</sub> is included in Annex A to the Kyoto protocol. Recovery of HFC<sub>23</sub> is difficult, which means that it is usually released into the atmosphere with residual HCFC<sub>22</sub>. The Executive Board therefore needs answers to two questions:

- Will the project proposed for the CDM promote higher HCFC<sub>22</sub> production than in the baseline, thus increasing emissions of residual HCFC<sub>23</sub>?
- Can the project determine whether the increase in HCFC<sub>22</sub> emissions, which is not included in Annex A to the Kyoto Protocol, constitutes leakage in the acceptance of the CDM?

If the answer to both questions is “yes,” then the leakage is not accounted for in the project and its boundaries will have to be altered to include it.

#### Drawing conclusions

For this project developer, and even more so for those developing large-scale projects in terms of emission reductions, this example has at least two implications:

- Developers must check that they are submitting all the documents required by the Executive Board to register a project. Although it is true that the DOE theoretically checks off the list of documents at the time of validation, the Executive Board is not a purely administrative body and it should be expected to take an active part in maintaining the environmental integrity of the mechanism by properly applying the approved project methodologies;
- When drawing up the project’s emission monitoring protocol, great care must be taken in estimating “leakage,” by using the most pessimistic assumptions. “Leakage” is often slight in relation to the emission reductions generated by projects, and will only have a minor impact on the project’s value for the developer.

<sup>a</sup> Rules for revision requests have been defined by the Marrakesh Accords (COP7, Article 12, paragraphs 41 and 65), and specified by the Executive Board. For further details, see <http://cdm.unfccc.int/EB/Meetings/016/eb16repan5.pdf>.

<sup>b</sup> The GHGs included in Annex A to the Kyoto Protocol are those concerned by commitments to quantified emission reductions or limitation: CO<sub>2</sub>, CH<sub>4</sub>, N<sub>2</sub>O, and the HFC, PFC and SF<sub>6</sub> groups.

<sup>c</sup> According to the second and third IPCC assessment reports, the 100-year GWP for HFC<sub>23</sub> is 12,000 and 1,700 for HCFC<sub>22</sub>.

### 3. Assessing emission reductions

#### > BASELINE CALCULATION

The baseline emissions correspond to the quantitative assessment of baseline scenario emissions.

##### Baseline emissions – the Tremembé biogas project

The biogas produced by the controlled landfill was estimated by the project developer's internal research department based on its simulation model. This estimate is used to assess baseline emissions, and therefore theoretical emission reductions, in order to provide an approximate figure. However, the certification and issuance of CERs will be based on the measured quantities of biogas captured and burned on site.

The model used is a kinetic model, with four key parameters:

- The quantity of waste;
- Its characteristics, particularly the organic carbon content;
- Typical duration of methanization;
- Waste temperature.

Baseline emissions will also depend on the lifetime of the site.

The values chosen for these parameters were based on existing data or conservative estimates.

It is important to present clearly and in a transparent manner all the assumptions used to determine the baseline (emission factors, emission projection models, etc.) and their specific origin.

The following parameters should be specified:

- The baseline calculation parameters, which will remain fixed over the entire duration of the chosen accounting period (e.g. the emission factor for baseline activities replaced by project activities);
- The variable parameters taken into account in the monitoring plan (e.g. the volume of project activity). However, the baseline must initially be calculated *ex ante* before being adjusted with these variable *ex post* parameters.

#### > PROJECT EMISSION CALCULATION

To determine the financial viability of the proposed project, future emissions related to the project activity must be estimated at the outset.

As for the baseline, project emissions must be estimated and calculated in a transparent manner for the entire duration of the chosen crediting period.

By way of example, emissions can be estimated as follows:

Table 5 - Example of an emission reduction calculation table

An 8-MW power station project uses biomass as fuel. Its emissions are therefore considered nil.

The baseline applied to the next seven years corresponds to the national electricity expansion plan implemented by the electricity company at lower cost. In a local context, this biomass project, despite its innovative nature, would not have been chosen on account of its relatively high KW installation cost.

Every year, the baseline depends on the average emission coefficient of the grid's power stations. The project developer has detailed information (commissioning and closure of power stations) for the first seven years of the project's life, corresponding to the initial crediting period. For the subsequent years, he has taken the emission factor for the seventh year as the baseline, in order to estimate the emission reductions that the project could generate, it being understood that the baseline will be reviewed for each new crediting period.

Year	Grid emission coefficient (kgCO <sub>2</sub> /MWh)	Annual project production (MWh/year)	Avoided emissions (metric tons of CO <sub>2</sub> equivalent)	Total emission reductions (metric tons of CO <sub>2</sub> equivalent)
2002	315	20,400	6,426	6,426
2003	310	36,700	11,377	17,803
2004	335	36,700	12,295	30,098
2005	315	36,700	11,561	41,658
2006	290	36,700	10,643	52,301
2007	280	36,700	10,276	62,577
2008	260	36,700	9,542	72,119
2009	260	36,700	9,542	81,661
2010	260	36,700	9,542	91,203
2011	260	36,700	9,542	100,745
2012	260	36,700	9,542	110,287
2013	260	36,700	9,542	119,829
2014	260	36,700	9,542	129,371
2015	260	36,700	9,542	138,913
2016	260	36,700	9,542	148,455
2017	260	36,700	9,542	157,997
2018	260	36,700	9,542	167,539
2019	260	36,700	9,542	177,081
2020	260	36,700	9,542	186,623
2021	260	36,700	9,542	196,165
2022	260	36,700	9,542	205,707
<b>Total</b>		<b>754,400</b>	<b>205,707</b>	

- For energy projects, direct on-site emissions are calculated by multiplying the project output by the project emission factor. Direct off-site emissions are calculated similarly;
- For end-use energy efficiency projects, project emissions can be calculated by multiplying an activity parameter (i.e. reduction in energy used, reduction in transmission and distribution losses, etc.) with the appropriate emission factors.

**Tremembé biogas project emissions**

The project emissions will depend on the same key parameters as the baseline, but with the addition of an essential criterion: the extraction efficiency of the degassing network.

**› NET EMISSION REDUCTIONS**

The net emission reductions generated by a project are calculated by subtracting the total project emissions from the baseline emissions and adjusting for leakage. Calculations should be made for each year in the crediting period and expressed in metric tons of CO<sub>2</sub> equivalent. As for the other calculations, all numbers and assumptions must be transparent.

**Net emission reductions =**

- + Baseline emissions
- Project emissions
- Leakage

**Net emission reductions – the Tremembé project**

The emission reductions are effective as they are taken into account – in addition to the theoretical calculation from the production model – based on the regular readings performed on the site.

The methane collected from the biogas recovery project is then burned, and destroyed, in an incinerator which recovers the heat produced to effectively treat leachates (fluids), which are potentially very harmful to the environment if not treated.

The combustion efficiency of flare stacks, the incinerator, and the gas engine is almost 100%. All the captured and burned gas volumes can therefore be used as a calculation basis for the metric tons of CO<sub>2</sub> emissions avoided through the project's development.

The following information is necessary for the calculation of net reduction emissions relating to biogas combustion:

- The molecular mass of methane is 16g/mol;
- The molecular volume of a gas under normal temperature and pressure conditions is 22.4L/mol;
- The global warming potential of methane is 21.

The emission reductions in metric tons of CO<sub>2</sub> equivalent are as follows:

$$\text{Emission reductions} = \frac{\text{Volume of biogas recovered in Nm}^3 \times (16 \times 10^{-6} \text{ t/mol} \times 1000 \text{ L/Nm}^3)}{22.4 \text{ L/mol}} \times 21$$

plus the reductions relating to the diesel combustion that was avoided for the electricity generator.

Diagram 11 – Design of the Tremembé biogas project baseline

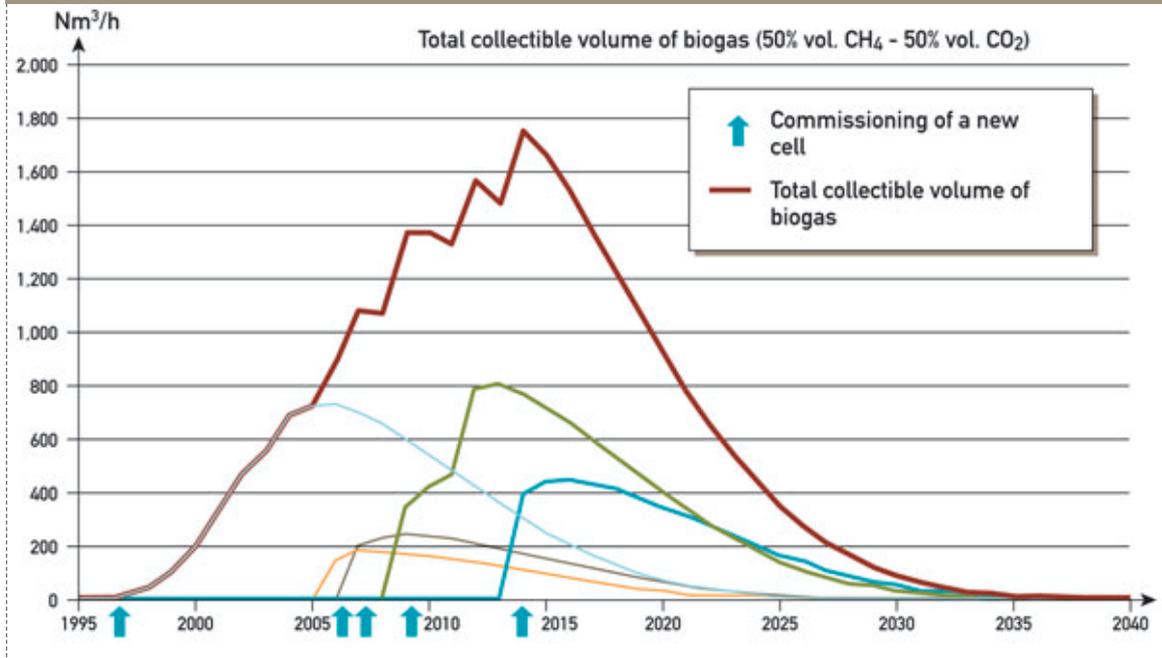
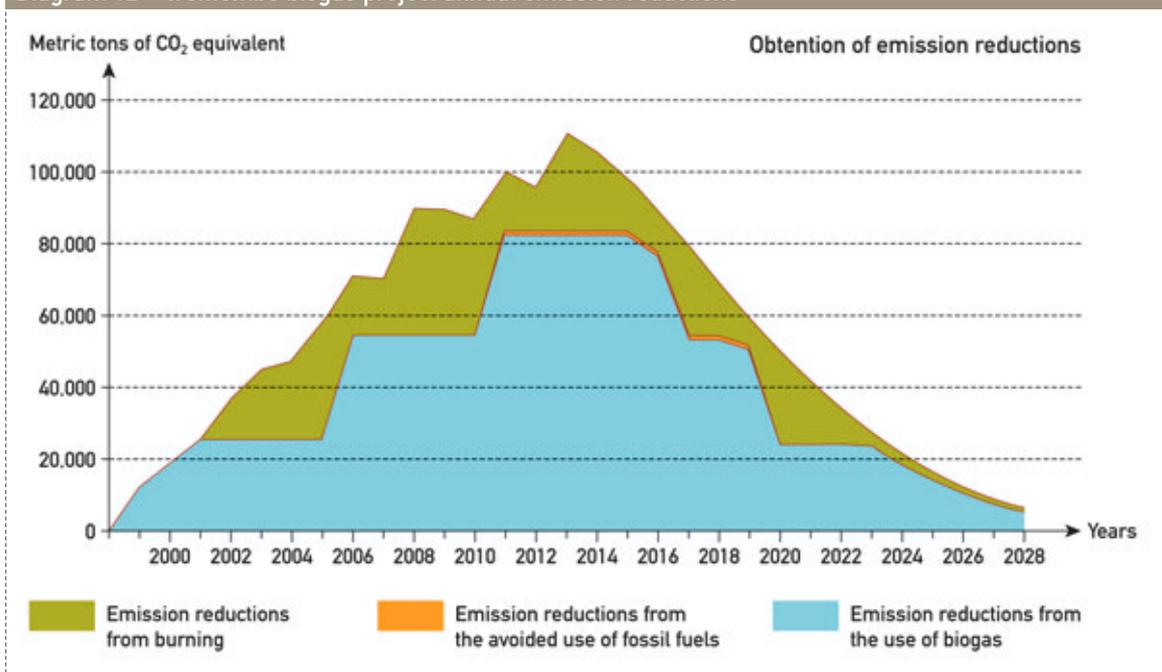


