PROCEEDINGS

Seminar on

Clean Development Mechanism

September, 2005, Jaipur, India

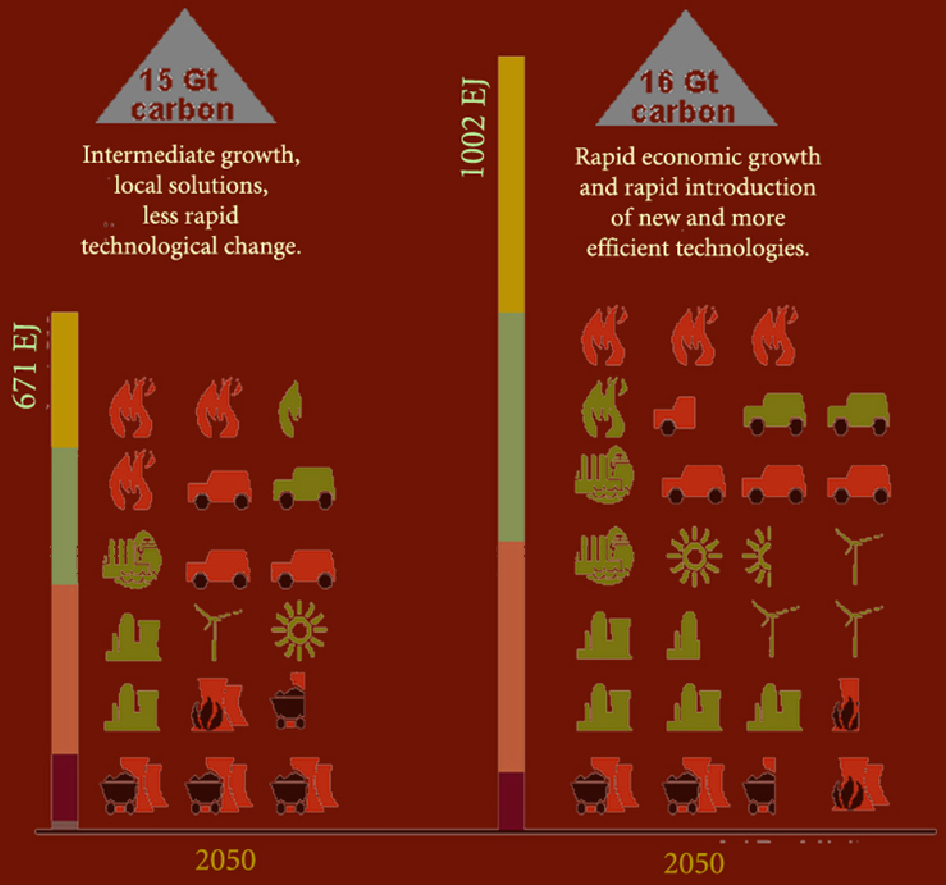
Organised by

Development Alternatives

Supported by

Institute for Global Environmental Strategies

Meeting Future Energy Needs



ORGANISATIONAL PROFILE

Development Alternatives

Development Alternatives is a non-profit corporate organisation with a mission to sustainable development through appropriate technology, institutional design and environmental management.

Climate Change Centre, **Development Alternatives**, works on global environmental issues such as global warming, climate change, sea level rise, desertification and deforestation. Economic and policy analysis of global environmental mechanisms is an important part of Climate Change Centre's activities. The activities of the Centre are broadly three fold; research on operational and applied aspects of climate change, technical assistance to industry and other stakeholders in taking up Clean Development Mechanism projects, and outreach and awareness generation among different stakeholder groups.

Institute for Global Environmental Strategies (IGES)

Established in 1998, the Institute for Global Environmental Strategies (IGES) is an independent, not-for-profit think tank, based in Japan, that goes beyond research to provide practical ways to protect the earth's environment and to realize greater sustainability and equity in the global community. The principal geographical scope of its activities is Asia-Pacific region, an area which is experiencing rapid economic development and which will affect the global environment through its population growth, urban environmental problems and other environmental issues.

The IGES mission is to move human society to become more environmentally and socio-economically sustainable. The ultimate goal of IGES is to create a new paradigm for the global community so that the unsustainable production and consumption patterns currently observed can be changed into sustainable ones.

Acknowledgements

Development Alternatives (DA) sincerely acknowledges the invaluable support provided by Institute for Global Environmental Strategies (IGES), Japan, for organising the Workshop in Jaipur, Rajasthan.

DA would like to express its heartfelt thanks to the participants from Punjab and Rajasthan. We would like to express our sincere gratitude to ***Shri. Gajendra Singh Ji, Hon'ble Minister***, Energy, Government of Rajasthan for inaugurating the workshop. We are also grateful to Mr. D.C. Samant, Addl. Chief Secretary (Infrastructure) and Mr. Yaduvendra Mathur, Secretary, Energy, Government of Rajasthan for their gracious presence and patronage.

Thanks are also due to the eminent speakers for making active contributions during the two day Workshop.

Special thanks are extended to officials from Rajasthan Renewable Energy Corporation (RREC) Limited, particularly to Mr. Rakesh Verma, Chairman & Managing Director, RREC Limited for their precious time and valuable inputs.
Last but not the least, DA wishes to appreciate its staff members for their dedicated effort to make the workshop a success.

EXECUTIVE SUMMARY

Throughout the 21st century and beyond, global climate change will have significant impacts on the human and other species on this planet. Global temperatures are projected to increase upto 5.8 ^{0}C by 2100, and at least some of this warming is unavoidable. To address this issue, the Kyoto Protocol to the United Nations Convention on Climate Change (UNFCCC) came into force on February 16, 2005. Ratification of the protocol mandates signatory Annex I countries to reduce their cumulative emissions by at least 5.2% from the 1990 levels. Developing countries have no commitment under the Protocol but they are eligible to participate in a market instrument like the Clean Development Mechanism (CDM).

India is among the biggest suppliers of CDM projects with more than 250 projects already being accorded the Host Country Approval. The potential for development of such projects, however, is much more and efforts in this direction can really accelerate this process.

Recognising the need for capacity building, a two day workshop was organised in the state of Rajasthan, in India, by Development Alternatives, India, with support from Institute for Global Environmental Strategies (IGES), Japan. Rajasthan is situated in the North Western part of India. The state has a fairly high potential for development of CDM projects (based on renewable energy and energy efficiency) due to approximately 1300 MW of potential for renewable energy, extensive mining operations and industries and a booming hotel industry. Key representatives from these sectors were the participants in the two-day workshop in Jaipur.

The Workshop comprised four Technical sessions. These sessions elaborated on basics of climate change and CDM, the CDM project cycle, the current CDM market and issues such as baseline, additionality etc. Hands-on experience to project developers was ensured through two simultaneous group exercises wherein the participants were divided into two working groups for designing Project Idea Notes.

Since the workshop was designed to be very interactive, it gave a platform to all the stakeholders to clarify their doubts and share their experiences. The participants felt a strong need for formation of a state level nodal agency for CDM to assist project developers in developing CDM projects. Many project developers showed interest in developing their own projects into CDM projects

An analysis of the feedback from the participants revealed that most of the officials had no prior exposure to the concept of CDM. After attending the various sessions of the workshop, they felt their knowledge on CDM had improved considerably and it could now be termed as 'Average'. While the content of the workshop was found to be 'relevant', the group exercises were highly appreciated. The participants also highlighted a need for more events focussing especially on the current carbon markets and the CDM approval and registration procedures.

The main outcome of the workshop was several key industry representatives were introduced to the concept of CDM. Several potential project developers showed keen interest in developing their projects into CDM projects. Consequently, two projects have already been taken forward and their Project Idea Notes prepared. Several more projects are already in the pipeline.

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WELCOMING THE DIGNITARIES





LIGHTING OF LAMP





INAUGURAL SESSION

The inaugural session was graced by the Hon'ble Minister of State, Energy, Government of Rajasthan, Shri Gajendra Singhji. Mr. D.C. Samant, Additional Secretary, Infrastructure, Govt. Of Rajasthan, Mr. Yaduvendra Mathur, Secretary, Energy, Government of Rajasthan, were among the other dignitaries present on the occasion.

From left to right*: Dr. K. Vijaya Lakshmi, Mr. Yaduvendra Mathur, Shri. Gajendra Singh Ji, Mr. D.C. Samant, Mr. Rakesh Verma and Mr. Keisuke Iyadomi*

Dr. K.VIJAYLAKSHMI , Senior Programme Director, Development Alternatives welcomed the participants from Punjab and Rajasthan by briefly describing the importance of Clean Development Mechanism(CDM) and the reasons why a developing country like India should avail the benefits offered by this mechanism. She cautioned the audience about the harm industrialisation has caused over the years to the environment and emphasised the need to shift to renewable sources of energy to meet the ever-growing demands of the world population. She acknowledged the financial support of Institute for Global Environmental Strategies (IGES) and the kind support received from Rajasthan Renewable Energy Corporation (RREC) for making this training programme a successful one.

Mr. YADUVENDRA MATHUR, Secretary, Energy, Government of Rajasthan, mentioned about the high transaction costs involved in developing CDM projects but encouraged the project developers to take up more such projects in collaboration with other developers and get them bundled so as reduce the transaction costs. He also emphasised the importance of the presence of potential buyers from developed countries in such programmes. He also suggested the project developers to avail different funds from Asian development Bank and World Bank for developing such projects. He encouraged the participants to take up biofuel and forestry projects and avail CDM benefits from them. He highly appreciated the professionals from DA for their effort in raising the awareness of potential project developers and other stakeholders in such a critical and technical mechanism as CDM.

Mr. D.C. SAMANT, Additional Chief Secretary, (Infrastructure) Govt. of Rajasthan expressed his pleasure in attending the workshop. He highlighted the fact that very rapid economic development in the last few centuries leading to unprecedented growth in per capita income has also led to increased global warming and thus climate change. Even a 2^0C rise in temperature could lead to a significant rise in sea level, putting at risk 40-50% of the world population. CDM as a part of the Kyoto Protocol is a significant step to reduce the emission of these greenhouse gases, particularly carbon. Activities such as renewable energy, energy efficiency, biofuels, solid waste management etc that reduce GHG emissions could get a significant boost from a mechanism like CDM. He finally congratulated RREC and DA for organising the workshop and wished it a success.

MR. KEISUKE IYADOMI, Country Officer, IGES, Japan introduced the activities of his institute and the Integrated Capacity Strengthening programme on CDM to the audience. He illustrated Government of Japan's position, status and vision regarding the Kyoto Protocol and efforts being made at different levels to comply by the Kyoto Protocol. He also mentioned of the potential buyers of CERs from Japan. He sincerely thanked RREC for extending its support and active cooperation to make the programme a success.

The Chief Guest Shri GAJENDRA SINGH, Hon'ble Minister of State, Energy, mentioned about the dependence of Indian economy on agricultural produce and the ill effects of climate change on agriculture in India. He showed urgency in tackling the problem of global warming and requested the developed countries to help the developing world, financially and technically in shifting to renewables, which has a huge potential in Rajasthan. He was also apprehensive of the investment cost involved in setting up these renewable energy projects and encouraged the CDM route to help the project developers. He reiterated the polluter pays principle and urged the Indian business community to take full advantage of CDM. He assured full Government support in creating an enabling environment, through policies, regulations and incentives (e.g. tax exemptions) to these type of project developers.

MR. RAKESH VERMA, Chairman & Managing Director, Rajasthan Renewable Energy Corporation (RREC) highlighted the initiatives taken by RREC in promoting renewable energy projects in the state and also CDM activities taken up by RREC. He gave an overview of the potential of renewable energy projects in the state and encouraged the participants in harnessing this potential to the fullest extent. He also acknowledged the efforts of his staff and DA professionals in bringing the industrial sectors to a common platform for discussions and sensitisation on CDM. He assured full support from RREC to activities involving CDM projects in the state of Rajasthan.

Integrated Capacity Strengthening for the Clean Development Mechanism / Joint Implementation

Keisuke Iyadomi

IGES Training Programme on the Clean Development Mechanism
under the Integrated Capacity Strengthening for CDM (ICS-CDM)
Rajasthan, India
September 22nd, 23rd

Integrated Capacity Strengthening for the Clean Development Mechanism/Joint Implementation ICS-CDM/JI

Keisuke Iyadomi
Country Officer, CDM Programme
Institute for Global Environmental Strategies

1

IGES Institute for Global Environmental Strategies (IGES)

- Internationally oriented policy think tank established by the Government of Japan, 1998
- Conduct pragmatic and innovative strategic policy research to support sustainable development in the Asia-pacific region
- 6 Projects:
  - Climate Policy Project
  - Forest Conservation Project
  - Urban Environmental Management Project
  - Freshwater Resources Management Project
  - Business for Sustainable Society Project
  - Long-term Perspective and Policy Integration Project

2

IGES Integrated Capacity Strengthening for CDM/JI (ICS-CDM/JI)

- Conducted by IGES since 2003, under the auspices of Ministry of the Environment, Japan
- Objective is to assist diverse stakeholders involved in CDM/JI projects, while satisfying needs for their implementation through;
  - Providing information and raising awareness on CDM/JI
  - Supporting institutional networks among organizations involving CDM/JI projects
  - Contributing the training of human resources to operationalize CDM/JI projects
  - Supporting CDM/JI projects identification, development and implementation activities
- Target Country: Cambodia, China, India, Indonesia, the Philippines, Thailand and Russia (JI)

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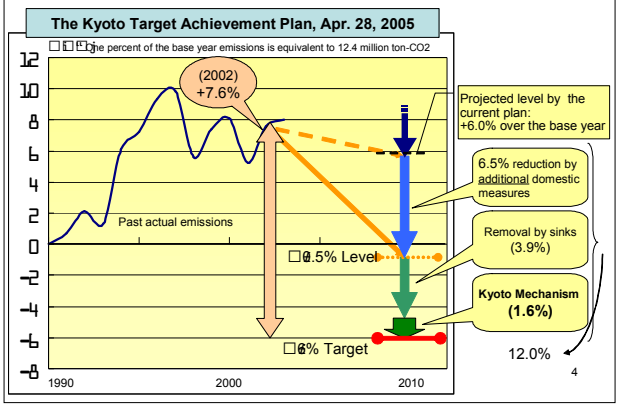
IGES Japan and the Kyoto Protocol



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IGES Japan Kyoto Mechanisms Acceleration Programme

- Coordinated programme by several Japanese ministries
- Capacity Building, Feasibility Study, Underlying Finance, and Upfront Payment are conducted by several organization with a help from host countries
- Japan will strengthen its efforts to utilize the Kyoto mechanism to achieve its Kyoto target.
  - Budget: 5 billion yen (FY2004) → **10 billion yen (FY2005) (Approx. 100 Million US Dollar)**
- ICS-CDM/JI is a part of JKAP

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IGES Japan Carbon Finance (JCF)

- To purchase CERs and ERUs (ERs) from CDM/JI projects issued for the crediting period until 2012
- Committed fund amount is approximately US $ 140 million
- Funded by many Japanese enterprises, Japan Bank for International Corporation (JBIC) and the Development Bank of Japan (DBJ)
- All types of CDM/JI projects are eligible
- Payment on delivery in principle (up-front payment may be taken in case-by-case)
- Submission of Project Information Notes (PINs) are required

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Training Programme on Clean Development Mechanism in Rajasthan

To formulate real CDM projects in Rajasthan and Punjab

1st Training Programme: Sep. 22, 23

- Provide necessary but easy-to-understand information for CDM
- Group Exercise for developing project ideas and to formulating Project Concept Notes (PCNs)

2nd Training Programme: November

- Invite selected participants to complete Project Design Documents (PDDs)
- Provide necessary information for further steps to implement CDM project activities

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Thank you !

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INTRODUCTION TO CDM AND ENABLING ENVIRONMENT

In Session II, three speakers, Dr. Parul Rana Madaria from DA, spoke on recent developments on Climate change impacts and global concerns. Mr. Mathur presented the status and potential of CDM projects in Rajasthan. Mr. Iyadomi gave a detailed presentation on current CDM market in the world.

DR. PARUL RANA MADARIA, DA: She started with some facts and evidences of occurrence of climate change in the world. She cited the snowing in Dubai in 2004, heat wave in Europe in 2003, increased frequency and intensity of drought and floods in India. Concerns of eminent leaders, like Kofi Annan and Tony Blair were cited and efforts by the global community to combat climate change were referred to. She also presented the causes and ill effects of climate change on several sectors like water, agriculture, forestry, fisheries, biodiversity etc. To end she put forth two possible options for facing this global challenge: Mitigation and Adaptation. She ended with a very brief introduction to the Kyoto Protocol, its flexibility mechanisms and CDM in particular. Thus she set the stage for deliberations in the upcoming sessions.

MR. SUNIT MATHUR, RREC: He expressed the need for accelerated economic growth with environmental conservation. He mentioned that Indian CDM projects could very well capture 10% of global CDM market. Then he discussed the potential of CDM projects in the state of Rajasthan and proudly mentioned that the state has the highest number of approved (by DNA, GoI) projects till date. He presented the present status of CDM projects in the state, projects in pipeline and several initiatives taken by RREC to take this forward.

MR. KEISUKE IYADOMI, IGES: He enriched the knowledge of the audience by presenting the current CDM market. He mentioned that though only 21 projects have been registered till date (21st Sept, 2005) there were 202 projects under validation stage and Brazil and India are the greatest suppliers of CDM projects. He informed that the carbon price has increased by 21% since 2004's prices and is expected to increase exponentially as 2012 draws near. He updated the participants with various unilateral and multilateral carbon funds available for conditional support for development of CDM projects. He encouraged the audience by provided a list of potential buyers of CERs.

