Market Opportunities through Climate Change Mitigation

Press Briefings

By Centre for Environment Education, Ahmedabad
GreenCOM

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Report of Press Briefings for Business Journalists

By Kiran Chhokar, Centre for Environment Education
Reviewed by Mary Paden, GreenCOM

Background

Between August 26 and 31, 2000, the Centre for Environment Education and GreenCOM held three half-day press briefings for business journalists on *Market Opportunities through Climate Change Mitigation*. The three briefings were held in Delhi, Chennai and Mumbai respectively. The purpose of the briefings was to bring to the attention of business journalists the market opportunities in trading emission reductions in greenhouse gases through mechanisms being currently discussed and negotiated by member countries of the United Nations, and the implications of these opportunities for India. This was done with the hope that the exposure would encourage the journalists to seek additional information on this controversial topic and follow developments as they unfold so that they can engage in an informed debate about it. They would then be better equipped to create awareness among, and meet the information needs of, business and industry leaders in India.

This report is about the briefings, the preparatory work leading to the briefings, and the follow-up after the briefings.

Preparation

To design a meaningful, credible and persuasive programme, we decided to begin by assessing the information needs of both the media and the industry. We tried to find out the following.

- What the two groups already know about emissions trading and related issues
- What they should know
- What they want to know

To assess the information needs of media, we interviewed 26 journalists in different parts of the country. For information about the industry we depended on a research study conducted by the Indian Market Research Bureau (IMRB) for GreenCOM for another part of the larger project. The study focused on five energy-intensive sectors of Indian industry—aluminium, cement, power, steel and sugar.

We found the level of awareness among the journalists to be quite low. Of the 26 people interviewed, 13 knew almost nothing about emissions trading or related issues; four knew quite a lot. However, interest levels were quite high, with 13 people (including six from the group with the lowest awareness) expressing keen interest in learning more about the topic and another seven expressing moderate interest. Six journalists expressed no interest.

Our analysis of the interviews revealed that the journalists wanted to know the following.

- What is climate change?
- What are UNFCCC and the Kyoto Protocol?
- What are the flexibility mechanisms, especially the Clean Development Mechanism (CDM)?
- How will the mechanisms work?
- What are India's main concerns?

Among the industry respondents too the level of awareness was quite low. Their main questions were:

- What are the flexibility mechanisms?
- How will CDM be operationalized?
- What is the position of the Indian government on emissions trading?
- What will be the opportunities for industry in India?

- What are likely to be the short and long –term implications of emissions trading for Indian industry?
- What has been the experience of other countries in any form of emissions trading?

Products

To support and strengthen our awareness generation effort, in addition to the briefings we developed

- An Information Kit, and
- A Web site

The information kit was put together to respond to the information needs and concerns expressed by the journalists and the industry respondents. It also contains some additional background information that we thought the journalists should have. The intention was to give them a set of information which they could refer to whenever they were ready to write on the subject.

The kit contains ten information sheets and two diskettes. Individual sheets deal with

- Science of climate change
- History of international efforts at combating climate change
- Market-based abatement mechanisms being negotiated
- Some concerns being expressed by different groups in India
- Preparations being made by some countries for the greenhouse gas market
- Sectoral opportunities for greenhouse gas mitigation in India

The kit also contains a glossary, references, and addresses of relevant websites. It also contains a list of forthcoming events where issues related to climate change and emissions trading are likely to be discussed, which could be used by journalists as pegs for stories.

All of this information has also been made available on one of the two diskettes in the kit. This is to facilitate sifting and reorganization of information, and its copyright-free reproduction with augments and updates. The other diskette contains the text of the United Nations Framework Convention on Climate Change (UNFCCC) and the Kyoto Protocol, as well as some stories about emissions trading from the Wall Street Journal as examples of what has been appearing in the Western press.

To overcome the static nature of the print medium, a website has also been designed and installed. At present it contains all the information from the kit plus some updates. A transcript of the one of the press briefings will also be put up soon. The information on the web will be periodically updated.

The Briefings

During the interviews with the journalists we had asked them about their preferences about the duration of the briefings, where they should be held, at what time of day and on which day of the week. They also said that they would like to hear presentations by experts and would want some take-home material to last till a story came along. Based on their feedback, we planned and organized three half-day briefings, each starting between 9.30 and 10 AM and ending with lunch around 2 PM.

The date, place and venue of the briefings were

- 26 August New Delhi The India Habitat Centre
- 29 August Chennai The Taj Connemara
- 31 August Mumbai The Marine Plaza Hotel

The briefings were structured into three parts. The first part provided introductions and an overview of the science of climate change, the Climate Change Convention and the international negotiations, the flexibility mechanisms and the upcoming stories. The CEE and GreenCOM team and USAID representatives handled this part. The second part dealt with how emissions trading would work, how different countries are preparing for it, and presented different carbon trading scenarios. The resource persons for this part were two American consultants who offered different and complementary perspectives on emissions trading.

Mark Cherniack who has worked on several carbon offset and some carbon trading projects, was present at all three briefings. Mr. Charlie Parker, who has been helping set up carbon trading systems in Kazakhstan and some other countries, was present only in Mumbai. The third part was a panel discussion on the positions, views and concerns of the different stakeholders in India. The panelists included representatives of the industry, NGOs, government and academia.

To participate in the briefings we had invited journalists from both the English and the regional language press--business journalists as well as environmental journalists who contribute to the business publications or to the business pages of the mainstream newspapers. We had also invited business reporters and anchors of business shows from several television channels.

Although several journalists had confirmed participation, the turnout at each of the briefings was rather low. However, several important publications were represented.

- Daily newspapers: *The Times of India* and *The Hindu*
- Business dailies: *Business Standard, Financial Express, The Hindu Businessline*
- Business magazines: *Business Today* and *Business India*
- Others: *Frontline* (a weekly magazine), and the India Abroad News Service
- Regional language dailies and magazines: *Sakal, Maharashtra Times, Lokprabha, The Hindustan Daily Urdu, Janmabhoomi.*

The journalists who attended the briefings were very attentive, interested, asked intelligent questions and participated actively in the discussion. The regional language press was well represented in Mumbai, but only two journalists from the mainstream English language business press attended the briefing.

Although none of the television reporters attended the briefings, the New Delhi Television did a live interview with Mr. Cherniack and Mr. Dutta Roy, an industry leader who was a panelist at the Delhi briefing, in their daily news roundup on the popular Star News channel.

Follow –Up
…With Those Who Did Not Attend

During the run up to the briefings, fifty-five journalists had confirmed that they would attend the three briefings, but finally only 19 of them turned up. Because we had been warned that this might happen, especially in Delhi, we had sought the help of USAID in calling the invited journalists and repeating the invitation. In Chennai and Mumbai we had personally met and invited most of the journalists. To ascertain the reasons for the low turn out, we tried to contact all those who had not shown up.

Attendance status	Delhi	Chennai	Mumbai	Total
Confirmed attendance	16	18	21	55
Attended	6	8	7	21
Confirmed but did not attend	10	11	15	36
Attended but did not confirm	1	0	1	2

We could contact only 29 of the 36 who had confirmed that they would attend but did not. The reasons that they gave for not attending are as follows:

** We could not check with the deputed persons because we did not know who they were*.

Twenty of the journalists contacted asked for the information kit, and 14 of them expressed interest in being on our proposed listserve. Subsequently two of them have expressed great interest in the subject.

…With Those Who Attended

We also contacted journalists who had attended the three briefings. The intention was to get their feedback on what they thought of the briefings and the information kit, to find out whether they had written, or were likely to write, anything on the subject, and to seek their suggestions on what kind of continued support they would like.

Those who had attended the briefings were more difficult to contact than those who had not. Of the 21 journalists who had attended the three briefings, we were able to contact only 11 on the phone. Two were on leave. The others keep very irregular hours and were therefore not contactable. We mailed them a brief questionnaire but only one responded to that. The feedback we received was as follows:

Reasons for not attending	**Frequency**
Inadequate staff	1
Organizational permission not received	1
Person who confirmed quit organization	2
Could not remember the reason	2
Language problem because the briefings were in English	3
Did not receive final letter of invitation	4
Person deputed did not attend *	4
Did not receive final agenda or received it too late	5
Out of town/busy	7
Total	**29**

Comments about the briefings.

- Was quite effective.
- Liked the nonpolemic nature of briefings.
- Good effort in the right direction.
- Useful.
- Introduced me to important issues that I was knew nothing about.
- My concern about CEE trying to promote such a controversial issue was set at rest by the objective and balanced handling of the issue.
- Good workshop (4 responses).
- Earnest and serious attempt.
- Knowledgeable speakers.

The two negative comments about the briefings were the following.

- Speakers rushed through their presentations because of want of time, therefore not enough time for discussion.
- Too much talk, not enough interaction.

Comments about the information kit

- Good, introductory documentation.
- Useful reference material.
- Very usable.
- Good stuff. Will not go unused.
- Very exhaustive.
- Literature should have been sent in advance. Not much wiser at the end of the briefing, but made sense after reading the kit.
- While trying to write a piece I realized that it contains all the background information I needed.

Articles written

- Two substantial articles have been written so far
    - "Don of green diplomacy" by Gopi Warrier in the financial daily *Business Line,* September 29, 2000.
    - "The environment as a commodity" by Sudha Mahalingam in *Frontline,* October 27, 2000.
- Two news stories about the briefings in the Marathi language in *Maharashtra Times* and *Janmabhoomi* in September 2000.
- A related story on electric vehicles appeared in *Business Line* in early September. (We have been promised a copy but have not received it so far.)
- A story in *India Abroad* (we have not received a copy so far.)

Eight journalists, including two who did not attend the briefings, said that they hoped to write about the issue some time in the near future. Six of them said they hoped to write in November during COP-6.

Suggestions for support

All the journalists contacted said that they would appreciate if we could continue to provide them information on the subject through our website, listserve and more briefings. Specific comments included the following:

- The briefings should be conducted in the regional languages so that the non-English media can also benefit.
- The Information Kit should be translated into as many regional languages as possible if we want a wider coverage of the issue.
- Send updates and additional information through the listserve.
- Inform the journalists of events that we think should be covered.
- Inform about developments regarding the issue within the country.

Further Efforts

The briefings were just a beginning in getting the issue of market opportunities on the radar screen of business journalists in India. To ensure that the tremendous effort that went into planning and organizing the briefings and developing the information material does not go waste, and that the required impact is created, substantial follow up is necessary.

1. During discussion at the debriefing at USAID in Delhi on September 5, 2000, the following suggestions were put forth

- Identify, from among the journalists who had attended the briefings, those who seemed most interested and willing to pursue the subject. USAID/Public Affairs Office could send those journalists on study tours after which they would be expected to write about the subject and make presentations to their colleagues at the press club, thereby creating greater awareness. (We sent our recommendations of names to USAID the following week.)
- USAID/ Public Affairs Office could provide incentives to journalists to cover these issues. The incentives could be a trip to a conference abroad, or something that the journalists perceive to be of value.

2. At the debriefing at CEE in Ahmedabad, it was suggested that briefings could be held by CEE in some or all of the cities/towns where we have our regional and state offices, namely Ahmedabad, Bangalore, Guwahati, Hyderabad, Lucknow and Pune. As we have good connections with the local press in each of these places, we could expect a good turn out at the briefings.

3. Based on the feedback provided by the journalists and our own assessment, the following things should be done:

- The Listserve should be activated and should carry at least some new information, update, article or news report from the western press every week
- The website too should be updated regularly. Hits and sign-ups should be regularly monitored to know the extent to which the website is being visited and used.
- The print and electronic media in India should be monitored for coverage of the subject, both by those who attended the briefings and others.
- The information kit should be translated into a few regional languages. We suggest Hindi, Gujarati, Marathi, Assamese, Telugu and Kannada as kits in these languages would form useful reference material for journalists in the states where CEE has its offices, and where we could conveniently organize some future briefings.

Agendas of Three Press Briefings

Delhi
Chennai
Mumbai

Market Opportunities through Carbon Emission Mitigation
Press Briefing
New Delhi, India Habitat Centre, August 26, 2000

10:30 Introduction and Context

Welcome

Dr. Kiran Chhokar, Centre for Environment Education, Ahmedabad.

Overview: 6 points and 2 stories

Mary Paden, GreenCOM, USA.

USAID's involvement in Greenhouse Gas Mitigation Efforts in India

Mr. Richard L. Edwards, Office of Environment, Energy and Enterprise, USAID, India, New Delhi.