Diagram 12 – Tremembé biogas project annual emission reductions



## 4. Setting up a monitoring plan

Project developers need to develop a monitoring plan as part of their PDD. The monitoring plan outlines how data will be collected from the project once it is operational. The project developer is responsible for the design and implementation of the monitoring plan. Once the project is operational, the monitoring results collected will be sent for verification to the DOE.

The monitoring plan should provide for the collection and archiving over the entire duration of the crediting period of all relevant data necessary for:

- Estimating and measuring project-specific GHG emissions within the defined project boundary, as presented and validated by the Executive Board of the CDM;
- Identifying increased emissions outside the project boundary.

It should be noted that the baseline methodologies and the monitoring plan are related, since they must be proposed and approved together. Should the project developer wish to use a different baseline methodology and monitoring plan combination, he must submit a proposal to the Methodology Panel.

Furthermore, the monitoring plan design should be as simple as possible in order to reduce the future costs of verification to a minimum.

### › WHAT ARE THE CRITERIA FOR THE MONITORING PLAN?

**The monitoring plan defines a number of monitoring activities which ensure that all project GHG emissions are checked and quantified. The project must be continuously monitored to quantify its actual emission reductions.**

The monitoring plan is a guide which lists the procedures involved in project monitoring: main project indicators and monitoring of environmental impacts.

The monitoring plan is designed to meet the terms and conditions laid down by the Kyoto protocol, which stipulates that CDM projects must generate real measurable long-term emission reductions.

### › CONTENT OF THE MONITORING PLAN

Project developers are responsible for the monitoring methodology that they intend to use, but

Table 6 – Components of the Tremembé biogas project monitoring plan

Component	Monitoring parameter	Method/Instrument	Frequency
Sink	A) Pressure in the sinks	A) Portable analyzer	A) Daily
	B) Gas stream in the sinks	B) Portable analyzer	B) Daily
	C) Biogas concentration in methane, CO <sub>2</sub> and oxygen	C) Portable analyzer	C) Daily
Leachate incinerator	A) Gas stream	A) Cumulative meter	A) Continuous
	B) Steam temperature	B) Thermal probe	B) Continuous
	C) Volume of leachates	C) Flow meter	C) Continuous
	D) Emissions	D) Analysis	D) Defined by the Brazilian Environmental Agency
Flare stack	A) Gas stream	A) Moving plate	A) Daily
	B) Combustion temperature	B) Thermal probe	B) Continuous
	C) Emissions	C) Analysis	C) Defined by the Brazilian Environmental Agency
Collection system inspection	A) Biogas collection network integrity	A) Visual inspection of the network	A) Daily

the following suggestions will help them to ensure that their monitoring plans are based on well-founded techniques and a robust data collection strategy. The main points for consideration are as follows:

- Description of the monitoring process: this description must provide an overview so as to ensure that the collected data is exhaustive, consistent and reliable;
- Identification of GHG sources: the identified sources must be mentioned, particularly which ones will be monitored and the reasons for this choice;
- Proposed measurement methodologies: measurement methodologies, based on well-founded techniques for each GHG source and type, must be defined. These methodologies must be approved by the Executive Board. If a different measurement protocol is used, the project developer must provide a description of the methodology, an assessment of its advantages and disadvantages, and specify whether or not it has been successfully applied to other scenarios;
- Collection strategy: suitable collection methods must be formulated to provide data with the desired accuracy;
- Data archiving and retrieval: the data must be securely stored and easily accessible to facilitate its verification. Procedures should be defined, stating the duration over which the data must be preserved;

### Monitoring content – the Tremembé biogas project

The project developer already monitors the gas extraction system using the grid instruments, so as to ensure regular optimal functioning. The data collected is used as the basis for the verification of emission reductions. In particular, flow measurements before the flare stack and evaporator provide for an accurate calculation of the effective emission reductions.

In addition, the following information is also measured on site, so that it can be incorporated into the model:

- The volume covered by the controlled landfill: topographical readings are performed every year to determine the volume used and the capacity not used by the controlled landfill project;
  - Waste tonnage: the waste entering the site is weighed;
  - Waste composition: the waste accepted on site must be classified according to its composition, the significant criterion being the waste's organic carbon content.
- Quality assurance/quality control: the stages to guarantee quality control must be defined, and written reports on the results of the internal account verifications must be prepared;
  - Procedures for the calculation of emissions and total emission reductions: the aim of the monitoring plan is to assess the emission reductions generated by the project. The process explaining how the data required for the calculation of the prevented emissions is gathered and processed must be covered.

VOLUME

B



## Part Four

**The contractual  
and legal phase  
of the CDM project**



# The contractual and legal phase of the CDM project

## In brief:

**W**ith respect to the project mechanisms, the **Kyoto Protocol**, under Articles 6 and 12 that provide for Joint Implementation (JI) and the Clean Development Mechanism (CDM) respectively, only refers to the “Parties,” i.e. the States that will have ratified it. It **does not specify any predetermined scope and legal rights** with regard to implementation **for the “legal entities”** (companies, NGOs, local authorities, etc.) likely to initiate actual CDM projects. On the face of it and by extension, it does not refer to any direct relationship between the “legal entity” that initially generated the GHG emission reductions (CER credits in the case of the CDM) by implementing a project, and the “recovery” of these same credits (under purchase conditions, as in the case of the CERUPT program implemented by the Netherlands, which comply with public procurement regulations within the European Union) by the State-“Party” according to the Protocol under whose jurisdiction they fall. This depends on the national decisions made by the various States having made commitments in respect of the Protocol (see Volume A of this guide).

Having said this, it **nevertheless remains incumbent upon each CDM project developer to negotiate the sharing between himself and his partners of the “CERs” to be generated**, once the project has been validated by the CDM Executive Board, and in the course of verifications stipulated in the PDD and submitted to the Executive Board.

The CER holder, whether this is the government of the project’s host country (which is also entirely free to negotiate the ownership of a portion of the CERs), a “legal entity” under the jurisdiction of the latter or a different “legal entity” (under the jurisdiction of the country where it has registered a corporate name, i.e. in most cases the investor), can choose between **various options regarding the use of these credits**. For a “legal entity” subject to quantified GHG emission control objectives in its own country, particularly under the European Union Emissions Trading Scheme (see Volume A), **the choice of the most efficient means of using credits, from an economic and financial point of view, will be arbitrated**.

## 1. Negotiations for credit sharing

In many projects (concession agreements, joint ventures, biomass projects assuming development of the wood industry and investment in wood boilers, etc.), several operators will be involved in the project as a whole. Who can therefore claim ownership of the CERs generated by the project?

The Kyoto Protocol provides only two indirect responses to these general questions: on the point when the CERs, issued by the CDM Executive Board, and following CDM registration, can be transferred from the Executive Board to a third party, whether a government or private entity, and on the eligibility conditions for the transfer of CERs to an Annex 1 register. The Kyoto Protocol states that an Annex 1 country can only acquire CERs if it has:

- Ratified the Kyoto Protocol;
- Calculated its Assigned Amounts;
- Set up a national register;
- Set up a national system for the estimation of GHG emissions;
- Submitted an annual national inventory of its GHG emissions to the UNFCCC;
- Submitted additional information for the Assigned Amounts.

Few countries are likely to meet these conditions before 2007;<sup>28</sup> CERs are unlikely to be obtained before this date. Private or public operators

wishing to obtain CERs must therefore wait until the countries where they wish to recover CERs have completed all these procedures.

**However, as the Kyoto Protocol does not define any standard rules on ownership and credit sharing, it is essential that the problem is solved contractually.**

Although CERs cannot yet be officially issued by the CDM Executive Board (at the time of writing), the problem of credit ownership should be resolved upstream with all project participants by means of a contractual arrangement stating the future distribution of CERs among the various project partners. It should therefore be noted that determining the project boundaries is a key phase for calculating emission reductions and identifying the operators who may be involved in credit sharing.

In particular, the policy applied by the host country regarding this issue should be verified.

<sup>28</sup> For France, these obligations could be met as from 2006. This will have to be confirmed in good time with the authorities concerned.

