SEMINAR ON CDM: OPPORTUNITIES IN RAJASTHAN

Co-organised by

Rajasthan State Pollution Control Board

Development Alternatives

CHAPTER - 1

Basics of Climate Change

What is Climate Change?

Ever since the earth came into being there has been a climate system. The climate of a place is the average weather that it experiences over a period of time (20-30 years). The factors that determine the climate at a location are the rainfall, sunshine, wind, humidity, and temperature. When these weather parameters shows deviation from normal trends and this deviation is persistent for 2-3 decades, it is defined as climate change.

Why is Climate Changing?

Over the last 150-200 years the change has been taking place too rapidly. The main reason for this is Enhanced Greenhouse Effect. Over the years, greenhouse effect (the trapping of greenhouse gases by the earth's atmosphere, thereby increasing the temperature of earth's surface) has been responsible for sustaining the life on earth by maintaining the earth's temperature at a comfortable 180C. But, human activities have greatly increased the quantity of greenhouse gas emissions at a rapid pace, which has resulted in Enhanced Greenhouse Effect. The increase in the quantity of greenhouse gases has raised the temperature of the earth substantially, a phenomenon commonly known as global warming, leading to climate change.

The principal reason for the mounting thermometer is a century and a half of industrialization: the burning of ever-greater quantities of oil, gasoline, and coal, the cutting of forests, practice of certain farming methods among others.

Why is the concern for the changing climate?

The reasons for concern are many. The average temperature of the earth's surface has risen by 0.6 degrees C since the late 1800s. It is expected to increase by another 1.4 to 5.8 degrees C by the year 2100 -- a rapid and profound change. This may affect various systems (human, animal, forest, agriculture, fisheries, coastal ecosystems etc.) adversely.

The average sea level rose by 10 to 20 cm during the 20th century, and an additional increase of 9 to 88 cm is expected by the year 2100. (Higher temperatures cause ocean volume to expand, and melting glaciers and ice caps add more water.) If the higher end of that scale is reached, the sea could overflow the heavily populated coastlines of such countries as Bangladesh, cause the disappearance of some nations entirely (such as the island state of the Maldives), foul freshwater supplies for billions of people, and spur mass migrations.

Agricultural yields are expected to drop in most tropical and sub-tropical regions -- and in temperate regions, too, if the temperature increase is more than a few degrees C. Drying of continental interiors, such as central Asia, the African Sahel, and the Great Plains of the United States, is also forecast. These changes could cause, at a minimum, disruptions in land use and food supply.

Vector borne diseases such as malaria may expand to new areas that are presently not being affected by such diseases.

Global warming is a "modern" problem -- complicated, involving the entire world, tangled up with difficult issues such as poverty, economic development, and population growth. Dealing with it will not be easy. Ignoring it will be worse.

How to Address the Problem?

There are two possible ways to address the problem of Climate Change. Either to reduce the emission of these greenhouse gases (mitigation), or by Adapting different systems (human, animal and ecosystems etc.) to the changing climate.

What International Efforts are being made?

Since 1988, an Intergovernmental Panel on Climate Change (IPCC) has reviewed scientific research and provided governments with summaries and advice on climate problems.

In 1992, most countries (189) joined an international treaty -- the United Nations Framework Convention on Climate Change -- to begin to consider what can be done to reduce global warming and to cope with whatever temperature increases are inevitable.

Recently a number of nations have approved an addition to the treaty, called the Kyoto Protocol, which has more powerful (and legally binding) measures. The protocol has taken effect from February, 2006.

CHAPTER - 2

The Kyoto Protocol

What is the Kyoto Protocol ?

The Kyoto Protocol was adopted at the 3rd session of the Conference of the Parties (COP3) to the United Nations Framework Convention on Climate Change (UNFCCC) held in Kyoto, Japan, in December 1997.

The Protocol defines quantified greenhouse gas (GHG) emissions reduction targets for Annex I Parties. Annex I Parties means those countries listed in Annex I of the UNFCCC. They are developed countries including Economies in Transitions, e.g. Russia and Eastern Europe. There are no quantified emission reduction targets for non-Annex I countries (e.g. India, China and other 127 countries)

Which Greenhouse Gases are included in the Protocol ?

GHGs defined by the Protocol are carbon dioxide (CO2), methane (CH4), nitrous oxide (N2O), HFCs, PFCs, and SF6.

What are the targets specified in the Protocol?

Countries have different targets for the 5-year period of 2008-2012 (1st commitment period) The base-year emissions are the Party's aggregate GHG emissions in 1990 (whereas, countries may use 1995 as its base year for HFCs, PFCs, and SF6).'Assigned amounts' for each Party is calculated from the base-year emissions and emission reduction target.

What if the countries do not meet their targets?

Party not meeting their emission reduction targets shall be applied the following penalties:

- ⇒ Deduction from the Party's assigned amount for the 2nd commitment period of a number of tones equal to 1.3 times the amount in tones of excess emissions;
- ⇒ Development of a compliance action plan; and
- ⇒ Suspension of the eligibility to make transfers under Article 17 of the Protocol until the Party is reinstated.

- Quantified GHG emissions reduction targets (in other words, emission caps) for Annex I Parties are as follows.

Reduction targets stipulated in the Kyoto Protocol are -8% for each EU (15) member state Parties. However, the table below shows their reduction targets after adjusting the targets amongst the EU (15) member state Parties.