During the session, the participants discussed on probable buyers of CERs, the national and international agencies involved in the process and the current and likely future prices of carbon credits.

Basics of Climate Change and Clean Development Mechanism

Dr. Parul Rana-Madaria

Basics of Climate Change and CDM

Workshop on
Clean Development Mechanism:
Hotel Clarks Amer, Jaipur

Dr. Parul Rana Madaria
Development Alternatives
22nd September, 2005

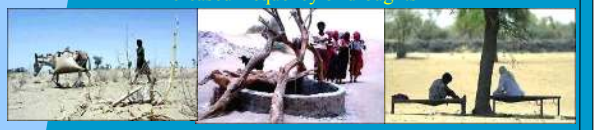
In 2004, it Snowed in Dubai…..

a rocky desert

The World is changing……..
2003 Heat wave in Europe

The World is changing……..
Calamities in India

Increased frequency of droughts



Increased frequency of floods, cyclones

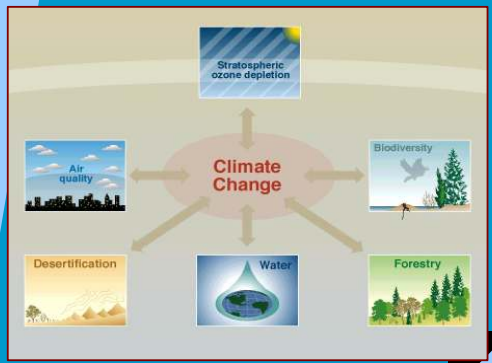
The World is changing……..
and people are worried

"Climate change…….may well be the greatest challenge that your generation will face."
-- Kofi Annan
UN Secretary General

"I mean a challenge so far-reaching in its impact and irreversible in its destructive power, that it alters radically human existence."
Tony Blair

"Conditions are changing……the spell of droughts has significantly increased over the last few years
-- a villager in Rajasthan

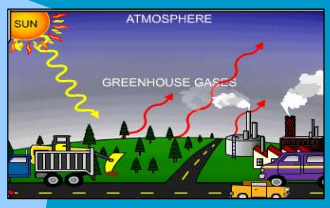
Climate Change affects …….



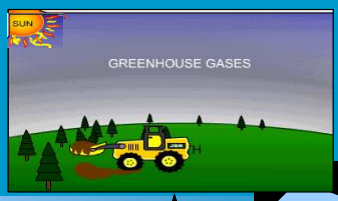
Climate Change would have potential impacts on :

- rainfall and its distributions
- cyclones
- sea level rise *(loss of life and livelihoods)*
- agriculture *(reduced yield and crop losses)*
- forests *(fires, loss of biodiversity)*
- energy *(increased demand)*
- human health *(malaria,increased diseases)*

……. on economy and quality of life



Why Climate change



Enhanced greenhouse effect

Why the GHGs are increasing

- Burning of fossil fuels
- Industries
- Transport
- Construction
- Agriculture
- Land use change and deforestation
- Rapid population growth

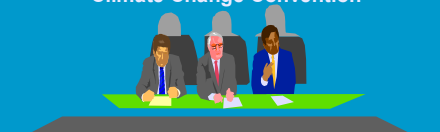
Addressing Climate Change

The possible options are :

- Mitigation of climate change
- Adaptation to climate change

Global Action

Climate Change Convention



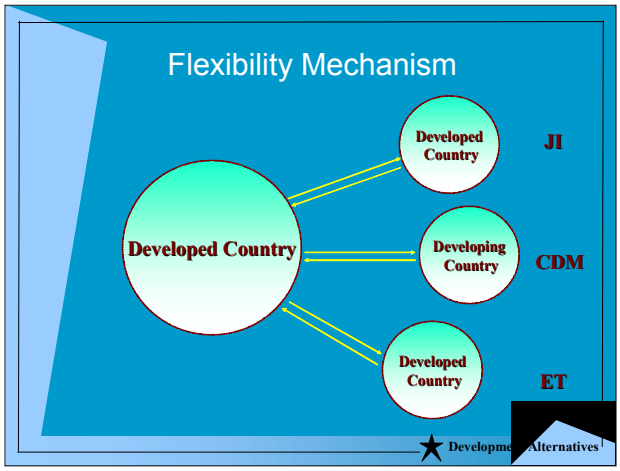
During the June'92 Earth Summit at Rio de Janerio representatives of 154 countries signed the UN Framework Convention on Climate change.

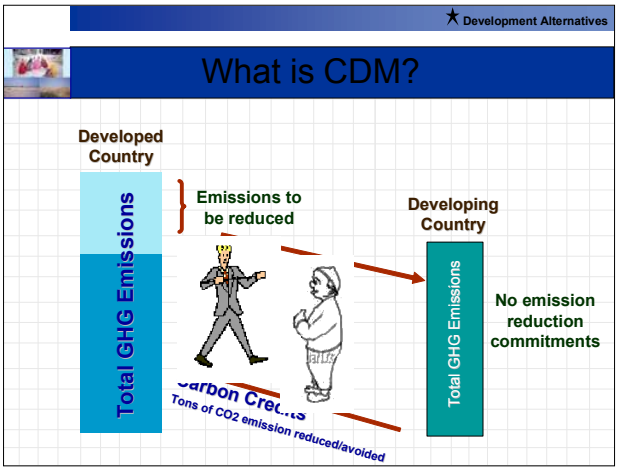
1997: Adoption of Kyoto Protocol

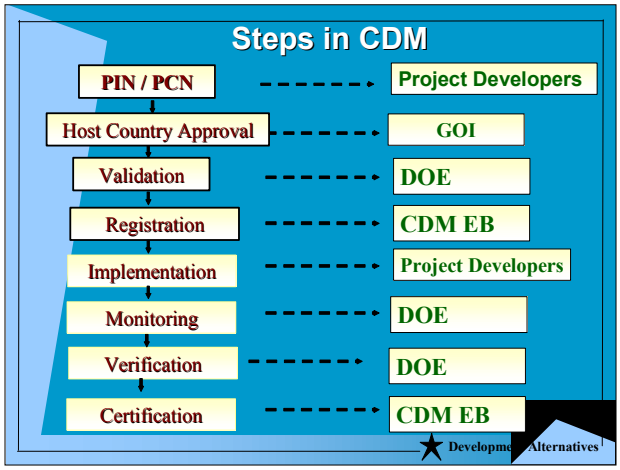
- Kyoto Protocol signed by 184 countries came in to force on 16 Feb 2005 with ratification by Russia.
- Developed countries commited to reduce GHG emissions by atleast 5.2 % below their 1990 levels.

Clean Development Mechanism (CDM)

- **The purpose of CDM is to :**
  - assist developing countries in achieving sustainable development
  - assist developed countries in achieving compliance with their emission reduction targets
  - contribute to stabilisation of greenhouse gas concentration in the atmosphere at safe level


Flexibility Mechanism
Developed Country
Developed Country
Developing Country
Developed Country
JI
CDM
ET


Development Alternatives
What is CDM?
Developed Country
Total GHG Emissions
Emissions to be reduced
Developing Country
Total GHG Emissions
No emission reduction commitments
Tons of CO2 emission reduced/avoided


Steps in CDM
PIN / PCN
Project Developers
Host Country Approval
GOI
Validation
DOE
Registration
CDM EB
Implementation
Project Developers
Monitoring
DOE
Verification
DOE
Certification
CDM EB


Thank You

Clean Development Mechanism

Sunit Mathur

Clean Development Mechanism

Presentation By

Rajasthan Renewable Energy Corporation
(22nd September, 2005)

Green House Gases

Accumulation of Carbon Di Oxide (CO_2), Chloro Floro Carbons (CFC), Methane (CH_4) & Nitrous Oxide (NO_x) in the atmosphere cover the Green House Gases (GHG)

GHGs are accumulated in the atmosphere due to combustion of fossil fuels like coal, oil and natural gases etc.

Kyoto Protocol

Industrialization since 18th century, generation of Green House Gases have resulted in progressive global warming.

Kyoto Protocol drafted at Kyoto, in 1992 to combat global climate change

- **Joint implementation (Developed Countries)**
- **Clean Development Mechanism (Developing Countries)**
- **International Emission Trading (Emission Credit through special market)**

CDM Objectives

To assist developing countries in achieving sustainable development & in contributing to ultimate objectives of United Nations Framework Convention on Climate Change (UNFCCC)

To assist developing countries in achieving compliance with their qualified emission limit & reduction commitments.

Eligibility Criterion

CDM projects should be well being

- **Socially**
- **Economically**
- **Environmentally**
- **Technologically**

Indian Scenario

Formation of an Advisory Group on Climate Change under Ministry of Environment and Forest (MoEF) which is the nodal agency on climate change issue in India.

Energy Sector is main CO_2 emitter accounting for 87% of CO_2 emissions.

GHG emission in India is 3% of the world.

CDM Options

Projects prioritized for CDM:

- Coal power plant using IGCC (Integrated Gasification Combined Cycle)
- Coal Power Plant using PFBC (Pressurised Fluidised Bed Combustion)
- Renovation and Modernization of Power Plants
- Wind based power generation
- Solar Thermal Energy for Power generation
- Underground Coal gasification technology projects

Continue…

Wind Pumps for agriculture

Direct reduction process in the iron & steel industry

Continuous pulp digesters in the pulp & paper industry

Demand side management by efficient motors

Continue…

Because of high potential of GHG reduction, India can avail new opportunity through CDM projects.

India can capture 10% of Global CDM market.

Annual revenue estimated ranges from US$ 10 million to 330 million

Benefits from Estimated Emission Reduction from the Renewable Energy Projects

Type of Project	Tones of CO_2/ MW/Year	Monetized ER benefits/MW/Year @Rs 250/CER	5MW project for the crediting period of 7 years
Biomass			
(90% PLF)	7,000	Rs. 17.5 lacs	Rs. 6.12 Crores
(50% PLF)	3,850	Rs. 9.62 lacs	Rs. 3.36 Crores
Small Hydel (35% PLF)	3,000	Rs. 7.5 lacs	Rs. 2.62 Crores
Wind Farm (20% PLF)	1,750	Rs. 4.37 lacs	Rs. 1.53 Crores

Barriers

Barriers perceived by many countries are

- Lack of awareness
- Financial barriers due to present low and uncertain returns
- Technological barriers
- Institutional barriers
- Infrastructural limitations
- High transaction cost

Small-Scale Projects

The following categories of projects qualify for fast-track approval procedure

- Renewable Energy projects with minimum output capacity equivalent to 15 MW
- Energy efficiency improvements which reduce energy consumption on supply or demand side up to 15 Gwh/yr
- Other project activities that both reduce emission and directly emit less than 15kt of CO2 annually.

Horizon for Renewables

Multi technology development programmes initiated by GOI define best options for GHG emission reductions.

MNES suggested for a study and development of overall methodology for Renewable Energy Project under CDM.

Wind, Solar, Hydel & Biomass Projects suggested to be brought under positive list of CDM.

PROGRESS IN RAJASTHAN
(Wind Energy Based Systems)

Wind Projects :

Installed Projects	306.12 MW
Other Registered Projects	264.00 MW
Projects in Pipeline	36.45 MW
Investment in the state	Rs. 1377 Crores
Electricity produced 2003-04	100 MU
Electricity produced 2004-05	360 MU
Electricity produced 2005-06	265 MU
Reduction in carbon emission	652500 MT

Biomass Energy Based Systems

Biomass Based Power Projects in Rajasthan

- Rajasthan State has immense potential in form of Juli-flora (Vilayati Babool), Mustard husk, Rice-husk and other agriculture residues for the biomass fuel.
- Based on the biomass fuel, power project of IPPs, totaling to 113 MW have been registered with RREC.
- Out of this, 7.8 MW (7 MW net) proejct of M/s. Kalptaru Power Transmission Ltd. have been comissioned at Padampur, Sri Ganganagar District on 15th July, 2003

Future Projection for Biomass Energy

S No	Name of firm/Location	Capacity	Biomass to be used	Expected date of commissioning
1.	M/s Kalp Taru Energy Venture Pvt Ltd, Mumbai/Narauli	8MW	Mustard Husk/Stalk	31.03.06
2.	M/s Amrit Environmental Technologies Pvt Ltd Mumbai/Keshwana Tehsil Kotputli	8MW	Mustard Husk/Stalk & other Agro Wastes	31.03.06
3.	M/s Kalp Taru Power Transmission Ltd, Mumbai/Khatoli	8MW	Mustard Husk/Stalk	31.03.06
4.	M/s Alwar Power Co, Gurgaon/MIA Alwar	25 MW	Mustard Husk/Stalk	7.5 MW capacity to be installed by 31.03.06

Continue

S No	Name of firm/Location	Capacity	Biomass to be used	Expected date of commissioning
5.	M/s Chambal Power Ltd, Kota/Village Rangpur Kota	7.5 MW	Mustard Husk/Stalk/Rapeseed stock & wheat Straw	31.10.05
6.	M/s Birla Corporation Ltd, Chanderia/Chanderia	15 MW	Woody/Agro Waste	31.10.05
7.	M/s Sanjog Sugars & Eco Power Pvt Ltd./Sangaria district Hanumangarh	7.5 MW	Rice Husk/Mustard Husk/Cotton Stalk/Baggasse	By July 2007

Village Energy Security Through Biomass

MNES, GOI, has launched a National Programme on Village Energy Security through Biomass.

The Programme aims at meeting energy requirements of a village through locally available biomass resources with full participation of the local community.

The programme will provide quantum jump to rural economy and contribute to growth with equity and employment generation.

Under the programme, RREC has identified 19 locations to implement the test projects.

The location selected are un-electrified remote villages / hamlets of the electrified villages which would not be electrified by conventional means upto 2012.

Future Projection Towards ULG Projects

- Rajasthan has large reserves of lignite
- Till now 3173 million MT Geological reserve of Lignite have been assessed in Barmer, Bikaner, Nagaur & Jaisalmer District.
- The deposits so far assessed in Rajasthan have potential to generate 2500 MW power from shell on deposits (through CBM technique) and more than 15000 MW from deep seated lignite (through ULG process) sustainable for more than 100 years.

Continue …..

- RREC has selected a site in village Bharka-Bothiya in Barmer District and applied for prospecting licence to Mines & Mineral Deptt., GoR for exploration of Petroleum Product and setting up of Power Project based on syn Gas
- The cost of power generation would be very less in compare to other forthcoming power projects based on Coal, Natural Gas etc.
- Green House Gases would be reduced to a great extent and as such, this would be a qualified candidate for CDM project.

ISCC Mathania

Capacity	-	155 MW
CC Block	-	125 MW
Solar Block	-	30 MW
Out put		
CC Block	-	853 GWh
Solar Block	-	63 GWh
CO_2 Abatement		
Solar Portion	-	65100 Tons/a
Total abatement of		
CO_2 in plant life	-	13.96 Million Tons
Cost of the project	-	Rs. 822.66 Crores
Cost of power produced	-	Rs. 2.82 per/Kwh (LEC)

Activities taken by RREC for the development of CDM Projects

- With an approval of the Board, RREC started to work as Nodal agency for capacity building, providing consultancy for earning the carbon credits & set up a independent CDM promotion cell for facilitation of small scale CDM projects.
- Prepared a background note sent to private entrepreneurs stake holders Govt organisation along with PIN/PCN. It will provide support to create possible CDM – ability of the projects through learning by doing.
- Under the Chairmanship of CMD, RREC, a brain storming session was organised on 2.4.05 & 4.4.05.