Elaboration of the 6 points

Dr. R. Gopichandran, CEE, Ahmedabad.

11:30 Panel Discussion

Introduction of Panel Topics and Speakers

Moderator: Dr. R. Raghuraman, Confederation of Indian Industry (CII).

Options for India

Dr. A. Damodaran, Professor, Indian Institute of Plantation Management, Bangalore.

Industry Perspectives

Dr. G.C. Dutta Roy, Chief Executive-Power, DCM Shriram Consolidated LTD, New Delhi.

Concerns

Dr. R. Gopichandran, Program Coordinator, Industry Initiatives, CEE, Ahmedabad

Questions and Discussion

12:45 Keynote Presentation

Market Opportunities through Carbon Emissions Mitigation: Scenarios for the future

Mark Cherniack, Trexler and Associates, Portland, Oregon, USA.

1:30 Questions and Discussion

2:00 Website presentation

Dr. Kiran Chhokar, Centre for Environment Education, Ahmedabad.

2:10 Lunch

Press Briefing
Chennai, Taj Connemara Hotel, August 29, 2000

10 AM Introduction and Overview of the Issues

Welcome

Dr. Kiran Chhokar, Centre for Environment Education, Ahmedabad

Introduction

Dr. Padmanabhan, USAID

Overview

Seven Points and Two Stories: Mary Paden, GreenCOM, the Environmental Education and Communication Project of USAID

The Problem and the International Response

Dr. R. Gopichandran, Program Coordinator, Industry Initiatives, CEE, Ahmedabad

Market Mechanisms and Opportunities for Companies and Countries

Mr. Mark Cherniak, Trexler and Associates, Portland Oregon

Questions and Discussion

Tea Break and Website Demonstration 10 Minutes

12 PM Panel on Opportunities for India

Moderator

Dr. K. R. Ranganathan, Former Member Secretary, Central Pollution Control Board.

Public Sector Possibilities

Dr. A Damodranan. Professor, Indian Institute of Plantation Management, Bangalore.

Private Sector Possibilities

Dr Ram Thyagarajan, Managing Director, Arooran Sugars/ Confederation of Indian Industry (CII), Chennai and Mr. (Arun Thyagarajan) (substitute speaker), Chief, Infrastructue Development Corporation, Chennai

Questions and Discussion

1:30 PM Lunch Buffet

2 PM Adjourn

Press Briefing
Mumbai, Hotel Marine Plaza, August 31, 2000

10:30 AM Introduction to the Issues

Welcome

Dr. Kiran Chhokar, Centre for Environment Education, (CEE) Ahmedabad,

USAID Greenhouse Gas Project

Dr. Kavita Sinha, Office of Environment, Energy, & Enterprise, USAID India

Overview

Mary Paden, GreenCOM, the Environmental Education and Communication Project of USAID

Refresher on the Science of Climate Change

Mary Paden

Introduction to the International Agreements, and Mechanisms

Dr. R. Gopichandran, Program Coordinator, Industry Initiatives, CEE

11:15 Market Opportunities for Carbon Reduction Preparations in Other Countries and Scenarios for India

Mark Cherniak, Trexler and Associates, Portland, Oregon

How to Trade in Carbon Emissions and Experiences in Key Countries

Charlie Parker, Materials Development Corporation, Boston, Ma.

12:15 Questions and Discussion

12:30 Coffee/Tea Break and Demonstration of Web site

12:45 Panel on Opportunities for India

Moderator: Kartikeya V. Sarabhai, Director CEE

- *Indian Industry Perspective:* Dr. R.V. Shahi, Chair and Managing Director, Bombay State Electricity Supply Ltd.
- *India's Preparedness for Emissions Trading*: Dr. A Damodaran, Professor, Indian Institute of Plantation Management, Bangalore
- *Some Concerns*: Darryl D'Monte, Independent Journalist
- *CDM Opportunities for Rural Development:* Dr. Datye, author *of Banking on Biomass*
- *CDM Opportunities: the CRISIL Evaluation*: Dr. Hemant Joshi, Managing Director, Credit Rating and Investment Services of India Ltd.

1:45 Questions and Discussion

2 PM Lunch

2:30 Adjourn

Summary of Press Briefings

Summary of Press Briefings on Carbon Emissions Trading

By Kiran Chhokar, Centre for Environment Education
Reviewed by Mary Paden, GreenCOM Resource Center Director

This is a summary of the proceedings of three seminars for business journalists on Market Opportunities through Climate Change Mitigation. These seminars, held at New Delhi, Chennai and Mumbai, were organized by the Centre for Environment Education in collaboration with GreenCOM, an environmental education and communication project funded by USAID.

The proceedings at the seminars were structured along three segments. (i) Introductory remarks (ii) An overview of the science of Global Climate Change, the agreements and the trading mechanisms, and (iii) views, experiences and reactions of Indian stakeholders.

Introductory Remarks

Dr. Kiran Chhokar (Programme Coordinator, Centre for Environment Education) welcomed the participants at the seminars. She highlighted the context of the education and awareness initiatives of CEE with specific reference to this particular project.

- The issues related with climate change and the options being negotiated by the international community are complex and controversial.
- The purpose of the seminars is to provide a platform to people with different views to put forth their positions.
- We hope that the seminars will introduce business journalists to the subject and help them understand what the controversy is about, what the concerns and mechanisms are, so that when they write about it they are more informed and can participate in a more informed debate and can decide whether to oppose or support Emissions Trading and the Clean Development Mechanism.

Ms Mary Paden (Director, Resource Center, GreenCOM, Washington DC, USA) elaborated on the role of GreenCOM in this collaboration. She presented the overall framework of the capacity building objective of this project, including the process of assessing information needs of the industry.

- The industries want to be more energy efficient because it saves money.
- Industries want to have a good public image which polluting industries do not have.
- Some want to do the right thing with the environment. Some industries want to be clean, to do well and to do good at the same time, which is now quite possible in many areas.
- A research study of five energy-intensive sectors of Indian industry conducted by the Indian Market Research Bureau (IMRB) for GreenCOM revealed a high level interest in carbon emissions trading. Based on the preliminary research findings, CEE and GreenCOM developed an information package. The programme of briefings around the country to business press is intended to be a starting effort. The business journalists could then take this information and spread it more widely to businessmen and industry leaders across the country.

The salient features of her presentations were:

- Climate change is real and is a major problem; intensive political debates on how to respond are on internationally; some experiments on market mechanisms are set to provide useful learnings; private markets have shown enthusiasm about carbon trading; several governments are setting up agencies to approve the emissions trading process. The probable options for India in this global context need to be examined.

- Two big stories underlie this issue and are likely to come up over the next several months. One is environmental and the other economic. While the environmental story is about the role of market mechanisms in tackling global warming, the economic story centres around the existing uncertainty of markets and potential profits.

Mr. Richard L. Edwards (Director, Office of Environment, Energy & Enterprise, USAID) at the seminar in Delhi spoke about USAID's role.

- This seminar and the exercise of Information Capacity Building reflects the commitment of the United States to enhance cooperation with India. It is a logical sequel to the agreement signed between India and the United States during the US Presidential visit to India in March 2000.

- USAID is particularly involved in mobilizing nearly US $ 45 million for energy efficiency projects and another US $ 50 million for cross-country initiatives. This is in addition to about US $ 200 million as loan for Clean Energy activities to be initiated between governments, and with the private sector. These initiatives reflect the proactive approach of the USAID to enable transition to lower GHG emissions in different parts of the globe.

- It will be useful for India to consider the process of moving into newer technology paths with probable funding from projects through the Clean Development Mechanism, keeping in view the need to sustain economic growth along with joining global efforts in addressing the problems of global and local pollution.

- It is important to get the rules right and become competitive to achieve good results, thereby ensuring flows of finances to improve efficiency and pollution abatement. A study by CRISIL forecasts an investment inflow of nearly US $ one billion for CDM projects.

- The approaching sixth session of the Conference of Parties (COP-6), provides the most appropriate context to understand the relevance and significance of improving preparedness (through an enhanced appreciation of the diverse aspects).

Mr. S. Padmanabhan (Senior Energy and Environment Advisor, USAID) emphasized the following in his introductory remarks at the Chennai seminar.

- Capital mobilization to meet increasing energy needs over the next 15 years must be strongly linked with energy efficiency. Technical and financial performance of utilities has to be enhanced through power sector reforms. Environmental impacts of power development and the need to mitigate local and global problems are also significant issues. The US $ 20 million ECO project, the South Asian Regional Initiative and other programmes in the utility sector represent proactive measures supported by USAID.

- In order to highlight the successes of several such initiatives and those of the enterprises, media can play a critical role by reporting on facts, investment opportunities and energy management benefits. Such an effort, moving away from advocacy reporting, will help firms access appropriate information and will guide them to take suitable action.

Ms Kavita Sinha (Project Management Specialist, Office of Environment, Energy & Enterprise, USAID), in her opening remarks at the Mumbai seminar, stressed the following:

- The importance of holistic approaches linking improved energy conversion in commercial and non-commercial activities in the process of addressing social aspirations.

- The crucial need for forging partnerships with various stakeholders and entities to understand opportunities in becoming more competitive in the process of meeting economic goals.

- Partnerships with the National Thermal Power Corporation, financial institutions such as CRISIL (Credit Rating Information Services of India Limited), IDBI (Industrial Development Bank of India) etc., NGOs such as CEE, and other academic institutions are representative of reaching out to the diverse set of stakeholders in the process of finding solutions.

- Media persons could help shape dialogue and create an environment for informed debate by understanding the interlinkages and the stated concerns of the various stakeholders.

Dr. Gopichandran (Programme Coordinator, Industry Initiatives, CEE) presented an overview at all three seminars.

Overview of the Science, the Agreements, and the Trading Mechanisms

- The impact of greenhouse gases emanating from industrial, agricultural and transport-related activities, landuse change and forestry activities is global in nature.

- The objective of the Convention is to achieve "stabilization of greenhouse gas concentration in the atmosphere at a level that will prevent dangerous anthropogenic interference with the climate system" (FCCC Article 2).

- The Convention notes that the largest share of historical and current global emissions of greenhouse gases has been contributed by the industrialized countries. It also notes that the per capita emissions in developing countries are still relatively low, but will increase in the process of economic development. Considering the global nature of Climate Change, the Convention calls for appropriate international response in accordance with each country's "common but differentiated responsibilities", and assigns the lead in combating climate change to industrialized countries.

- The negotiations among member countries of the UN have centred around how emissions quotas should be determined for the countries. Should every country try to stabilize where it is now? Or should the industrialized countries reduce emissions, while the emissions continue to grow in developing countries? Should emissions be determined on a historical or a per capita basis? Developing countries have argued that no emissions limits should impede their economic development. Industrialized countries, while accepting responsibility to set and meet emissions reduction targets in industrialized countries first, also argue that there are many cost-effective opportunities for developing countries to become more energy efficient. Several mechanisms have been negotiated into the Convention that allow developed countries to pay for and get credit for emissions abatement in developing countries.

- The Kyoto Protocol sets terms for legally binding commitments for the industrialized countries. It also proposed mechanisms to enable countries to move towards cleaner technology.

- The Kyoto Protocol lists six greenhouse gases whose emissions should be reduced and controlled. They are carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulphur hexafluoride (SF_6). It does not list GHGs already included in the ozone depletion abatement under the Montreal Protocol.

- The Kyoto Protocol calls for:

- Emissions Reduction. Industrialized countries (listed in Annex B in the Protocol) agreed to limit their greenhouse gas emissions, setting themselves Quantified Emission Limitation and Reduction Objectives (QELROs). The overall reduction limit that they have jointly committed themselves to is 5 per cent below their 1990 levels. They will achieve these targets in the period 2008 - 2012 (termed the first commitment period).

- Supplementarity. Parties included in Annex B may transfer emission reduction units (ERUs) among themselves, or acquire certified emissions reductions (CERs) from non-Annex B countries, from projects which are aimed at reducing greenhouse gases. Reduction thus achieved has to be in addition to any that would have accrued or been achieved even otherwise.

- Promotion of sustainable development by industrialized countries**.** Annex I countries are required to also integrate sustainable development priorities in their emission reduction efforts through activities such as enhancement of energy efficiency in relevant sectors, protection and enhancement of carbon sinks and reservoirs, promotion of sustainable forms of agriculture and of new and renewable energy options.