European Union (15 member states)			Economics in Transition(EIT)			Other Parties		
Party	Target	GHG emissions in 1990	Party	Target	GHG emissions in 1990	Party	Target	GHG emissions in 1990
Portugal	27.0%	59.3	Russian Federation	0%	3046.6	Iceland	10%	3.3
Greece	25.0%	109.4	Ukraine	0%	978.9	Australia	8%	417.9
Spain	15.0%	283.9	Croatia	-5%	31.8	Norway	1%	50.1
Ireland	13.0%	53.8	Poland	-6%	564.4	New Zealand	0%	61.5
Sweden	4.0%	72.2	Romania	-8%	265.1	Canada	-6%	595.9
Finland	0.0%	70.4	Czech Republic	-8%	192.0	Japan	-6%	1187.2
France	0.0%	568.0	Bulgaria	-8%	138.4	USA	-7%	6082.5
Netherlands	-6.0%	211.7	Hungary	-6%	122.2	Switzerland	-8%	52.4
Italy	-6.5%	511.2	Slovakia	-8%	72.9	Liechtenstein	-8%	0.3
Belgium	-7.5%	145.7	Lithuania	-8%	50.9	Monaco	-8%	0.1
UK	-12.5%	748.0	Estonia	-8%	43.5	Turkey		
Austria	-13.0%	78.6	Latvia	-8%	25.4			
Denmark	-21.0%	7.07	Slovenia	-8%	20.2			
Germany	-21.0%	1,243.7	Belarus		129.2			
Luxembourg	-28.0%	13.4						
EU	-8.0%	4,240.0						

CHAPTER - 3

Clean Development Mechanism

What is the Clean Development Mechanism (CDM)?

The Clean Development Mechanism is a mechanism to help business sector earn additional revenues for undertaking greenhouse gas emission reducing projects. Credit is earned in the form of Certified Emission Reductions. The objective of the CDM is to assist developing countries achieve sustainable development on the one hand, and assisting Annex I countries in achieving their obligations under the Kyoto Protocol cost effectively, on the other.

How are CDM projects developed?

Two Options for CDM projects	
• Industrialised countries (state / private companies) invest in projects in developing countries that contribute to reduction / avoidance of greenhouse gas emissions.	• Developing countries (state/private companies) make investments and implement the projects that reduce/avoid greenhouse gas emissions on their own.
• The investing industrialised country can credit the emission reductions achieved (against baseline emissions in the developing country) in this project towards its own emission commitment	• These entities in developing countries can sell the emissions credit generated from the projects to industrialised countries at the prevailing carbon prices.

A country where CDM project is implemented, is called a host Party.

The credit from the CDM is called certified emission reduction (CER) which is equivalent to 1 tonne of CO_2 eq of Greenhouse gas emission reduced/avoided.

What types of projects are eligible for CDM?

Energy

⇒ Renewable energy projects: Wind, solar, hydro, biomass, geothermal
⇒ Power Generation involving Combined Cycle turbines, clean coal technology
⇒ Projects involving Co-generation: Sugarcane, chemical processes

Industry

- ⇒ Efficiency in Boilers. Motors, lighting
- ⇒ Cogeneration-chemical, metallurgy, paper
- ⇒ Retrofits
- ⇒ Energy efficiency/conservation in Production Process
- ⇒ Projects involving fuel switching from coal/diesel/petroleum to Natural Gas, methane, biomass & biogas
- ⇒ Waste Fuel Recovery – including landfills

Municipal Operations

- ⇒ Energy Efficiency in street lighting, water pumping
- ⇒ Waste to energy
- ⇒ Methane capture from sewage treatment plants

What are the two types of CDM projects?

Small-scale projects

The following types of projects fall under the small scale category:

- ⇒ Type (i) : Renewable energy project activities with a maximum output capacity equivalent to up to 15 MW(or an appropriate equivalent)
- ⇒ Type (ii) : Energy efficiency improvement project activities which reduce energy consumption, on the supply and/or demand side, by up to the equivalent of 15GWh/year
- ⇒ Type (iii) : Other project activities that both reduce anthropogenic emissions by sources and directly emit less than 15,000 t-CO_2equivalent annually

Large scale projects

All projects that are eligible for CDM but do not fall under the small scale category are large scale projects.

What are the benefits for the small scale projects ?

SSC project activities follow the stages of the project cycle specified in the next section. In order to reduce transaction costs, however, modalities and procedures are simplified for Small Scale Category (SSC) project activities, as follows

- ⇒ Project activities may be bundled or portfolio bundled at the following stages in the project cycle: the PDD, validation, registration, monitoring, verification and certification ;

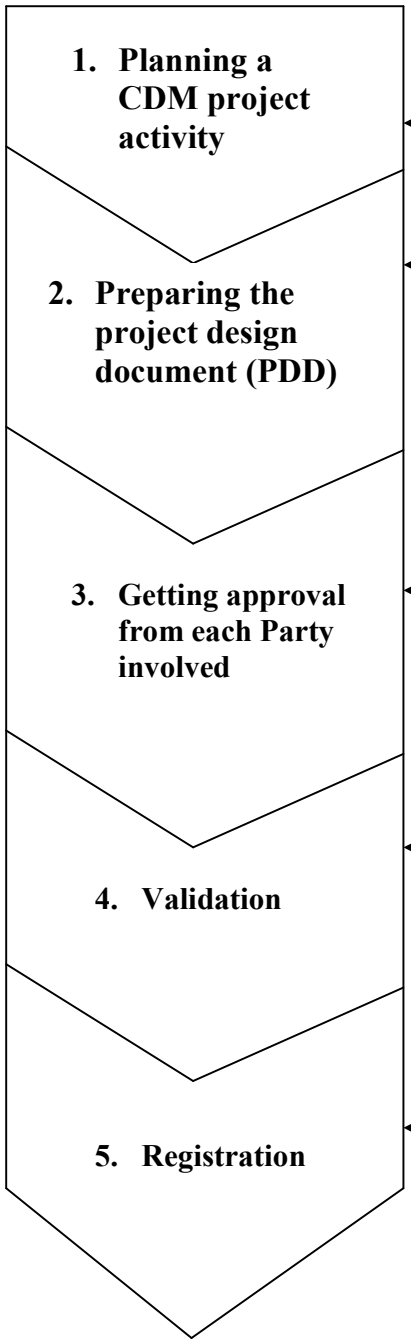
⇒ The requirements for the PDD are reduced;

⇒ Baselines methodologies by project category are simplified to reduce the cost of developing a project baseline;

⇒ Monitoring plans are simplified to reduce monitoring costs;

⇒ The same operational entity may undertake validation, and verification and certification.