## 2. Using “carbon credits”

There are two main possibilities for the project developer:

- The developer may decide to keep the credits and register them in a registry account of his choice. He can then use them at his convenience, in particular, to demonstrate his compliance with his emission obligations (e.g. a developer subject to the European Directive on emission allowances);
- The developer may decide to sell the credits on the market when he no longer needs them.

The various conditions of sale are described in

the following paragraphs. However, it should be noted that the developer can decide, based on his initial search for financing, to include in the project's cash flow statement the expected credit amounts and the estimated income from their sale, which in fact correspond to additional financing flows. In this instance, he may even find, prior to project implementation, a buyer with whom he can set up a purchase agreement and who will ultimately receive the credits issued by the CDM Executive Board. The credits are then accounted for in the project's financial set-up.

### 3. Setting up an emission reduction purchase agreement

The emission reduction purchase agreement must set forth the terms and conditions of credit delivery and payment between the seller (the project developer) and the buyer.

This is a standard contractual relationship, designed to cover the legal aspects of credit ownership, the terms of payment and delivery and the management of risks inherent to the transaction, i.e.:

- Risks inherent to all projects: “country” risk, foreign exchange and inflation risk, etc.;
- Risks specific to the CDM phase of the project: the risk of default (the project is not implemented/or does not generate the expected CERs); deadline risk; counterparty risk (the CER buyer withdraws or is in default);
- The contract, to which the PDD must be appended, must also include the following information:

- *Compliance with national and international requirements* (these are conditions precedent to the completion of the transaction);
- *Description of the purchase agreement’s purpose* (type of allowances, quantity, year, etc.);
- *Initial ownership of the credits generated by the project*: this results from negotiations between the project stakeholders, as from the preparation of the PDD if possible;
- *Allocation of risks and guarantees*;
- *Purchase conditions* (price, terms of delivery, etc.), generally listed in an annex;
- *Standard clauses*: commitments of the parties, indemnity clauses, default, termination clause, confidentiality, dispute resolution, taxes (including specific CDM expenses: Executive Board registration fees and adaptation fees).

### 4. Terms of payment: the various options

There are different types of credit purchase agreements depending, in particular, on:

- The type of project;
- The state of progress;
- The general organization;
- The risks;
- The rating of the stakeholders in the transaction.

**In the following paragraphs, the project developer is assumed to be the owner and therefore the seller. This may not necessarily be the case, which is the reason why the agreement must contain an ownership clause.**

#### › FIRM PURCHASE

##### » With advance payment

This type of purchase is the most highly sought by developers, insofar as they provide the best guarantee for income from emission credits income.

From the buyer’s perspective, these terms of payment correspond to a loan (payment for goods received at a later date) and therefore a high-risk situation (risk that the project will not be implemented, deadline risks, risks on the amount and quality of credits, etc.).

This type of agreement must therefore include strong guarantees for the buyer, which will be reflected in a lower purchase price, the standard consideration for high risk. In the event of market pressure, and therefore a higher price for emission allowances or credits, the project developer will lose out.

##### » Payment on delivery

In the case of payment on delivery, the buyer contractually undertakes to purchase the credits once they have been transferred by the host country or issued by the Executive Board. These terms combine security for the seller and reduced risk for the buyer.

The credit purchase price is defined in the

agreement: it can be fixed or variable, which generates different levels of risk for either party.

» **Fixed price**

The number of credits delivered is stated in the agreement, as is the frequency of delivery (most often annually), date of delivery to the buyer's account, and the price, expressed in the chosen currency, which can be indexed to inflation.

Pursuant to international laws, a clause must be drafted to manage the baseline review and its consequences for the delivery clauses.

» **Variable price (market indexed)**

In this type of contract, the price is expressed as a formula which correlates the purchase price with the market price of the credits. For example, this may refer to the average recorded during the year, the median, the highest price, or any other type of correlation.

The indexed price can nevertheless be contained by stipulating a ceiling and a threshold in the agreement, or by limiting the annual growth rate.

» **CALL OPTION (PAYMENT ON DELIVERY)**

In this type of contract, the seller pays the project developer a call option premium upon signing the agreement, which contains a clause stating the date from which the option may be exercised, e.g. the first delivery date. Once the option is exercised, the price is set forth in the agreement: it may be fixed or variable.

If the option is not exercised for whatever reason, the buyer loses the premium to the seller. However, in the event of default by the seller (project failure or number of allowances lower than the amount stipulated in the agreement), he must pay the premium and any compensation to the buyer. The agreement must account for all possible scenarios.

» **RECOURSE TO THE MARKET**

The owner of the credits may not wish to enter into an agreement with a buyer and may prefer to turn to the market once in possession of allowances or credits. According to the level of market organization and liquidity, he can employ a broker or find a buyer directly.

## 5. Risks and uncertainties surrounding the volume and price of credits

Table 7 shows the advantages and disadvantages for the seller of each of the terms described above.

This review is not exhaustive:



**There may be as many types of contract as there are transactions!**

	Terms and conditions	Advantages	Disadvantages
FIRM PURCHASE	Advance payment	Guaranteed amount of income	Risk of reimbursement of the entire amount, discounted, in the event of default Lower price in theory
	Payment upon delivery (fixed price)	Higher price than in the advance payment scenario Guaranteed price No market risk	No possibility for sale at the best price in the event of market pressure
	Payment upon delivery (variable price)	Possibility for sale at the best price in the event of market pressure	Risk of fall in price No guarantee of income
CALL OPTION			Obligation to sell at an agreed price No guarantee as to the sequence of events in the transaction Risk of reimbursement of the option premium in the event of default
RECOURSE TO THE MARKET		Best price sale	Need to know the market and contacts Market risk in the event of a price collapse

### Trends in CDM project transactions<sup>a</sup>

#### *Credit volumes offered on the market*

Since 2003, there has been a very significant rise in the number of transactions concerning emission reductions generated by CDM projects. 2004 is expected to see an annual traded volume in excess of 100 MteqCO<sub>2</sub>, reflecting tenfold growth over the two years since the market opened. It must be remembered, however, that at this stage, transactions on the carbon market concern credits that do not yet exist. At the time of writing, no emission reductions had yet been verified and certified, so that no CERs have yet been issued by the Executive Board.<sup>b</sup>

#### *Projects generating traded carbon emissions*

The great majority of the emission reductions currently being traded are from CDM project activities where CERs are the only benefit expected. These are mainly activities involving HFC breakdown and the recovery and burning off of biogas from landfills. These projects typically have:

- Significant reduction margins generating potentially large supply in terms of emission reductions;
- Low risks (well-proven technology and easily demonstrated additionality) and consequent attractiveness pulling demand upwards;
- Low cost for the CDM portion, in terms of the total investment required for some projects;
- Well defined methodological steps, enabling faster, lower-cost development of the CDM portion of the projects.

On the other hand, the transaction volume for emission reductions generated by energy projects is low. Despite the increasing number of approved methodologies (especially in the electrical power sector), these projects are still hampered by a number of obstacles: low potential reduction volumes per project, more complex implementation from the technical point of view, higher development costs for the CDM portion.

#### *Main characteristics of current transactions*

The carbon market is characterised by extreme variability in types of purchasing contracts for emission reductions.

However, they can be grouped into two main categories:

#### **1. Forward purchasing of potential CERs that do not yet exist**

Several stages between the signature of the contract and the actual issue of CERs have yet to be completed (implementation of project activity, validation and subsequent registration under the CDM, generation of emission reductions and their verification). In this case, the buyer bears the risk of non-delivery of the credit volume provided for during the different project stages.

#### **2. Purchase of CERs with payment on delivery**

In these transactions, the project developer undertakes to deliver a predetermined volume of CERs generated by emission reductions planned for in the project activity implemented under the CDM. In this case, the project developer bears the same risk as the buyer in the previous case of not delivering the CER volume provided for, and, depending on the contract, may then be subject to various penalties.

On average, transaction prices in forward purchasing agreements conclude in 2004 were some 30% lower than emission credit prices in payment-on-delivery agreements. As the Kyoto Protocol comes into force in the near future, this may result in a smaller difference in price since the new situation will remove some of the uncertainties over the future of the projects concerned.

<sup>a</sup> Drawn from conclusions in the World Bank report entitled "State and Trends of the Carbon Market 2004."

<sup>b</sup> The majority of projects developed under the CDM are still in the "Project Design" phase and their effective implementation has not yet begun (see diagram 2 showing the project cycle, page 29).

# To conclude

**A**s previously observed, **the successful development of a CDM project**, which is beneficial to both the host country and its foreign proponents, **is not an easy objective**, particularly at the present stage of the CDM learning process. The calculation methodologies for emission reductions are still not completely finalized, the legal and tax frameworks are still being drafted and the assessment of the risks associated with the “CDM” phase of a project lacks the benefit of hindsight. Despite these uncertainties, **many host countries, as well as businesses and institutions in Annex 1 countries, have shown their confidence in this new tool** by developing a CDM project portfolio, and many initiatives have been taken to boost development. A process has been created,<sup>a</sup> enabling the various partners involved to gradually internalize the “carbon constraint” in their choices investment, thus providing a response to the **global warming challenge**.

At this stage in the mechanism’s development, three points are of particular importance:

- **Close cooperation with the host country** from the initial stages of the CDM project. This cooperation is decisive. The CDM is a cooperative tool for the host country’s sustainable development, which implies a true joint working relationship with partners and local institutions.
- A robust CDM project is above all a **conventional but well-defined project**. Its “CDM” phase is principally an economic advantage to promote more efficient and environmentally friendly technologies, while overcoming the existing obstacles.
- The quality of definition of the “baselines,” and ultimately, in a more general sense, **the appropriateness of the methodology used**, are among the essential prerequisites for the validation and approval of any CDM project. Following the submission of initial methodologies for registration by the Executive Board, it is vital that the project developer base the CDM documentation on a flawless line of argument using the “case-law” progressively enacted by the Executive Board.

In organizing a CDM project, a French developer unfamiliar with this new mechanism would benefit from contacting the Economic Department of the French Embassy in the countries concerned, in order to request information on the CDM context specific to the country (institutional organization, contact information for the CDM Designated National Authority, policies, CDM criteria and priorities of the country, possibilities of local specialized expertise, etc.). Where necessary, **selective government financial backing** may be considered to facilitate the initial preparation of CDM projects. This limited backing will focus on particularly innovative projects. **Particular attention** will also be directed towards developing small-scale projects based on an accelerated procedure, with a preference for projects situated in countries which are unfamiliar with the CDM and have limited resources (LDC).