- Further negotiations led to defining three mechanisms for emissions abatement. They are 1) joint implementation (JI) of projects that generate credits among the industrialized countries, 2) a Clean Development Mechanism (CDM) in which industrialized countries make investments in developing countries to both reduce emissions and promote sustainable development, in return earning credits for emissions reduction, and 3) international emissions trading (IET) among Annex 1 countries. The first two mechanisms are project-based mechanisms; the third would most likely involve government-to-government trading.

- Under the Convention industrialized countries (members of the Organization for Economic Development or OECD) and the states of Central and Eastern Europe, collectively called Annex I countries, make voluntary commitments to limit their emissions of greenhouse gases so that by 2000 they are emitting no more than they were in 1990 (4). No commitments are required of the developing countries (referred to as the non-Annex 1 parties) in recognition of their need for development. The industrialized countries are also expected to provide "new and *additional* financial resources" (rather than redirect existing development aid) to help finance greenhouse gas reduction projects as well as promote and finance transfer of environmentally sound technologies to non-Annex 1 countries.

- The Government of India has adopted proactive measures which include the establishment of five expert groups to look at different scenarios, impacts, the implications of the flexibility mechanisms, technology transfer, land-use and forestry options to understand the implications of participation in this global effort and structure appropriate strategies.

- The strategies should address the concerns of industry to ensure maximum returns and benefits within the sustainable development framework of the country, and should focus on capacity building. They should also ensure that components of transparency, accountability, precise measurements, treatability and consistency in operations and compliance are built into the development of projects and related transactions.

- It is also important to understand that some caveats have emerged which include (a) recognition that global scale emission trading represents unchartered territory even for such a country as the USA, in addition to the need to ensure efficiency, compliance and the supplemental nature of accounting for commitments in addition to domestic action.

- The significance of entitlements and related equity aspects in ensuring medium and long-term benefits, cannot be overemphasized, clearly reflecting the principles of equity, fairness and transparency, embodied in the framework convention and climate change.

Mark Cherniack (Manager, GHG Project Development, Trexler and Associates, Inc., Portland, Oregon, USA)

Status of greenhouse gas markets, and CDM activities initiated by some countries

The portfolio of greenhouse gas emission reduction projects including offsets needs to look at location-specific relevance and highlighting maximum returns, in conjunction with the development imperatives of the location of the project.

- The CDM is aimed at reducing compliance cost for Annex-1 countries, and in the process promote sustainable development for non-Annex-1 countries. It is also expected to help fund adaptation processes in transition to more efficient regimes. The 100 or so experimental projects undertaken in different parts of the world under the Activities Implemented Jointly (AIJ) program do not lead to any credits, which could be accounted for evolving abatement approaches. These projects will provide useful information and experience on all aspects of GHG project development for consideration in the design of the CDM. It is important to ensure quality control for credits and the projects on which they are based. Quality control here refers to unambiguous quantification of reductions in emissions, evaluation of co-benefits with reference to CDM frameworks and allocation of credits.

- Depending on the rules of CDM including the scope of supplementarity, additionality, and the specific transaction costs that will be established by developing country host governments, the project investors may either look at the potential low-cost options available in a developing country or choose to stay back home and explore options that may cost much less in their own countries. This process may still help reduction of emissions, but may not help developing countries which look for investment that enables sustainable development improvement opportunities.

- Different scenarios on project-related investment flows into India with reference to the degree of supplementarity, additionality criteria and projected carbon prices were discussed. The projected benefits were in terms of greenhouse gas mitigation project-based investment flows ranging from US $ 100 million to US $ 9 billion, with carbon prices ranging from as low as US $ 0.95 cents per ton to US $ 10 - 65 per ton. Regulatory regimes that asked for lesser supplemental domestic action in Annex-1 countries may invite greater investment flows

- Globally the market value for CO_2 ranges from US $0.50 cents to US $ 5 per ton, depending on the nature of project. Most importantly, these prices reflect the amounts that buyers and sellers are willing to pay in the absence of a more formal market. In a few cases, prices can rise up to US $ 30 per ton, depending on the quality of credits. Prevailing market conditions also determine the extent of benefits, relating to either the purchase of emission credits, or the firms choosing to comply with environmental values by investing in greenhouse gas emission control measures. Credible and creditable projects based on clear guidelines will help development of good quality projects and contribute to the benefits on a sustainable basis.

- The Prototype Carbon Fund of the World Bank operates with approximately US $ 180 million. The projects that may be funded are essentially being looked at as learning experiences and are likely to have relatively higher costs than projects in an ongoing market.

- Several countries including India and China have agreed to consider terms of reference for going forward with national strategy studies

- Argentina is setting up an agency for reviewing projects that can be considered through the CDM route. Zimbabwe has grouped several smaller projects within several sectors to match capital flows

from Annex-1 countries, and to enhance the financial viability of smaller projects, which are more typical in smaller countries.

- Brazil has established a national forum to advise its President on aspects relating to the development of its CDM regime. Colombia has designed a national office to actively interpret and identify project opportunities. Their particular focus is on forestry-related options. Costa Rica is emphasizing wind-related and forestry projects, depending on its country-specific requirements. India and China are emphasizing multiple opportunities in energy and related sectors.

- The Latvia Landfill project that captures methane emissions from landfills further extending to related energy optimization is an interesting example. This is the first project funded by the World Bank's Prototype Carbon Fund and has led the government to legislate that all landfills in Latvia incorporate landfill methane gas collection systems.

Mr. Charlie Parker (President, Materials Development Corp. Carlisle, Massachusetts, USA**)**

Some examples of emissions trading mechanism

- Projects need to be completely transparent, with ensured quality of credits. The reduction in emissions has to be sustainable over a period of time.

- Securing credits and monetizing credits are two different processes. Securing credits means turning claimed reductions into viable credits that are being proven and accepted by an authority that operates in the venue where the project is being undertaken. This means that the project needs to be proposed in detail and all aspects of what is being done from a reduction standpoint need to be clearly delineated. That begins by saying what the baseline condition was before the project was undertaken or what it would be afterwards if the claimed reduction aspect of the project was not done. Then, in contrast to that, there needs to be a distinct calculation to show what the project or the effort or the activity will accomplish in terms of reduction.

- Kazakhstan has set up the Climate Change Convention Centre (CCCC), their own individual approval authority, which will be operating by the end of this summer. It has the backing of the entire government. The CCCC officer reports to a board of directors made up of six ministries of the Kazak government. They examine, approve and accredit the projects done in their country.

- Brazil is setting up a process for Clean Development Mechanism by designating the Ministry of Science and Technology as the approval and accreditation body. It will undertake to examine and approve projects in their country.

- A third approach can be wherein a country can designate one of its ministries to act as a cognizant body which examines the proposal that is being made to some other approving body and says that in their examination they have determined that it meets the criteria and requirements of UNFCCC.

- A fourth option can be for interested governments to involve brokers, traders and buyers of these credits and examine if it is acceptable to establish a private body for examining opportunities as long as it adopts all the criteria and requirements, and the process and procedures in compliance with the needs of the UNFCCC.

- There can be three, four or five different parties to a project but they all must sign the Apportionment Agreement, that this is their share of the project at the beginning and for ever more because the brokers, traders and buyers do not want to be involved in arguments as referees as to who is getting credits. Secondly, there needs to be an independent third party who will monitor, track and record reductions. This is done annually or more frequently depending on the nature of the credits and the reductions claimed.

- Another category is one where a fourth party, different both from the third party who monitors, tracks and records, and from a second party who approves and accredits, comes in and verifies and certifies that each of those steps was done in accordance with all accepted practices for that field.

Reactions of Indian Stakeholders

Dr. G.C. Dutta Roy (Chief Executive Power, DCM Shriram Consolidated Ltd., New Delhi)

Industry perspective

- Enhancing energy efficiency in firms is the most important opportunity in the context of greenhouse gas abatement. CDM could bring in investments also in areas of fuel substitution, renewable energy, forestry, audit, certification, monitoring and verification of projects. Demand side management, including power generation and distribution, also constitutes an important area.

- The industry is watching the development of institutional, legal and regulatory frameworks. It is keen on understanding the process of developing projects and setting baselines, additionality issues, total market potential, management of technologies and the complexity of the CDM process itself. The costs of transactions will have an important bearing on the success of bringing in investments. Benchmarking and standardization, sustainability of the projects with reference to market forces are also important parameters.

- It is important to examine how India is going to take up competitive positions with respect to the approaches of other competing countries, particularly China and Brazil, with reference to capturing CDM opportunities.

Dr. A. Damodaran (Professor, Indian Institute of Plantation Management, Bangalore)

Structure and implications of an emissions trading system

The principal focus of the presentation was on examining the implications of developing a domestic emission trading system for India as a forerunner to developing mechanisms of response to participation in international trading regimes.

- A domestic emissions trading system will enable firms to move towards improved levels of environmental performance, structuring the financial returns from market-based measures as a consequence of being able to trade emission credits.

- Rigorous monitoring of emissions and verification of emissions reductions are two important aspects that determine the success of trading systems in ensuring quality of transactions in emissions reduction credits.

- Existing policy and regulatory frameworks in environmental protection in India, including the Air Act, the Hazardous Waste Management Rules, and the comprehensive Environment Protection Act, provide a scope for waste exchange by linking generators of wastes with potential buyers. Such a system provides for a rudimentary basis for trading to emerge in the long run.

- It would be worthwhile to examine the institutional structures related to the domestic system of sulphur dioxide emission trading in the USA. An advanced emissions tracking system contributes to strict monitoring and evaluation of compliance. The Environment Protection Agency administers the codes of compliance including allocations for emission levels and credits that can be traded. The Chicago Board of Trade handles the transactions in emission credits. A tribunal handles redressal mechanisms relating to transactions of credits.

- India could also evolve comparable structures towards fulfilling abatement goals and facilitate improved levels of environmental performance. The 10th Five-Year Plan of the country also highlights transition to higher levels of environmental performance. We need appropriate fiscal policies to promote efficient technologies. A national emissions trading system may provide additional incentives to enable transitions to improve environmental performance, motivated by market forces.

- The average cost of abatement will be the price of the credits. Emissions trading lowers the cost of compliance. This mechanism is related more to the advantages of improved environmental performance, which is beyond the levels of compliance.

- The critical issues in emissions trading in the international context relate to allocations. The grandfathering principle of allocating allowance levels to emit is based on historical emissions of firms. The principle could be appropriate only for a national system of emissions trading. In the case of an international system of emissions trading, grandfathering might not be appropriate. Several stakeholders in India ask for population-based allocations of allowances for trading in the global context.

    - It is interesting to recognize that China has categorically stated that it will not take up any emissions reduction obligation before attaining a certain level of economic development. It does not want to compromise on the use of its abundant coal, and adheres very strongly to the country's specific sustainable development concerns. Pricing mechanisms of resources and regulatory frameworks, combined with appropriate negotiating strengths, enable greater levels of environmental performance.

Dr. Ram Thyagarajan (Chairman and Managing Director, Thiru Arooran Sugars Ltd., Chennai)

- Industry is in favour of CDM as an opportunity to become more energy efficient. It becomes all the more relevant, particularly since it is difficult to raise funds in the market place. The sugar industry provides ample opportunities, particularly in the area of bagasse-based cogeneration wherein the potential is approximately 3500-5000 MW of power. The present level of realization of power through cogeneration is only 200-250 MW. This is despite the fact that only about Rs. 2.5 -3 crore is needed for every MW of power to be generated. The opportunities for linking other co-benefits with reference to sustainable development, particularly in rural economies, is quite significant.

- Baselines and additionalities are presently being defined for the sugar sector. In this context, location-based baselines, which vary across the country, may not be helpful for the sugar sector. Baselines for comparison of emissions reductions should not be different for sugar firms in different states of the country. It is important to establish uniform baselines for the sector all across the country.

Mr. Ajay Narayanan (Vice President Environment, Infrastructure Development Finance Company Ltd., Chennai)

- It will be useful to know how the national and sectoral baselines will be applied with reference to CDM opportunities. It may not always be required that CDM opportunities be linked with transfer of technology. It is important to first ensure the financial viability of the project and then add on the carbon benefits, further contributing to the success of the project.