What are the various stages of the CDM project cycle



1. **Planning a CDM project activity**

- CDM project participants (PPs) plan a CDM project activity
- There are several conditions in order to be registered as a CDM project activity , and PPs should consider those conditions from a planning stage.

2. **Preparing the project design document (PDD)**

- PPs prepare the project design document (PDD) for a CDM project activity
  - ⇒ There is the standard format for the PDD, and PPs must fill in all the contents as necessary.

3. **Getting approval from each Party involved**

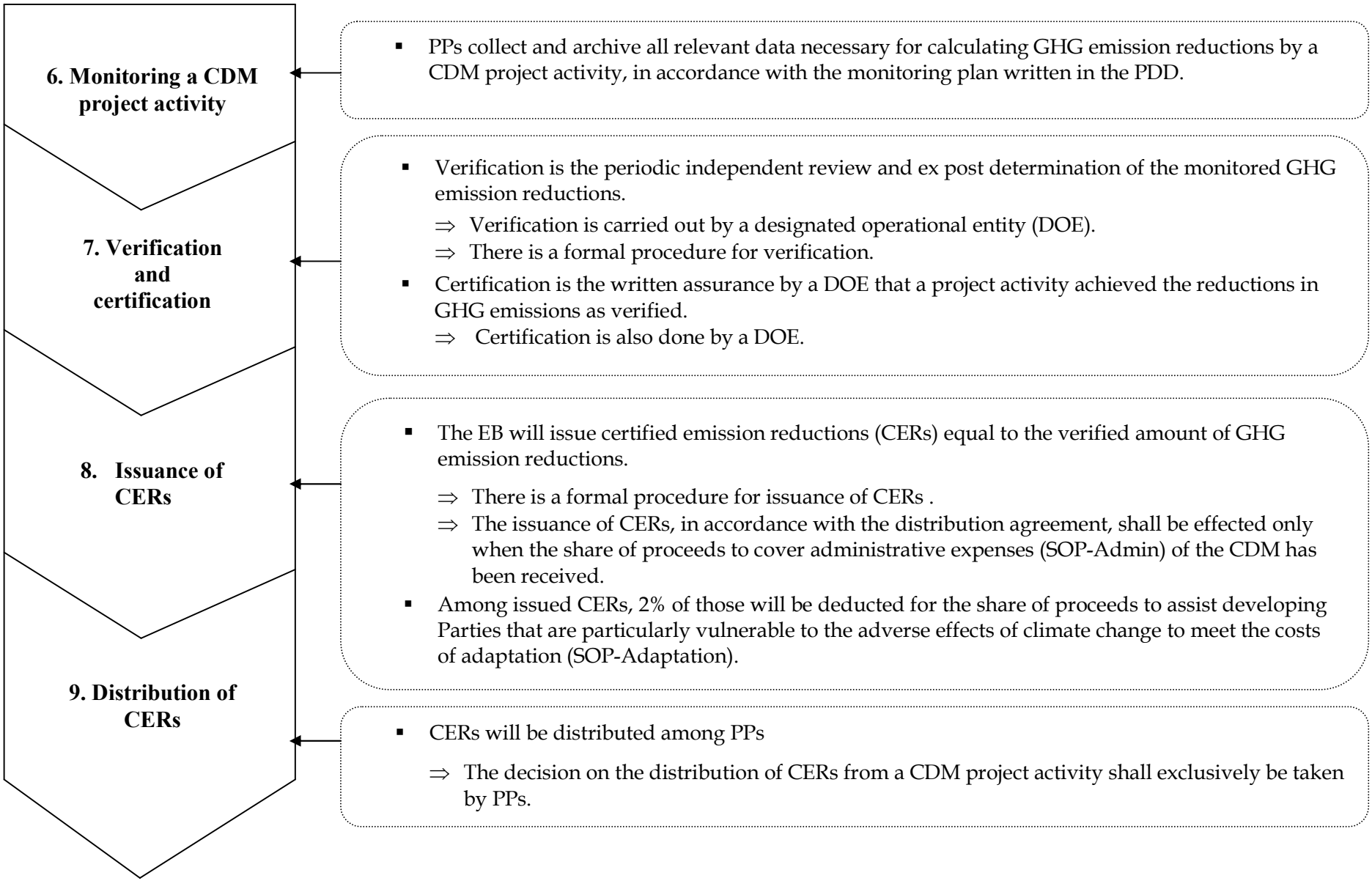
- PPs shall get written approvals of voluntary participation from the designated national authority (DNA) of each Party involved, including host Party.
  - ⇒ The written approval from host Party should include confirmation by the host Party that a project activity assists it in achieving sustainable development.
  - ⇒ A Party involved is a Party that provides a written approval.
  - ⇒ The registration of a project activity can take place without an Annex I Party being involved at the stage of registration
  - ⇒ The details of approval procedure is up to each Party.
- PPs may get written approvals in step (1), (2) or even (4)
  - ⇒ But PPs must get written approvals before a request for registration.

4. **Validation**

- Validation is the process of independent evaluation of a project activity against the requirements of the CDM on the basis of the PDD.
  - ⇒ Validation is carried out by a designated operational entity (DOE).
  - ⇒ There is a formal procedure for validation.