<sup>a</sup> *This process will be reinforced as from 2005 by the entry into force of the emission allowances European Directive*



**VOLUME**

**B**



## Annexes

**English-French Lexicon**

**Reference texts**

**List of Parties included  
in Annex I to the UNFCCC**

**Least Developed Countries (LDC)**

**CDM methodologies approved by the  
Executive Board and their application  
to date**

**Examples of CDM methodologies  
submitted to the Executive Board**

**Conversion tables**

**The Project Design Document (PDD)**

## 1. English-French Lexicon

English	Abbreviation	French	Abbreviation
Activities implemented jointly	AIJ	Activités exécutées conjointement	AEC
Additionality		Additionnalité	
Applicant entity		Entité candidate	
Assigned Amount	AA	Quantité attribuée (aux Parties)	QA
Assigned Amount Unit	AAU	Unité de quantité attribuée	UQA
Baseline		Scénario de référence	
Boundaries		Périmètre	
Burden sharing		Bulle de répartition	
Business as Usual	BAU	Scénario sans effort de réduction des émissions	
Certified Emission Reduction	CER	Unité de réduction certifiée des émissions	URCE
Certified Emission Reduction Unit Procurement Tender	CERUPT		
Clean Development Mechanism MDP	CDM	Mécanisme pour un développement propre	
Commitment period		Période d'engagement	
Conference of the Parties	COP	Conférence des Parties	CP
Countries with Economies in Transition	CET	Pays en transition vers une économie de marché	
Crediting period		Période de comptabilisation	
Designated National Authority	DNA	Autorité nationale désignée	AND
Designated Operational Entity	DOE or OE	Entité opérationnelle désignée	EOD ou EO
Developing countries	DC	Pays en développement	PED
Emission Reduction Purchase Agreement	ERPA	Contrat d'achat de réduction d'émissions	
Emission Reduction Unit	ERU	Unité de réduction des émissions	URE
Emission Reduction Unit Procurement Tender	ERUPT		
European Union Emissions Trading Scheme	EU ETS	Système européen d'échange de quotas	
Executive Board of the Clean Development Mechanism	EB	Conseil exécutif du mécanisme pour un développement propre	
Focal point		Point focal	
French Global Environment Facility	FGEF	Fonds français pour l'environnement mondial	FFEM
Global Environment Facility	GEF	Fonds pour l'environnement mondial	FEM
Global Warming Potential	GWP	Pouvoir de réchauffement de la planète	PRP
Greenfield		Création d'activité <i>ex nihilo</i>	
Greenhouse gas(es)	GHG	Gaz à effet de serre	GES
Intergovernmental Panel on Climate Change	IPCC	Groupe intergouvernemental sur l'évolution du climat	GIEC
Interministerial Task-force for Climate Change	ITCC	Mission interministérielle de l'effet de serre	MIES
Joint Implementation	JI	Mise en œuvre conjointe	MOC
Land Use, Land-Use Change and Forestry	LULUCF	Utilisation des terres, changement d'affectation des terres et foresterie	UTCF
Leakage		Fuites	
Memorandum of Understanding		Protocole d'accord	
Metric ton of CO <sub>2</sub> equivalent	tCO <sub>2</sub> eq	Tonne d'équivalent CO <sub>2</sub>	teqCO <sub>2</sub>

English	Abbreviation	French	Abbreviation
Monitoring		Suivi	
National Communication		Communication nationale	
National Program for tackling Climate Change		Programme national de lutte contre le changement climatique	PNLCC
Non-Governmental Organization	NGO	Organisation non gouvernementale	ONG
Official Development Assistance	ODA	Aide publique au développement	APD
Project Design Document	PDD	Descriptif de projet ou PDD (Plan de Développement)	
Project Identification Note	PIN	Note d'identification du projet	NIP
Prototype Carbon Fund	PCF	Fonds prototype carbone	
Registration		Enregistrement	
Removal Unit	RMU	Unité d'absorption	UA
Sink		Puits	
Small scale project		Projet à petite échelle	
Supervisory Committee	SC	Comité de supervision de la mise en œuvre conjointe	
United Nations Environment Program	UNEP	Programme des Nations unies pour l'environnement	PNUE
United Nations Framework Convention on Climate Change	UNFCCC	Convention-cadre des Nations unies sur les changements climatiques	CCNUCC
Validation		Validation	
Verification		Vérification	
World Meteorological Organization	WMO	Organisation météorologique mondiale OMM	

## 2. Reference texts

### › ARTICLE 12 OF THE KYOTO PROTOCOL

1. A clean development mechanism is hereby defined.
2. The purpose of the clean development mechanism shall be to assist Parties not included in Annex I in achieving sustainable development and in contributing to the ultimate objective of the Convention, and to assist Parties included in Annex I in achieving compliance with their quantified emission limitation and reduction commitments under Article 3.
3. Under the clean development mechanism:
  - (a) Parties not included in Annex I will benefit from project activities resulting in certified emission reductions; and
  - (b) Parties included in Annex I may use the certified emission reductions accruing from such project activities to contribute to compliance with part of their quantified emission limitation and reduction commitments under Article 3, as determined by the Conference of the Parties serving as the meeting of the Parties to this Protocol.
4. The clean development mechanism shall be subject to the authority and guidance of the Conference of the Parties serving as the meeting of the Parties to this Protocol and be supervised by an executive board of the clean development mechanism.
5. Emission reductions resulting from each project activity shall be certified by operational entities to be designated by the Conference of the Parties serving as the meeting of the Parties to this Protocol, on the basis of:
  - (a) Voluntary participation approved by each Party involved;
  - (b) Real, measurable, and long-term benefits related to the mitigation of climate change; and
  - (c) Reductions in emissions that are additional to any that would occur in the absence of the certified project activity.
6. The clean development mechanism shall assist in arranging funding of certified project activities as necessary.
7. The Conference of the Parties serving as the meeting of the Parties to this Protocol shall, at its first session, elaborate modalities and procedures with the objective of ensuring transparency, efficiency and accountability through independent auditing and verification of project activities.
8. The Conference of the Parties serving as the meeting of the Parties to this Protocol shall ensure that a share of the proceeds from certified project activities is used to cover administrative expenses as well as to assist developing country Parties that are particularly vulnerable to the adverse effects of climate change to meet the costs of adaptation.

9. Participation under the clean development mechanism, including in activities mentioned in paragraph 3(a) above and in the acquisition of certified emission reductions, may involve private and/or public entities, and is to be subject to whatever guidance may be provided by the executive board of the clean development mechanism.

10. Certified emission reductions obtained during the period from the year 2000 up to the beginning of the first commitment period can be used to assist in achieving compliance in the first commitment period.”

### › DECISION 17/CP.7 - MODALITIES AND PROCEDURES FOR A CLEAN DEVELOPMENT MECHANISM AS DEFINED IN ARTICLE 12 OF THE KYOTO PROTOCOL

“*The Conference of the Parties,*

*Recalling* Article 12 of the Kyoto Protocol which provides that the purpose of the clean development mechanism shall be to assist Parties not included in Annex I to the Convention in achieving sustainable development and in contributing to the ultimate objective of the Convention, and to assist Parties included in Annex I in achieving compliance with their quantified emission limitation and reduction commitments under Article 3 of the Kyoto Protocol,

*Recalling also* its decision 5/CP.6 containing the Bonn Agreements on the implementation of the Buenos Aires Plan of Action, *Aware* of its decisions 2/CP.7, 11/CP.7, 15/CP.7, 16/CP.7, 18/CP.7, 19/CP.7, 20/CP.7, 21/CP.7, 22/CP.7, 23/CP.7, 24/CP.7 and 38/CP.7,

*Affirming* that it is the host Party’s prerogative to confirm whether a clean development mechanism project activity assists it in achieving sustainable development,

*Recognizing* that Parties included in Annex I are to refrain from using certified emission reductions generated from nuclear facilities to meet their commitments under Article 3, paragraph 1,

*Bearing in mind* the need to promote equitable geographic distribution of clean development mechanism project activities at regional and subregional levels,

*Emphasizing* that public funding for clean development mechanism projects from Parties in Annex I is not to result in the diversion of official development assistance and is to be separate from and not counted towards the financial obligations of Parties included in Annex I,

*Further emphasizing* that clean development mechanism project activities should lead to the transfer of environmentally safe and sound technology and know-how in addition to that required under Article 4, paragraph 5, of the Convention and Article 10 of the Kyoto Protocol,

Recognizing the need for guidance for project participants and designated operational entities, in particular for establishing reliable, transparent and conservative baselines, to assess whether clean development mechanism project activities are in accordance with the additionality criterion in Article 12, paragraph 5(c), of the Kyoto Protocol,

**1.** *Decides* to facilitate a prompt start for a clean development mechanism by adopting the modalities and procedures contained in the annex below;

**2.** *Decides* that, for the purposes of the present decision, the Conference of the

Parties shall assume the responsibilities of the Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol as set out in the annex below on modalities and procedures;

**3.** *Invites* nominations for membership in the executive board:

(a) For facilitating the prompt start of the clean development mechanism, from

Parties to the Convention to be submitted to the President of the Conference of the Parties at its present session, with a view to the Conference of the Parties electing the members of the executive board at that session;

(b) Upon the entry into force of the Kyoto Protocol, to replace any member of the executive board of the clean development mechanism whose country has not ratified or acceded to the Kyoto Protocol. Such new members shall be nominated by the same constituencies and elected at the first session of the Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol;

**4.** *Decides* that, prior to the first session of the Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol, the executive board and any designated operational entities shall operate in the same manner as the executive board and designated operational entities of the clean development mechanism as set out in the annex below;

**5.** *Decides* that the executive board shall convene its first meeting immediately upon the election of its members;

**6.** *Decides* that the executive board shall include in its work plan until the eighth session of the Conference of the Parties, *inter alia*, the following tasks:

(a) To develop and agree on its rules of procedure and recommend them to the Conference of the Parties for adoption, applying draft rules until then;

(b) To accredit operational entities and designate them, on a provisional basis, pending the designation by the Conference of the Parties at its eighth session;