Continue…

- Another programme "Information & Contact Programme" was also organised by Indo German Chamber of Commerce on dated 4th & 5th May 2005 which facilitate business contact between Indian & German companies.
- Another Work shop on CDM was organised on the occasion of "Akshay Urja Diwas" on dated 17.8.05
- RREC floated NIT for consultancy services for development of PIN, PDD & facilitation of CDM till credit of CER's for its 25 MW Wind Power Project.The contract is under finalisation.
- RREC has identified 3 Projects for preparation of PDD

Continue…

RREC, under UNDP Programme, has identified 3 Projects (Based on Biomass) for preparation of PDD

S No	Name of the Firm/Location	Capacity	Status
1.	Amrit Environmental Technologies Pvt Ltd/ Kotputli district Jaipur.	8 MW	PDD submitted to CDM Authority
2.	Kalp Taru Energy Venture Pvt Ltd/ Narauli district Bharatpur	8 MW	PDD under preparation
3.	Sanjog Sugars & Eco Powers Pvt Ltd/ Sangaria district Hanumangarh	7.5 MW	Land under finalisation

Status of Bio Mass based projects under pipe line

S No	Name of firm/Location	Capacity	Biomass to be used	Expected date of commissioning
1.	M/s Kalp Taru Energy Venture Pvt Ltd, Mumbai/Narauli	8MW	Mustard Husk/Stalk	31.03.06
2.	M/s Amrit Environmental Technologies Pvt Ltd Mumbai/Keshwana Tehsil Kotputli	8MW	Mustard Husk/Stalk & other Agro Wastes	31.03.06
3.	M/s Kalp Taru Power Transmission Ltd, Mumbai/Khatoli	8MW	Mustard Husk/Stalk	31.03.06
4.	M/s Alwar Power Co, Gurgaon/MIA Alwar	25 MW	Mustard Husk/Stalk	7.5 MW capacity to be installed by 31.03.06

Following 10 Nos of Projects have been approved by National CDM Authority New Delhi

S No	Name of the Project	Name of the Firm
1.	8 MW Power generation from waste heat in Cement Plant	Shree Cement
2.	Optimum utilisation of clinker & conservation factor improvement	Birla Cement
3.	Use of fly ash to substitute clinker in blended cements	Shree Cement
4.	Waste heat recovery power plant	J.K. Cement Works
5.	7.8 MW Electricity generation from Musturd crop residues	Kalp Taru Power
6.	7.5 MW Musturd Crop residue based power Project	Alwar Power Company

Continue…

S No	Name of the Project	Name of the Firm
7.	7.5 MW Power generation from Mustard crop & sugar cane bagasse waste	Chambal Power
8.	58.2 MW Enercon bundled Wind Power Project	Enercon India Ltd
9.	Fuel switch from coal to bio mass for process heat in cement klin using millet & soyabean husk	Shree Cements Ltd
10.	GHG emission reduction by oxidtion of HFC 23 at refrigerant (HFC-22)	SRF Ltd

Rajasthan leads in CDM

S No	State	Total Projects approved by CDM Authority	Total CER's up to 2012
1.	Rajasthan	10 Nos	4,65,72,584
2.	Gujrat	3 Nos	3,42,22,165
3.	Karnataka	14 Nos	1,29,07,244
4.	Uttar Pradesh	7 Nos	53,89,713
5.	Tamil Nadu	8 Nos	49,93,269
6.	Orrisa	5 Nos	45,10,767
7.	Andhra Pradesh	7 Nos	32,39,900
8.	Jharkhand	3 Nos	19,50,211
9.	Punjab	5 Nos	19,42,093

Continue…

S No	State	Total Projects approved by CDM Authority	Total CER's up to 2012
10.	Chattisgarh	3 Nos	19,07,436
11.	West Bengal	4 Nos	9,46,445
12.	Himachal Pradesh	3 Nos	4,51,118
13.	Uttranchal	2 Nos	2,63,668
14.	Madhya Pradesh	1 No	1,37,816
15.	Maharashtra	1 No	27,000

Thank You

Current Clean Development Mechanism (CDM) Market

Keisuke Iyadomi

IGES Training Programme on the Clean Development Mechanism under the Integrated Capacity Strengthening for CDM (ICS-CDM)
Rajasthan, India
September 22nd, 23rd

Current CDM Market

Keisuke Iyadomi
Country Officer, CDM Programme
Institute for Global Environmental Strategies

1

IGES

Outline

- Overview of CDM Market progress
- Sellers under current CDM Market
- Buyers under current CDM Market

2

IGES

Overview of CDM Market progress

Major issues to impact on CDM

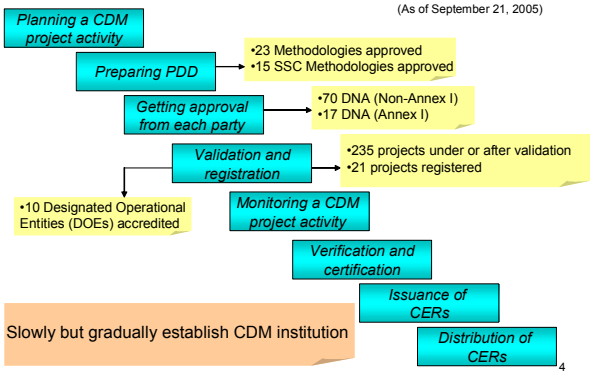
- Acknowledgement of the necessities to speed-up process under CDM EB, and to promote projects related to energy-efficiency and transportation sector (COP10, Dec. 2004)
- Kyoto Protocol entered into force (Feb. 16, 2005)
- G8's New Presidency's commitment to Climate Change and Africa (Gleneagles Summit, Jul. 05, 2005)
- Asia-Pacific Partnership on Clean Development Technologies (US, Australia, Japan, India, China and South Korea)

3

IGES

CDM Project Cycle

(As of September 21, 2005)



4

IGES

21 Registered CDM Projects

(As of September 21, 2005)

Date	Title	Host	Annex I	t-CO2/year
17-Sep-05	Landfill Gas Extraction and Utilization at the Matuail landfill site, Dhaka, Bangladesh	Bangladesh		80,000
17-Sep-05	Landfill gas extraction on the landfill Villa Dominico, Buenos Aires, Argentina	Argentina	Netherlands	588,889
2-Sep-05	Methane capture and combustion from swine manure treatment for Corneche and Los Guindos	Chile	Canada Japan	84,083
2-Sep-05	Methane capture and combustion from swine manure treatment for Pocillas and La Estrella	Chile	Canada Japan	247,428
2-Sep-05	Methane capture and combustion from swine manure treatment for Peralillo	Chile	Canada Japan	78,867
27-Aug-05	Kuyasa low-cost urban housing energy upgrade project, Khayelitsha (Cape Town; South Africa)	South Africa		6,580
19-Aug-05	La Esperanza Hydroelectric Project	Honduras	Italy	37,032
15-Aug-05	Slvador da Bahia Landfill Gas Management Project	Brazil	Japan U.K.	664,674
6-Aug-05	Clarion 12 MW (Gross) Renewable Sources Biomass Power Project	India		26,300
18-Jul-05	5 MW Dehar Grid-connected SHP in Himachal Pradesh, India	India		16,374

5

IGES

21 Registered CDM Projects

(As of September 21, 2005)

Date	Title	Host	Annex I	t-CO2/year
18-Jul-05	Graneros Plant Fuel Switching Project	Chile	Japan	19,348
26-Jun-05	Huitengxile Windfarm Project	China	Netherlands	51,429
3-Jun-05	Santa Cruz landfill gas combustion project	Bolivia		82,680
3-Jun-05	Cortecito and San Carlos Hydroelectric Project	Honduras		37,466
23-May-05	Biomass in Rajasthan – Electricity generation from mustard crop residues	India	Netherlands	31,374
23-May-05	E7 Bhutan Micro Hydro Power CDM Project	Bhutan	Japan	524
23-Apr-05	Cuyamapa Hydroelectric Project	Honduras		35,660
24-May-05	HFC Decomposition Project in Ulsan	Republic of Korea	Japan	1,400,000
8-May-05	Project for GHG emission reduction by thermal oxidation of HFC 23 in Gujarat, India	India	Japan Netherlands UK	3,000,000
11-Jan-05	RIO BLANCO Small Hydroelectric Project	Honduras	Finland	17,800
18-Nov-04	Brazil NobaGear Landfill Gas to Energy Project	Brazil	Netherlands	670,133

6

Other Progress on CDM

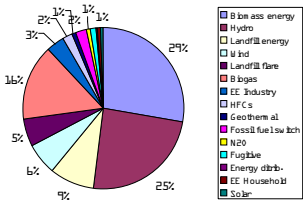
- DNA notification to UNFCCC (Non-Annex I) **70**
- DNA notification to UNFCCC (Annex I) **17**
- Total Methodologies submitted **160**
- Methodologies approved **23**
- Methodologies under revision **5**
- Methodologies not approved **46**
- Meth Panel not yet to assess **46**
- DOEs accredited **10**
- AEs indicative letter **17**
- NAI (Non-Annex I Party) ratification **118**

(Point Carbon, Sep. 6, 2005)

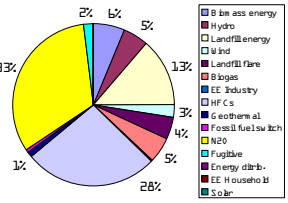
7

202 projects are under or after validation stage

Number of Projects



Annual CERs

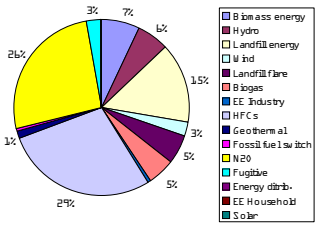


UNEP RISO Centre, Denmark (Aug 15, 2005)

8

202 projects are under or after validation stage

Accumulated CERs until 2012



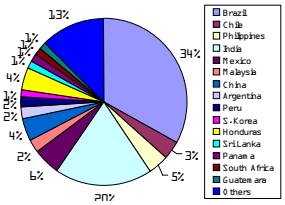
- 374 mt-CO2 credits may be delivered until 2012
- 93 out of 202 projects is small-scale CDM
- Small-scale renewable (hydro, biomass) share larger in terms of number
- HFCs and N2O projects are dominant under the current market

UNEP RISO Centre, Denmark (Aug 15, 2005)

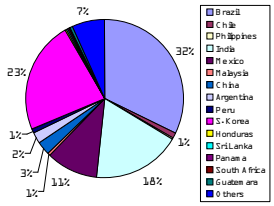
9

Regional share

Number of Projects



Annual CERs

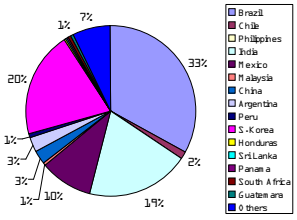


UNEP RISO Centre, Denmark (Aug 15, 2005)

10

Regional Share

Accumulated CERs until 2012



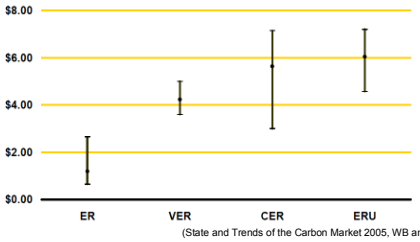
- Brazil and India are the major countries to supply projects
- S. Korea and Mexico increase their chare in terms of amount of credits

UNEP RISO Centre, Denmark (Aug 15, 2005)

11

Current Carbon Price

Prices for non-retail project based ERs
Jan. 2004 to Apr. 2005 (US$/tCO2-e)



(State and Trends of the Carbon Market 2005, WB and IETA)

- Prices have substantially increased from 2003
- Prices of CERs has increased by 21% relative to last year

12

Major Carbon funds

Donor	Target amount (Mt)	Title	Target (Mt)	Total amount (US $)	Target	Other
Netherlands Gov. (943 M US$)	100	**ERUPT (SENTER Novem)**	12	-	JI, AAU	
		CERUPT (SENTER Novem)	8	-	CDM	
		The Netherlands CDM Facility (WB)	21	90.5 M	CDM	
		The IFC-Netherlands Carbon Facility (IFC)	10	56.2 M	CDM	
		The Netherlands EBRD Carbon Fund (EBRD)	6	41.M	JI	
		CAF Netherlands Carbon Fund (CAF)	10	58.1 M	CDM	
		(Rabo Bank)	10	58.1 M	CDM	
Spanish Gov. (257 M US$)	100	**The Spanish Carbon Fund (WB)**	34	219 M	CDM, JI, AAU	Private sector
Italian Gov. (19.1 M US$)	60	**The Italian Carbon Fund (WB)**	(10)	80 M	CDM, JI	Private sector
Dutch Gov. (162 M US$)	19	**The Danish Carbon Fund (WB)**	5-6	35.2 M	CDM, JI	Private sector
		Danish Carbon dk.	-	-		
		Danish Carbon Facility (Eco Securities, Standard Bank London)	1-2	9.5 M	CDM, JI, AAU	
Austria Gov. (371 M US$)	35	**Austrian JI/CDM Program (Kommunalkredit)**	-		CDM, JI	

(METI, Aug. 2005)

Major Carbon funds

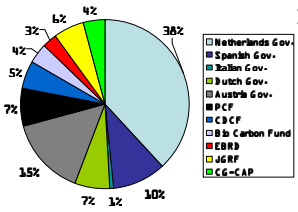
Donor	Target amount (Mt)	Title	Target (Mt)	Total amount (US $)	Target	Other
Multilateral fund		**Prototype Carbon Fund (WB)**	(23)	182 M	CDM, JI	Gov (6). Private sector (17)
		Community Development Fund (WB)	(16)	129 M	CDM, JI	Gov (8). Private sector (14)
		Bio Carbon Fund (WB)	(13)	100 M	sink	Gov (5). Private sector (6)
		Multilateral Carbon Credit Fund (EBRD)	(8-24)	66.7 M-190 M	CDM, JI, ET	
Private entities		**JGRF (JCF)**	(18)	134 M	CDM, JI, AAU	Japanese Private (31), DBJ, JBIC
		GG-CAP (Natsource Asset Management Co.)	(13)	105 M	CDM, JI	Private sector

(METI, Aug. 2005)

- 98 out of 202 projects already identified credit buyer(s)

Buyers under current market

Share of Major Credit Buyers



- Led by WB and Netherlands
- Gov. Procurement growing
- Buyers is looking for low risk projects – risk remained on
  - ✓ National institutional risk (Policy, DNA, tax, etc.)
  - ✓ Non-delivery risk
  - ✓ Carbon price
  - ✓ Uncertainty after 2012
  - ✓ Etc.

Thank you !

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CASE STUDIES IN CDM PROJECT DEVELOPMENT

In this session project developers from the Cement Sector and Biomass Sector presented their respective projects. They mentioned in detail the various impediments faced during the course of preparing Project Design Document and registration with the CDM Executive Board.

MR. R. BHARGAVA, Shree Cements Limited, Beawar presented a case study on GHG abatement projects in the cement industry. He elaborated on 3 projects in Shree Cements Limited, viz. optimal utilization of clinker, utilization of Biomass fuels for Pyro-processing in Cement plant and 8 MW Waste Heat Recovery Based Captive Power Project. The total CERs from the 3 projects are approximately 2,10,000 per annum and Host Country Approval for these projects has been obtained. This presentation cleared several doubts of the participants from the Cement industry.

MR D.S. CHAUHAN from Kalpataru Power Transmission Limited presented a CDM project on 7.8 MW Biomass based Power Plant at Sri Ganganagar in Rajasthan. The renewable resource used is Mustard Crop residue, which is presently an agricultural waste and is burnt in the fields emitting GHGs unnecessarily. Due to this project, the mustard crop residue shall be harnessed to generate power. The power generated is supplied to the nearest 132 KV sub-grid station. Several risks being faced by the project were also highlighted in the presentation. Biomass based power being a potential source of renewable energy in Rajasthan, this presentation led to intense discussions among the participants.

DR. AJAY BARARIA from Alwar Power Company Private Limited shared his experience of preparing a CDM project. He highlighted several practical issues related to appointment of consultants for project documentation, the risks involved in a CDM project, the procedure for sale of carbon credits and contractual obligations pertaining to emission reductions purchase agreement. This presentation was found to be highly enlightening for the workshop participants as Dr. Bararia shared his experiences and knowledge on some of the most critical issues for project developers.

MR. UDIT MATHUR presented a case study on Vertical Shaft Brick Kiln (VSBK), being implemented by DA. In this project 100 VSBKs were installed in 4 States (Madhya Pradesh, Jharkhand, Chattisgarh and Orissa) replacing 60 Clamps Kilns and 40 Movable Chimney Bull's Trench Kilns. Approx. 46,000 CERs per annum is expected from the project. The project faced both investment and technological barriers. The project is at validation stage.

DR. ANISH CHATTERJEE presented a case study of energy efficiency in hotel industry (Hotel Orchid and Lotus Suite, Mumbai), which is being facilitated by DA. Several simple but efficient technological interventions were made by the hotels to save energy. The two hotels will claim about 4,000 CERs per annum. This project is undergoing validation.

Clean Development Mechanism Opportunities at Shree Cements Limited, Beawar

R. Bhargava

Clean Development Mechanism

Opportunities

At

Shree Cements Limited, Beawar

In this presentation…

- Background
- About CDM
- Climate Change Management
- GHG abatement projects
- The progress on the projects

Background-Shree Cement Limited

- Vision-creation of 10 million Ton by the year 2010
- Operates cement manufacturing facility of 3 million efficiently at Beawar in Rajasthan, India
- Largest plant at a single location in North India
- Capacity utilisation 117% vs. 82% Indian cement Industry average
- Green field project: Bangur Cements of 1.2 MTPA capacity is under commissioning at Ras, Rajasthan.
- Has 42 MW Captive Power Plant using pet coke to meet its total power requirements.
- Is an ISO 9001-2000, 14001 and OHSAS-18001 certified company
- Has one of the most advanced R&D centre existing in Indian cement industry, recognized by DSIR, Govt. of India

- Shree is again a highest rated four star company in the Benchmark survey by Whitehopleman U.K. Shree remains the benchmark for other companies in terms of overall energy consumption
- Appointed leader of cement sector task force by Bureau of Energy Efficiency, Ministry of power, Govt. of India.
- Member of CoRE– BCSD of Indian chapter-The Energy Resource Institute, a member of World Business Council for Sustainable Development (WBSCD), Switzerland
- First Indian cement company to join Cement Sustainability Initiative of WBSCD
- First Indian cement company to join Global Reporting Initiatives as an Organisational Stakeholder
- Sustainability issues are covered under 6R philosophy.

Reduce Consumption	Raise Production
Release Less	Replace conventional fuel & raw material
Research & Records	Restore

Awards won by Shree Cement in the field of :

- **Overall Quality**
- **Good Corporate Citizenship**
- **Safe and Healthy Work Place**
- **Exemplary Employment Practices**
- **Environment Protection and Practices**
- **Energy conservation**
- **Productivity**

- **2003-2004 Rajasthan productivity council award.**
- **2003-2004 TERI corporate Award for Environment Excellence**
- **2003 National Safety Award by ministry of Labour, Govt. of India**

Philosophy

"AAH NO BHADRA : KRATAVO YANTU VISHWATAH:"

"Rigveda:"

Let Noble Thoughts Come to Us from All over the World.