Dr. K. R. Datye (Society for Advancement of Renewable Materials and Energy Technologies, Mumbai)

Opportunities in the rural sector

He stressed the need to look at systemic options that tackle the problem of climate change. The synergy that exists among biomass, energy and materials offers ample scope for using not only biomass-based fuel

instead of fossil fuels, but also of converting biomass into useful materials such as construction materials. He gave the example of sleeper beds made of compacted sand blocks and bamboo reinforcements which match the strength of reinforced concrete. The sleeper beds used as road bases are fabricated in village workshops and replace energy-intensive materials used in road building. Such options not only cut down on GHG emissions but also open up avenues for employment and income generation in small town and rural areas of India. The concept of market has to be extended to social acceptability among poor communities.

Mr. Hemant Joshi (Executive Director, Credit Rating Information Services of India Limited, Mumbai)

- Significant business opportunities exist in areas of transfer of technologies, particularly in power generation, industrial operations and the transportation sector.

- CRISIL has quantified a saving potential of approximately Rs.80 billion with improved operations enabled through CDM, particularly in electricity supply.

- Significant issues with regard to CDM are certification, verification of projects, measurement and transaction costs

Mr. Darryl D'Monte (Chairperson, Forum of Environmental Journalists of India, and Vice President, International Federation of Environmental Journalists)

Some concerns of different stakeholders in the context of the operation of the flexibility mechanisms

- If industry has been responsible for creating global climate change, is it also going to correct it? In other words, is business the problem or is it the solution?

- Climate change is a fundamental economic, ecological and moral issue, which we should tackle. The Centre for Science and Environment in its recent publication *Green Politics* raises some of the critical interlinkages in terms of environmental and economic equity aspects, which need to be clearly addressed in the process of evolving strategies. These include concerns regarding selling emission rights for short-terms benefits which may lead to compromise of long-term economic growth and development. This may also lead to a situation where the developing countries may be left with only costlier options at a period of time when they will be required to make emission abatement commitments

- The ownership of emission reduction units in relation to the level of stake is another important issue.

- Most developing countries believe it is unfair of developed countries to ask them to make voluntary commitments to reduce emissions.

- Developed countries argue that per capita entitlements that developing countries are recommending would be unfair to countries with stable populations.

- Developing countries are calling for the need to examine transitions to non-carbon options.

Remarks of Chairpersons of the Discussion Panels

Dr Raghuraman (Senior Advisor Energy, Confederation of Indian Industry (CII), New Delhi)

- CII has been, over the last year-and-a-half, actively associated with the USAID in exploring opportunities for accessing technologies for Indian industry. The CDM appears to be an important opportunity for technology transfer to become a reality in terms of tangible benefits in improved

environmental performance. The private sector in India has been setting up several working groups, including the CII-United States Energy Agency (USEA) joint working group, and the Indo-US Business Dialogue events, in exploring these opportunities.

Prof. K.R. Ranganathan (Former Member Secretary, Central Pollution Control Board)

In his remarks at the Chennai Seminar, he pointed to

- The need for mechanisms which are easy to implement.
- Efficient management of industrial production and environmental protection, as well as improved performance in agriculture, transport and other energy end-uses are also important areas for immediate consideration for CDM.

Kartikeya V. Sarabhai (Director, Centre for Environment Education)

In his remarks at the Mumbai seminar, he highlighted

- A broad range of business opportunities exist in India in the context of responding to the challenge of greenhouse gas abatement. These could be captured by different sets of service providers, including consultancy agencies, project developers, auditors and insurance companies through training initiatives in comprehensive capacity building.
- There is need to ensure appropriate adaptation of imported technologies and also develop indigenous technologies in our small towns and villages.
- It is important to capitalize on India’s negotiating capabilities and the understanding of the Indian bureaucracy in dealing with international treaties towards consolidating India's leadership position and protecting the interests of the developing countries which do not have this advantage.

Slide Shows From Press Briefings

Slide Show

Overview: 7 Points and 2 Stories

Mary Paden, GreenCOM

Overview: 7 Points & 2 Stories

Market Opportunities through Climate Change Mitigation

1. Climate Change is Real

International scientists agree

2. Nations Have Agreed to Act

Climate Convention has been signed by 181 nations who agree to stabilize emissions

*3. Agreement is Near on the Political Debate on **How** to Act*

- Historic or per capita emissions?
- International meeting in November at the Hague may decide some issues (COP 6)

4. Experiments are Underway with New Tools in the Private Sector

- Global Scale Market Mechanisms
  - World Bank's Prototype Carbon Fund
  - Activities Implemented Jointly (AIJ)
  - Joint Implementation (e.g.USIJI)

5. Enthusiasm is Emerging in Private Markets

- Beyond the experiments/ no subsidies
- Natsource, Kantor Fitzgerald, and Arthur Anderson
- Estimates range from US $5-$20 billion per year over the next 10 years.

6. Governments are Getting Ready for Emissions Trading

- Setting up mechanisms to approve carbon emission reduction credits
- Brazil, Argentina, China, Kazakhstan

7. Options for India

- Some scenarios for the economic opportunities based on the negotiated decisions.

2 Big Stories

Environment & Economic

Environment Story

- For the first time, market mechanisms are being tried internationally to solve a global environmental problem.

Economic Story

- Leading financial sources predict that huge profits are possible in the new market of carbon emissions trading. Market is uncertain but worth watching.

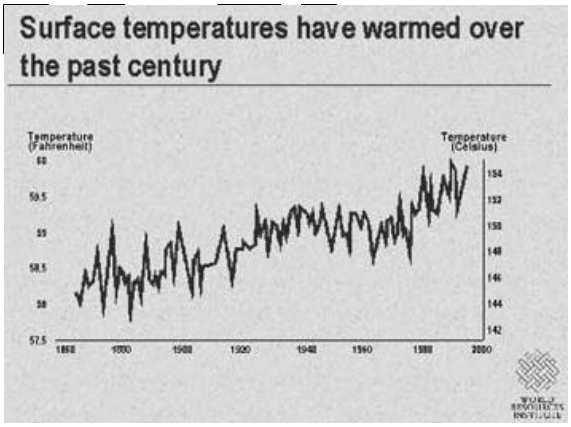
Slide Show

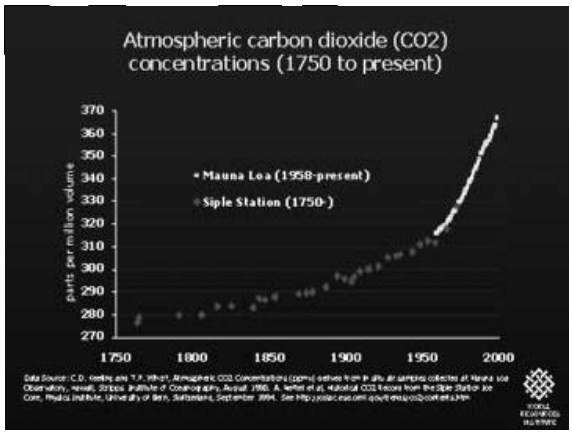
Climate Change: The Science

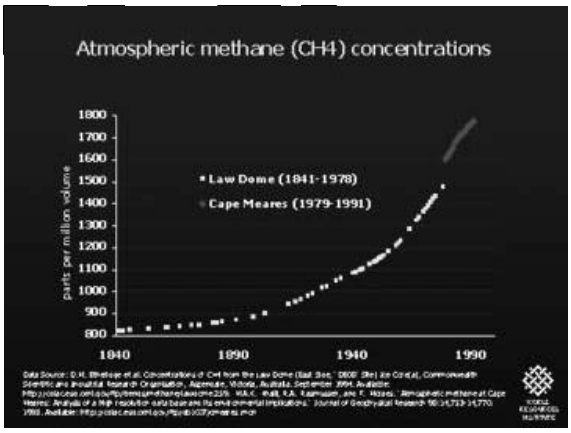
Mary Paden, GreenCOM

Climate Change

The Science





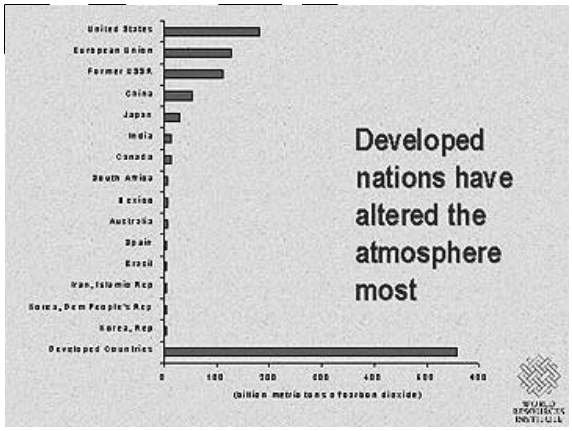


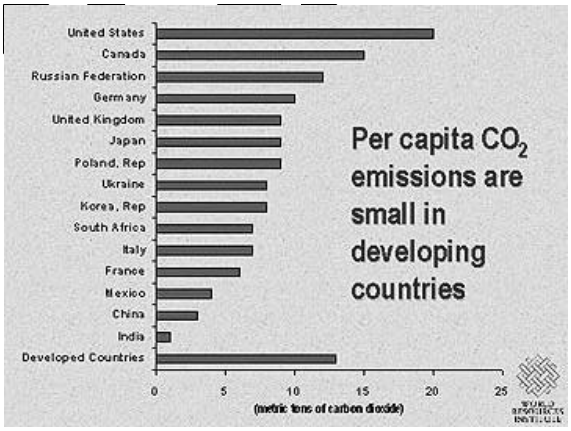
Greenhouse Gases and Sources

- Carbon Dioxide — Burning fossil fuels
- Methane — Rice paddies, gas leak
- Nitrous Oxide — Burn coal, biomass
- CFCs — Refrigerants, etc.
- HFCs — Substitute for CFC
- PFCs — Substitute for CFC
- Sulfur hexafluoride — Insulating materials

Greenhouse Gases are Not Air Pollutants

- They do not have a direct impact on human health (e.g. respiratory disease)
- They are not smelly
- Previously no government has had standards to regulate their emissions
- Air pollutants affect a city or region; greenhouse gases affect the global atmosphere





Future Role of India and China

- Although currently both total and per capita emissions are lower than in developing countries, the situation will change as population grows (more capitas) and economic development increases (more emissions per capita)
- In the future India and China will be major CO2 emitters

Effects of Climate Change

- Rise in sea levels
- More violent storms
- More floods
- More droughts
- Disruption of food production—drier or wetter, hotter or colder
- Spread of tropical diseases to temperate zone
- Species extinctions
- Refugees & social tensions
- Huge financial costs

Slide Show

Greenhouse Gas Markets: Bottom Line for India

Mark Cherniack, Trexler and Associates

Greenhouse Gas Markets: Bottom Line for India

India Press Briefing
Mumbai
August 31, 2000

Mark Cherniack
Manager, GHG Project Development

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Who is Trexler and Associates?

✓A Specialized Climate Change Firm
- ➡ Finding policy solutions
- ➡ Supporting corporate/government strategy development
- ➡ Developing mitigation projects

✓Worked on First Offset Projects
✓Wrote First Offset Contracts
✓Won First GHG Regulatory Proceeding in U.S.
✓Developed First Major GHG Portfolio (US$5 MM)
✓Took First U.S. Companies Climate Neutral

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The State of the Greenhouse Gas Market

✓ Yes, There is Already a Market!
✓ Dozens of Transactions to Date
- ➡ More than 100 AIJ Pilot Phase projects registered

✓ Brokers Increasingly Trading GHG Credits
- ➡ Financial mechanisms increasingly complex
- ➡ Options and other vehicles being relied upon

✓ Market Development Will be Limited Until Standardized GHG Commodity is Created

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What Does Market Experience Tell Us?

✓ Price Trend is Upward, as Expected
- ➡ New projects = more rigorous, quantifiable
- ➡ More energy-based projects
- ➡ Extraction of economic rents increasing
- ➡ A great deal depends on the rules

✓ Offset Demand Will Rise
- ➡ Financial motivations increasingly present, both regulatory and market based

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So What is CO_2 Worth?

✓ Today:
- ➡ \$0.50 - \$5/ton CO_2, depending on project and use of the credits (environmental positioning vs. risk management)

✓ In 2005-2010:
- ➡ \$5-10/ton, assuming policy moves forward?

✓ In 2010-2020:
- ➡ Up to \$30/ton a possibility?