(c) To develop and recommend to the Conference of the Parties, at its eighth session, simplified modalities and procedures for the following small-scale clean development mechanism project activities:

(I) Renewable energy project activities with a maximum output capacity equivalent of up to 15 megawatts (or an appropriate equivalent);

(II) Energy efficiency improvement project activities which reduce energy consumption, on the supply and/or demand side, by up to the equivalent of 15 gigawatt/hours per year;

(III) Other project activities that both reduce anthropogenic emissions by sources and directly emit less than 15 kilotonnes of carbon dioxide equivalent annually;

(d) To prepare recommendations on any relevant matter, including on Appendix C to the annex below, for consideration by the Conference of the Parties at its eighth session;

(d) To identify modalities for seeking collaboration with the Subsidiary Body for Scientific and Technological Advice on methodological and scientific issues;

**7.** *Decides*:

(a) That the eligibility of land use, land-use change and forestry project activities under the clean development mechanism is limited to afforestation and reforestation;

(b) That for the first commitment period, the total of additions to a Party's assigned amount resulting from eligible land use, land-use change and forestry project activities under the clean development mechanism shall not exceed one per cent of base year emissions of that Party, times five;

(c) That the treatment of land use, land-use change and forestry project activities under the clean development mechanism in future commitment periods shall be decided as part of the negotiations on the second commitment period;

**8.** *Requests* the secretariat to organize a workshop before the sixteenth session of the Subsidiary Body for Scientific and Technological Advice with the aim of recommending terms of reference and an agenda for the work to be conducted under paragraph 10(b) below on the basis of, *inter alia*, submissions by Parties referred to in paragraph 9 below;

**9.** *Invites* Parties to provide submissions to the secretariat by 1 February 2002 on the organization of the workshop referred to in paragraph 8 above, and to express their views on the terms of reference and the agenda for the work to be conducted under paragraph 10(b) below;

**10.** *Requests* the Subsidiary Body for Scientific and Technological Advice:

(a) To develop at its sixteenth session terms of reference and an agenda for the work to be conducted under subparagraph below, taking into consideration, *inter alia*, the outcome of the workshop mentioned in paragraph 8 above;

(b) To develop definitions and modalities for including afforestation and reforestation project activities under the clean development mechanism in the first commitment period, taking into account the issues of non-permanence, additionality, leakage, uncertainties and socio-economic and environmental impacts, including impacts on biodiversity and natural ecosystems, and being guided by the principles in the preamble to decision -/CMP.1 (*Land use, land-use change and forestry*) and

the terms of reference referred to in subparagraph (a) above, with the aim of adopting a decision on these definitions and modalities at the ninth session of the Conference of the Parties, to be forwarded to the Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol at its first session;

**11.** *Decides* that the decision by the Conference of the Parties at its ninth session, on definitions and modalities for inclusion of afforestation and reforestation project activities under the clean development mechanism, for the first commitment period, referred to in paragraph 10 (b) above, shall be in the form of an annex on modalities and procedures for afforestation and reforestation project activities for a clean development mechanism reflecting, *mutatis mutandis*, the annex to the present decision on modalities and procedures for a clean development mechanism;

**12.** *Decides* that certified emission reductions shall only be issued for a crediting period starting after the date of registration of a clean development mechanism project activity;

**13.** *Further decides* that a project activity starting as of the year 2000, and prior to the adoption of this decision, shall be eligible for validation and registration as a clean development mechanism project activity if submitted for registration before 31 December 2005. If registered, the crediting period for such project activities may start prior to the date of its registration but not earlier than 1 January 2000;

**14.** *Requests* Parties included in Annex I to start implementing measures to assist Parties not included in Annex I, in particular the least developed and small island developing States among them, with building capacity in order to facilitate their participation in the clean development mechanism, taking into account relevant decisions by the Conference of the Parties on capacity-building and on the financial mechanism of the Convention;

**15.** *Decides:*

(a) That the share of proceeds to assist developing country Parties that are particularly vulnerable to the adverse effects of climate change to meet the costs of adaptation, as referred to in Article 12, paragraph 8, of the Kyoto Protocol, shall be two per cent of the certified emission reductions issued for a clean development mechanism project activity;

(b) That clean development mechanism project activities in least developed country Parties shall be exempt from the share of proceeds to assist with the costs of adaptation;

**16.** *Decides* that the level of the share of proceeds to cover administrative expenses of the clean development mechanism shall be determined by the Conference of the Parties upon the recommendation of the executive board;

**17.** *Invites* Parties to finance the administrative expenses for operating the clean development mechanism by making contributions to the UNFCCC Trust Fund for Supplementary Activities. Such contributions shall be reimbursed, if requested, in accordance with procedures

and a timetable to be determined by the Conference of the Parties upon the recommendation of the executive board. Until the Conference of the Parties determines a percentage for the share of proceeds for the administrative expenses, the executive board shall charge a fee to recover any project related expenses;

**18.** *Requests* the secretariat to perform any functions assigned to it in the present decision and in the annex below;

**19.** *Decides* to assess progress made regarding the clean development mechanism and to take appropriate action, as necessary. Any revision of the decision shall not affect clean development mechanism project activities already registered;

**20.** *Recommends* that the Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol, at its first session, adopt the draft decision below.”

### › DRAFT DECISION -/CMP.1 (ARTICLE 12) – MODALITIES AND PROCEDURES FOR A CLEAN DEVELOPMENT MECHANISM AS DEFINED IN ARTICLE 12 OF THE KYOTO PROTOCOL<sup>a</sup>

*The Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol,*

*Recalling* the provisions of Articles 3 and 12 of the Kyoto Protocol,

*Bearing in mind* that, in accordance with Article 12, the purpose of the clean development mechanism is to assist Parties not included in Annex I to the Convention in achieving sustainable development and in contributing to the ultimate objective of the Convention, and to assist Parties included in Annex I in achieving compliance with their quantified emission limitation and reduction commitments under Article 3 of the Kyoto Protocol,

*Aware* of its decisions -/CMP.1 (*Mechanisms*), -/CMP.1 (*Article 6*), -/CMP.1 (*Article 17*), -/CMP.1 (*Land use, land-use change and forestry*), -/CMP.1 (*Modalities for the accounting of assigned amounts*), -/CMP.1 (*Article 5.1*), -/CMP.1 (*Article 5.2*), -/CMP.1 (*Article 7*) and -/CMP.1 (*Article 8*), and decisions 2/CP.7 and 24/CP.7,

Cognizant of decision 17/CP.7 on modalities and procedures for a clean development mechanism as defined in Article 12 of the Kyoto Protocol,

1. *Decides* to confirm, and give full effect to any actions taken pursuant to, decision 17/CP.7 and to any other relevant decisions by the Conference of the Parties, as appropriate;

2. *Adopts* the modalities and procedures for a clean development mechanism contained in the annex below;

<sup>a</sup> *This project shall be submitted to the first “Conference of the Parties serving as the meeting of the Parties” (CMP.1) following entry into force of the Kyoto Protocol.*

3. *Invites* the executive board to review the simplified modalities, procedures and the definitions of small-scale project activities referred to in paragraph 6(c) of decision 17/CP.7 and, if necessary, make appropriate recommendations to the Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol;

4. *Decides* further that any future revision of the modalities and procedures for a clean development mechanism shall be decided in accordance with the rules of procedure of the Conference of the Parties serving as the meeting of the Parties to the Kyoto Pro-

ocol, as applied. The first review shall be carried out no later than one year after the end of the first commitment period, based on recommendations by the executive board and by the Subsidiary Body for Implementation drawing on technical advice from the Subsidiary Body for Scientific and Technological Advice, as needed. Further reviews shall be carried out periodically thereafter. Any revision of the decision shall not affect clean development mechanism project activities already registered.

### 3. List of Parties included in Annex I to the UNFCCC

Australia	Finland	Lithuania <sup>a</sup>	Slovenia <sup>a b</sup>
Austria	France	Luxembourg	Sweden
Belarus <sup>a d</sup>	Germany	Monaco <sup>b</sup>	Switzerland
Belgium	Greece	Netherlands	Turkey <sup>e</sup>
Bulgaria <sup>a</sup>	Hungary <sup>a</sup>	New Zealand	Ukraine <sup>a</sup>
Canada	Iceland	Norway	United Kingdom of Great Britain and Northern Ireland
Croatia <sup>a b</sup>	Ireland	Poland <sup>a</sup>	United States of America
Czech Republic <sup>a b</sup>	Italy	Portugal	
Denmark	Japan	Romania <sup>a</sup>	
Estonia <sup>a</sup>	Latvia <sup>a</sup>	Russian Federation <sup>a</sup>	
European Economic Community <sup>c</sup>	Liechtenstein <sup>b</sup>	Slovakia <sup>a b</sup>	

<sup>a</sup> Countries with economies in transition.

<sup>b</sup> Countries added to Annex 1 by an amendment effective as of August 13, 1998.

<sup>c</sup> The Protocol adopted in 1997, after the entry in force of the Treaty of Maastricht, employs the term European Community.

<sup>d</sup> Belarus had not ratified the Convention in 1997 when the Protocol was adopted and does not therefore feature in Annex B of the Protocol. Belarus ratified the Convention in 2000, but has not yet ratified the Protocol. Belarus recently requested an amendment to Annex B of the Protocol to set a quantified commitment.

<sup>e</sup> Turkey has not yet ratified the Convention and does not feature in Annex B of the Protocol. The 26/COP7 decision adopted in October 2001 by the Conference of the Parties acknowledges the specific case of Turkey which, after becoming a Party, would hold a position different from that of the other Parties included in Annex 1 to the Convention.

**Note:** In addition to the Parties included in Annex 1 to the Convention, Kazakhstan notified its intention to comply with the provisions of the Convention concerning the Annex 1 Parties. In accordance with the provisions of the Protocol, Kazakhstan will therefore be included in the list of Annex 1 Parties. However, the country has no quantified commitment and does not feature in Annex B of the Protocol.