Climate Change-Enhanced Green House Effect

- Human activities are increasing the **concentration of Green House Gases** (GHGs) in the atmosphere.
- This enhances the green house effect, commonly known as **"Climate Change"**
- Climate Change leads to
  - **Rise** in **average global temperature**
  - **Changes** in **precipitation quantity** and pattern
  - Changes in **vegetation**
  - Increased **storm surges**
  - **Sea level rise**
  - Bangladesh might submerge in next 50 years

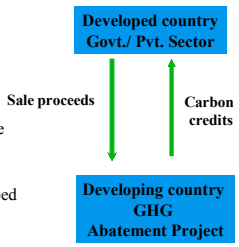
Green House Gases (GHGs)

- Green House Gas (GHGs)
  - Carbon Di Oxide
  - Methane
  - Nitrous oxide
  - Per fluoro carbons
  - Hydro fluoro carbons
  - Sulphur hexa fluoride
- Global Warming Potential (GWP)
  - 1
  - 21
  - 310
  - Upto 9500
  - Upto 11700
  - 23900

What is CDM

- Project undertaken in developing country generates **reductions in greenhouse gas emissions**
- **Accures Certified Emission reductions (CER) credits (equal to 1MT of CO_2 equivalent)**
- **The** credits can be used to contribute to the emission reduction **commitments of industrialized countries**
- **A project based activity** between developed and developing countries **(Govt./private sector)**

Reduction at lower cost by investing in developing countries when Marginal Cost of Abatement of GHGs is lower



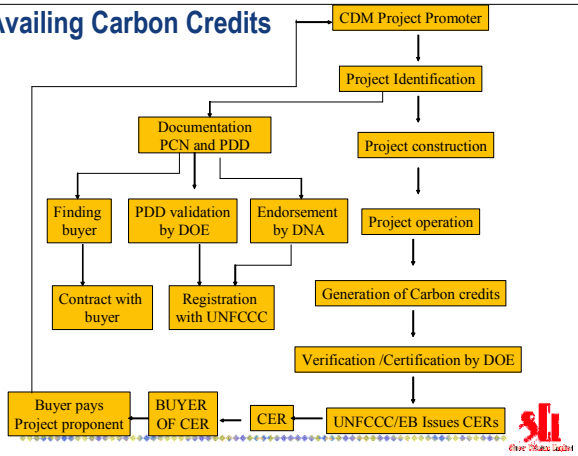
Where is CDM applicable?

- **Renewable energy**
  - Wind power
  - Solar
  - Biomass power
  - Hydel power
- Fuel switching (from fossil fuel to green fuel like Biomass, Rice husk etc.)
- **Energy efficiency measures related to**
  - Boiler
  - Pumps
  - Turbines
  - Installation of various speed drives
  - Efficient cooling systems
  - Back pressure turbines etc.

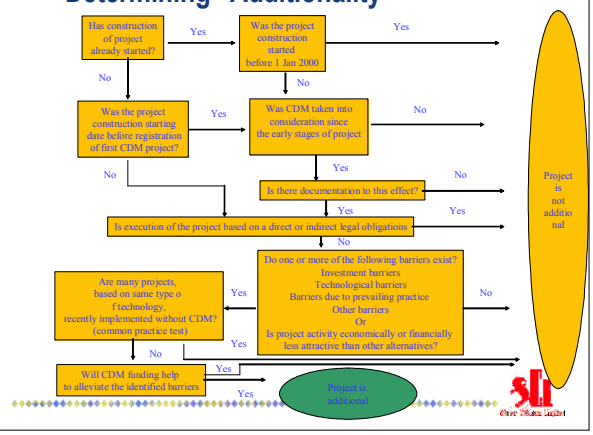
Contd....

- **In waste management**
  - Capturing of landfill methane emission to generate power
  - Utilization of waste for generation of energy and energy efficiency projects
- **In transport**
  - IC (Internal Combustion) engines at micro level
  - Fuel switch from gasoline and diesel to natural gas
  - Modal shift from air to train, road to train at macro level
  - Replacement of shipment of certain raw materials through pipelines
- **Afforestration/ reforestation /Carbon sequestration**

Availing Carbon Credits



Determining "Additionality"



Various steps of CDM

- Identification of project
- Development of Project Design Document (PDD)
- Approval of project by host DNA
- Validation by DOE
- Application for methodology to EB (if new)
- Application for registration to EB
- Implementation
- Monitoring and verification
- Application for issuance of CERs to EB

Few criteria

- Project start date after January 2000
- CER 20,000 or more i.e. abatement of 20,000 t. CO_2-EQV.
- General rules:
  - Electrical energy saving projects
    1KWH = 0.8-0.9 kg. of CO_2
  - Power generation
    1 MW = 4000~5000 t CO_2
  - Coal saving
    1 kg. = 1.3~1.6 kg CO_2
  - Fuel oil saving
    1 liter oil =3-3.5 kg CO_2
  - NG based Power Plant
    1Kwh generation = 0.35~0.45 kg CO_2
    1 kg NG burning/saving=2.4~2.5kg CO_2

CDM as on August-2005

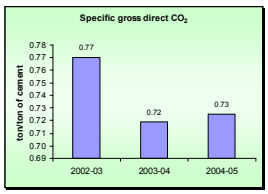
- Globally
  - Kyoto Protocol signed in: 1997
  - KP came into force after ratification criteria were met: 16-Feb-2005
  - Number of countries ratified/acceded/approved KP: 153
  - Number of CDM projects registered at UNFCCC: 12
  - Number of approved methodologies: 27

CDM as on August-2005

- In India
  - Indian Govt. acceded KP: August 2002
  - Conference of Parties (CoP-8) held in India: October-November 2002
  - Designated National Authority (DNA) formed: November 2003
  - Projects approved by DNA: 107
  - Number of projects registered at UNFCCC: 4

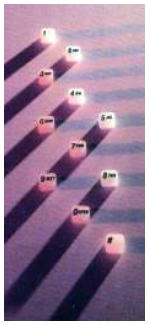
Climate Change Management

- We have developed a climate-change mitigation strategy
- Our carbon dioxide emissions are well below the average emission of Indian cement industry-0.85 to1.0 ton/ton of cement
- Ernst & Young has been engaged to provide climate change advisory services under flexibility mechanisms of Kyoto Protocol for three Clean Development Mechanism (CDM) projects



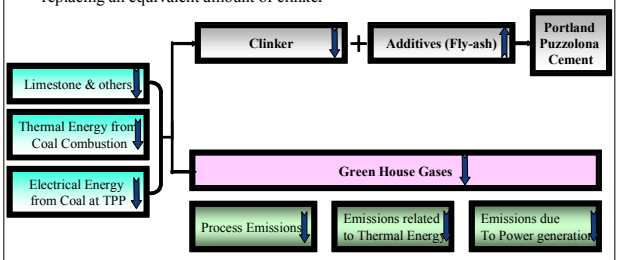
GHG Abatement Projects

1. Optimal utilization of clinker
2. Utilization of Biomass fuels for Pyro-processing in Cement plant
3. 8 MW Waste Heat Recovery Based Captive Power Project



1 Optimal utilization of Clinker

- Project activity entails reduction of the clinker content of the Portland Pozzolonic Cement (PPC) produced by increasing the flyash additive percent (%) thereby replacing an equivalent amount of clinker



Optimal utilization of Clinker

Baseline methodology: Consolidated baseline methodology for increasing the blend in cement production is likely to be approved in next meeting of EB.

Approx. quantity of clinker saved: 0.4 million tons/annum

Total CER: 55,000/annum (avg.)

Revenue from carbon credit sales : 2,750,000* USD in 10 years

** USD 5 / Ton of CO_2*

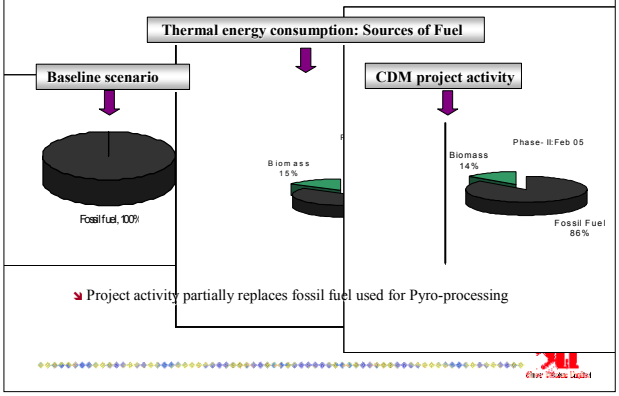
2 Utilization of Biomass fuels for Pyro-processing

- Project utilizes biomass fuel for Pyro-processing and partially substitutes fossil fuel combustion in kilns
- Phase wise Implementation

S. No.	Phase	Biomass quantity (TPD)	Location	Biomass Fuel
1	I	150	Unit -2	Millet husk, Soya bean husk, Cotton sepal, Mustard husk ,
2	I I	100	Unit -1	

- The project activity is the first of its kind in India and has been developed by SCL through R& D and numerous trails.

Project description cont.....



- Project activity partially replaces fossil fuel used for Pyro-processing

Utilization of biomass fuels

Baseline methodology: ACM 003 "Emissions reduction through partial substitution of fossil fuels with alternative fuels in cement manufacture"

Approx. quantity of Petcoke saved: 33,500 ton/annum

Total CER: 100,000/annum

Revenue from carbon credit sales : 5,000,000 USD in 10 years

3 8 MW Waste Heat Recovery Captive Power Project

- Objective: To recover and utilize heat content of waste exit gases from pre-heater and clinker cooler gases to generate steam for power generation
- The project activity will generate electricity of the order of 48.47 million kWh per annum partially replacing the electricity generated by carbon intensive fuels in Captive Power Plant (CPP)
- The project activity includes four Waste Heat Recovery (WHR) boilers, two fed by the preheater exit gas and other two by clinker cooler exit gas and an 8 MW steam turbine generator

Waste heat recovery project

Baseline methodology: ACM 004 "Consolidated baseline methodology for waste gas and/or heat for power generation"

Electrical Energy generated : 48.47 million units / annum approx.

Total CER: 55,000/annum

Revenue from carbon credit sales : 2,750,000 USD in 10 years

Progress of the 3 CDM project activity

Milestones achieved in the CDM process

1. Preparation of Project Concept Note
2. Preparation of Project Design Document
3. Selection of Validation Agency (in process)
4. Host Country Approval

Milestones yet to be achieved

5. Project Validation
6. Project Registration

Thank You

Contact information :

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7.8 MW Biomass Based Power Plant in Glimpses

D.S. Chauhan

Kalpataru Power Transmission Limited
7.8 MW Biomass based Power Plant
In Glimpses

1. **The Plant**

Kalpataru Power Transmission Limited
7.8 MW Biomass based Power Plant
In Glimpses

2. **Huge Fuel Stock Yard**

Kalpataru Power Transmission Limited
7.8 MW Biomass based Power Plant
In Glimpses

3. **The Turbine**

4. **The DCS Control Room**

Kalpataru Power Transmission Limited
7.8 MW Biomass based Power Plant
In Glimpses

5. **The Electro Static Precipitator**

6. **The RO Plant**

Kalpataru Power Transmission Limited
7.8 MW Biomass based Power Plant
In Glimpses

7. **Cooling Tower**

Kalpataru Power Transmission Limited
7.8 MW Biomass based Power Plant
In Glimpses

8. **Water Reservoir**

9. **Temple & Greenbelt Development**

Kalpataru Power Transmission Limited
7.8 MW Biomass based Power Plant
In Glimpses

10. Power Plant In night

KALPATARU GROUP

- The Kalpataru Group is a professionally managed conglomerate with a powerful presence in areas as diverse as Real Estate Development, Power Generation, Transmission and Distribution, Civil Contracting and International Trading. The group has an annual revenue of over Rs. 1000 crores.
- Kalpataru Power Transmission Ltd. (KPTL) a Kalpataru Group Company is one of the fastest growing company in infrastructure and Contracting sector. A public listed company, Kalpataru Power posted revenues in excess of Rs. 565 crores in 2004-05 and is expected to exceed Rs. 850 crores in the current year.

MUSTARD CROP & RAJASTHAN

- Mustard is the second largest oil seed in India. It is sown in September / October and harvested in February / March every year. Average yield per hectare is 10-15 qtls. Mustard oil is widely used as cooking medium, extraction are used as cattle feed & crop residue is used as fuel.
- Rajasthan is a desert State with semi arid conditions and is ideal for Mustard cultivation.
- Over 40% of Indian mustard production is grow in Rajasthan, specially in Alwar, Bharatpur, SriGanaganagar, Sawai Madhopur, Tonk Districts.
- Mustard grain to Biomass ratio is 1: 1.5 times.

CHOICE OF MUSTARD CROP RESIDUE AS FUEL

- Mustard Crop Residue (Mix of Husk & Stock/Stem) is a promising fuel with a high calorific value with 3800 KCal/Kg & low Ash content (6-7%).
- It is generally not used as fodder or domestic fuel or thatching.
- Presently used as manure, animal bed , fuel in brick kilns and for briquette manufacturing. Rest is burnt or just left in the fields for Bio-decay.
- Biomass fuels due to there low bulk density and one time availability in a year, it is important to source the fuel from maximum 50 KM radius due to handling cost and transportation cost besides to have adequate storage facility.
- Power generation from Mustard Crop Residue is based on conventional thermal technology.

Renewable Energy & Biomass Potential in India.

- Renewable Energy is Non-Conventional Energy and less polluting. It includes Biomass Energy also.
- Biomass Energy is the use of crop residues, agro industrial residues, forest & wood waste etc to produce energy.
- Over 400 Million MT of agro residues are generated in India and out of this 100 Million Tons of agro residues are available as surplus.
- Most Biomass based Projects in India are within 3 MW – 8 MW range and direct combustion is suitable & proven technology for most Biomass fuels.

SITE SELECTION

- For Selecting a Site-Location for Biomass based Power Plant, the major criteria are :-

  a) In the middle of Biomass availability Area
  b) Good all around road connectivity
  c) Near to 132 KV Grid Sub-Station
  d) Availability of adequate & good quality water.

SOCIO-ECONOMIC & ENVIRONMENTAL BENEFITS

Our SriGanganagar Project is a pioneer effort for Biomass based Power Projects in Rajasthan. Its Socio Economic & Environmental benefits are:

- Use of Agro waste which otherwise had no major commercial use & value.
- Realization of fair/reasonable value for the farmers an additional source of income.
- Assistance to farmers in their disposal of such residue which was otherwise burnt / left to decay.
- Reduction in uses of conventional / fossil fuels.
- Additional rural employment generation – fuel handling, transportation, automobile work shops etc.
- To show the possibilities of using agricultural waste that has not been used as a fuel for electricity generation before (with enormous potential for replication).
- Reduction in T & D losses of the state – Being at dispersed rural locations.
- Increased utilization of renewable energy in the Indian electricity system, more specifically by using agricultural waste (mustard crop residues) as a biomass source.
- The unit shall contribute, though in a small measure, to bridging the gap between the supply and demand of power in the state and the region.
- More importantly, the bridging of this gap shall be by the use of a less polluting and renewable resource and particularly with lesser climate change implication.

SOCIO-ECONOMIC & ENVIRONMENTAL BENEFITS

- This project is also a technology demonstration project which has demonstrated successful use of another agricultural waste for energy generation. This could spur not just replication of the same but also experiments with other agri-residues that are presently not being used.
- The renewable resource is presently an agricultural waste, which is burnt in the fields emitting GHGs unnecessarily. The same shall be harnessed to generate power and to that extent the unit further contributes to reduction of GHG emissions.
- Increased income security shall contribute to the empowerment of the most vulnerable sections of the society.
- In the long run the replication of the units may result in considerable improvement in the income status of the rural communities of the region and the price of the waste may increase to a level prompting switch to other fuels like LPG etc. for domestic use.

Risk Factors in implementation & operation of Biomass based Power Plant

A) Mustard Crop Residue (MCR) Collection :

- Even though a radius area is reserved under the Policy for each plant the fuel availability risk is of the highest order.
- The Plant has to be located at the center of the highest fuel availability. The change in location by a few Kms changes the scenario changes significantly with long term repercations.
- No single crop is sown on more than 25 to 30 % of 50 Kms radius area in every season.
- After various uses as manure, animal bed, for adulteration, in brick kilns & for briquette manufacturing only small quantity is available for use in power generation.
- Very poor & little infrastructure facilities like single village roads with bumps & pit holes, no trucks but camel cart, bullock carts & tractor trolleys as transport.
- Wastage of large quantity of mustard husk in the fields because small quantities per field reduces the availability.
- Hundred's of brick kilns & many briquette units scattered all over the region reduces the availability and increases the landing cost.

Risk Factors in implementation & operation of Biomass based Power Plant

- Mustard since grown in deserts and arid areas is laden with dust to varying amount and dust is generally intentionally mixed by unscrupulous suppliers.
- Hoarders have come up in the entire area and prices tend to rise many times.
- Since availability only once in a year, the fuel storage requirement is for more than 8 months. Therefore huge fuel storage yard, fuel handling equipments, fire fighting system and conveying systems are required. This increases capital cost & also auxiliary power consumption.
- Mustard Crop has a tendency of self-combustion and highly unpredictable after the rainy season.
- Mustard fuel has a tendency of combing in to a strong bridge form and this results into very poor flowability through the feeders.
- While feeding the Mustard Crop Residue to the conveying system the fuel has to be dragged over long distances on kaccha land of the stock yard resulting in carry over of dust and soil to the Boiler.