5. **Registration**

- Registration is the formal acceptance of a validated project as a CDM project activity.
  - ⇒ Registration is done by the CDM executive board (EB).
  - ⇒ There is a formal procedure for request for registration.
  - ⇒ PPs shall pay registration fee at registration stage.


6. Monitoring a CDM project activity
PPs collect and archive all relevant data necessary for calculating GHG emission reductions by a CDM project activity, in accordance with the monitoring plan written in the PDD.
7. Verification and certification
Verification is the periodic independent review and ex post determination of the monitored GHG emission reductions.
⇒ Verification is carried out by a designated operational entity (DOE).
⇒ There is a formal procedure for verification.
Certification is the written assurance by a DOE that a project activity achieved the reductions in GHG emissions as verified.
⇒ Certification is also done by a DOE.
8. Issuance of CERs
The EB will issue certified emission reductions (CERs) equal to the verified amount of GHG emission reductions.
⇒ There is a formal procedure for issuance of CERs .
⇒ The issuance of CERs, in accordance with the distribution agreement, shall be effected only when the share of proceeds to cover administrative expenses (SOP-Admin) of the CDM has been received.
Among issued CERs, 2% of those will be deducted for the share of proceeds to assist developing Parties that are particularly vulnerable to the adverse effects of climate change to meet the costs of adaptation (SOP-Adaptation).
9. Distribution of CERs
CERs will be distributed among PPs
⇒ The decision on the distribution of CERs from a CDM project activity shall exclusively be taken by PPs.

What are the various entities related to CDM projects?

Conference of Parties

The Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol (COP/MOP):

- ⇒ Has authority over CDM and provides guidance to the CDM;
- ⇒ Decides on the recommendations made by the EB on its rules of procedure,
- ⇒ Decides on the designation of operational entities (OEs) accredited by the EB;
- ⇒ Reviews annual reports of the EB;
- ⇒ Reviews the regional and subregional distribution of designated operational entities (DOEs) and CDM project activities;
- ⇒ Assists in arranging funding of CDM project activities, as necessary

CDM Executive Board

The EB supervises the CDM, under the authority and guidance of the COP/MOP , and shall:

- ⇒ Make recommendations to the COP/MOP on further modalities and procedures for the CDM and/or any amendments or additions to rules of procedure for the EB, as appropriate;
- ⇒ Approve new methodologies related to, inter alia, baselines, monitoring plans and project boundaries;
- ⇒ Review provisions with regard to simplified modalities, procedures and the definitions of small scale CDM (SSC) project activities, and if necessary, makes appropriate recommendations to the COP/MOP;
- ⇒ Be responsible for the accreditation of operational entities (OEs), and make recommendations to the COP/MOP for the designation of OEs .
- ⇒ Make any technical reports to the public and provide a period of at least 8 weeks for public comments on draft methodologies and guidance;
- ⇒ Develop and maintain the CDM registry ;
- ⇒ Formally accept a validated project as a CDM project activity (registration);
- ⇒ Instruct to issue CERs for a CDM project activity to the CDM registry administrator;

Designated National Authority (DNA)

As per the Kyoto Protocol, Parties participating in the CDM shall set up a designated national authority (DNA) for the CDM.

- ⇒ CDM project participants (PPs) shall receive written approval of voluntary participation from the DNA of each Party involved.
- ⇒ The written approval shall include confirmation by the host Party that the project activity assists it in achieving sustainable development.
- ⇒ The details of approval procedure is up to each Party.

In case of India, the composition of the "National Clean Development Mechanism (CDM) Authority" is as follows:

1.	Secretary (Environment and Forests)	Chairperson
2.	Foreign Secretary or his nominee	Member
3.	Finance Secretary or his nominee	Member
4.	Secretary, Industrial Policy and Promotion or his nominee	Member
5.	Secretary, Ministry of Non Conventional Energy Sources or his nominee	Member
6.	Secretary, Ministry of Power or his nominee	Member
7.	Secretary, Planning Commission or his nominee	Member
8.	Joint Secretary (Climate Change), Ministry of Environment and Forests	Member
9.	Director (Climate Change), Ministry of Environment and Forests	Member-Secretary

The National Clean Development Mechanism (CDM) Authority receives projects for evaluation and approval as per the guidelines and general criteria laid down in the relevant rules and modalities pertaining to CDM in addition to the guidelines issued by the Clean Development Mechanism Executive Board and Conference of Parties serving as Meeting of Parties to the United Nations Framework Convention on Climate Change.

The evaluation process of CDM projects includes an assessment of the probability of eventual successful implementation of CDM projects and evaluation of extent to which projects meet the sustainable development objectives, as it would seek to prioritize projects in accordance with national priorities.

The National Clean Development Mechanism (CDM) Authority can recommend certain additional requirements to ensure that the project proposals meet the national sustainable development priorities and comply with the legal framework so as to ensure that the projects are compatible with the local priorities and
stakeholders have been duly consulted.

The Authority ensures that in the event of project proposals competing for same source of investment, projects with higher sustainable development benefits and which are likely to succeed are accorded higher priority.

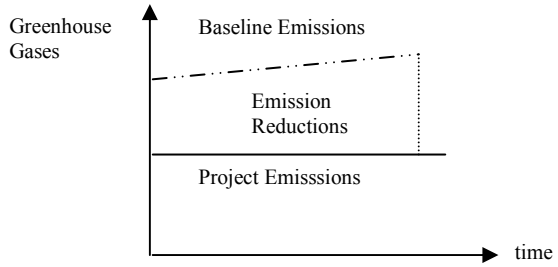
Designated Operational Entity (DOE)

A DOE under the CDM:

- Is either a domestic legal entity or an international organization accredited and designated, on a provisional basis until confirmed by the COP/MOP, by the EB.
- Has two key functions:
  - ⇒ It validates and subsequently requests registration of a proposed CDM project activity
  - ⇒ It verifies emission reduction of a registered CDM project activity, certifies as appropriate and requests the EB to issue Certified Emission Reductions (CERs) accordingly
  - ⇒ Upon request, the EB may allow a single DOE to perform all these functions within a single CDM project activity.