## 4. Least Developed Countries (LDC)

Africa		Asia		Small Insular Developing States	
1	Angola	1	Afghanistan	1	Cape Verde
2	Benin	2	Bangladesh	2	Comoros
3	Burkina Faso	3	Bhutan	3	Haiti
4	Burundi	4	Cambodia	4	Kiribati
5	Central African Republic	5	Lao People's Dem. Rep.	5	Maldives
6	Chad	6	Myanmar	6	Samoa
7	Dem. Rep of the Congo	7	Nepal	7	Sao Tome & Principe
8	Djibouti	8	Yemen	8	Solomon Islands
9	Equatorial Guinea			9	Tuvalu
10	Eritrea			10	Vanuatu
11	Ethiopia				
12	Gambia				
13	Guinea				
14	Guinea Bissau				
15	Lesotho				
16	Liberia				
17	Madagascar				
18	Malawi				
19	Mali				
20	Mauritania				
21	Mozambique				
22	Niger				
23	Rwanda				
24	Senegal				
25	Sierra Leone				
26	Sudan				
27	Tanzania				
28	Togo				
29	Uganda				
30	Zambia				
	Somalia <sup>a</sup>				

<sup>a</sup> Somalia is not Party to the Convention.

## 5. CDM methodologies approved by the Executive Board and their application to date

The variety of potential reductions in GHG emissions throughout all economic sectors is reflected in the diversity of the methodologies that have already been approved by the Executive Board.

Table A provides a summary, for each of the 15 sectors listed by the Executive Board, of the methodologies approved, at the time of writing, for conventional and small-scale projects, as well as methodologies that have been approved but not yet formalised.

Table B gives the titles and references of all consolidated methodologies.

Finally, Table C gives the criteria used to assess project additionality for all projects currently under validation by a DOE, as shown in the PDDs submitted to public consultation.

For further information, please refer to the PDDs already submitted for public consultation at: <http://cdm.unfccc.int/Projects/Validation>.

Table A – Approved and formalised methodologies by sector

Sector		Methodology <sup>a</sup>	Methodology for small-scale projects <sup>b</sup>
Ref.	Denomination		
01	Energy – production (renewable/non renewable source)	AM0004 AM0005 AM0007 AM0010 AM0014 AM0015 NM0010rev	AMS-I.A AMS-I.B AMS-I.C AMS-I.D AMS-II.B
02	Energy – distribution		AMS-II.A
03	Energy - efficiency		AMS-II.C AMS-II.D AMS-II.E AMS-II.F
04	Manufacturing industries	AM0007 AM0008 AM0014	AMS-II.D
05	Chemical industries		
06	Construction		AMS-II.E
07	Transport		AMS-III.C
08	Mining and extractive industries		
09	Metal production		
10	Fugitive fossil fuel emissions (solid, liquid and gaseous)	AM0009	AMS-III.D
11	Fugitive emissions from production and use of HFC, PFC and SF <sub>6</sub>	AM0001	
12	Use of solvents		
13	Waste	AM0002 AM0003 AM0006 AM0010 AM0011 AM0012 AM0013 AM0016 NM0010rev NM0032	AMS-III.D AMS-III.E
14	Afforestation and reforestation		
15	Agriculture	AM0006 AM0016	

<sup>a</sup> Source : <http://cdm.unfccc.int/methodologies/PAmethodologies/approved.html>.

<sup>b</sup> Source : <http://cdm.unfccc.int/pac/howto/SmallScalePA/ssclismeth.pdf>.

Table B – Consolidated methodologies by sector <sup>a</sup>

Sector		Consolidated methodology	Methodology title
Ref.	Denomination		
01	Energy – production (renewable/non renewable sources)	ACM0002	Consolidated methodology for grid-connected electricity generation from renewable sources
13	Waste	ACM0001	Consolidated methodology for landfill gas project activities

<sup>a</sup> Source : <http://cdm.unfccc.int/methodologies/PAmethodologies/approved.html>.

Table C – Additionality assessment method for projects under validation as part of the CDM<sup>a</sup>

Project	Sector	Methodology used	Stage 2 – investment analysis			Stage 3 - Obstacles		
			Simple cost analysis	Comparison with alternatives	Benchmark	To investment	Technological	Usual practice
Thermal oxidation of HFC23, Gujarat, India	11 – Fugitive emissions of halocarbons and SF <sub>6</sub>	AM0001	✓					
HFC breakdown, Ulsan, Korea	11 – Fugitive emissions of halocarbons and SF <sub>6</sub>	AM0001	✓					
Recovery and burning off of landfill gas, Salvador da Bahia, Brazil	13 - Waste	AM0002	✓			✓		
Energy recovery from landfill gas, Nova Gerar, Brazil	13 - Waste	AM0003			✓		✓	
Energy recovery from landfill gas, Lara Maua, Brazil	13 - Waste	AM0003			✓			
Energy recovery from landfill gas, Marca, Brazil	13 - Waste	AM0003			✓			
Recovery and burning off of landfill gas, Santa Cruz, Bolivia	13 - Waste	AM0003				✓		
Energy recovery from rice husks and cotton stalks, Tamil Nadu, India	01 – Energy-production	AM0004				✓	✓	✓
30MW hydropower plant, El Gallo, Mexico	01 – Energy-production	AM0005				✓	✓	
Capture and combustion of biogas from pig manure, Peraillo, Chile	13 – Waste 15 - Agriculture	AM0006		✓			✓	
Capture and combustion of biogas from pig manure, Pocillas and La Estrella, Chile	13 – Waste 15 - Agriculture	AM0006		✓			✓	
Capture and combustion of biogas from pig manure, Corneche and Los Guindos, Chile	13 – Waste 15 - Agriculture	AM0006		✓			✓	
Fuel switching, Graneros plant, Chile	04 – Manufacturing industries	AM0008	✓					
Energy recovery from landfill gas, Chisinau, Moldova	13 - Waste	AM0011			✓			
Recovery and burning off of landfill gas, Villa Dominico, Argentina	13 - Waste	AM0011	✓					
Energy recovery from landfill gas, Tremembé, Brazil	13 - Waste	AM0011	✓					

<sup>a</sup> (a) Projects under validation as of 1 November 2004. Note that one project may be included in more than one sector.

## 6. Examples of CDM methodologies submitted to the Executive Board

The CDM projects below had been submitted by 30 October 2004 to the CDM Executive Board (methodology panel) by developers or candidate operational entities, in order to obtain opinions on the new methodology proposed to assess emission reductions.

The panel has held eight sessions to date to examine – in some cases several times, after successive revisions – some fifty methodologies. Of these, sixteen were approved to be used as models. They are identified with a code in letters and figures, as in AMxxx-NMyyy, where the second group refers to the file that was used as a basis for developing the “Approved Methodology.”

It is in the interest of readers to refer on a regular basis to the CDM Executive Board’s web site for the “jurisprudence” being built up in this way. The list of methodologies is frequently updated, and may be consulted, as well as the other documentation relating to each methodology, at: <http://cdm.unfccc.int/methodologies>.

Because some data (project location, role and names of the various participants, annual GHG reduction quantities, etc.) may be subject to transcription errors, we advise users to refer to the original files.

UNFCCC Ref.	Host country	Sector	Title of CDM project submitted to CDM EB for opinion on Methodology	teqCO <sub>2</sub> /year
<b>Méthodologies Approuvées (AM) et projets correspondants de référence</b>				
AM001-NM007	South Korea	Industry	Ulsan – breakdown of HFC23 in a chemical plant <i>Ineos Fluor Corp, Japan</i>	1,400,000
AM002-NM004	Brazil	Municipal waste	Salvador de Bahia – biogas recovery and use <i>Suez Environnement</i>	From 6,000 to 46,000
AM003-NM005rev	Brazil	Municipal waste	Nova Gerar – SP - biogas recovery and use <i>SA Paulista-PCF-Ecosecurities</i>	51,000
AM004-NM019	Thailand	Biomass industry	Rice husks for energy production <i>Mitsubishi Securities</i>	83,000
AM005-NM023	Mexico	Hydropower	El Gallo – 30 MW hydropower plant <i>Corporación Mexicana de Hydroelectricidad de CV; CER buyer - PCF</i>	70,000
AM006-NM022	Chile	Biomass industry	Perailillo – Recovery & combustion of biogas from an industrial pig farm <i>Agrosuper, Chile; Agent : CO2e.com (Canada)</i>	95,000
AM007-NM028	India	Biomass industry	Tamil Nadu – enlargement of several bagasse-fired cogeneration power plants (coal substitution) <i>Thiru Arooran Sugars (India), Winrock International India; CER buyer: PCF</i>	430,400
AM008-NM16rev	Chile	Efficiency / Industry	Graneros – substituting natural gas for coal in a food products industry <i>Nestle</i>	16,700
AM009-NM026	Viêt-Nam	Hydrocarbons	Recovery and recycling of associated gas from the Ran Dong offshore deposit	From 677,000 to 1,200,000
AM010-NM010rev	South Africa	Municipal waste	Durban – recovery & recycling of biogas <i>Durban municipal authority and PCF</i>	414,000
AM011-NM021	Brazil	Municipal waste	Trémembé - recovery & recycling of biogas <i>ONYX &amp; ERUPT</i>	70,000
AM012-NM032	India	Municipal waste	Lucknow – Tamil Nadu - recovery & recycling of biogas <i>LLucknow Nagar Nigu (India), Asia Bioenergy India Ltd., Infrastructure Development France Company Ltd. (India); CER buyer: PCF</i>	101,800
AM013-NM0039	Malaysia	Biomass industry	Pantai Remis – Treatment by fermentation of oil palm residue and recycling the resulting biogas for electricity production <i>Bumibipower Mitsubishi</i>	55,200
AM014-NM018rev	Chile	Industry / Tertiary	Metrogas – package cogeneration industry and tertiary sector in Santiago <i>Metrogas Chill &amp; Electric Power Dvt Cy</i>	115,000
AM015-NM001rev	Brazil	Biomass industry	Vale do Rosario – cogeneration with bagasse from sugarcane <i>VRBC, SP, Brazil</i>	102,000
AM016-NM0034rev2	Brazil	Biomass industry	Patos de Minas – Minas Gerais – Recovery/use of biogas from treatment of effluent from industrial pig farm <i>Granja Becker (Brazil), LB Pork Inc. (Brazil), AgCert Canada Co</i>	20,000