Risk Factors in implementation & operation of Biomass based Power Plant

B) Mustard Crop Residue reaction as fuel in Boiler :

- Mustard Crop Residue has a very high volatile content (65-70%) and is very light in weight.
- The Alkali / Chlorine compounds are highly corrosive in nature. They specifically impact the high metal temperature areas in the superheaters.
- The Ash fusion temperature of the high Alkali Ash is very low.
- The low Ash fusion temperature results in heavy deposits of Ash in the furnace water walls resulting in reduction of heat pick up capacity of the furnace. Clinker formations are also there.
- We have already spent about Rs. 2 Crores on modifications in the Boiler in 2 years of operation.

Risk Factors in implementation & operation of Biomass based Power Plant

C) Ground Water Availability:- Availability of good quality of water in adequate quality & that too at the center of the mustard growing area is a majaor risk factor in Rajasthan.

- Mustard is grown where rainfall intensity is low and water availability is also low.
- Power Plant requires huge quantity of water.
- Both are paradoxical to each other.
- Water (Good Quality) availability is a great risk in all the districts of Rajasthan where mustard is grown.
- Also ground water level is depleting every year very fast.
- Continuous Canal water availability is also uncertain.

Risk Factors in implementation & operation of Biomass based Power Plant

D) Environmental Restrictions:- In Rajasthan mustard is grown mostly in the bordering districts like, Sri Ganganagar, Alwar, Bharatpur, Sawaimadhopur, Tonk, Karauli, Kota, Baran, Bundi etc. There are Environmental Restrictions like 25 KM distance from boundaries of reserved forests & sanctuaries (Like Ghana Bird Sanctuary, Ranthambore Wild Life Reserved Forests etc.) and outside of Taj Trapezium etc. These restrictions combined with central location in the biomass availability area leave a very little choice for the site selection.

Clean Development Mechanism (CDM) Assistance Only A Risk Mitigation

- Rajasthan is not a economically & environmentally rich State.
- Infrastructure facilities are also still in the developing stage.
- The Status of Agriculture sector is also below. Half of the State is in the desert zone & farmers are very poor.
- The availability of proper manpower is not adequate & economical.
- Drought and Famine are a regular phenomenon.
- The availability of the Biomass fuel & its price is a major risk factor.
- Availability of good & adequate water on regular basis is also a major risk factor.
- The transportation infrastructure is very week.
- Mustard Crop Residue being a typical fuel, its handling & using as a fuel is not an easy task for a small project. An average PLF of 57% in 2 years of our operation is an indication of the risks involved.
- Our revenues are fixed as per the policy but because of above so many risks we can not control the costs.
- The Government/RERC/Financial Institutions or anybody else is not going to share or subsidize our losses because of the above existing risks.
- We have not received any assistance or funds from any Government Agencies.
- Therefore the CDM Assistance should be treated as a "Risk Mitigation Tool" and not as "additional income" at all.

CDM Project Development and Experience

Dr. Ajay Bararia

A. BACKGROUND

1. What is Carbon Credit?
2. The Kyoto Mechanism - How are emission targets met?
   - Countries can buy "emission credits"
   - Earn emission credits through joint implementation (JI)
   - CDM - which calls for investment in developing countries by promoting the transfer of environment-friendly technologies
3. Projects eligible for Carbon Credits
4. CDM Project Cycle
5. Carbon Trading
6. Who is Buying?
7. What if a country fails to reach the Kyoto emission target?
8. What is in store for India?

B. STEPS REQUIRED TO ARRANGE CARBON TRADING

1.Do you need to retain Consultants/Advisors?

Options:

- Guidelines are available; you may be able to accomplish the arrangement on your own
- Retain a Consultant - Check with the market about the prevailing rates/prices. Since so many projects (e.g., flurochemicals, sugar mills, power companies, etc.) are now trying to earn carbon credits, the consultants might consider reducing their prices. Please do bargain!!!
- Consultants' Services and their Compensation:
  - They may accept a retainer - you may be better off if you settle a lump sum.
  - They may defer the retainer and accept a 'success Fee'. This protects you from depleting your liquidity.
  - A 'hybrid' arrangement, or the combination of a retainer and a success fee
  - Some FI/Government Agencies (e.g., REC, IDFC, RREC, etc.) are also venturing in this field
  - Engagement Letter/Terms
  - Payment of Retainer, etc

2. Risks involved in a CDM Project (Risks that will worry a buyer country):
   - Risks associated with the conventional development of a project, e.g., Licensing/NOC requirements, Govt. Clearances, financing, etc.
   - Fuel Supply Risks
3. Documentation Required:
   - Project Idea Note (PIN)
   - Project Concept Note (PCN)
   - Project Design Document (PDD)
4. Host Country (HC) Approval:
   - Submission for HC Approval
   - Meeting of the National CDM Authority (NCA)
   - Host Country Letter of Approval (LoA)

C. Sale of Carbon Credits

1. Tenders from Purchasing Countries
2. Response to Tenders/Expression of Interest (EoI) in prescribed form
3. Approval of EoI by the Purchasing Country
4. Detailed Proposal
5. Approval of Proposal - Negotiations with the Purchasing Countries
6. Carbon Credit Market - day-to-day developments. Impact of these development on rates
7. Approval of the Proposal

D. Signing of Emission Reduction Purchase Agreement (ERPA)

1. Contractual Obligations
2. Period of Contract
3. Emission Reductions generated after 2012
4. Rate and Payments:Including Advance Payments
5. Reimbursement of Costs

E. VALIDATION OF A CDM PROJECT

1.Search for a Validation Agency
2. Proposal and Fee to be charged
3. Arrangements regarding submission of documents
4. Coordination of comments during posting on the website, etc.
5. Submission of documents for Registration with EB

F. REGISTRATION OF A CDM PROJECT

1. Coordination between UNFCCC and your Consultant regarding documents required, including letter of authorization, etc.
2. Fee for Registration
3. Posting on the Website/Comments from participants/other parties/ coordination for resolution of comments, etc.
4. Letter of Registration by EB

Vertical Shaft Brick Kiln: Case Study

Udit Mathur

Vertical Shaft Brick Kiln Cluster Project:

A CDCF Project

Udit Mathur

September, 2005

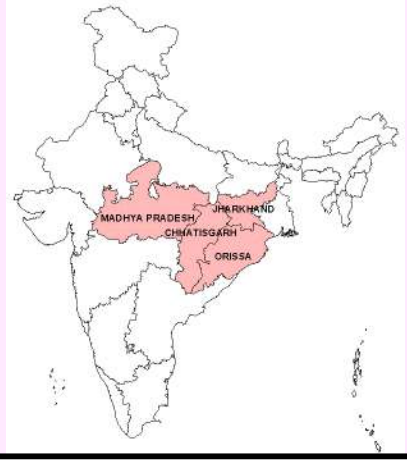
Brick Sector in India

Size	❖ Estimated Production: 140 billion bricks ❖ More than 100000 small and medium sized units ❖ Consumes approx. 24 million tonnes of coal every year
Social Performance	❖ Employs 4 million people (181000 in project states) *…..7% are women* ❖ Brick workers mostly migratory, extremely poor with very few alternatives and fragile livelihood security ❖ Terms of engagement are one-sided ……*gross exploitation*
Environmental Performance	❖ Majority of technologies fail on environmental standards/ Supreme Court Directives ❖ Brick sector contributes significantly to CO_2 emissions
Dynamics	❖ Pollution a cause of concern for regulators ❖ Absolutely no change in social dynamics.

Present Project

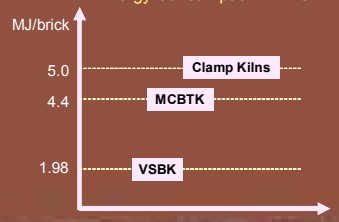
- Technology and Action for Rural Advancement *(TARA)* will facilitate installation of 100 VSBKs across 4 states
- TARA will provide the technology package and existing kiln owners the finance.
- 60 Clamp Kilns & 40 MCBTKs will be replaced by VSBKs ……*hence emission reductions*
- Falls within the category of small scale projects as defined by the UNFCCC.

VSBK PROJECT STATES



Emission Reductions

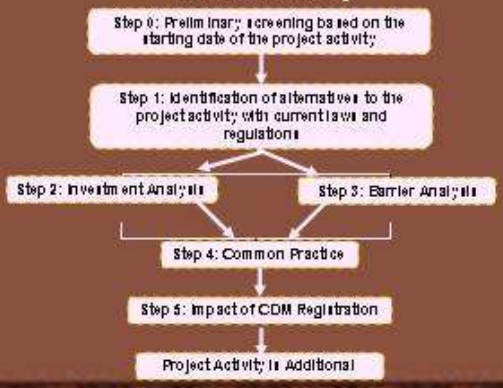
- **Two baselines**
  - Energy consumption in Clamp Kilns (*60 kilns*)
  - Energy Consumption in MCBTKs (*40 kilns*)



Emission Calculations

- **Total Energy Consumption** = Specific Energy Consumption * Total Bricks produced
- Carbon Emission Factor (CEF) for bituminous coal = 25.8 tonnes of carbon per Terajoule
- ***Emissions*** = Total Energy Consumption * CEF
- ***Emission Reductions***
  - = Emissions from Clamps (60) + Emissions from MCBTKs(30) – Emissions from VSBK (100)
  - = 50062+32633 – 36712 = **45983 tones of CO_2 per year**

Additionality



Identification of Alternatives

- Continue existing operation with MCBTKs *(not legal)*
- Replace MCBTKs by Clamp Kilns *(not profitable)*
- Replace MCBTKs by Fixed Chimney BTKs
- Replace MCBTKs by VSBK.

Investment Analysis

- IRR for Fixed Chimney BTK: 34%
- IRR for VSBK: 24%

Barrier Analysis

- **Investment Barrier** : Existing kiln owners used to cash requirements of Rs. 20 lakh per annum. In VSBK double is required
- **Technological Barrier**
  - Reluctance to adopt a new technology
  - Service infrastructure not yet in place
  - Require more trained manpower

Impact of CDM Registration

- Increases IRR for entrepreneurs to 29%
- Bridges the financing gap for TARA to undertake the project
- Helps alleviating other barriers

Monitoring

- Kiln owner will report to TARA - coal consumption, number of bricks produced, unlaoding schedule etc.
- TARA will analyse the information to check for its consistency and calculate emission reductions
- To avoid over-reporting of savings, ceiling for CERs will be based on rated production capacity

Sustainable Development

- Social well-being
- Economic well-being
- Environmental well-being
- Technological well-being

Social well-being

- **Problems faced by brick workers:**
  - Inequitable basis of wage fixation and contracting with the employer
  - Lack of independent recognition of women as wage earning persons
  - Lack of skill-based work opportunities and virtually no skill up-gradation
  - Lack of education facilities for children
  - Absence of basic amenities e.g. clean water, sanitation

Social well-being

- Benefits to be made available at VSBK sites
- Community to be involved in Planning, Implementation & Management of project
- Training provided to workers leading to higher productivity and higher wages.
- Women's savings group to be set up and managed by workers
- Elementary insurance products to be made availsble
- Savings to be channeled into infrastructure such as handpumps, creche, community stoves etc.

Economic well-being

- **20% of carbon revenues dedicated for community benefits** *($ 360 per group per annum)*
- **Amount to be credited to bank account held jointly by women's group**
- **Savings of women's group to be matched by CDCF in ratio 2:1**
- **Total savings will enable groups to**
  - raise additional credit and invest in social assets
  - Inter-loan amongst group members
  - Avail of group insurance schemes
  - Have financial security for emergency requirements

Environmental well-being

- Savings in coal *(30-50%)*
- Improvement in Air Quality
- Emission Standards for Particulate Matters

Size	Kiln Capacity	BTK (mg/Nm³)	VSBK (mg/Nm³)
Small	<15000 bricks/day	1000	300
Medium	15000-30000 bricks/day	750	250
Large	>30000 bricks/day	750	250

Observed value for VSBK : 80-250 mg/Nm³

Technological well-being

- **Lower fuel requirements**
- **Less land requirements**
- **Less firing time** *(24-30 hours for VSBK compared to 15-25 days for clamps and 20-30 days for MCBTKs)*
- **Minor influence of weather variations**
- **Improved brick quality**

Thank You

Energy Efficiency Initiatives In Hotels : Case Study

Dr. Anish Chatterjee

Development Alternatives

CDM PROJECT ON
ENERGY EFFICIENCY INITIATIVES AT LOTUS SUITES AND THE ORCHID HOTEL, MUMBAI

BY
Dr. Anish Chatterjee
DEVELOPMENT ALTERNATIVES

1

Development Alternatives

Kamat Hotels India Ltd.

Foundation: Mr. V.K. Kamat in 1972.
50 hotels ---Today

Hotels in the Project

The Orchid, Mumbai
- Asia's first 5 star certified as an Ecotel Hotel
- Awarded the Green Globe Award by World Travel Mart, London
- Was honoured with "Green Hotelier & Restaurateur Award" by IH&RA

The Lotus Suites, Mumbai
- Is a 196 room 4 star hotel designed as an Environmentally Sensitive Hotel
- Will be fully operational from the year 2004-05

2

Development Alternatives

Technologies Installed

- Replacement of Condenser , STL Pumps and Production Pumps by low consumption and high efficiency pumps
  Energy Saving:4,22,039 KWh/year (27%)
- Replacement of incandescent lamps by PL & CFLs
  Energy Saving: 33,73,016 KWh/year (64%)
- Replacement of feet electronic chokes by electronic chokes
  Energy Saving: 46,814 KWh/year (26%)

3

Development Alternatives

Technologies Installed

- Variable Frequency Drive
  Energy Saving: 38106 KWh/year (24%)
- Installation of Auto Power Factor Control Panel
  Energy Saving: 2,10,240 KWh/year (8%)
- Ozonized Fresh Air: Maintains air quality, thus reducing the fresh air requirement and hence the A/C load
  Energy Saving: 55,582 KWh/year (11%)

4

Development Alternatives

Technologies Installed

Eco Button : Reduces load on A/C plant by automatically increasing temperature by $2^{o}C$ for each room where the eco-button is switched on.
Energy Saving: 3,11,856 KWh/year (1%)

Desuperheater: Heat generated during condensation on chiller plant is recovered to preheat the water flowing through Hot Water Generator
Energy Saving: 534360 KWh/year

Total Energy Saving: 2294272.2 KWh/Year

5

Development Alternatives

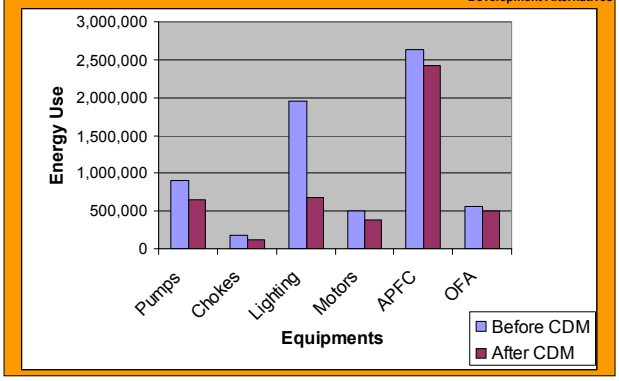
Total Savings

Equipments Installed	Savings (kWh/year)	Savings (in Rs.) Rs. 4.25 / unit
Low consumption & high efficiency pumps	2,89,080	12,28,590
Electronic chokes	1,06,792	4,53,866
Installation of CFL	16,22,957	68,97,567
Eco-Button	3,11,856	13,25,388
De-super heater	15,23,087	64,73,119
APFC Panel	2,10,240	8,93,520
Ozonised fresh air	55,582	2,36,223
Installation of VFDs	1,25,706	5,34,250

6

Total Savings

Development Alternatives



Baselines

Development Alternatives

Any project proposal must clearly & transparently describe methodology of determination of baseline.

Emission baseline is the agreed methodology to quantify "*what would have happened* " in the absence of the project.

It is established by using data, simulations & assumptions specific to a particular project.

8

Baseline

Development Alternatives

- Emissions before CDM activity
  1. Emissions from energy use = Energy Use before equipments installed * Emission Coefficient for the Western Grid
     - = 29million kWh/yr * 1.076 kg CO2/kWh
     - = 31million kg CO_2/ yr
  2. Emissions from boiler use = 0.2million kg CO_2/ yr

Total emissions before CDM project activity
= 31 + 0.2 (million)
= **31.2 million kg CO_2/ yr**

9

Baseline

Development Alternatives

- Emissions After CDM project activity

Emissions from energy use =Energy use after equipments installed * Emission Coefficient for the Western Grid

= 25million kWh/yr * 1.076 kg CO_2/kWh

= 27.3million kg CO_2/ yr

Emission Reduction = 3959 tonnes CO_2/yr

10

Additionality Criteria

Development Alternatives

Project participants shall provide an explanation to show that the project activity would not have occurred anyway due to at least one of the following barriers:

Investment barrier: A financially more viable alternative to the project activity would have led to higher emissions;

Technological barrier: A less technologically advanced alternative to the project activity involves lower risks and so would have led to higher emissions;

Barrier due to prevailing practice: Prevailing practice or existing regulatory or policy requirements would have led to implementation of a technology with higher emissions;

Other barriers:

- Institutional barriers
- Limited information
- Competition for capital etc.