✓ Definition of "CO_2 Credits" Still Unclear
✓ Value of CO_2 Credits Largely Depends on Rules

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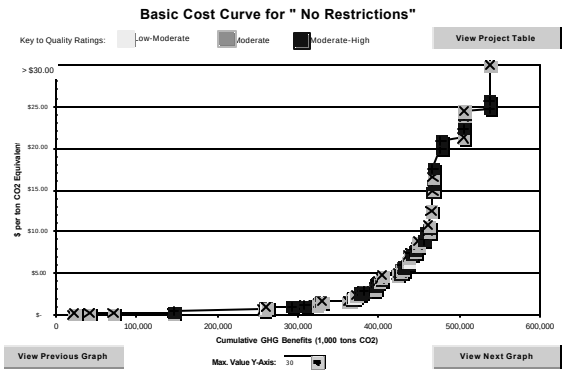
GGOCAD Cost Curve



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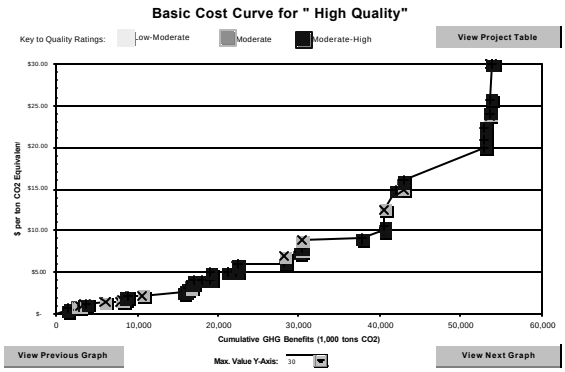

What Will Markets Need to Function?

- ✓ Supply and Demand for Credits
  - ➡ Demand dependent on policy anticipation
  - ➡ Supply dependent on clear definition of the tradable commodity
    - ✦ Qualification rules (additionality, sectors, etc.)
    - ✦ Monitoring and verification standards
- ✓ Standardizing the Commodity Important
  - ➡ Across sectors: energy, LUCF, methane, N_2O
- ✓ Market Transparency and Manageable Transaction Costs Important

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Market Preparations Are Underway

- ✓ Private Sector Increasingly Active
- ✓ National Strategy Studies Helping Developing Countries Get Positioned
- ✓ World Bank's Prototype Carbon Fund Helping Countries Gain Experience
- ✓ Individual Countries Taking Their Own Steps
- ✓ A Basic Perception Among Buyers AND Sellers That Preparing Now Will Increase Long-Term Benefits of Market Participation

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Market Development Conclusions

- ✓ GHG Market Potentially Huge
- ✓ Beginnings of Market Already in Place
- ✓ Key Rules, Infrastructure Still Needed
- ✓ Countries and Companies Beginning to Prepare
- ✓ Preparing For the Market Likely to Increase Financial Gains for Both Countries and Companies

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Projecting the Global Mitigation Market

- ✓ First Commitment Period is 2008-2012
- ✓ Annex B Countries Agreed to Reduce Emissions by Average of 5.3% From 1990
- ✓ Annex B Annual Reduction Commitments Equivalent to 2-4 Billion Tons CO_2 by 2010
- ✓ Global GHG Mitigation Market Projected to Reach and Exceed $100 Billion Annually

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Projecting the Size of the CDM

- ✓ The Tonnage and Financial Value to Flow Through the CDM is Highly uncertain
- ✓ Depends Significantly on the Rules
- ✓ Estimates Suggest CDM Will:
  - ➡ Have a global GHG market share of 20-50%
  - ➡ Involve 400 million to almost 2 billions tons CO_2/year
  - ➡ Have a value between US$5-20 billion per year over next 10 years

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What Are Key CDM Market Uncertainties

- ✓ Mitigation Cost Uncertainties (for all countries)
- ✓ Implementation of CDM "Supplementarity"
- ✓ Implementation of Project "Additionality"
- ✓ Implementation of the "Adaptation Tax"
- ✓ Specifying Sustainable Development Screens
- ✓ Specification of the CDM's Scope
  - ➡ Positive/negative technology lists?
  - ➡ The role of forestry and land use projects?
- ✓ Magnitude of Transaction Costs

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Estimates of the CDM Market

Study	Market Share (percent)	Market Size (MtCO2)	Market Price (US$/t)	Market Value ($Billions)
Haites	25-27	976-2,100	10.00	9.8-21
US Govt.	19-46	528-1,263	6.54-11.44	6.0-8.3
Austin et al.	33-35	1,457-2,653	3.54-7.08	5.2-17.4
Zhang	21-58	484-1,314	0.95-3.43	0.46-4.5

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Developing CDM Scenarios

- ✓ A Number of Studies Have Developed Scenarios of Future CDM Activity
- ✓ Such Scenarios Based on Many Assumptions, Some Questionable, and Not Always Consistent
- ✓ Actual Mitigation Cost Curves for Annex B and Developing Countries Poorly Understood; Key to Predicting CDM Activity
- ✓ All Scenarios Should be Treated as Thought Provoking Rather Than as Scientific Projections

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Developing CDM Scenarios

- ✓ "Supplementarity" May be a Key Issue for Magnitude of the CDM
  - ➡ It might not make a big difference if Annex B countries have large cheap reduction options
  - ➡ But this is not what modelers have tended to assume
- ✓ "Additionality" a Key Issue for Environmental Relevance and Economic Value of the CDM

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Scenario A: EU Supplementarity

- ✓ Limits Annex B "Flexibility" to 50% of Reductions (from 1990 emissions levels)
- ✓ Haites Projects That Role of the CDM Would be Limited to 110 Million Tons CO_2, With A Value of US$1,110 Million
- ✓ Zhang Projects That The Market Would be Limited to 485 Million Tons CO_2, With A Value of US$461 Million
- ✓ CDM's Global Market Share Estimated at 3-21%
- ✓ India's CDM Share: $100 - 300 Million?

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Scenario B: 50% of BAU Emissions

- ✓ Limits Annex B "Flexibility" to 50% of Reductions from 2010 BAU Emissions
- ✓ Less Restrictive than EU Ceilings on Flexibility
- ✓ Haites Projects A CDM Market of 954 Million Tons CO_2, With A Value of US$9,620 Million
- ✓ Zhang Projects the CDM Market Would be 620 Million Tons CO_2, With A Value of US$795 Million
- ✓ CDM's Global Market Share Estimated at 25%
- ✓ India's CDM Share: $200 Million - 2.5 Billion

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Scenario C: No Supplementarity Cap

- ✓ Annex B Countries Face No Restrictions on Use of Flexibility Mechanisms, Including CDM
- ✓ Haites Projects The CDM Market Would Reach 2 Billion Tons CO_2, With A Value of US$21Billion
- ✓ Zhang Projects The CDM Would Involve 1 Billion Tons CO_2, With A Value of $2.8 Billion
- ✓ CDM's Global Market Share Projected at 50-60%
- ✓ India's CDM Share: $750 Million to 5 Billion?

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Scenario A: Very Loose Additionality

- ✓ No Model Projections Exist
- ✓ Very Loose Additionality Means:
  - ➡ Many BAU projects earn CDM credits
  - ➡ CDM floods global GHG market?
  - ➡ Overall credit prices depressed, including CERs?
  - ➡ Protocol objectives undercut?
- ✓ CDM Funding Becomes Indistinguishable from Foreign Direct Investment?
- ✓ Most "CDM Funding" Goes to the Big 3 Countries
- ✓ But: Little Net Financial Benefit Results?

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Scenario B: Balanced Additionality

- ✓ Well Balanced Additionality Means:
  - ➡ BAU project crediting kept to modest level
  - ➡ Truly additional projects not excluded by rules
  - ➡ CDM funding supplements and helps leverage Foreign Direct Investment
  - ➡ Otherwise neglected sectors receive more funding
  - ➡ GHG credits prices rise significantly from today's levels, but don't become politically impossible
- ✓ CDM Funding Likely to be More Real, Distributed
- ✓ CDM More Environmentally Relevant

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Scenario C: Too Stringent Additionality

- ✓ Overly Stringent Additionality Means
  - ➡ Very few BAU projects credited
  - ➡ But many truly additional projects also eliminated
  - ➡ Credit prices rise rapidly, potentially undercutting political support for the Protocol
- ✓ Available Funding Likely to Go to Highly Desirable Projects (renewables, energy efficiency)
- ✓ But Overall Funding Likely to Be Much Reduced
- ✓ Environmental Relevance of CDM Likely Undercut

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Country Status: Argentina

- ✓ Announced Emissions Target at COP-5
- ✓ Believes That With Voluntary Commitments, Will Be Able to Participate More Actively and Profitably in the Protocol's Market Mechanisms, Including Mechanisms Available Only to Countries With Emissions Targets
- ✓ Setting up Agency for CDM Reviews and Approvals
- ✓ Has Completed National Strategy Study Process

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Country Status: Brazil

- ✓ Just Created National Forum on Climate Change to Advise President on Climate Change, and Place Brazil in a Leadership Role on Kyoto Protocol
- ✓ Currently Participating in the World Business Council on Sustainable Development (WBCSD) and Brazil/US Aspen Global Forum Processes to Identify Potential GHG Reduction Projects in Brazil.
- ✓ Considering Joining National Strategy Studies Program

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Country Status: Colombia

- ✓ Recently Completed National Strategy Study
- ✓ Very Active in Promoting Potential Value of CDM
  - ➡ Potential value estimated at US$475 MM for Bolivia, equal to banana exports
- ✓ Very Active Proponent of Forestry in the CDM Based on Perception of Comparative Advantage
- ✓ Designing National CDM Office for Capacity Building and Evaluating Projects

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Country Status: Zimbabwe

- ✓ Government Recognizes That Economic Instability an Obstacle to CDM Funding
- ✓ Need for CDM Office Recognized
- ✓ Acting on Presumption That Smaller Projects Will Need to Be Grouped and Packaged to Manage Transaction Costs
- ✓ Government Developing Project Pipeline to Get a Head Start on Attracting Funding

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The Bottom Line For India

- ✓ India's Role in the CDM Likely to be Significant, Regardless of How it is Structured
- ✓ However, Environmental and Financial Relevance of CDM Still Open to Question
  - ➡ From environmentally irrelevant to highly relevant
  - ➡ From negligible funding to billions of dollars
- ✓ India's Environmental, Sustainable Development, and Financial Gains from CDM Still Very Much on the Table
- ✓ It Greatly Depends on the CDM Rules

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The Bottom Line For India

- ✓ It's All in the CDM Rules
  - ➡ CDM technical standards for projects could render the mechanism much less environmentally relevant (crediting many BAU projects, or denying "real" projects)
  - ➡ CDM supplementarity rules could create multiple markets, undercut CDM demand, reducing financial returns to developing countries
  - ➡ India's own national implementation rules could, in theory, be so expensive, unfriendly, or unpredictable that funders don't participate in CDM projects

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Web Site Contents

www.ceeindia.org/greenhousegases

Briefing Kit for Journalists

The materials in the Press Briefing Kit, Market Opportunites through Climate Change Mitigation, are identical to the information on the Centre for Environment Education's Web site, www.ceeindia.org/greenhousegases.

These materials were distributed to journalists on a floppy disk at GreenCOM's three press briefings.

About This Kit

This kit on ***Market Opportunities through Climate Change Mitigation*** has been specially designed for business journalists in India. Much of the content has been put together in response to the concerns and information needs expressed by journalists interviewed by the Centre for Environment Education for this collaborative project with GreenCOM.

The purpose of the project is to help improve the understanding of business journalists about the growing concern with global climate change, the need for the abatement of greenhouse gas emissions, the international negotiations about mechanisms to reduce emissions, and the emerging market opportunities to do so. It is hoped that this will encourage the journalists to seek additional information on the topic so that they can engage in an informed debate about international negotiations, domestic concerns, and about setting up financial mechanisms at the national level.

The kit contains ten information sheets and a disk. The information sheets deal with the following topics:

1. Climate Change: The Background
2. Combating Climate Change: A History of International Efforts
3. Market Mechanisms: Some Concerns
4. Market-based Mechanisms for Greenhouse Gas Abatement
5. Country Preparations for the Greenhouse Gas Market
6. Sectoral Opportunities for Greenhouse Gas Mitigation in India
7. Forthcoming Events
8. Glossary
9. Websites
10. References

For the convenience of journalists, all of the above information is also contained in the disk included in this kit. This should help in easy sifting and reorganizing of information, and in its reproduction with updates and augments. We hope that the journalists will find it useful.