What are the main items in the Project Design Document?

1. **Baseline:** The baseline (scenario and emissions) for a CDM project activity is the scenario that reasonably represents GHG emissions that would occur in the absence of the proposed project activity.



Difference between the baseline emissions and GHG emissions after implementing the CDM project activity (project emissions) is emission reductions.

Considerations while establishing the baseline

- A baseline (scenario and emissions) shall be established:
  - ⇒ By PPs in accordance with provisions for the use of approved and new methodologies;
  - ⇒ In a transparent and conservative manner regarding the choice of approaches, assumptions, methodologies, parameters, data sources, key factors and additionality, and taking into account uncertainty;
  - ⇒ On a project-specific basis;
  - ⇒ In the case of small-scale CDM project activities in accordance with simplified procedures developed for such activities;
  - ⇒ Taking into account relevant national and/or sectoral policies and circumstances, such as sectoral reform initiatives, local fuel availability, power sector expansion plans, and the economic situation in the project sector.

- Before calculating baseline emissions, it is necessary to identify baseline scenarios.
- A baseline (emissions) shall cover emissions from all gases, sectors and source categories within the project boundary.

2. **Additionality:** A CDM project activity is additional if GHG emissions are reduced below those that would have occurred in the absence of the registered CDM project activity.

   - The DOE shall review the PDD to confirm that the project activity is expected to result in a reduction in GHG emissions that are additional to any that would occur in the absence of the proposed project activity.
   - PPs have to write explanation of how and why this project activity is additional and therefore not the baseline scenario in a PDD, including;
     - ⇒ a description of the baseline scenario determined by applying the methodology,
     - ⇒ a description of the project activity scenario, and
     - ⇒ an analysis showing why the emissions in the baseline scenario would likely exceed emissions in the project activity scenario.
   - "The tool for the demonstration and assessment of additionality"provides a general framework for demonstrating and assessing additionality. PPs may also propose other tools for the demonstration of additionality.

3. **Project Boundary and Leakage :**

   Project Boundary: The project boundary shall encompass all anthropogenic GHG emissions by sources under the control of the PPs that are significant and reasonably attributable to the CDM project activity.

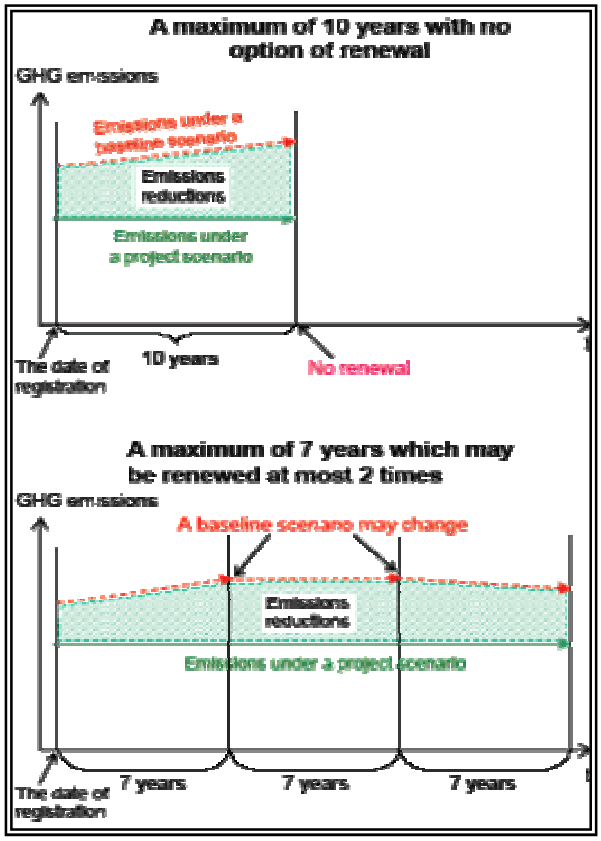
   Leakage: Leakage is defined as the net change of GHG emissions which occurs outside the project boundary, and which is measurable and attributable to the CDM project activity.

   - ⇒ In an operational context, the terms measurable and attributable should be read as "which can be measured" and "directly attributable", respectively.
   - ⇒ Reductions in GHG emissions shall be adjusted for leakage in accordance with the monitoring and verification provisions.

4. **Monitoring :** Monitoring refers to the collection and archiving of all relevant data necessary for determining the baseline, measuring GHG emissions within the project boundary of a CDM project activity and leakage, as applicable.
   - ⇒ A monitoring plan for a proposed project activity shall be based on a previously approved monitoring methodology or a new methodology.
   - ⇒ Project Participants can use an existing monitoring methodology that has been approved by the EB and made publicly available along with the relevant guidance
   - ⇒ Project Participants may also propose a new methodology

5. Crediting Period

- CERs shall be issued for a crediting period starting after the date of registration of a CDM project activity
- PPs select a crediting period for a proposed project activity from one of the following alternative approaches
  - ⇒ A maximum of 7 years which may be renewed at most 2 times. For each renewal, a DOE determines and informs the EB that the original project baseline is still valid or has been updated taking account of new data where applicable.
  - ⇒ A maximum of 10 years with no option of renewal.
- GHG emission reductions since 2000 may be eligible to claim CERs.