11

Additionality in the Project

Development Alternatives

- Environmental Additionality
  - Emission Reduction = 3959 tonnes CO2eq/yr
- Barriers Overcome
  - Institutional Barriers
    - Lack of experience with energy efficiency investments
    - Low priority towards data collection
    - Uncertain energy savings
  - Financial Barriers
    - Cash constraints
    - Competition for capital

12

Additionality

Development Alternatives

Proposed Activity, Technology or Equipment	Hotel	Business as Usual scenario in India	Barriers Present
Air-conditioning plant with de–super heater	The Orchid and Lotus Suites	Existing old and inefficient AC Plants are in operation; most new hotels do not install de-super heater	Investment Barrier Institutional Barrier
Injection of ozone (O3) to space air circulation	Lotus Suites	Not present	Technological Barrier
Provision of ozone treatment to condenser water	Lotus Suites	Not present	Technological Barrier
Heat Recovery Wheel	Lotus Suites	Prevalent in a few metro 5-star category hotels	Institutional Barrier Investment Barrier
Variable Frequency Drives	Lotus Suites	Present in very few hotels.	Price Barrier

13

Additionality *(Contd....)*

Development Alternatives

Proposed Activity, Technology or Equipment	Hotel	Present state-of-the-art in India	Barriers Present
Solar PV Lighting	Lotus Suites	Solar PV lighting is present in *a few* top-range metro hotels;	Price Barrier
APFC Panel	Lotus Suites	Not present	Technology Barrier Price Barrier
Replacement of lights by CFLs	Lotus Suites	Present in most hotels	Price Barrier
Double Speed Motors	Orchid Hotel	Not very common in Indian hotels	Price barrier
Condenser, STL and Production pumps (with higher efficiency)	Orchid Hotel and Lotus Suites	Hotels in India do not replace their existing pumps with these	Price Barrier
Eco-button	Orchid Hotel and Lotus Suites	Totally new concept. Not present in any other hotels in India	Technological Barrier Barrier due to prevailing practice Limited information barrier

14

Sustainable Development

Development Alternatives

It is the prerogative of the host Party to confirm whether a CDM project activity assists it in achieving sustainable development.

Following aspects should be considered while designing CDM project Activity:

- Social well being
- Economic well being
- Environmental well being
- Technological well being

15

Sustainable Development

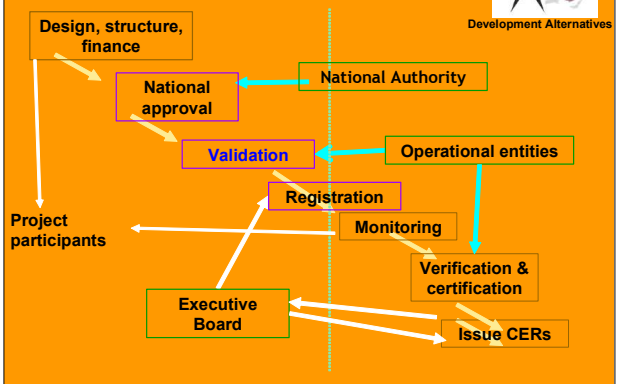
Development Alternatives

S.D. Factors	Indicators	Impacts/Results
Economic Well-Being	Employment Generation	30 more jobs created
Environmental Soundness	CO_2 reduction	3959 tonnes per year
	SO_2 reduction	380 tonnes per year
	NO_x reduction	11 tonnes per year
	Ash reduction	5.06 tonnes per year
	SPM reduction	111µg/nm^3
	RPM reduction	86µg/nm^3
	Water Management	70,000 litres of water recycled everyday.
Social wellbeing	Community Development	Contribution to children's welfare organisation
Technological Adaptation	Replication	Replicated in 2 more hotels

16

CDM Project Cycle

Development Alternatives



17

Development Alternatives

Thank you!

18

TECHNICAL ISSUES IN CDM

In this technical session, Dr. Anish Chatterjee from DA presented various steps of the CDM cycle. He described the cost implications involved in developing a CDM project. The intricacies of baseline determination and additionality were illustrated by Mr. Udit Mathur.

Presentations

Group Discussions

Presentations

Group Discussions

CDM Criteria & Roadmap for CDM Project Development

Dr. Anish Chatterjee

Development Alternatives

CDM Criteria & Roadmap for CDM Project Development

Seminar on

Clean Development Mechanism

on

September 22nd – 23rd, 2005

Dr. Anish Chatterjee
Development Alternatives

1

The Development Alternatives Group

A new kind of not-for-profit corporation that combines social objectives with business like methods and revenue streams

The DA Group believes that the key to achieve sustainable development is the creation of sustainable livelihoods in large numbers

Sustainable livelihoods implies….. informed and empowered communities……with access to dignified and viable income generation opportunities ……and a clean and healthy environment

MITIGATION OPTIONS IN THE ENERGY SECTOR IDENTIFIED ARE :

Development Alternatives

- Improvements in energy efficiency through upgrading currently employed technologies
- Introduction of advanced technologies that are more efficient
- Use of renewable energy sources wherever feasible to bring down the carbon content of the grid, to provide sustainable energy, and as a decentralised energy source at remote areas

3

MITIGATION POTENTIAL

Development Alternatives

Greenhouse Gas	Mitigation Options	MitigationPotential 2002-2012 (million tons)	Long-term Marginal Cost ($/ton of carbon equivalent)
Carbon	Demand-side energy efficiency	45	0-15
	Supply-side energy efficiency	32	0-12
	Electricity transmission and distribution	12	5-30
	Renewable electricity technologies	23	3-15
	Fuel switching (gas for coal)	8	5-20
	Forestry	18	5-10
Methane	Enhanced cattle feed	0.66	5-30
	Anaerobic manure digesters	0.38	3-10
	Low methane rice varieties	marginal	5-20
	Cultivation practices	marginal	0-20
Nitrous Oxide	Improved fertilizer application	marginal	0-20
	Nitrification inhibitors	marginal	20-40

Source: Based on modeling exercises reported in Rana, A. and Shukla, P.R. (2001), Ghosh et al. (2001); Garg A. Shukla, P.R. (2002), and ALGAS (1998)

4

What is CDM

Development Alternatives

Developed Country

Total GHG Emissions

} Emissions to be reduced

Developing Country

Total GHG Emissions

Investments

Carbon Credits

No emission reduction commitments

5

CDM PROJECT ELIGIBILITY

Development Alternatives

Such activities should be

- Approved by the Govts. of the participating Parties
- be host country driven
- May involve private / or public entity
- Environmental integrity is a must
- Economic efficiency for cost effectiveness
- Equity

Implementation of such projects should result in** social, environmental, economic and technological well-being **- the four pillars of sustainable development

6

Types of CDM Projects

Development Alternatives

Energy

- Renewables: Wind, solar, hydro, biomass, geothermal
- Power Generation: Combined Cycle turbines, clean coal technology
- Fuel Switching: Natural Gas, methane, biomass & biogas
- Co-generation: Sugarcane, chemical processes

7

Types of CDM Projects

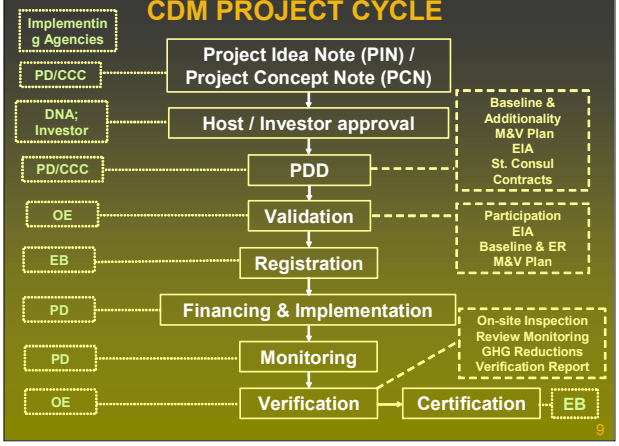
Development Alternatives

Industry

- Efficiency: Boilers. Motors, lighting
- Cogeneration-chemical, metellurgy, paper
- Retrofits
- Production Process
- Waste Fuel Recovery – including landfills

8

CDM PROJECT CYCLE



9

CDM PROJECTS

Some Important Aspects

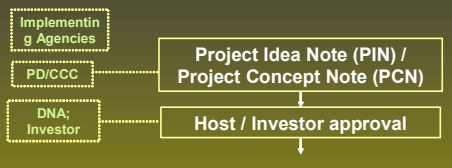
Development Alternatives

- Participation is voluntary, approved by each party involved
- Additional to any that would occur in the absence of certified project activity
- Project fulfills the criteria of financial additionality
- Reduction of emissions should be real, measurable and should have long time benefits
- Project should contribute to the sustainable development of the host country

10

CDM PROJECT CYCLE

Development Alternatives



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PIN/PCN

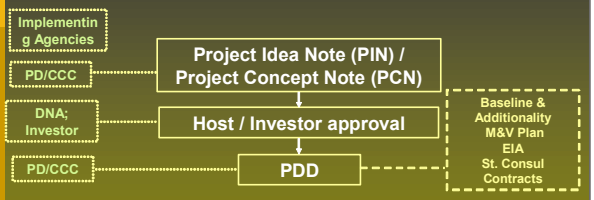
Development Alternatives

- Name of the project
- Ownership details of project sponsors
- Project Description
- Status of Project Clearances
- Financing details of the projects
- Total CDM contribution sought
- IRR with & without CDM revenue
- Estimate of GHG abetment
- Sustainable development criteria
- Project Risks

12

CDM PROJECT CYCLE

Development Alternatives



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PROJECT DESIGN DOCUMENT

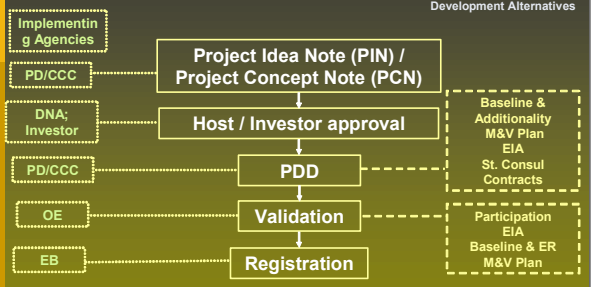
Development Alternatives

- Project Description
- Promoter Details
- Baseline
- Additionality
- Sustainable Development Criteria
- Monitoring Plan
- Financial Status

14

CDM PROJECT CYCLE

Development Alternatives



15

Validation of CDM Projects

Development Alternatives

- Validation is a process of independent evaluation of a project activity by a designated Operational Entity (OE) against the requirements of the CDM on the basis of the PDD.

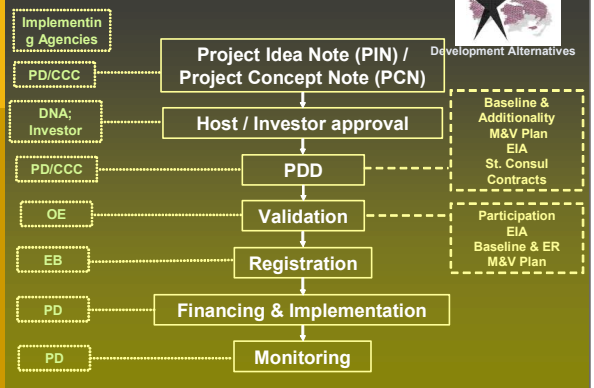
Registration

- Registration is the formal acceptance of a validated project as a CDM project by the Executive Board.
  - Registration is the prerequisite for verification, certification and issuance of the CERs

16

CDM PROJECT CYCLE

Development Alternatives



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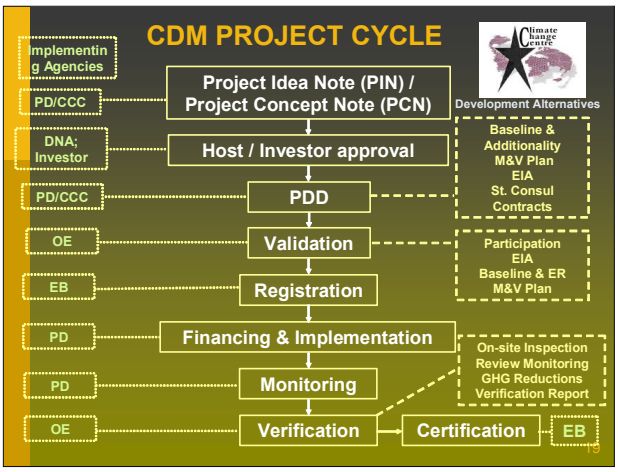
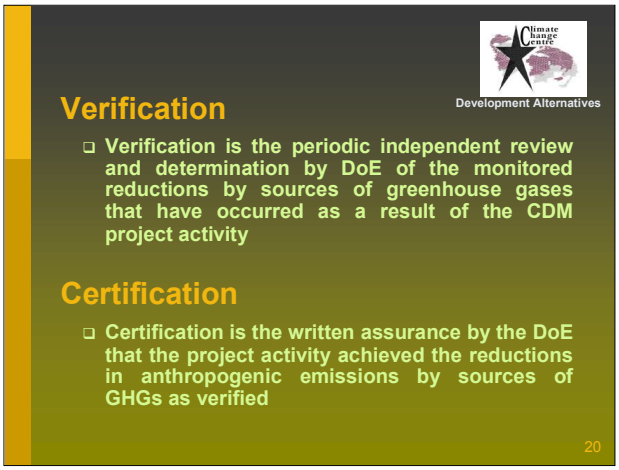
MONITORING

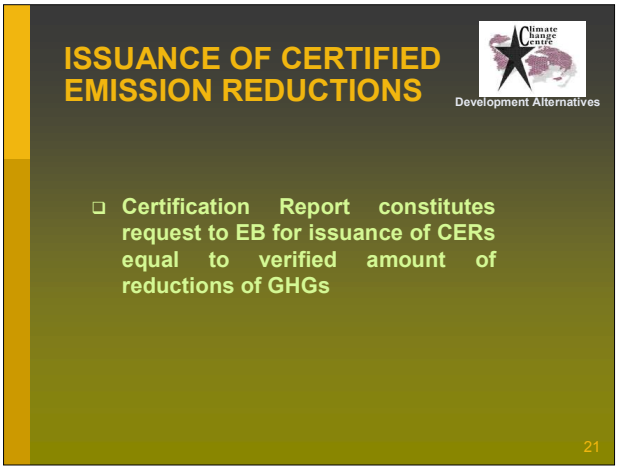
Development Alternatives

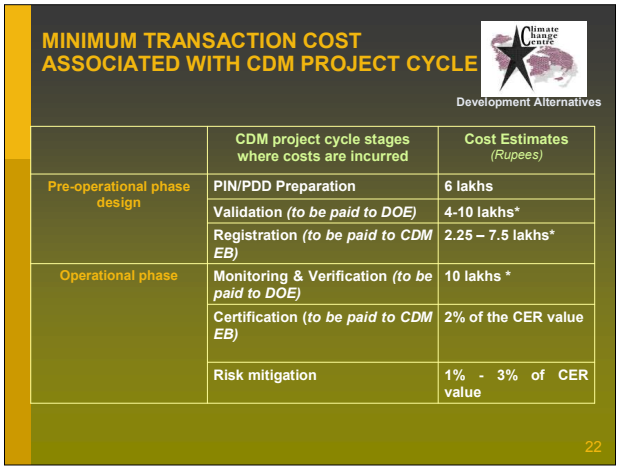
- Project Participants, as part of the PDD provide a monitoring plan:
  - Based on previously approved methodology/new methodology
  - Determined by DoE as appropriate to circumstances of the project activity
  - Reflects good monitoring practice
  - A monitoring report in accordance with monitoring plan is to be submitted to the DoE for verification

18

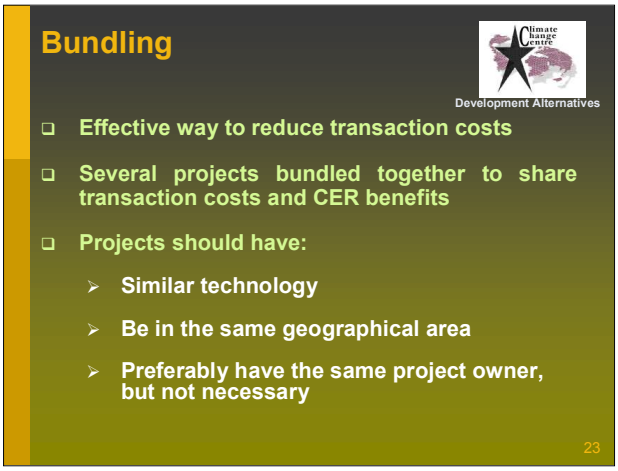








	CDM project cycle stages where costs are incurred	Cost Estimates *(Rupees)*
Pre-operational phase design	PIN/PDD Preparation	6 lakhs
	Validation *(to be paid to DOE)*	4-10 lakhs*
	Registration *(to be paid to CDM EB)*	2.25 – 7.5 lakhs*
Operational phase	Monitoring & Verification *(to be paid to DOE)*	10 lakhs *
	Certification *(to be paid to CDM EB)*	2% of the CER value
	Risk mitigation	1% - 3% of CER value



Technical Issues in CDM Projects

Udit Mathur

Technical issues in CDM Projects

Udit Mathur
Development Alternatives

Seminar on
Clean Development Mechanism
September 22nd – 23rd , 2005

What are the technical issues

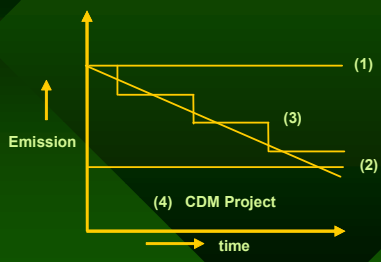
- Need to show that GHG emission reduction is happening
- Need to show that emission reductions would not have happened anyways
- How will we monitor that claimed number of emission reductions is happening

What is a Baseline

"The baseline for a CDM project activity that reasonably represents the anthropogenic emissions by sources of greenhouse gases that would occur in the absence of the proposed project activity."