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Climate Change: The Background

The scientific evidence is clear: the earth's climate is changing. The atmosphere is warming and this trend will continue. Because of the complexity of atmospheric and oceanic currents this warming will produce violent storms, drought and floods and other not-yet-predictable weather events. Already several examples of atmospheric warming are available from around the globe. For example, nine of the hottest years recorded in more than a century have occurred since 1988 (1). Worldwide, July 1998 was the hottest month ever (2). In 1998 India experienced its worst hot spell in 50 years, which took a toll of over 3,000 lives (3). Another startling phenomenon is the retreat of the Himalayan glaciers—18 m per year in the case of Gangotri (4). These changes are happening because humans have released various heat-absorbing gases into the atmosphere--mainly through burning fossil fuels.

For the past two decades scientists have been collecting and debating evidence of long-term climate change. Are the observed warming trends simply natural variations in climate or are they a long- term trend? And if there is a trend, what is causing it--human activity or natural fluctuations? In 1988 the United Nations set up the Intergovernmental Panel on Climate Change (IPCC)—an official scientific body comprised of leading atmospheric scientists to investigate climate change. IPCC's Second Assessment Report published in 1995 states that climate change is a long-term trend, and human activities are its major cause. At the root of this is the human use of fossil fuels. When burnt they release what are called greenhouse gases (GHGs).

Greenhouse Gases

However, the release of key GHGs--carbon dioxide, methane, and nitrous oxide--is not only due to the burning of fossil fuels. It is also a part of nature's normal processes. Like the panes of a greenhouse, GHGs allow sunlight to pass through the troposphere (lower atmosphere), but trap the heat. As the heat rises from the earth's surface, into the troposphere, some of this heat escapes into space, some is reflected back to the surface by the molecules of GHGs, warming the air. This natural trapping of heat, or the *greenhouse effect*, has made earth habitable. Without it the earth would have been a cold, lifeless planet

Thus in the normal scheme of things GHGs, which make up less than 1 per cent of the atmosphere, are benign. Their levels in the atmosphere are determined by a balance between "sources" (processes which release these gases) and "sinks" (processes which absorb or remove them). But a lot of modern human activity tends to disrupt this optimal balance. Such disruption may happen by way of introducing new or additional sources of natural GHGs, of manmade GHGs such as CFCs and their substitutes, or of interference with natural sinks. The enhanced levels of GHG accumulation in the atmosphere resulting from this disruption are the cause of Global Warming and Climate Change.

Levels of greenhouse gases are rising as a direct result of human activity. Additions by human activity can significantly affect the amount of heat trapped in the atmosphere over time, and most of these gases have fairly long life spans, ranging from ten to thousands of years. What we put into the atmosphere today will therefore continue to warm the planet for a long time to come.

Potent Warmers of the Globe

Carbon dioxide (CO_2) is responsible for over 60 per cent of the current global warming from GHGs produced by human activities since preindustrial times (around 1750). Its concentration since then has increased by more than 30 per cent and currently increases by 1 per cent every year. The main sources (75 per cent) are the burning of fossil fuels, particularly coal, and increasingly, motor vehicle exhaust. Deforestation and biomass burning contribute 25 per cent. CO_2 remains in the atmosphere for around 200 years (5).

Methane (CH_4) can trap 20 to 25 times more heat than CO_2 on a molecule for molecule basis. It is produced by decomposition of organic matter in rice paddies, natural wetlands, landfills, intestines of cattle, sheep and termites, and in natural gas leaks. Its concentration has doubled since preindustrial times. It stays in the atmosphere for only 10-12 years, but it is removed when it reacts with the hydroxyl (OH) radical to form CO_2 (3).

Nitrous oxide (N_2O) can trap 200 times more heat than CO_2 on a molecule for molecule basis and has a life span of 120 to 190 years (1, 5). It is released from a variety of sources including the burning of biomass and coal, the application of nitrogen fertilizers, and from nylon production. Its concentration is growing by 0.25 per cent per year.

Chlorofluorocarbons (CFCs) can trap 1,500 to 1,700 times more heat than CO_2 on a molecule for molecule basis and remain in the atmosphere for several thousand years. The main sources are leaking refrigerants, industrial solvents, aerosol propellants and production of plastic foams. The concentration of CFCs had been growing by 4 per cent per year in the 1990s, but their use is now being phased out under the Montreal Protocol because of their ozone-depleting properties. As a result, CFCs are not included within the scope of the Framework Convention on Climate Change or the Kyoto Protocol. The substitutes developed for CFCs do not directly destroy ozone in the earth's atmosphere but do contribute to global warming.

Hydrofluorocarbon gases (HFCs) are a manmade alternative for CFCs for use in refrigeration, as agents used to blow foams or insulation, and as solvents or cleaning agents specially in semiconductor manufacturing. Their global warming potential is, however, 4,000 to 10,000 times that of CO_2.

Perfluorocarbons (PFCs) are replacement gases for CFCs, but are also a by-product of aluminium smelting. Small amounts are also produced during the uranium enrichment process. They can trap 6,000 to10,000 times more heat than CO_2 as GHGs (6).

Sulphur hexafluoride (SF_6) is a manmade gas used as insulating material for high-voltage equipment such as circuit breakers. It is also used for detecting water leaks in cable cooling systems. It can trap 25,000 times more heat than CO_2 (5).

Although at present the CFC substitutes listed above contribute little to global climate change, the projected growth in their use could contribute to it significantly in the 21st century (6).

How Much Have Greenhouse Gases Increased?

Concentration of greenhouse gases in the atmosphere has continued to increase. Atmospheric

concentrations of CO_2, CH_4 and N_2O have increased by 30 per cent, 145 per cent and 15 per cent respectively since preindustrial times. CO_2 concentration, for example, has increased from 280 ppmv (parts per million by volume) in the 1750s to almost 360 ppmv in 2000. The IPCC has set 450 ppmv as the top concentration at which greenhouse gases should be stabilized by the end of the 21st century (6).

Effects of a Warmer World

Most scientists agree that the earth's mean temperature has risen by at least 0.6ÎC over the last 120 years. Global warming will lead to a rise in mean sea levels as water expands when heated. The earth's average sea level is expected to rise by about 50 cm by 2100, flooding many low-lying islands and coastal areas. Some of them, such as many islands of the Maldives and large parts of southern Bangladesh, may even become permanently submerged.

The energy imbalance in the climate system caused by global warming will result in more violent weather events, increasing the threat of drought and floods (already a major factor due to other kinds of environmental degradation) and intense storms.

Global warming also poses serious threats to food production, fresh water sources and human health. Tropical diseases such as malaria could spread to formerly temperate zones, affecting 60 per cent of humanity. Sea-level rise and changing weather patterns could trigger large-scale migration from more seriously affected areas. By 2050 global warming could produce as many as 150 million environmental refugees, most of whom would migrate to other countries, causing social tensions and political instability (5). All these consequences of global warming will translate into huge financial costs.

The way ahead

Scientists estimate that just to stabilize the levels of CO_2 in the atmosphere at their current levels, current global emissions will have to be cut by 60 to 80 per cent. But projections suggest that between 1990 and 2010 CO_2 emissions will increase by nearly 50 per cent (7).

Recognizing climate change as a serious global problem, countries of the world got together to discuss what could be done to check the threat. The first World Climate Conference was held in 1979. A formal system of governmental negotiations to tackle the problem was subsequently initiated which resulted in the UN Framework Convention on Climate Change. The legally-binding Kyoto Protocol requiring industrialized countries to make GHG emission reductions is currently open for ratification. It is not yet clear when it will come into force.

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Combating Climate Change: A History of International Efforts

Growing scientific evidences in the 1980s linking global climate change with greenhouse gas (GHG) emissions from human activities prompted several governments to collectively address the emerging concern about the impacts of global warming.

In 1990 the UN General Assembly established the Intergovernmental Negotiating Committee (INC) for a Framework Convention on Climate Change (FCCC). The Convention, drafted by the INC, was adopted on 9 May 1992. It was signed in June at the UN Conference on Environment and Development, or the Earth Summit, in Rio de Janeiro by 154 states and the European Union (EU). The Convention entered into force on 21 March 1994. By November 1999, 181 States and the EU had ratified the Convention which committed signatories to make voluntary efforts to curtail their GHG emissions (1, 2).

In February 1995 the INC was dissolved and the Conference of Parties (COP), comprising all members who have ratified the Convention, became the decisionmaking body of the Convention. The COP is responsible for promoting and reviewing the implementation of the Convention, and keeping the entire process on track (3).

The Framework Convention on Climate Change

The objective of the Convention is to achieve "stabilization of greenhouse gas concentration in the atmosphere at a level that will prevent dangerous anthropogenic interference with the climate system" (FCCC Article 2). The Convention further states that "such a level should be achieved within a time frame sufficient to allow ecosystems to adjust naturally to climate change, to ensure that food production is not threatened and to enable economic development to proceed in a sustainable manner".

The Convention notes that the largest share of historical and current global emissions of greenhouse gases has been contributed by the industrialized countries. It also notes that the per capita emissions in developing countries are still relatively low, but will increase in the process of economic development. Considering the global nature of Climate Change, the Convention calls for appropriate international response in accordance with each country's "common but differentiated responsibilities", and assigns the lead in combating climate change to industrialized countries.

Under the Convention industrialized countries (members of the Organization for Economic Development or OECD) and the states of Central and Eastern Europe, collectively called Annex I countries, make voluntary commitments to limit their emissions of greenhouse gases so that by 2000 they are emitting no more than they were in 1990 (4). No commitments are required of the developing countries (referred to as the non-Annex 1 parties) in recognition of their need for development. The industrialized countries are also expected to provide "new and *additional* financial resources" (rather than redirect existing development aid) to help finance greenhouse gas reduction projects as well as promote and finance transfer of environmentally sound technologies to non-Annex 1 countries.

The FCCC establishes a framework of principles and institutions, and a process for parties to agree to specific actions. It also provides for review and integration of additional commitments

in response to changes in "scientific understanding and political will".

The Global Environment Facility

The Convention entrusted the Global Environment Facility (GEF) to operate a financial mechanism to provide funds for greenhouse gas emission abatement projects and technologies. The COP sets policies, programme priorities and eligibility criteria related to the Convention (1, 3). GEF's core fund has about US$ 2 billion to support the programme (5). Much of the GEF's money has gone not to projects but to enabling activities, helping developing countries comply with their reporting and internal assessment responsibilities.

The Negotiations

The negotiations among the countries have centred around how emissions quotas should be determined for the countries. Should every country try to stabilize where it is now? Or should the industrialized countries reduce emissions, while the emissions continue to grow in developing countries? Should emissions be determined on a historical or a per capita basis? Developing countries have argued that no emissions limits should impede their economic development. Industrialized countries, while accepting responsibility to set and meet emissions reduction targets in industrialized countries first, also argue that there are many cost-effective opportunities for developing countries to become more energy efficient. Several mechanisms have been negotiated into the Convention that allow developed countries to pay for and get credit for emissions abatement in developing countries (6).

Six COP meetings

COP-1 was held in Berlin in 1995 where three issues dominated the proceedings: the need to clearly define adequate commitments, elaborate on financial mechanisms, and set the criteria for joint implementation of projects (7). The EU proposed to stabilize its emissions by 2000. The G77 countries (including India) and China agreed to negotiate for a mandate to ask for legally binding commitments from Annex 1 signatories. The Organization of Petroleum Exporting Countries (OPEC) was particularly concerned that global efforts to reduce emissions from use of fossil fuel may have serious impacts on its economies. It wanted protection from any stronger a Convention and even sought compensation for the economic losses they may have to face as a consequence of these abatement initiatives (6). The G77 countries also agreed to participate in experimental abatement projects with developed countries, the so-called Activities Implemented Jointly (AIJ) Pilot Phase.

Also in 1995 ***The Second Assessment Report of the Intergovernmental Panel on Climate Change*** was published. The report set to rest some of the scientific uncertainty around the issue of climate change by stating that it is a real long-term trend and that it is caused mainly by human activities. The report reinforced the need for concerted abatement efforts. In response, Germany called for a 10 per cent abatement by 2005 and 15-20 per cent by 2010 using the 1990 baseline.

At the ***COP-2 in Geneva in 1996*** USA stated that it was examining stabilization schedules for periods only beyond the year 2000. Accordingly it proposed a framework of broad abatement goals achievable over longer time frames. The EU however reiterated its commitment to work

towards the year 2000 goal. The Alliance of Small Island States (AOSIS) was particularly happy with the EU commitment since they saw a ray of hope against the potential acceleration of global warming which could lead to their submergence (6).