UNFCCC Ref.	Host country	Sector	Title of CDM project submitted to CDM EB for opinion on Methodology	teqCO <sub>2</sub> /year
<b>Nouvelles Méthodologies à l'examen (NM)</b>				
NM0012-rev	Jamaica	Wind farm	Wigton wind farm <i>Renewable Energy Systems UK et Petroleum Corp of Jamaica</i>	52,200
NM0017-rev	China	Industry – refinery	Fushun – Improved energy efficiency of steam networks in PetroChina and Armstrong USA refineries	81,900
NM0018	Chile	Industry / Tertiary	Metrogas – package cogeneration industry and tertiary sector in Santiago <i>Metrogas Chilil &amp; Electric Power Dvt Cy</i>	115,000
NM0020-rev	Colombia	Hydropower	La Vuelta & La Herradura hydropower plants <i>Empresas Publicas de Medellin</i>	78,000
NM0024-rev	Colombia	Wind farm	Jepirachi – 19.5 MW wind farm <i>Empresas Publicas de Medellin, CER buyer: PCF</i>	62,300
NM0027	India	Biomass industry	Tamil Nadu – enlargement of several bagasse-fired cogeneration power plants (coal substitution) <i>Thiru Arooran Sugars (India), Winrock International India; CER buyer: PCF</i>	430,400
NM0029	Brazil	Biomass industry	Barreiro – Minas Gerais – switching from coal to charcoal in foundries (new version after major changes Sept. 2003) <i>V&amp;M do Brasil, Ecoscurities: CER buyers IFC Netherlands and Toyota Tsusho Corp</i>	962,000
NM0030	India	Biomass industry	Balrampur – Uttar Pradesh – increase in capacity with bagasse-fired cogeneration (+18 MW) <i>Balrampur Chini Mills Ltd (India)</i>	93,600
NM0031-rev	India	Efficiency / Industry	Bhubaneshwar – Orissa – Electricity production (10 MW) by recovery of hot gases from sponge iron manufacture <i>Orissa Sponge Iron Ltd. (India)</i>	45,400
NM0033	Costa Rica	Efficiency / Industry	Cartago – Improved energy efficiency in cement works with new 3000 t/day kiln <i>HOLCIM Costa Rica, Oficina Costarricense de Implementacion Conjunta, Ministry of the Environment</i>	75,400
NM0035	India	Biomass industry	Tamil Nadu – enlargement of several bagasse-fired cogeneration power plants (coal substitution) <i>Thiru Arooran Sugars (India), Winrock International India; CER buyer: PCF</i>	178,400
NM0036	Egypt	Wind farm	Zafarana – 120 MW wind farm <i>New and Renewable Energy Authority (Egypt) &amp; Japan Bank for International Cooperation</i>	227,000
NM0037-rev	India	Efficiency / Industry	Jagdishpur – Uttar Pradesh – Improved energy efficiency in an ammonia plant <i>Indo Gulf Fertiliser Ltd</i>	24,500
NM0038	Moldova	Municipal waste	Chisinau – Methane recovery and use in a sewage works <i>Chisinau Sewage Cy, Danish Ministry of the Environment</i>	72,700
NM0040	Malaysia	Biomass industry	Chemot – use of coconut husks to replace coal in a cement works <i>Lafarge Malaysian Cement</i>	145,000
NM0041	Thailand	Biomass industry	Korat – Treatment by fermentation of waste from starch manufacture (tapioca) and recycling of methane <i>KWTE</i>	370,000
NM0042	India	Water / municipal	Karnataka – Reducing energy consumption of water pumps for municipal water supply companies <i>KUIDIFC (India), Quality Tonnes, PCF-CDCF (USA)</i>	36,500

UNFCCC Ref.	Host country	Sector	Title of CDM project submitted to CDM EB for opinion on Methodology	teqCO <sub>2</sub> /year
NM0043	Panama	Hydropower	Bayano – Rehabilitation of a hydropower dam with 86 MW power output increase AEs	39,100
NM0045-rev	India	Efficiency / Industry	Chittigarh – Rajasthan – Recycling waste cinders from power plants in clinker manufacture <i>Birla Corporation Ltd</i>	25,800
NM0047	Indonesia	Efficiency / Industry	Citeurup, Cirebon and Tarjun – partial substitution of clinker <i>Indocement and Heidelberg (Germany)</i>	695,000
NM0048	Indonesia	Biomass industry	Citeurup, Cirebon and Tarjun – use of alternative fuels <i>Indocement and Heidelberg (Germany)</i>	218,000
NM0050	Thailand	Biomass industry	Ratchasima – Recycling bagasse to produce electricity for the grid <i>Angvian Industry Cy (Mangkanai Group) &amp; Min. Foreign Affairs, Denmark</i>	75,000
NM0051	Brazil	Hydropower	Passo de Meio – 30 MW Francis hydropower plant at water surface <i>Brascan Energetica – Ecoinvest</i>	86,500
NM0053	Papua	Geothermal energy	Lihir Island – 53 MW geothermal installation <i>Lihir Gold Ltd., SMEC HGM &amp; Ecosecurity</i>	298,000
NM0054	Ecuador	Hydropower	Sibimbe – 15 MW hydropower plant at water surface <i>Hidalgo &amp; Hidalgo – Carbon Finance Unit (WB)</i>	68,300
NM0057	India	Efficiency / Industry	Hirakud-Orissa - Reducing emissions of PFC (C <sub>2</sub> F <sub>4</sub> and C <sub>2</sub> F <sub>6</sub> ) and CO <sub>2</sub> by modifying aluminium electrolysis cells	255,000
NM0058	China	Habitat	Houma-Shanxi – Improving efficiency of urban heating and cogeneration <i>Shanxi Erastone Public Authority – Hou Ma Power Station – Danish cooperation and PCF</i>	102,000
NM0059	Brazil	Efficiency / Industry	Serra – Espertu Santu – Recovery and recycling of hot gases from steelworks for electricity production <i>Compania Siderurgica de Tubaraon - PwC</i>	41,000
NM0060	Thailand	Biomass industry	Dan Chang – New 28 MW bagasse-fired cogeneration plant to sell electricity to the grid <i>Dan Chang Bio-Power Cy – Mitr Phol Sugar Cy</i>	80,000
NM0061	South Korea	Efficiency / Industry	Onsan - Reducing N <sub>2</sub> O emissions from a polyamide factory <i>Rhodia Polyamide (Korea), Rhodia Polyamide Intermediates and Rhodia Energy SAS (France)</i>	10,500,000
NM0062	India	Efficiency / Industry	Thanjavu – Tamil Nadu – 120 MW natural gas power plant with cogeneration <i>Aban Power Cy</i>	231,600
NM0063	Ban Gladesh	Municipal waste	Dhaka – switching to aerobic composting of organic waste from uncontrolled anaerobic fermentation <i>Waste Concern (NGO), Royal Haskoning, Municipality of Dhaka</i>	25,000
NM0064	Brazil	Efficiency / Industry	Serra – Espiritu Santu – Reducing electricity consumption in iron and steelworks <i>Compania Siderurgica de Tubaraon - PwC</i>	5,600
NM0066	China	Efficiency / Industry	Hegang – Helongjian – Recovery/recycling of methane from coal mines <i>Hegang Coal Group Industry Ltd., Niigata Power Systems Cy and Chugoku Electric Cy (Japan)</i>	62,400

## 7. Conversion tables

The following tables are intended to enable project developers to quickly assess, as a first screening, the project's potential emissions reductions. The figures provided are purely indicative.

To carry out a more extensive evaluation, the project developer will find further information on the following Websites:

- <http://www.ghgprotocol.org/standard/tools.htm>: to download sector-specific GHG emissions

calculation tools. The project developer might in particular find useful information in the calculation tool “*Calculating CO<sub>2</sub> emissions for stationary combustion*”;

- <http://www.iea.org/statist/calcul.htm>: a unit converter;

- [http://www.bp.com/files/16/statistical\\_review\\_1612.pdf](http://www.bp.com/files/16/statistical_review_1612.pdf): conversion factors are provided in the *Statistical Review of World Energy 2003*.

GHG	GWP
CO <sub>2</sub>	1
CH <sub>4</sub>	21
N <sub>2</sub> O	310
SF <sub>6</sub>	23,900
PFCs	6,500 à 9,200
HFCs	140 à 11 700

Multiples		
Kilo	k	1,000
Mega	M	1,000,000
Giga	G	1,000,000,000
Tera	T	1,000,000,000,000

Volume	L
1 cubic meter (m <sup>3</sup> )	1,000
1 cubic foot (ft <sup>3</sup> )	28.32
1 US gallon (gal)	3.79
1 US barrel (bl)	159

Mass	kg
1 metric ton (t)	1,000
1 pound (lb)	0.454

Energy	kWh	J	cal
1 watthour (Wh)	0.001	3,600	860
1 megawatthour (MWh)	1 000	3,600,000,000	860,000,000
1 gigajoule (GJ)	278	1,000,000,000	329,000,000
1 000 000 BTU	293	1,055,000,000	252,000,000
1 ton oil equivalent (toe)	11 630	41,868,000,000	10,000,000,000

Fuel	LHV (GJ / ton)	LHV (GJ / m <sup>3</sup> )	kg CO <sub>2</sub> /GJ (LHV)	kg CO <sub>2</sub> /ton	kg CO <sub>2</sub> /m <sup>3</sup>
Natural gas		0.04	55		
LPG		24	65		2
Gasoline	45	34	69	3,150	1,550
Diesel oil	42	36	74	3,100	2,350
Fuel oil	41	37	75	3,100	2,700
Coal	23		95	2,200	2,600
Lignite	14		100	1,400	
Wood and wood waste	19		100	1,900	

## 8. The Project Design Document or PDD

### > CAUTION

The Project Design Document (PDD), as developed by the United Nations Framework Convention on Climate Change, is presented below in digest form.