The Marrakech Accords

BASELINE



BASELINE DETERMINATION

Baseline should be established:

- By project participants using approved/new methodologies
- In a transparent and conservative manner, taking into account uncertainty
- On a project – specific basis
- For small scale projects, as per simplified procedures
- Taking into account relevant policies and economic situation in the project sector

Approaches to Baseline Determination

- Existing actual or historical emissions
- Emissions from a technology representing economically attractive course of action, taking into account barriers to investment
- Average emissions of similar project activities undertaken in previous five years in similar circumstances and are in top 20% performance-wise

BASELINE VALIDITY

Development Alternatives

- Maximum of seven years, renewable at most two times, or
- Maximum of 10 years with no option of renewal

Development Alternatives

Baselines - Determination of the 'anyway scenario'
- what would have taken place anyway

- Questions
  - Data Availability
  - How fast are standard business practices changing ?
  - Emissions vs technology benchmarks
  - Sectoral / national or project level ?
  - Static or dynamic ? Is it related to greenfield / retrofitting ?
  - Are there identifiable project barriers ?

Baselines for Energy Efficiency Projects

Development Alternatives

- EE Projects can be categorised as
  - Adoption of energy efficient equipment at many sites
    - If energy displaced is fossil fuel,
      - Baseline = Amount of fuel * Emission Coefficient of fuel
    - If the energy displaced is electricity,
      - Baseline = Energy baseline * Emission Coefficient of grid
  - Energy efficiency and fuel switching measures at single industrial facility
    - The energy baseline consists of the energy use of the existing equipment that is replaced in the case of retrofit measures and of the facility that would otherwise be built in the case of a new facility.
    - Baseline = Energy Baseline * Emission Coefficient
  - Energy efficiency and fuel switching measures for buildings
    - Same calculation as above

Case Study

Development Alternatives

Baselines for Energy efficiency and fuel switching measures for buildings

Hotel Orchid & Lotus Suites, Mumbai

Energy use of equipment replaced
=288,49,675 kWh/yr

Emissions Baseline
= 28849675 *1.0796kgCO_2/kWh
= 3959 tonnes CO_2/yr

Types of Eligible RE Projects

Development Alternatives

- Solar Photovoltaics
- Mini Hydro
- Tidal/Wave
- Wind
- Geothermal
- Biomass

Capacity < 15 MW for small scale projects

Baseline Determination for Small-scale Renewable energy projects

Development Alternatives

- The RE projects could be categorised as
  - On-Grid
    - Baseline = Kwh produced by RE generating unit * Emission Coefficient for the grid (kgCO_2eq/kWh)
  - Off-grid (Replacing existing fuels such as kerosene/diesel
    - EB = Annual Output
      1- Avg technical distribution losses from mini grids
  - Thermal applications
    - Solar thermal water heaters and dryers
    - Solar cookers
    - Bio-energy for water, space heating

Case Study : Mini Hydel

Development Alternatives

- **Plant Details**
  - Installed Capacity: 3 MW
  - Plant Load Factor : 75%
  - Electricity Produced (Annually): 191.09 lakh units
  - Auxiliary Consumption: 0.5%
  - Transmission Losses: 2%
  - Energy Available for sale: 175.8 lakh units

Case Study : Mini Hydel

Development Alternatives

- **Grid Details:**
  - Relevant Grid : Northern Grid
  - Grid Composition:
    - Thermal – 74.1%
    - Nuclear – 4.5%
    - Hydro – 21.4%
  - Transmission & Distribution Losses : 20%
  - Baseline Carbon Emissions : 0.85 kgCO2/kWh

Case Study : Mini Hydel

Development Alternatives

- **Emission Reductions** = Kwh produced by RE generating unit * Emission Coefficient (kg CO_2equ/kWh) of the grid

  = 175.8 lakh*0.85

  = 14943 tonnes CO_2 /Yr

Case Study : Solar Lanterns

Development Alternatives

- **Project Details:**
  - Installation of solar lanterns to replace kerosene lamps
  - No. of lanterns: 10,000
  - Wattage : 10 W
  - Usage : 4 hours per day

Case Study : Solar Lanterns

Development Alternatives

- **Energy Baseline** = $\frac{\text{Annual Output}}{\text{1- line losses}}$

  = $\frac{\text{150000 kWh/yr}}{\text{1-.20}}$

  = 187,500 kWh/yr

- **Emissions Baseline** = 187500 * 0.9

  = 168750 kgCO2/yr

Additionality

Development Alternatives

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

Additionality

Development Alternatives

Purpose

- To ensure that Emission Reduction due to Business-As-Usual measures in developing countries should not be credited under CDM

Necessary Condition

- The emissions from thhe proposed project are less than the baseline emissions

Sufficient Condition

- The proposed CDM project is not a baseline scenario project and hence would not have been implemented in absence of CDM

Tools for Assessment of Additionality

Development Alternatives

- Identification of alternatives to the Project Activity
- Investment Analysis to deteremine that the project activity is not the most economically or financially attractive
- Barrier Analysis
- Common Practice Analysis
- Impact of registration of the proposed project as a CDM project activity

Identification of Alternatives

Development Alternatives

- Alternatives include activities that provide outputs or services similar to proposed CDM activity

…….if proposed project activity is the only alternative amongst the ones considered that is in compliance with all regulations, then the proposed CDM activity is not additional

Investment Analysis

Development Alternatives

Determine appropriate analysis method

- If no financial/economic benefits from project then simple cost analysis otherwise investment comparison or benchmark analysis

Comparison of Financial indicators

- Show that the CDM project does not have the highest IRR among the alternatives

Sensitivity Analysis

- Show that conclusion regarding financial attractiveness is robust to variations in critical assumptions

Barrier Analysis

Development Alternatives

Determine whether the proposed activity faces barriers that

- Prevent the implementation of this type of project activity
- Do not prevent the implementation of atleast one of the alternatives
- Types of barriers
  - Investment: e.g. lack of funding for such projects
  - Technological: lack of skilled manpower, infrastructure
  - Prevailing Practice: project activity "first of its kind"

…….if one of the above two steps not satisfied, project activity not additional

Impact of CDM Registration

Development Alternatives

Show how approval of project activity as CDM will alleviate economic and financial hurdles and other identified barriers.

•This may be benefits from CDM such as

- GHG reductions
- Revenues from selling CERs
- Attracting new players not exposed to same bariers

……. If this step satisfied project activity additional

Case Study

Development Alternatives

- Energy Efficiency in Buildings (Hotel Orchid & Lotus Suites, Mumbai)
  - Additionality proved through:
    - Lack of experience with energy efficiency investments
    - Low priority towards data collection
    - Cash Constraints
    - Competition for capital
    - Uncertain Energy Savings

Case Study

Development Alternatives

- Demand-side energy efficiency programmes for specific technologies

  (Vertical Shaft Brick Kiln)
  - Additionality proved through:
    - Investment barrier
    - Technological barrier
    - Barrier due to low penetration
    - Barrier due to prevailing practice

Case Study

Development Alternatives

- Electricity Generation for the Grid
  - Across RE projects, several barriers have been shown, such as
    - Availability of finance
    - Regulatory related barriers
    - Low IRRs
    - High investment costs
    - Technological barriers, especially in wind and solar projects

Monitoring

Development Alternatives

- As per Marrakech Accords, participants should include ,as part of PDD, a monitoring plan providing for:
  - Collection & archiving of all relevant data necessary to calculate project emissions
  - Collection & archiving of all relevant data necessary to calculate baseline emissions
  - Quality assurance & control procedures for monitoring process
  - Procedures for periodic calculations for emission reductions

Monitoring Methodologies

Development Alternatives

- A monitoring plan can be based on
  - Previously approved methodology
  - New methodology
    - Be determined by DoE as appropriate to circumstances of proposed project activity
    - Reflects good monitoring practice appropriate to the type of project activity

Monitoring Methodologies for Small Scale Projects

Development Alternatives

Demand-side energy efficiency programmes for specific technologies

- For devices replaced, number & power of replaced devices to be recorded and monitored
- For devices installed, either “power” and “operating hours” or “energy use” to be recorded and monitored

Monitoring Methodologies for Small Scale Projects

Development Alternatives

- Energy efficiency and fuel switching measures for industrial facilities
  - For retrofits, monitoring includes:
    - Documenting the specifications of the equipment replaced;
    - Metering the energy use of the industrial facility, processes or the equipment affected by the project activity;
    - Calculating the energy savings using the metered energy obtained above

Monitoring Methodologies for Small Scale Projects

Development Alternatives

- Energy efficiency and fuel switching measures for industrial facilities
  - For a new facility, monitoring includes
    - Metering the energy use of the equipment installed;
    - Calculating the energy savings due to the equipment installed.

Monitoring Methodologies for Small Scale Projects

Development Alternatives

- Energy efficiency and fuel switching measures for buildings
  - For retrofits, monitoring includes:
    - Documenting the specifications of the equipment replaced;
    - Metering the energy use of the building(s) before and after the replacement equipment is installed;
    - Calculating the energy savings due to the measures installed.

Monitoring Methodologies for Small Scale Projects

Development Alternatives

- Energy efficiency and fuel switching measures for buildings
  - For new facilities, monitoring includes:
    - Metering the energy use of the building(s);
    - Calculating the energy savings of the new building(s).

Case Study

Development Alternatives

- Energy Efficiency in Buildings (Hotel Orchid & Lotus Suites, Mumbai)

Data type	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?
Electricity Consumption	kWh/ yr	M	Once in a day	100%	Electronic and paper both	2 years after the end of the crediting period
Number of VFDs	Units	M	Once in a day	100%	Electronic and paper both	2 years after the end of the crediting period
Number of CFLs, classified according to power	Units	M	Once in a day	100%	Electronic and paper both	2 years after the end of the crediting period
Number of electronic chokes	Units	m	Once in a day	100%	Electronic and paper both	2 years after the end of the crediting period

Monitoring Methodologies for Small Scale Projects

Development Alternatives

- Grid Connected RE Projects
  - Monitoring consists of metering the electricity generated
  - For co-fired plants, amount of biomass and it's energy content is to be monitored

Monitoring Methodologies for Small Scale Projects

Development Alternatives

- Off-grid projects
  - Monitoring consists of
    - Metering the energy produced by a sample of the systems where the simplified baseline is based on the energy produced multiplied by an emission coefficient

Monitoring Methodologies for Small Scale Projects

Development Alternatives

- If the emissions reduction per system is less than 5 tonnes of CO_2 a year:
  - Recording annually the number of systems operating (evidence of continuing operation, such as on-going rental/lease payments could be a substitute); and
  - Estimating the annual hours of operation of an average system, if necessary using survey methods. Annual hours of operation can be estimated from total output

Case Study : Solar Lanterns

Development Alternatives

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
Observation	*Whether solar lantern is operating*	*Yes/no*	*Not applicable*	*Once per year*	*33 % of lanterns in each community*	*Electronic and paper*	*2 years*	*To verify operation*
Survey	*Hours used per night*	*Hours*	*Estimated (e)*	*Once per year*	*10 % of lanterns in each community*	*Electronic and paper*	*2 years*	*To verify usage pattern*

Monitoring Methodologies for Small Scale Projects

Development Alternatives

- For thermal applications
  - Monitoring consists of
    - Metering the energy produced by a sample of the systems where the simplified baseline is based on the energy produced multiplied by an emission coefficient.

      OR
    - Metering the thermal and electrical energy generated for co-generation projects;

      OR

Development Alternatives

Thank You

DESIGNING PROJECT IDEA NOTES

In Session V, the participants were divided into two groups. Each group was given the task of developing a PCN/PIN. One PIN was on biomass based electricity generation, the other being on wind mill. The participants were asked to develop a baseline, establish additionality, design a monitoring plan and propose a sustainable development programme for each project. Each group was asked to nominate a rapporteur among themselves who presented the group work to a larger audience.

Group-work



Sharing of exercises



PROGRAMME SCHEDULE

Venue: Hotel Clarks Amer, Jaipur
September 22-23, 2005

DAY 1 – September 22, 2005

9:30–10:00 Registration

SESSION I: INAUGURAL SESSION

10:00–10:05 Lighting of the lamp

10:05-10:20 Welcome Address, Dr. K Vijayalakshmi, Programme Director, *Development Alternatives.*

10:20-10:35 Address by Shri Yaduvendra Mathur, Secretary Energy, *GoR*

10:35-10:50 Address by Mr. Keisuke Iyodomi*, Institute for Global Environmental Strategies, Japan*

10:50-11:05 Address by Shri D. C. Samant, Addl. Chief Secretary (Infrastructure), *GoR*

11:05-11:15 V*ote of Thanks* by Shri Rakesh Verma (IAS), Chairman & Managing Director, *Rajasthan Renewable Energy Corporation Ltd., Jaipur*

11:15–11:30 Tea Break

SESSION II: INTRODUCTION TO CDM AND ENABLING ENVIRONMENT

11:30–11:50 Inaugural Address by Shri Gajendra Singh Khinwsar, Hon'ble Minister of State, Energy, *GoR.*

11:50: 12:10 Basics of Climate Change & CDM, Dr. Parul Rana-Madaria*, Development Alternatives*

12:10–12:30 CDM Progress in Rajasthan, Mr. Suneet Mathur, *RREC Jaipur*

12:30-12:45 Current CDM Market, Keisuke Iyadomi*, IGES Japan*

- Discussion

1:00 – 2:00 Lunch

SESSION III: CASE STUDIES IN CDM PROJECT DEVELOPMENT

2:00-2:20 CDM Project on Cement Industry, *M/s Shree Cement Ltd.*

2:25-2:40 CDM Project on Biomass based Power Plants, *M/s Kalpataru Power Ltd.*

2:45-3:05 CDM Project on Biomass based Power Plants, *M/s Alwar Power Co. Ltd.*

3:30–3:45 Tea Break

SESSION IV: DESIGNING PROJECT IDEA NOTES

3:45–4:00 Roadmap for CDM Project Development, Dr. Anish Chatterjee, *Development Alternatives*

4:05 – 4:35 Technical issues in CDM Projects, Udit Mathur*, Development Alternatives*

- Discussion

RECEPTION & DINNER *(7:15 – 09:00)*

DAY 2 – September 23, 2005

SESSION V	
9:45-10:05	Recap of Day 1
10:15-10:30	CDM Project on Energy Efficiency in Hotels
10:30 – 10:45	CDM Project in Brick Kilns
10:45–11:00	Tea Break
SESSION VI	
11:00-01:00	Group exercise on designing of Project Idea Notes
1:00 – 02:00	**Lunch**
SESSION VI	
2:00-3:00	Presentation of Group exercise by Participants
3:00-3:30	Discussion
3:30-4:00	Tea Break
4:00-5.00	**WRAP - UP**

Summary of Feedback

Government Officials

1. Primary Areas of interest : Renewable Energy & Energy Efficiency in power generation, transmission& distribution
2. While most of the officials had no prior exposure to the concept of CDM, after the workshop, they rate their familiarity with basic concepts of CDM and CDM Project Cycle as 'Good'.
3. Almost all the government officials thought they learnt 'a lot' at this workshop and also found the topics and agenda 'relevant'.
4. The group exercise was found to be 'very helpful' in understanding the issue
5. For future CDM capacity building workshops, following topics should be focused on:
    a. CDM approval & registration procedure
    b. Carbon Market
    c. CDM Financial issues

Private Sector

1. Primary Areas of interest: Renewable Energy & Energy Efficiency in industrial processes such as mining, cement etc.
2. Most of the participants had not attended any event on CDM before this workshop and rated their familiarity with Kyoto Protocol and CDM as 'poor'. After attending the various sessions of the workshop, they felt their knowledge on CDM had improved considerably and could be termed as 'Average'.
3. The reasons for attending the workshop were varied, the top ones among them being
    a. They own eligible potential projects and are interested in developing them as CDM projects
    b. Are interested in becoming a professional in the field
    c. Are interested in learning how to handle CDM projects
    d. They have attended before a basic CDM workshop and were interested in learning more on specifics
4. The participants found that while the materials provided in the workshop were 'most relevant' , the group exercises and discussions were 'helpful to some extent'.
5. For future CDM capacity building workshops, following topics should be focused on (in order of priority):
    a. Carbon Market
    b. CDM approval & registration procedure
    c. CDM Matching with investors
    d. Financial issues

NGOs/Consultants

This group identified the requirements for the country:

1. Involvement of local stakeholders in national policy for CDM
2. Further research/analysis on key CDM related issues
3. Building legal systems to ensure property rights and ownership of CERs
4. Building own capacity to identify and prepare CDM project proposals.