In October 1997 Brazil proposed a 30 per cent reduction in emissions and the need for a Clean Development Fund to finance investments supporting abatement tasks in developing countries. While EU was willing to look at a 7.5 per cent reduction possibly by 2005 and 15 per cent by 2010, the US was keen only on a time frame of 2008-2012 as the period for demonstrable stabilization of emissions.

COP-3 was held at Kyoto in December 1997. Delegates approved the **Kyoto Protocol**, which set terms for legally binding commitments for the industrialized countries. It also proposed mechanisms to enable countries to move towards cleaner technology (8).

The Kyoto Protocol lists six greenhouse gases whose emissions should be reduced and controlled. They are carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulphur hexafluoride (SF_6). It does not list GHGs already included in the ozone depletion abatement under the Montreal Protocol.

The Kyoto Protocol calls for:

Emissions Reduction Industrialized countries (listed in Annex B in the Protocol) agreed to limit their greenhouse gas emissions, setting themselves Quantified Emission Limitation and Reduction Objectives (QELROs). The overall reduction limit that they have jointly committed themselves to is 5 per cent below their 1990 levels. They will achieve these targets in the period 2008 - 2012 (termed the first commitment period) (9).

Supplementarity Parties included in Annex B may transfer emission reduction units (ERUs) among themselves, or aquire certified emissions reductions (CERs) from non-Annex B countries, from projects which are aimed at reducing greenhouse gases. Reduction thus achieved has to be in addition to any that would have accrued or been achieved even otherwise (9).

Promotion of sustainable development by industrialized countries Annex I countries are required to also integrate sustainable development priorities in their emission reduction efforts through activities such as enhancement of energy efficiency in relevant sectors, protection and enhancement of carbon sinks and reservoirs, promotion of sustainable forms of agriculture and of new and renewable energy options (9).

Flexibility Mechanisms

Further negotiations led to defining three mechanisms for emissions abatement. They are 1) joint implementation (JI) of projects that generate credits among the industrialized countries, 2) a Clean Development Mechanism (CDM) in which industrialized countries make investments in developing countries to both reduce emissions and promote sustainable development, in return earning credits for emissions reduction, and 3) international emissions trading (IET) among

Annex 1 countries. The first two mechanisms are project-based mechanisms; the third would most likely involve government to government trading. (See Information Sheet 4 for more on these market-based flexibility mechanisms.)

For the Kyoto Protocol to enter into force 55 parties, including Annex I parties together accounting for at least 55 per cent of their total CO_2 emissions in 1990, need to ratify it (9). By October 1999 only 16 countries had ratified it, of which Norway was the only Annex 1 country to do so (2).

COP-4 at Buenos Aires in 1998 saw Argentina, a non-Annex 1 country, taking on voluntary commitments with financial gains to be derived from emissions trading. Argentina also supported USA's demand for meaningful participation in GHG emission abatement by developing countries. Honduras, several Latin American and African countries, and the USA called for rapid creation of CDM opportunities. India and China said that CDM without emission entitlements for all countries on a per capita basis was not likely to support the sustainable development imperatives of developing countries (6).

COP-5 at Bonn in 1999 witnessed deliberations on the limits to tradability of credits. EU demanded that all credits generated through abatement tasks should not be accounted for compliance to commitments, nor should all the credits be traded. This demand was to ensure that industrialized countries also carry out domestic action in order to completely account for compliance with commitments (10). COP-5 also took note of the need to integrate India's call for ensuring that the parameters of flexibility mechanisms adequately integrate the equity concerns of the developing countries.

The need to achieve clearer perspectives on the equity issue has been placed on the agenda for ***COP-6 to be held at the Hague in the Netherlands in November 2000*** (11). While discussions on the flexibility mechanisms are expected to continue at *COP-6*, compliance and technology transfer are high on the agenda. Developing countries are expected to submit a list of prioritized technology needs for addressing climate change in the run-up to the meeting, and OECD will submit a list of environmentally sound technologies (12).

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Market Mechanisms: Some Concerns

The developing countries have several concerns about the environmental and equity objectives of the flexibility mechanisms that the Framework Convention on Climate Change offers the industrialized countries for meeting their commitments. Some of these concerns are:

Environmental Concerns

While the flexibility mechanisms seek to provide the greatest economic efficiency in GHG abatement efforts, they may in fact not always lead to the objective of the Convention—slowing climate change.

Several analysts recognize that the flexibility mechanisms for emissions trading primarily seek to provide greatest economic efficiency in GHG abatement efforts (1, 2, 3). By and large the inefficient technologies and prevailing economic structures of the developing countries provide much greater reductions for a unit of investment than could be achieved by the industrialized countries at home (1). According to one tentative estimate, abatement of one tonne of carbon would cost US $ 25 in India, $ 175 in USA, and $ 400 in a more energy efficient country like Japan (4).

The Centre for Science and Environment, a Delhi-based policy research and advocacy NGO, argues that by focusing on cheap options the mechanisms overlook ecological efficiency and effectiveness which would lead to achieving the ultimate objective of the Convention--namely, climate change mitigation. They argue that climate change and its impacts can be kept to a minimum only if a transition is made to zero-carbon energy options as rapidly as possible. As most of the low-cost options for GHG abatement are in the carbon energy sector, those are the options that industrialized countries will want to use, thereby locking the developing countries into the carbon energy system. They ask that the flexibility mechanisms should primarily support demand side management and renewable energy projects that promote the zero-carbon system (3).

Equity Concerns

Selling emission rights for short-term benefit may lead to a compromise of their long-term economic growth and development.

In the early phase of emissions trading developing countries might compete with each other to offer the cheapest options (5). While the industrialized countries may bank the credits for future use, the developing countries will probably be forced to buy costlier credits in the future when they might have to meet emission targets of their own (6).

By the time developing countries are required to make commitments, the cheaper options available there would all have been used up.

The industrialized countries would then no longer be interested in investing or trading in emissions credits and would turn attention to achieving targets through domestic action (3). Developing countries have been therefore calling for a ceiling on the proportion of commitments that can be met through trading. The European Union has suggested meeting commitment

targets with at least 50 per cent domestic action (7, 8).

Because the modalities of CDM are as yet unclear, developing countries are concerned about who will own the emission reduction units accruing from CDM projects, and whether the government or private entities would be allowed to keep a part to sell in the market.

It has been suggested that developing country governments could acquire credits by levying an endorsement "tax" (9, 10). The idea of South - South cooperative CDM projects has also been proposed (10).

Most developing countries believe it is unfair of developed countries to ask them to make voluntary commitments to reduce emissions.

Under the Convention no commitments are required of developing countries in recognition of their need for development. The US, however, has been unwilling to make binding emission reduction commitments unless developing countries with large, rapidly growing economies, such as India and China, make voluntary commitments to reduce their emissions. Most developing countries are unwilling to comply. They argue that commitments that are in any way "required" cannot be called "voluntary". Even without making binding or voluntary commitments, countries such as India claim that they are already involved in activities aimed at climate change mitigation. These include measures such as improvement in energy efficiency, energy conservation, development of renewable energy sources and technologies, and population control (11, 12).

Entitlements

To overcome many of these concerns the developing countries, particularly India and China, have been recommending a per capita approach to emissions entitlement. They claim that every human being has an equal right to the global atmosphere. At present an American adds as much carbon to the atmosphere as 19 Indians or 269 Nepalis (13). They have suggested that the amount of carbon emissions considered safe should be divided equally among all people of the world.

One advantage of an early decision on per capita entitlements would be that the developing countries would join the formal process of emissions abatement sooner. Their participation in a system of entitlements which permits trading of the unused portion would provide developing countries with an incentive to move towards a low emissions developmental path and would make them wary of allowing high GHG-emitting activities.

It has been argued that per capita entitlements would be unfair to countries with stable populations, and that they would provide countries a perverse incentive to increase their population. However, the solution to that problem could be the freezing of the global population distribution with reference to an agreed year beyond which per capita entitlements would go down if population goes up (3).

Some analysts believe that to achieve the aim of the Convention following the principles of equity and common but differentiated responsibilities, convergence of per capita emissions of industrialized and developing countries would have to be achieved in the long run within the

corridor of sustainability, or the "convergence corridor" (14, 15).

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Country Preparations for the Greenhouse Gas Market

Introduction

Although no international agreement on carbon emissions limits or trading opportunities has entered into force, the private sector and national governments have shown interest in and positioning for the type of market mechanisms described in the Kyoto Protocol. Countries setting up national frameworks, analyzing their mitigation opportunities and potential competitive advantages in the developing GHG market, and even developing project pipelines for sale into the market.

For developing countries that anticipate participating in carbon emissions trading, for example, several institutional and policy steps can be taken now to prepare. For example, countries can establish national positions regarding flexibility mechanisms; assess mitigation options; establish sustainable development priorities; establish a national infrastructure to manage the host country approval process; and take other measures. Initiating transparent processes that are not bogged down by unnecessary bureaucracy, fees, and delays will likely position countries to participate more competitively in future greenhouse gas markets. Countries that move early to take the necessary administrative and procedural steps will benefit from earlier participation in the developing markets. These steps can be taken even while countries continue to actively participate in and influence international negotiations involving the Protocol's flexibility mechanisms.

Several international programmes through which countries have begun to assess their opportunities and to participate in greenhouse gas markets include the Activities Implemented Jointly (AIJ) pilot phase, the National Strategies Studies (NSS) programme, and the World Bank's Prototype Carbon Fund (PCF).

The Activities Implemented Jointly (AIJ) Pilot Phase

The AIJ pilot programme was launched in 1995 at the First Conference of the Parties to the United Nations Framework Convention on Climate Change. AIJ was intended to let countries experiment with the concept of market mechanisms, but the programme did not provide for actual transfer of emissions reduction credits from one country to another. The AIJ programme specifically provided that AIJ-based emissions reductions would not count toward industrialized country emissions reduction commitments.

Any country could participate in the AIJ pilot phase. The Parties to the Framework Convention left open which projects Parties could pursue and the criteria that projects must meet, with one key exception: project financing was to be "additional" to other financial obligations of industrialized countries and existing official development assistance flows. The Parties established an AIJ reporting framework to ensure transparency and credibility.

Many countries set up programmes under the AIJ pilot phase, including Australia, Canada, Chile, Costa Rica, the Czech Republic, Finland, Germany, Guatemala, India, Japan, Mexico, the Netherlands, South Africa, Sri Lanka, the United States, and Vietnam. More than 100 projects have been formally classified as AIJ projects, and reviewed or approved by national AIJ programmes. However, the level of AIJ activity was less than many countries had anticipated, and many AIJ projects would have happened anyway.

Developing countries felt that the lack of AIJ activity suggested that industrialized countries were not serious about mitigation efforts. For industrialized countries, the key element of a market system – quantification and distribution of GHG emissions credits – had been omitted from the AIJ programme. By prohibiting international crediting and creating uncertainty regarding the future availability of crediting, the Parties established a largely self-defeating framework. The absence of credits eliminated much of the incentive for private-sector participation, undercut the rationale for aggressive efforts to quantify and verify project benefits, and hindered development of answers to technical issues raised by critics of market mechanisms.

Today the future of AIJ projects is not clear. It is not known whether they will be absorbed into the JI or CDM mechanisms, or under what terms. But given the likely near-term development of JI and CDM policy, few, if any, new AIJ projects are being undertaken.

National Strategy Studies (NSS)

A collaborative effort by the World Bank, the government of Switzerland, and other bilateral donors, the National Strategy Studies programme works with developing and "economies in transition" countries on climate change mitigation issues. NSS efforts include helping these countries assess their current and projected emissions status, understanding more fully the issues and opportunities associated with the Protocol's market mechanisms, putting into place national infrastructures, and beginning to develop project pipelines. Russia, Uzbekistan, the Czech Republic, Argentina, Colombia, and Zimbabwe have all completed National Strategy Studies; India, China, and Brazil are considering joining the NSS programme.

The host country conducts the study, collaborating with outside experts as needed. The primary goal of each study is to enable countries to better understand their options as the Protocol's market mechanisms continue to develop. Typically, studies are co-financed by the host country (providing 10–15 per cent of the budget) and international donors (providing up to 85 per cent of the budget).