The original document must be filled in and transmitted to the project stakeholders (Operational Entity, Designated National Authority, Executive Board...). It is available at:

<http://cdm.unfccc.int/Reference/Documents>

### Clean Development Mechanism - Project Design Document (CDM-PDD) Version 02 (in effect as of: 1 July 2004)

#### Contents

- A. General description of project activity
- B. Application of a baseline methodology
- C. Duration of the project activity / Crediting period
- D. Application of a monitoring methodology and plan
- E. Estimation of GHG emissions by sources
- F. Environmental impacts
- G. Stakeholders comments

#### Annexes

- Annex 1: Contact information on participants in the project activity
- Annex 2: Information regarding public funding
- Annex 3: Baseline information
- Annex 4: Monitoring plan

#### SECTION A. General description of project activity

- A.1. Title of the project activity:
- A.2. Description of the project activity:
- A.3. Project participants:
- A.4. Technical description of the project activity:
  - A.4.1. Location of the project activity:
    - A.4.1.1. Host country Party(ies):
    - A.4.1.2. Region/State/Province etc.:
    - A.4.1.3. City/Town/Community etc.:
    - A.4.1.4. Detail of physical location, including information allowing the unique identification of this project activity (*maximum one page*):
  - A.4.2. Category(ies) of project activity:
  - A.4.3. Technology to be employed by the project activity:
  - A.4.4. Brief explanation of how the anthropogenic emissions of anthropogenic greenhouse gas (GHGs) by sources are to be reduced by the proposed CDM project activity, including why the emission reductions would not occur in the absence of the proposed project activity, taking into account national and/or sectoral policies and circumstances:
    - A.4.4.1. Estimated amount of emission reductions over the chosen crediting period:
  - A.4.5. Public funding of the project activity:

## SECTION B. Application of a baseline methodology

- B.1. Title and reference of the approved baseline methodology applied to the project activity:**
- B.1.1. Justification of the choice of the methodology and why it is applicable to the project activity:**
- B.2. Description of how the methodology is applied in the context of the project activity:**
- B.3. Description of how the anthropogenic emissions of GHG by sources are reduced below those that would have occurred in the absence of the registered CDM project activity:**
- B.4. Description of how the definition of the project boundary related to the baseline methodology selected is applied to the project activity:**
- B.5. Details of baseline information, including the date of completion of the baseline study and the name of person (s)/entity (ies) determining the baseline:**

## SECTION C. Duration of the project activity / Crediting period

- C.1. Duration of the project activity:**
- C.1.1. Starting date of the project activity:**
- C.1.2. Expected operational lifetime of the project activity:**
- C.2. Choice of the crediting period and related information:**
- C.2.1 Renewable crediting period**
- C.2.1.1. Starting date of the first crediting period:**
- C.2.1.2. Length of the first crediting period:**
- C.2.2. Fixed crediting period:**
- C.2.2.1. Starting date:**
- C.2.2.2. Length:**

## SECTION D. Application of a monitoring methodology and plan

- D.1. Name and reference of approved monitoring methodology applied to the project activity:**
- D.2. Justification of the choice of the methodology and why it is applicable to the project activity:**
- D.2.1 Option 1: Monitoring of the emissions in the project scenario and the baseline scenario**
- D.2.1.1. Data to be collected in order to monitor emissions from the project activity, and how this data will be archived:**

ID number (Please use numbers to ease cross-referencing to table D.3.)	Data type	Data variable	Data unit	Measured (m), calculated (c) or estimated (e)	Recording frequency	Proportion of data to be monitored	How will the data be archived? (electronic/ paper)	For how long is archived data to be kept?	Comment

- D.2.1.2. Description of formulae used to estimate project emissions (for each gas, source, formulae/algorithm, emissions units of CO<sub>2</sub> equ.)**

**D.2.1.3. Relevant data necessary for determining the baseline of anthropogenic emissions by sources of GHGs within the project boundary and how such data will be collected and archived:**

ID number (Please use numbers to ease cross-referencing to table D.3.)	Data type	Data variable	Data unit	Measured (m), calculated (c) or estimated (e)	Recording frequency	Proportion of data to be monitored	How will the data be archived? (electronic/ paper)	For how long is archived data to be kept?	Comment

**D.2.1.4. Description of formulae used to estimate baseline emissions (for each gas, source, formulae/algorithm, emissions units of CO<sub>2</sub> equ.)**

**D.2.2. Option 2: Direct monitoring of emission reductions from the project activity (values should be consistent with those in section E)**

**D.2.2.1. Data to be collected in order to monitor emissions from the project activity, and how this data will be archived:**

ID number (Please use numbers to ease cross-referencing to table D.3.)	Data type	Data variable	Data unit	Measured (m), calculated (c) or estimated (e)	Recording frequency	Proportion of data to be monitored	How will the data be archived? (electronic/ paper)	For how long is archived data to be kept?	Comment

**D.2.2.2. Description of formulae used to calculate project emissions (for each gas, source, formulae/algorithm, emissions units of CO<sub>2</sub> equ.):**

**D.2.3. Treatment of leakage in the monitoring plan**

**D.2.3.1. If applicable, please describe the data and information that will be collected in order to monitor leakage effects of the project activity**

ID number (Please use numbers to ease cross-referencing to table D.3.)	Data type	Data variable	Data unit	Measured (m), calculated (c) or estimated (e)	Recording frequency	Proportion of data to be monitored	How will the data be archived? (electronic/ paper)	For how long is archived data to be kept?	Comment

**D.2.3.2. Description of formulae used to estimate leakage (for each gas, source, formulae/algorithm, emissions units of CO<sub>2</sub> equ.)**

**D.2.4. Description of formulae used to estimate emission reductions for the project activity (for each gas, source, formulae/algorithm, emissions units of CO<sub>2</sub> equ.)**

**D.3. Quality control (QC) and quality assurance (QA) procedures are being undertaken for data monitored**

Data (Indicate table and ID number e.g. 3.-1; 3.-2.)	Uncertainty level of data (High/Medium/Low)	Explain QA/QC procedures planned for these data, or why such procedures are not necessary

- D.4. Please describe the operational and management structure that the project operator will implement in order to monitor emission reductions and any leakage effects, generated by the project activity.
- D.5. Name of person/entity determining the monitoring methodology:

### SECTION E. Estimation of GHG emissions by sources

- E.1. Estimate of GHG emissions by sources:
- E.2. Estimated leakage:
- E.3. The sum of E.1 and E.2 representing the project activity emissions:
- E.4. Estimated anthropogenic emissions by sources of greenhouse gases of the baseline:
- E.5. Difference between E.4 and E.3 representing the emission reductions of the project activity:
- E.6. Table providing values obtained when applying formulae above:

### SECTION F. Environmental impacts

- F.1. Documentation on the analysis of the environmental impacts, including transboundary impacts:
- F.2. If environmental impacts are considered significant by the project participants or the host Party, please provide conclusions and all references to support documentation of an environmental impact assessment undertaken in accordance with the procedures as required by the host Party:

### SECTION G. Stakeholders' comments

- G.1. Brief description how comments by local stakeholders have been invited and compiled:
- G.2. Summary of the comments received:
- G.3. Report on how due account was taken of any comments received:

**Annex 1 - Contact Information On Participants In The 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:	

**Annex 2 - Information Regarding Public Funding****Annex 3 - Baseline Information****Annex 4 - Monitoring Plan**



Document produced with the assistance of

**Deloitte**.

and

**ECO SECURITIES**

Copyright© 2004 by Agence française de développement  
5, rue Roland-Barthes – 75598 Paris cedex 12 – France

All rights reserved. No part of this publication may be reproduced by any means, either electronic or mechanical, without permission in writing from Agence française de développement.



The design of the three volumes of the Guide, dedicated to the Kyoto Protocol project mechanisms, was carried out under the aegis of the Interministerial Taskforce for Climate Change (*Mission interministérielle de l'effet de serre*, MIES) (Philippe Meunier, Secretary-General) and the Economic and Trade Department (*Direction des relations économiques extérieures*, DREE) of the Ministry of Economy, Finance and Industry (Véronique Massenet, Environment Adviser to the Director), with the support of the French Global Environment Facility (*Fonds français pour l'environnement mondial*, FFEM) (Philippe Bosse, climate change expert).

The orientation and editorial content of the guide was supervised by a Steering Committee composed of about twenty representatives from the French administration:

- Ministry of Ecology and Sustainable Development: Ghislain Rieb, Marie-Claire Lhenry, Emmanuel Martinez
- Ministry of Economy, Finance and Industry: Philippe Grisoni (DGEMP)
- Ministry of Foreign Affairs: Olivier Nicolas, Jean-Philippe Dufour (DGCID)
- Ministry of Agriculture, Food, Fishing and Rural Affairs: Alain Chaudron
- Agency for Environment and Energy Management: Aurélie Bernard, Mathieu Wellhoff

and from the private sector :

- Entreprises pour l'Environnement: Patrick Nollet
- Club Ademe International: Jean-Claude Andreini
- CDC-Ixis: Céline Lauverjat
- Dalkia: Sophie Ducoloner
- EDF: Jean-Yves Caneill
- Gaz de France: Christine Faure-Fedigan
- Lafarge: Gaëlle Monteiller, Michel Picard
- Onyx: Cyril Coillot
- Total: Michel Fontaine

The guide was produced by a team of consultants, coordinated by Bernard Meunier (Seed): Alexandre Marty and Benoît Leguet (Deloitte), Paul Soffe and Véronique Bovée (EcoSecurities).

Furthermore, the guide benefited from the advice of experts, among others: Jean-Jacques Becker (Ministry of Economy, Finance and Industry, and member of the CDM Executive Board), Frederick Jeske (Treasury Department of the Ministry of Economy, Finance and Industry), Cyril Loisel (ONF), Matthieu Wemaere (Huglo-Lepage, formerly French national expert on secondment to the Environment Directorate-General of the European Commission),

as well as observations and suggestions from representatives from international and/or non governmental organizations: Sibi Bonfils (Institut de l'énergie et de l'environnement de la francophonie), Christophe Rynikiewicz and Raphaëlle Gauthier (Réseau action climat, French affiliate of the Climate Action Network), Hélène Connor (Hélio International), Mark Kenber and Liam Salter (WWF).

The preparation, publishing and distribution of this guide were financed through the French Global Environment Facility (FFEM).

**Mission Interministérielle  
de l'Effet de Serre**

**Ministère de l'Ecologie  
et du Développement Durable**

20 avenue de Ségur  
75302 Paris 07 SP

Tel. +33 1 42 19 20 21

Fax +33 1 42 19 10 43

<http://www.effet-de-serre.gouv.fr>

**Ministère de l'Économie,  
des Finances et de l'Industrie**  
**Direction des Relations  
Économiques Extérieures**

139, rue de Bercy  
75572 Paris cedex 12

Tel. +33 1 53 18 82 93

Fax +33 1 53 18 96 09

<http://www.missioneco.org/dree/>

**Fonds Français  
pour l'Environnement Mondial**

5, rue Roland-Barthes  
75598 Paris cedex 12

Tel. +33 1 53 44 42 42

Fax +33 1 53 44 32 48

<http://www.ffem.net>