PROJECT IDEA NOTE

A. Project description, type, location and schedule

Name of Project: COMPUCOM Wind Power Project in Jaisalmer and Sikar, at Rajasthan, India

Technical summary of the project ***Date submitted: December, 2005***

Objective of the project	The objective of this project is to install total 2.4 MW wind turbines connected to the state grind so that this project will contribute to reduce the country dependency of the imported fossil fuels and replace it by the sustainable renewable sources.
Project description and proposed activities (including a technical description of the project)	The project installed the following capacity of wind turbine in different located sites at the state of Rajasthan, India. ✓ 2 x 0.6 MW wind turbines in Jaisalmer (Total 1.2 MW) ✓ 2 x 0.6 MW wind turbines in Sikar (Total 1.2 MW) The commission date of these wind facilities is as follows. ✓ Wind turbines in Jaisalmer on March 4, 2004 ✓ Wind turbines in Sikar on December 31, 2004 Current actual electricity generation from those 4 wind turbines is approximately 6 million kWH per annum so that this project is contributing to reduce equivalent amount of electricity generated from imported fossil fuels in state owned grid of Rajasthan. At the time of beginning of operation, the company has been facing difficulties in handling this new equipments due to the lack of experience in operating and maintaining those facilities including trained operators in the state of Rajasthan. Therefore, the company had to burden the additional costs, which the project was in peril of operating. The project would not continue normal operation in the absence of CDM concept.
Technology to be employed	The wind facilities are provided by Enercon Co. Ltd **(need more technological description)**

Project developer	
Name of the project developer	**Compucom Software Limited**
Organizational category	Public limited
Other function(s) of the project developer in the project	Sponsor
Address	IT: 14-17, EPIP, RIICO Industrial Area, Sitapura, Jaipur 302 022, India
Contact person	**S. K. Surana** Managing Director of COMPUCOM Software Limited
Telephone / fax	Tel: 2770131, 5115901, 5115905 Fax: +91-141-2770335
E-mail and web address, if any	pramoda@compucomtech.co.in www.compucomtech.co.in
Type of the project	
Greenhouse gases targeted	CO_2
Type of activities	Abatement
Field of activities	
a. Energy supply	Renewable energy

Location of the project	
Region	*Rajasthan*
Country	India
City	Jaislmer, Sikar
Brief description of the location of the plant	*Jaislmer;* *Sikar; Harshenath pervat*
Expected schedule	
Earliest project start date	2004
Estimate of time required before becoming operational after approval of the PIN	N.A.
Expected first year of CER delivery	**2006**
Project lifetime	**20** years
Current status or phase of the project	**Operation**
Current status of the acceptance of the Host Country	No
The position of the Host Country with regard to the Kyoto Protocol	The Host Country a. signed, signed and ratified, accepted, approved or acceded to the Kyoto Protocol

B. Expected environmental and social benefits

Estimate of Greenhouse Gases abated / CO_2 Sequestered (in metric tons of CO_2-equivalent)	Annual: **5340 tCO2e** Up to and including 2012: **37380** tCO_2-equivalent Up to a period of 10 years: **53400** tCO_2-equivalent Up to a period of 7 years: **37380** tCO_2-equivalent Up to a period of 14 years: **74760** tCO_2-equivalent
Baseline scenario	Baseline scenario is continuing the current electricity generation sources of the state grid of Rajasthan in the absence of this project due to the barriers of this wind turbine on prevailing practice. *Emission coefficient of the state grid in Rajasthan is 0.899 kg-CO2e/kWh.*
Specific global & local environmental benefits	
Which guidelines will be applied?	N.A.
Local benefits	Those facilities generated employment opportunity so that local people received benefits from this project implementation.
Global benefits	Apparently, this project will contribute to reduce GHG emission.
Socio-economic aspects What social and economic effects can be attributed to the project and which would not have occurred in a comparable situation without that project?	1. Increased production of electricity, leading to economic development and energy security 2. Employment Generation of local population in the operations of wind farms
Which guidelines will be applied?	N.A.
Environmental strategy/ priorities of the Host Country	Government of Rajasthan is promoting renewable energy by offering subsidies and tax incentives for the installation of those applicable renewable energy generations. Tax holiday are eligible for ten years, and 80 % depreciation is allowed in the first two years. In addition, preferential tariff is introduced.

C. Finance

Total project cost estimate	
Total project costs	Approx. 2,758,620 USD (12 x 10 million Indian Rupees) (1 USD= 43.5 INR)
Sources of finance to be sought or already identified	IRR=15 % without CER **(need more description of Purchase Agreement with state grid)**
Equity	12 x 10 million Indian Rupees from COMPUCOM
Debt – Long-term	N.A.
Debt - Short term	N.A.
Not identified	N.A.
CDM contribution sought	US$ 897120
Indicative CER Price (subject to negotiation and financial due diligence)	Approx. 12 USD/CER

PROJECT IDEA NOTE

B. Project description, type, location and schedule

Name of Project: **Energy Efficiency in Industrial Beneficiation Plant at Jhamarkotra Mines, at Rajasthan, India**

Technical summary of the project ***Date submitted:*** ***December, 2005***

Objective of the project	Rajasthan State Mines & Minerals Limited intends to utilise low grade ore (LGO) through upgradation by beneficiation technology
Project description and proposed activities (including a technical description of the project)	The Jhamarkotra Mines are endowed with about 80 million tonnes of rock phosphate ore, out of which about 60 million tonnes of Low Grade Ore (LGO) consists of average 15-18% Phosphorous Pentaoxide (P_2O_5) making it not useful for commercial purposes. RSMML intends to utilise this ore through upgradation by beneficiation technology. RSMML in association with IBM developed a beneficiation process to enrich LGO. The process route and technology adopted by RSMML for the beneficiation is of its own kind in the world. Based on the success of this technology, a 1500 tonnes per day (tpd) capacity plant was set up in 1992. An expansion of this plant capacity to 3000 tpd is now being undertaken. The savings in greenhouse gas emissions happens due to adoption of new energy efficient technology for crushing and grinding. This technology is called the Roller Press/High Pressure Grinding Rolls Technology. It will supplement the currently existing Ball Mills for grinding. The roller press is the most energy efficient equipment available for grinding and is being used first time in the world for mineral processing. In conventional technology, the power consumption for processing of 1 metric tonne of LGO is approximately 50 kWh, whereas with the use of roller press, it comes down to 35 kWh.
Technology to be employed	The technology to be employed is called the Roller Press/High Pressure Grinding Rolls Technology. It will supplement the currently existing Ball Mills for grinding.

Project developer	
Name of the project developer	Rajasthan State Mines & Minerals Limited
Organizational category	Public limited
Other function(s) of the project developer in the project	Sponsor
Address	4, Meera Marg, Udaipur – 313004 Rajasthan, India
Contact person	**Mr. Gopal Gandhi**

Telephone / fax	Tel: 0294 – 2528681-85 Fax: +91-0294 – 2523170
E-mail and web address, if any	E-mail: gopalgandhi@rsmm.com
Type of the project	Energy Efficiency
Greenhouse gases targeted	CO_2
Type of activities	
Field of activities	
a. Energy supply	
Location of the project	
Region	*Rajasthan*
Country	India
City	Udaipur
Brief description of the location of the plant	
Expected schedule	
Earliest project start date	March 2003
Estimate of time required before becoming operational after approval of the PIN	N.A.
Expected first year of CER delivery	**December 31st 2006**
Project lifetime	10 Years
Current status or phase of the project	
Current status of the acceptance of the Host Country	N/A
The position of the Host Country with regard to the Kyoto Protocol	The Host Country a. signed, signed and ratified, accepted, approved or acceded to the Kyoto Protocol

B. Expected environmental and social benefits

Estimate of Greenhouse Gases abated / CO_2 Sequestered (in metric tons of CO_2-equivalent)	Annual: **12000 tCO2e** Up to and including 2012: **84000** tCO_2-equivalent Up to a period of 10 years: **120000** tCO_2-equivalent Up to a period of 7 years: **84000** tCO_2-equivalent Up to a period of 14 years: **168000** tCO_2-equivalent
Baseline scenario	The energy consumed by the currently existing Ball Mills for grinding.
Specific global & local environmental benefits	**Environmental Well-being** The environmental benefits of the project include the following ▪ The project contributes to reduction of GHG emissions *by* tonnes of CO_2in 10 years. ▪ Reduction in 1.5 million m^3 freshwater consumption due to reuse of wastewater of IBP after proper treatment at Acid Water Treatment Plant
Which guidelines will be applied?	N.A.
Local benefits	
Global benefits	Apparently, this project will contribute to reduce GHG emission.
Socio-economic aspects What social and economic effects can be attributed to the project and which would not have occurred in a comparable situation without that project?	**Technological wellbeing:** The Roller Press technology is a relatively new technology and a definite up-gradation over the archaic commonly found Ball Mills. It is being used for the first

	time in the world of mineral processing. However, prior to its stable operations, the organization faced several difficulties in running it smoothly. This project, by demonstrating the viability of the technologies' smooth operations, will promote widespread adoption of an environmentally sound technology.
Which guidelines will be applied?	N.A.
Environmental strategy/ priorities of the Host Country	

C. Finance

Total project cost estimate	
Total project costs	Rs 5391.00 Lakhs
Sources of finance to be sought or already identified	The Technology Development Board, Department of Science & Technology, Ministry of Science & Technology, Government of India has partially funded this project.
Equity	
Debt – Long-term	
Debt - Short term	
Not identified	N.A.
CDM contribution sought	N.A
Indicative CER Price (subject to negotiation and financial due diligence)	Approx. 07 USD/CER

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MEDIA COVERAGE

राजस्थान पत्रिका

राजस्थान पत्रिका | जयपुर | शुक्रवार | सितम्बर 23, 2005

'तापमान में बढ़ोतरी से पैदावार में कमी'

जयपुर, 22 सितम्बर (मे.सं.)। ग्लोबल वार्मिंग के प्रभाव से कृषि की पैदावार को कम होने से बचाने के लिए प्रदूषण रहित उद्यम लगाए जाने की आवश्यकता है। राजस्थान अक्षय ऊर्जा निगम व डवलपमेंट अल्टरनेटिव की ओर से क्लीन डवलपमेंट मैकेनिज्म (सीडीएम) विषय पर गुरुवार से शुरू दो दिवसीय सेमीनार में वक्ताओं ने ये विचार व्यक्त किए। सेमीनार के मुख्य अतिथि ऊर्जा राज्यमंत्री गजेन्द्र सिंह खींवसर ने कहा कि सीडीएम के माध्यम से ग्लोबल वार्मिंग में कमी लाकर राजस्थान जैसे प्रदेश में कृषि पैदावार बढ़ाई जा सकती है। अतिरिक्त मुख्य सचिव डी.सी. सामंत ने कहा कि एक अनुमान के अनुसार तापमान में तीन डिग्री सेंटीग्रेड की बढ़ोतरी से कृषि पैदावार में तीस से चालीस प्रतिशत तक कमी की संभावना है। निगम अध्यक्ष व प्रबंध निदेशक राकेश वर्मा ने सेमीनार में जानकारी दी कि देश में सर्वाधिक दस सीडीएम परियोजनाएं राजस्थान के लिए स्वीकृत की गई हैं। ऊर्जा सचिव यदुवेन्द्र माथुर, डवलपमेंट अल्टरनेटिव की डॉ. के. विजयलक्ष्मी और इंस्टीट्यूट ऑफ ग्लोबल एनवायरमेंटल स्ट्रेटेडीज के के. इयाडोमी आदि ने विचार व्यक्त किए।

दैनिक भास्कर

भारत का सबसे तेज बढ़ता अखबार

जयपुर । शुक्रवार 23 सितंबर, 2005

टेम्परेचर में 3 डिग्री की बढ़त से 30 फीसदी कम हो सकता है एग्रीकल्चर प्रोडक्शन

वार्मिंग रोकने के काम आ सकते हैं राज्य के एनर्जी सोर्स

सिटी रिपोर्टर

राजस्थान में सौर, पवन और बायो एनर्जी के स्रोत बड़ी मात्रा में मौजूद हैं जिससे एनर्जी रिक्वायरमेंट पूरी करने के साथ ही ग्लोबल वार्मिंग को भी नियंत्रण में किया जा सकता है।

वार्मिंग को कंट्रोल करने के लिए क्लीन डवलपमेंट मैकेनिज्म काम में ली जाए तो चमत्कारी परिणाम सामने आ सकते हैं। जापान के इंस्टीट्यूट फॉर ग्लोबल एनवायरमेंटल स्ट्रेटेजीज के सहयोग से होटल क्लार्क्स आमेर में आयोजित दो दिवसीय वर्कशॉप का इनॉगरेशन करते हुए एनर्जी मिनिस्टर गजेंद्रसिंह खींवसर ने यह जानकारी दी। राजस्थान रिन्यूएबल एनर्जी कॉरपोरेशन और नई दिल्ली की डेवलपमेंट अल्टरनेटिव की ओर से गुरुवार को क्लीन डेवलपमेंट मैकेनिज्म (सीडीएम) पर आयोजित वर्कशॉप में वक्ताओं ने ग्लोबल वार्मिंग पर काबू पाने के लिए सीडीएम को अपनाने पर जोर दिया।

खींवसर ने कहा कि ग्लोबल वार्मिंग के चलते ग्लेशियर तेजी से पिघल रहे हैं और इसके कारण क्लाइमेट में बदलाव आ रहा है और मेंचर साइकल गड़बड़ा रही है। राजस्थान में इसके कारण एग्रीकल्चर पर बुरा प्रभाव पड़ सकता है। एडीशनल

क्लीन डेवलपमेंट मैकेनिज्म?

विकसित देशों में औद्योगीकरण इस स्तर तक हो रहा है कि यहां प्रदूषण पर काबू पाना टेढ़ी खीर साबित हो रहा है। ऐसे में भारत जैसे देशों को ये देश क्लीन डवलपमेंट मैकेनिज्म यानी सीडीएम के तहत धनराशि उपलब्ध कराया रहे हैं कार्बन उत्सर्जित करने वाले प्लांट कार्बन क्रेडिट के हकदार बनते हैं। इंडियन नेशनल ऑथोरिटी ऑफ सीडीएम ने अभी तक 10 सीडीएम परियोजनाएं राजस्थान के लिए स्वीकृत की है। जिनसे वर्ष 2012 तक 4 करोड़ 66 लाख सर्टिफाइड इमिशन रिडक्शन होगा।

चीफ सेक्रेटरी (इन्फ्रास्ट्रक्चर) डीसी सामंत ने कहा कि डेवलप्ड कंट्रीज के फॉसिल फ्यूल यूज करने के कारण एंवायरमेंट ज्यादा गर्म हो रहा है। एक अनुमान के अनुसार टेंपरेचर तीन डिग्री सेंटिग्रेड बढ़ने से एग्रीकल्चरल प्रोडक्ट्स में 30 से 40 फीसदी तक कमी आ सकती है।

कॉन्फ्रेंस के चेयरमैन और मैनेजिंग डायरेक्टर राकेश वर्मा का कहना है कि इंडियन नेशनल अथॉरिटी ऑफ सीडीएम की ओर से अभी तक राजस्थान में 10 सीडीएम प्रोजेक्ट सेंक्शन किए गए हैं जो देशभर में सबसे ज्यादा हैं। इन प्रोजेक्ट्स से वर्ष 2012 तक चार करोड़, 66 लाख इमिशन रिडक्शन होंगे। इंस्टीट्यूट ऑफ ग्लोबल एंवायरमेंट स्ट्रेटेजीज के के.इयाडोमी ने बताया कि सीडीएम का बजट 2004-05 के पांच बिलियन येन के मुकाबले 2005-06 के लिए 10 बिलियन येन कर दिया गया है। वर्कशॉप में एनर्जी सेक्रेटरी यदुवेंद्र माथुर, डेवलपमेंट अल्टरनेटिव की के.विजयलक्ष्मी ने भी विचार रखे। वर्कशॉप में राजस्थान और पंजाब के एंटरप्रेन्योर्स ने सीडीएम के सेंक्शन प्रोजेक्ट्स के बारे में जानकारी ली। • पेज 7

महका भारत

जयपुर, 23 सितम्बर, 2005 9

अपारंपरिक ऊर्जा स्रोतों की कमी नहीं-गजेंद्र

जयपुर, 22 सितम्बर (कासं)। ऊर्जा मंत्री गजेन्द्र सिंह खींवसर ने कहा है कि प्रदेश में सौर, पवन, बायो एवं अक्षय ऊर्जा के स्रोत बहुतायत में उपलब्ध हैं। इनका दोहन करके ऊर्जा आवश्यकताओं की पूर्ति कर विकसित देशों द्वारा क्लीन डवलपमेंट मैकेनिज्म (सी.डी.एम.) के तहत उपलब्ध करवाई जा रही धन राशि का सदुपयोग किया जा सकता है। खींवसर गुरुवार को इंस्टीट्यूट ऑफ ग्लोबल एन्वायरनमेंट स्ट्रेटेडीज व राजस्थान अक्षय ऊर्जा निगम के आमेर में आयोजित क्लीन डवलपमेंट मैकेनिज्म विषय पर आयोजित दो दिवसीय कार्यशाला को मुख्य अतिथि के रूप में सम्बोधित कर रहे थे। उन्होंने कहा कि भारत कृषि प्रधान देश होने के कारण यहां की अर्थव्यवस्था कृषि पर आधारित है। ग्लोबल वार्मिंग के कारण ग्लेशियर्स के तेजी से पिघलने से जलवायु में परिवर्तन आ रहा है जिससे मौसम का प्राकृतिक चक्र प्रभावित हुआ है। इसका कृषि पैदावार पर विपरीत प्रभाव पड़ा है। उन्होंने कहा कि यही मैकेनिज्म से ग्लोबल वार्मिंग में कमी लाकर इनमें सुधार किया जा सकता है। खींवसर ने यह भी कहा कि धौलपुर में तीन सौ मेगावॉट क्षमता का प्लांट शुरू करने की योजना से होने वाले कार्बन क्रेडिट को प्रचलित दर पर विक्रय करने से अनेक योजनाएं लाभान्वित हो सकती हैं। इस अवसर पर इन्फ्रास्ट्रक्चर विभाग के अतिरिक्त मुख्य सचिव डी.सी. सामंत ने कहा कि विकसित देशों द्वारा फॉसिल फ्यूल का उपयोग किए जाने के कारण गर्म हो रहे वातावरण से कृषि पैदावार पर

Development Alternatives

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