List of Projects Approved by National CDM Authority of India

Project Name & Location	State	Sector	Status
Waste Heat Recovery based Power Generation, at Amona, Bicholim, Goa by SESA Goa Limited (SGL)	Maharashtra	Energy Efficiency	Approved
Use of waste gas for electricity generation at Jindal Thermal Power Company Limited at Toranagallu, Bellary, Karnataka by M/s JSW Energy Limited	Karnataka	Energy Efficiency	Approved
MSPSPL Waste Heat Recovery based captive power project at Jamgaon, Raigarh, Chhattisgarh by M/s MSP Steel & Power Ltd	Chattisgarh	Energy Efficiency	Approved
Energy efficiency & fuel switching measures in the Caustic Soda and Sodium Cyanide Plant at Baroda Complex of M/s Gujarat Alkalies & Chemical Limited	Gujarat	Energy Efficiency	Approved
Efficient utilization of Natural Gas and waste heat at Dahej Complex of M/s Gujarat Alkalies & Chemical Limited	Gujarat	Energy Efficiency	Approved
Reduction in steam consumption in stripper reboilers through process modifications at Jamnagar, Gujarat by M/s Reliance Industries Ltd	Gujarat	Energy Efficiency	Approved
11.2 MW waste heat recovery boiler at the ISA smelt furnace of Copper smelter at Tuticorin Tamil nadu by Sterlite Industries India Ltd., Tuticorin, Tamil Nadu	Tamil Nadu	Energy Efficiency	Approved
Energy Efficiency Measures in a Cement Plant at Chittorgarh, Rajasthan, India by M/s Birla Corporation Limited, Unit: Chittorgarh (BCL Chittorgarh: comprising of Birla Cement works (BCW) and Chanderia Cement Works)	Rajasthan	Energy Efficiency	Approved
Energy efficiency-Use of engine exhaust waste heat in waste heat recovery system to produce hot water at Kota, Rajasthan by M/s Samcor Glass Limited.	Rajasthan	Energy Efficiency	Approved

Energy efficiency-Use of turbine exhaust waste heat in waste heat recovery generator to produce steam at Ghaziabad, Uttar Pradesh by M/s Samtel Color Ltd.	Uttar Pradesh	Energy Efficiency	Approved
VGL Waste heat based 4 MW Captive power project at Raipur, Chhattisgarh by M/s Vandana Global Private Ltd	Chattisgarh	Energy Efficiency	Approved
Energy Efficiency Measures at Cement Production Plant in Central India at Satna, Madhya Pradesh by M/s Birla Corporation Ltd. Unit - Satna Cement Works	Madhya Pradesh	Energy Efficiency	Approved
Waste heat Based 12 MW Captive power project at Bharuch, Gujarat by M/s Phillips Carbon Black Ltd	Gujarat	Energy Efficiency	Approved
Methane Capture and use as fuel at Rajaram Maize products at Rajnandgaon, Chattisgarh by M/s Rajaram Maize products.	Chattisgarh	Industrial Process	Approved
Switching of fossil fuel from HSD to Natural gas by replacing the Diesel engines (1.6MWe*2) with Gas engines (1.5MWe*2) at Kota, Rajasthan by M/s Samcor Glass Ltd	Rajasthan	Fuel Switching	Approved
Increasing the Additive Blend in the Portland Slag Cement at Raigad, Maharastra by M/s Indorama Cement Limited.	Maharashtra	Industrial Process	Approved
Optimal utilization of clinker in PPC manufacturing at Raebareli Unit, Uttar Pradesh by M/s Birla Corporation Ltd.	Uttar Pradesh	Industrial Process	Approved
Optimal utilization of clinker: Substitution of clinker by flyash in Portland Pozzolona cement blend at OCL Rajgangpur, Sundargarh, Orissa by M/s OCL India Limited.	Orissa	Industrial Process	Approved
Alternative arrangement for preheating fuel NG at Babrala Plant, Bundaun District, Uttar Pradesh by M/s Tata Chemical Ltd.	Uttar Pradesh	Energy Efficiency	Approved
C-03 off gas utilization in primary reformer as fuel at Babrala Plant, Bundaun District, Uttar Pradesh by M/s Tata Chemical Ltd.	Uttar Pradesh	Industrial Process	Approved

Installation of Additional Urea Trays in Urea Reactors (11/21 R-01)at Babrala Plant, Bundaun District, Uttar Pradesh by M/s Tata Chemical Ltd	Uttar Pradesh	Energy Efficiency	Approved

Fuel Switching Sector

Industrial Fuel Switching from Naphtha to Natural Gas without extension of capacity and lifetime of the facility At Jhagadia Industrial Estate, Gujarat by M/s United Phosphorus Limited.	Gujarat	Fuel Switching	Approved
Switching of fuel from Naphtha to Natural Gas in the CCP at Dahej Complex of M/s Gujarat Alkalies & Chemical Limited	Gujarat	Fuel Switching	Approved
Switching of fuel from Natural Gas to Hydrogen in CCU-IIat Dahej Complex of M/s Gujarat Alkalies & Chemical Limited	Gujarat	Fuel Switching	Approved
Switching of fossil fuel from HSD to Natural gas by replacing the Diesel engines (1.6MWe*2) with Gas engines (1.5MWe*2) at Kota, Rajasthan by M/s Samcor Glass Ltd	Rajasthan	Fuel Switching	Approved
Industrial fuel switching from Naptha to Natural Gas with extension of capacity and lifetime of the facility at station II of GIPCL in Vadodara, Gujarat by M/s Gujarat Industries Power Co. Ltd	Gujarat	Fuel Switching	Approved
Grid connected electricity generation using natural gas by the Vemagiri Power Generation Ltd in Andhra Pradesh	Andhra Pradesh	Fuel Switching	Approved
Switching of fuel from Naphtha to Natural gas by Essar Power Limited at their power plant at Hazira in Surat District, Gujarat.	Gujarat	Fuel Switching	Approved
Switching of fuel from Naphtha to Natural gas by BSES Andhra Power Limited (BAPL) at their CCGT power plant at Samalkot, East Godavri District, A.P.	Andhra Pradesh	Fuel Switching	Approved
119 .80 MW Natural Gas Based Combined Cycle Power Plant, at Tanjavur, Tamil Nadu by M/s	Tamil Nadu	Fuel Switching	Approved

Aban Power Company Limited.			
1050 MW Natural gas based grid connected combined cycle power generation project at Akhakhol by M/s Gujarat Torrent Power Generation Limited	Gujarat	Fuel Switching	Approved
18 MW Natural Gas OPG Energy Pvt	Tamil Nadu	Fuel Switching	Approved
25 MW Natural Gas Captive Power plant, Coromondal Electric company Ltd	Tamil Nadu	Fuel Switching	Approved

Industrial Processes

SIDPL Methane extraction and Power generation project in PPC manufacturing at Nashik, Maharashtra	Maharashtra	Industrial Process	Approved
Blended cement with increased blend at Orient Cement Devapur and Jalgaon Plants by M/s Orient Cement Orient Paper Industries	Andhra Pradesh	Industrial Process	Approved
Optimal utilization of clinker in PPC manufacturing at Raebareli Unit, Uttar Pradesh by M/s Birla Corporation Ltd.	Uttar Pradesh	Industrial Process	Approved
ACC blended cement projects at; New Wadi Plant, Madukkarai Cement Works, Tikaria Cement Plant, Gagal Cement Works, Kymore Cement Works, Lakheri Cement Works, Chaibasa Cement Works by M/s The Associated Cement Company Ltd.	Andhra Pradesh	Industrial Process	Approved
Optimum Utilization of Clinker by PPC Production, at Sirohi, Rajasthan by Binani Cement	Rajasthan	Industrial Process	Approved
Blended cement projects at, Maratha Cement plan, Maharashtra; Gujarat unit; Himachal unit; Ropar unit; Rabriyawar unit, Rajasthan; by Gujarat Ambuja Cement Ltd.	Gujarat	Industrial Process	Approved
Reducing specific consumption of Clinker by development of product markets for PPC/	Uttar Pradesh	Industrial Process	Approved

blended cement in Madhya Pradesh and Uttar Pradesh by Jai Prakash Associates			
Energy Efficiency by upgradation of clinker cooler in cement manufacturing at Vikram Cement, Grasim Industries in Neemuch, M.P.	Madhya Pradesh	Industrial Process	Approved
Energy Efficiency by upgradation of clinker cooler in cement manufacturing at Grasim Cement, Raipur, Chhatisgarh	Chattisgarh	Industrial Process	Approved

Blended cement with increased blend at Orient Cement Devapur and Jalgaon Plants by M/s Orient Cement Orient Paper Industries	Andhra Pradesh	Industrial Process	Approved
SDPL Methane Capture and Power Generation project at Davanagere, Karnataka by M/s Samsons Distilleries Pvt Ltd	Karnataka	Industrial Process	Approved
Blended cement projects at, Maratha Cement plan, Maharashtra; Gujarat unit; Himachal unit; Ropar unit; Rabriyawar unit, Rajasthan; by Gujarat Ambuja Cement Ltd.	Gujarat	Industrial Process	Approved
Energy Efficiency by upgradation of clinker cooler in cement manufacturing at Grasim Cement, Raipur, Chhatisgarh	Chattisgarh	Industrial Process	Approved
Switching of fossil fuel from HSD to Natural gas by replacing the Diesel engines (1.6MWe*2) with Gas engines (1.5MWe*2) at Kota, Rajasthan by M/s Samcor Glass Ltd	Rajasthan	Fuel Switching	Approved

Renewable Energy

25.7 MW Bundled Wind Power Project" in Udumalpet, Tamil Nadu	Tamil Nadu	Renewable Energy	Approved
"37.62 MW Bundled Wind Power Project" in Nagercoil, Tamil Nadu	Tamil Nadu	Renewable Energy	Approved
21 MW Bundled Wind Power Project in Vankusawade, Maharashtra	Maharashtra	Renewable Energy	Approved
Wind Power project in Tamilnadu by Amarjothi Group at Tirunelveli,	Tamil Nadu	Renewable Energy	Approved

Tamilnadu by M/s Amarjothi Spinning Mills Limited.			
3.76 MW Electricity generation project from poultry litter in Tamil Nadu, by M/s Subhashri Bioenergies Pvt Ltd	Tamil Nadu	Renewable Energy	Approved
12 MW hydro power plant at Bhandardara, Ahmednagar, Maharashtra by M/s Dodson-Lindblom Hydro Power Pvt. Ltd	Maharashtra	Renewable Energy	Approved
2.5 MW windmill project at Sodamada, Jaisalmer by M/s Gujarat JHM Hotels Ltd.	Rajasthan	Renewable Energy	Approved
12.3 MW wind energy projects at Tirunelveli, Tamil Nadu by M/s Indowind Energy Ltd	Tamil Nadu	Renewable Energy	Approved
12 MW hydro power plant at Bhandardara, Ahmednagar, Maharashtra by M/s Dodson-Lindblom Hydro Power Pvt. Ltd	Maharashtra	Renewable Energy	Approved
2.5 MW windmill project at Sodamada, Jaisalmer by M/s Gujarat JHM Hotel Ltd.	Rajasthan	Renewable Energy	Approved
Switching of fossil fuel from HSD to Natural gas by replacing the Diesel engines (1.6MWe*2) with Gas engines (1.5MWe*2) at Kota, Rajasthan by M/s Samcor Glass Ltd	Rajasthan	Fuel Switching	Approved

15.4 MW wind farm at Satara, Maharashtra by M/s Ellora Time Limited	Maharashtra	Renewable Energy	Approved
5 MW Wind Power project at Baramsar and Soda Mada, Jaisalmer by M/s Transport Corporation of India Ltd.	Rajasthan	Renewable Energy	Approved
Generation of electricity from 1.2 MW capacity wind mills at Satara, Maharashtra by M/s Sun-n-Sand Hotels Pvt Ltd	Maharashtra	Renewable Energy	Approved

Generation of electricity from 4 MW capacity wind mills at Supa, Maharashtra by M/s Sun-n-Sand HotPvt Ltd	Maharashtra	Renewable Energy	Approved
Generation of electricity from 6.25 MW capacity wind mills at Soda Mada, Rajasthan by M/s Sun-n-Sand Hotels Pvt Ltd	Rajasthan	Renewable Energy	Approved
12.3 MW wind energy projects at Tirunelveli, Tamil Nadu by M/s Indowind Energy Ltd	Tamil Nadu	Renewable Energy	Approved
12 MW hydro power plant at Bhandardara, Ahmednagar, Maharashtra by M/s Dodson-Lindblom Hydro Power Pvt. Ltd	Maharashtra	Renewable Energy	Approved
6.3 MW Bagasse based power project at Bagalkot, Karnataka by M/s Jamkhandi Sugars Ltd.	Karnataka	Renewable Energy	Approved
2.5 MW windmill project at Sodamada, Jaisalmer by M/s Gujarat JHM Hotels Ltd.	Rajasthan	Renewable Energy	Approved
Switching of fossil fuel from HSD to Natural gas in a 5 MW turbine set at Samtel Color Ltd Ghaziabad, Uttar Pradesh by M/s Samtel Color Ltd	Uttar Pradesh	Fuel Switching	Approved
Blended cement with increased blend at Orient Cement Devapur and Jalgaon Plants by M/s Orient Cement Orient Paper Industries	Andhra Pradesh	Industrial Process	Approved
18 MW Kemphole Mini Hydel Scheme (KMHS)at Hassan, Karnataka, by M/s International Power Corporation Limited.	Karnataka	Renewable Energy	Approved

Solid Waste

6.6 MW Municipal Solid Waste to Electricity Generation Project in Hyderabad, Andhra Pradesh, India by Selco International Limited	Andhra Pradesh	Solid waste	Approved
Emission reduction through partial substitution of fossil fuel with alternative fuels like agricultural by-products & Municipal Solid Waste (MSW) in the Manufacturing of Portland Cementat Neemuch, Madhya Pradesh by M/s Vikram Cement.	Madhya Pradesh	Solid waste	Approved
Emission reduction through partial substitution of fossil fuel with alternative fuels like agricultural by-products, tyres and municipal solid waste (MSW) in the manufacturing of Portland cement, at Grasim south Cement (GS), Tamil Nadu	Tamil Nadu	Solid waste	Approved
SESL 6 MW Municipal Solid Waste based power Project at Vijayawada & Guntur, Andhra Pradesh by M/s Shriram Energy Systems Limited.	Andhra Pradesh	Solid waste	Approved
Municipal Solid Waste (MSW) processing cum power generation plant at Lucknow (UP) by Asia Bioenergy Limited (ABIL).	Uttar Pradesh	Solid waste	Approved

CLEAN DEVELOPMENT MECHANISM
PROJECT DESIGN DOCUMENT FORM (CDM-PDD)
Version 02 - in effect as of: 1 July 2004)

CONTENTS

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>>

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>>

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>>

A.4.1.1. Host Party(ies):

>>

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

>>

A.4.1.3. City/Town/Community etc:

>>

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>>

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>>

A.4.3. Technology to be employed by the project activity:

>>

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>>

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>>

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B.1. Title and reference of the approved baseline methodology applied to the project activity:

>>

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>>

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>>

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>>

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>>

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>>

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>>

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>>

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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 D.3)*	Data variable	Source of data	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)	Comment

D.2.1.2. Description of formulae used to estimate project emissions (for each gas, source, formulae/algorithm, emissions units of CO_2 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 variable	Source of data	Data unit	Measured (m), calculated (c), estimated (e),	Recording frequency	Proportion of data to be monitored	How will the data be archived? (electronic/ paper)	Comment

D.2.1.4. Description of formulae used to estimate baseline emissions (for each gas, source, formulae/algorithm, emissions units of CO_2 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 variable	Source of data	Data unit	Measured (m), calculated (c), estimated (e),	Recording frequency	Proportion of data to be monitored	How will the data be archived? (electronic/ paper)	Comment

D.2.2.2. Description of formulae used to calculate project emissions (for each gas, source, formulae/algorithm, emissions units of CO_2 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 variable	Source of data	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)	Comment

D.2.3.2. Description of formulae used to estimate leakage (for each gas, source, formulae/algorithm, emissions units of CO_2 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_2 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:

>>

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>>

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>>

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>>

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

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Glossary of Terms

CDM	Clean Development Mechanism
CER	Certified Emission Reduction
COP	Conference of Parties (to the UNFCCC)
COP/MOP	The Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol
DNA	Designated National Authority
DOE	Designated Operational Entity
EB	the CDM Executive Board
GHG	Greenhouse Gas
HFCs	Hydrofluorocarbons
KP	Kyoto Protocol
Party	Country or regional integration organization which has ratified the KP, unless otherwise specified
PDD	Project Design Document
PFCs	Perfluorocarbons
PP	Project Participant
SF_6	Sulfur Hexafluoride
SOP	Share of Proceeds
SSC	Small Scale CDM
UNFCCC	United Nations Framework Convention on Climate Change

Development Alternatives,
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