World Bank Prototype Carbon Fund (PCF)

The World Bank's Prototype Carbon Fund (PCF) was launched in January 2000 to promote the transfer of funds and climate-friendly technologies to developing countries and economies in transition. As a pilot activity the PCF is not intended to compete in the emissions reduction market as it matures. Originally the PCF was restricted to an

"investment" of US$150 million, and was scheduled to close to new investors on 31 March 2000. Due to increasing interest in the fund, the term has been extended and the maximum size of the PCF has been increased to $180 million.

During the next three years, the World Bank will invest PCF capital in approximately 20 climate change mitigation projects. The primary focus is expected to be renewable energy technology projects in developing countries. The projected price for the emissions reductions is between US$3 and 6 per ton of CO_2 or CO_2-equivalent. These prices should provide adequate incentives to the host entity and government as well as the Fund's investors. The Bank believes that emissions reductions pursued within the industrialized countries would have higher costs — between $10 and $15 per ton.

In accordance with the Kyoto Protocol, all PCF projects must have host country approval. A potential host country can sign a Memorandum of Understanding or a Letter of Endorsement (for a future project) to become a member of the PCF Host Country Committee. Countries that have signed MOUs with the PCF include Latvia, Costa Rica, Mexico, Guatemala, Argentina, El Salvador, Brazil, Nicaragua, Togo, Senegal, Zimbabwe, Burkina Faso, Uganda, Czech Republic, Honduras, Colombia, Morocco, Peru and Guyana. Governments reviewing their participation include Russia, Indonesia and Slovenia.

The Liepaja Solid Waste Management Project in Latvia is the first of two PCF projects currently getting underway; the second project is in Costa Rica and will involve development of renewable energy supplies. The Latvian project will replace existing landfills with an advanced waste management technology. Use of this "cell-based" landfill management system will accelerate and concentrate the production of methane, a strong greenhouse gas. By capturing the methane, which otherwise would be emitted, and using it to generate electricity, the project will reduce the use of fossil fuels for electricity production. The project is estimated to cost about US$6 per ton of CO_2-equivalent, including development and monitoring costs.

Individual Country Steps

Countries are at different stages of preparing for the developing GHG market. A snapshot of activities in several countries is found below.

Brazil

Brazil ratified the Framework Convention in 1994 and signed the Kyoto Protocol in 1998. In June 2000, Brazil created a National Forum on Climate Change, led by the Ministry of Science and Technology, to advise the president on climate change. Brazil advocates that the CDM be implemented as early as 2001, through the creation of an interim Executive Board soon after the Sixth Conference of the Parties to the Framework Convention in November 2000. The government of Brazil is currently participating in the World Business Council on Sustainable Development (WBCSD) and Brazil/US Aspen Global Forum processes to identify potential GHG reduction projects in Brazil.

WBCSD, in collaboration with the United Nations Development Programmeme, has begun to develop a "blueprint" to identify, select, and implement CDM projects in Brazil. Several Brazilian companies will do feasibility studies for these projects and WBCSD is assembling a project developers' guide.

The Brazil/US Aspen Global Forum's task force on Early Start Carbon Emission Reduction Projects is also working to help sponsors of GHG mitigation projects decide on strategies to get financing for those projects. The task force is currently evaluating several "early start" projects, including one forestry project and three projects with energy and forestry components. Project examples include:

- Improving lighting efficiency in supermarkets;
- Cogenerating electricity and steam from sawmill residue for onsite use and sales to the local electricity grid in isolated areas of Amazonia;
- Using local supplies of palm oil to fuel small internal combustion engines and electric generators to provide electricity to small villages far from the electric grid;
- Offering rebates to replace old, inefficient refrigerators with newer, more energy-efficient units.

Argentina

Argentina has had a high profile in climate change mitigation efforts. During the Fourth Conference of the Parties, the president of Argentina announced that his nation, a developing country with no emissions reduction obligations under the Framework Convention or the Kyoto Protocol, would set its own carbon emissions goals. These emissions goals, involving a reduction from "business as usual" emissions, were formally announced at the Fifth Conference of the Parties in October 1999. Argentina anticipates that by adopting these commitments, it will be able to participate more actively and profitably in the Protocol's market mechanisms, including mechanisms that may not be available to countries without commitments in place.

Argentina previously established an Office for Joint Implementation (or OAIC) in the Secretariat of Natural Resources and Sustainable Development. Argentina is now also considering establishment of a CDM office to provide the necessary country-level reviews and approvals.

China

China ratified the Framework Convention on Climate Change in 1993 and signed the Kyoto Protocol in 1998. The national Climate Change Coordination Office was established in 1990. This office coordinates ministries and government agencies in their efforts to address climate change. It has four working groups: scientific assessment, impact assessment and response strategies, economic implications, and convention implementation. China has been cooperating with Japan in the development of several mitigation projects. In May 2000, the United States and China also signed an agreement

to cooperate on environment and sustainable development issues, including climate change.

Colombia

Colombia recently completed a comprehensive National Strategy Study on implementation of the CDM, which estimated the potential benefits for Colombia from participation. For example, the study determined that under optimal conditions, the CDM could generate $435 million per year for the country, earnings similar to the economically important banana sector. In addition, the study concluded that forestry-sector projects would increase local incomes and provide other co-benefits and could be a viable alternative to illicit agriculture, cattle ranching, and unsustainable forest exploitation.

Colombia analyzed the potential prices for emission reduction credits under three scenarios and determined that the price for these credits would be:

- $9.80 per ton under the most probable scenario;
- $3 per ton under a weak market scenario; and
- $19 per ton under an optimistic scenario.

The study concluded that the "market could develop even without ratification of the Kyoto Protocol, given recent developments" in the private sector. The study presented an initial portfolio of high-quality CDM projects designed to serve as demonstration projects for future project development in the region.

Included in Colombia's study is an analysis of key sectors' abilities to develop and formulate cost-effective potential CDM projects. In the electricity sector, for example, Colombia found that 430 million tons of CO_2 emissions could be avoided for less than $16 per ton. More renewable energy projects became competitive at $20 per ton of CO_2.

Colombia analyzed possible institutional structures for implementing the CDM in the country and formulated its national negotiating position based on criteria that would aid Colombia's competitiveness in a carbon emissions trading market. For example, the country proposed designing a national office that would evaluate possible projects and work to build national capacity to propose projects. This office would be responsible for evaluating projects presented for approval as well as capacity building and promotion of carbon emissions trading in Colombia.

Kazakhstan

Kazakhstan, formerly part of the Soviet Union, signed the Kyoto Protocol in December 1999. The Kazakhstan government has set up the Climate Change Coordinating Center to be the national focal point for climate change activities. This agency reports to a board of directors made up of six government ministers. Responsibilities include the collection

of information to establish baseline emissions for the country through a greenhouse gas inventory and approval of emissions trading projects.

A company that wants to offer tradable emissions must have the emissions reduction plan certified by a private entity, such as the Society Generale du Surveillance (SGS) of Switzerland, to ensure that the proposal meets requirements of sustainability, additionality, and other standards (see information sheet 4). When the Center approves the project, it can offer its tradable emissions for sale. For example, the country has conducted a feasibility analysis on the potential to reduce GHG emissions by capturing and using methane which is released from coalmines.

India

India ratified the Framework Convention on Climate Change in 1993, but has not signed the Kyoto Protocol. India has not yet developed a national climate change policy; but climate change was included in the country's most recent five-year plan (1997-2002). The Ministry of Environment and Forests is responsible for climate change issues. India is preparing a greenhouse gas emissions inventory as a step towards establishing baseline emissions data, but there is no a government or private mechanism to provide host country approval for projects. Many Indian government officials have expressed a desire to wait until after international negotiations have settled certain issues to begin this task.

The US Agency for International Development is implementing an eight-year (1997-2005) Greenhouse Gas Environmental Pollution Prevention Project in which industry is working with government to increase energy efficiency and to develop climate-related policies and projects.

Zimbabwe

Zimbabwe signed and ratified the Framework Convention on Climate Change in 1992. Zimbabwe's GHG emissions are low, but the country has participated in opportunities to identify mitigation options. Zimbabwe has completed a National Strategy Study in which it identified five potential projects for reducing greenhouse gas emissions; all of these projects are believed to have a high potential for replication in the country. The projects are:

- use of coalbed methane for ammonia generation;
- investment in a mini-hydroelectric project to supply electric power to rural and semi-urban consumers;
- increasing boiler efficiency in industry;
- improving energy efficiency in tobacco curing; and
- generation of power from methane produced at a sewage plant.

Conclusions

There is a great deal of excitement about the potential of the Kyoto Protocol's market mechanisms to not only reduce the cost of Annex B countries' (i.e., industrialized countries) compliance with Protocol commitments, but also to help advance sustainable development and other goals of developing countries. Preparations for national and global markets in greenhouse gas reduction projects are underway in many countries. Countries as diverse as Brazil and Zimbabwe have begun to develop potential projects for these markets and put in place institutional structures to screen potential emissions trading projects. Though key policy issues and administrative details have yet to be worked out, countries that make preparations for participating in these market mechanisms, anticipate that they will be better placed to benefit from the mechanisms as carbon emissions trading markets develop.

Sectoral Opportunities for Greenhouse Gas Mitigation in India

Power generation, transportation, industrial activities, leaky pipelines that carry natural gas, land use changes and deforestation are some of the significant sources of greenhouse gas emissions in India (1). Mitigation efforts would therefore have to be directed at these sources.

A range of options exists for greenhouse gas emissions reduction and mitigation. The options include efficiency improvement in power generation, transmission, distribution and consumption; transition to less carbon intensive fuels such as natural gas, or to renewable energy sources; afforestation in order to sequester carbon; etc. (2 to 8). Renewable energy options would be most desirable as they would help India move towards a zero-carbon economy rather than locking it into a carbon energy system (9). Projects based on these options are viewed as significant opportunities under the Clean Development Mechanism (CDM) of the Kyoto Protocol.

If India is to avail of these opportunities, it must ensure that the projects are mutually beneficial, economically and ecologically viable and address the country's sustainable development needs (9,10,11). In recent years, several potential sector-specific opportunities in greenhouse gas abatement for India have been evaluated. The evaluations have focused on reduction amounts, economic viability and other benefits and whether they address the country's sustainable development needs.

Salient Features of Some Recent Project Evaluations

A recent study reviewed 22 potential CDM projects in different sectors in India (6). It used several analytical techniques to evaluate benefits of different options, and their consistency with national priorities identified in India's Ninth Five Year Plan (1997-2002).

The iron and steel sector is the largest industrial consumer of energy in India accounting for nearly 30 per cent of production costs. According to the study, in this sector modern coke preparation techniques could significantly improve coke quality and reduce energy consumption per unit production. Direct reduction processes, basic oxygen furnace, and continuous casting are some of the CDM opportunities which the study has identified for this sector.

India's cement industry, the fourth largest in the world, is highly energy-intensive. The study examines and recommends two GHG abatement options for the industry: 1) The dry precalciner kilns which allow 85-90 per cent pretreatment calcination to occur at much lower temperatures leading to significant energy savings compared to wet or semi-dry processes; 2) The dry suspension preheater kiln which uses waste heat recovered from the main kiln, thereby improving energy efficiency (6).

Another study identifies the foundry sector as a promising candidate for CDM intervention in the small-scale industry in India (12). India has about 7,000 foundries located in clusters of 100 to 400 units around the country. High energy intensity and high carbon dioxide releases reflect the poor technology status of this sector. Growing costs of production, shortage of skilled workforce, high transaction costs in procuring credit are some impediments to modernization in this sector. Introduction of an alternative furnace system tested rigorously for performance by

the Tata Energy Research Institute (TERI) is expected to improve energy efficiency by 33 per cent and reduce carbon dioxide emissions by nearly 36 per cent per year. The study proposes that CDM projects could fund the substitute technology and a credit delivery mechanism over a five-year period after which it would become financially self sustaining.

CDM obviously has a lot of potential in the power sector. In the business-as-usual scenario, power generation in India is expected to grow by at least 12,000 MW per year for 15 years (6). Renovation and modernization of relatively old thermal power plants cost less than setting up new plants, while also lowering carbon emission for every kWh of power generated (13).

Switching from coal thermal power generation to natural gas in a combined-cycle technology is likely to raise average gross efficiency of power generation from 28 per cent to nearly 50 per cent (6). However, it is also argued that newer, more expensive technologies such as the integrated gas combustion cycle may not offer the lowest-cost carbon benefits in the near future (13). Well developed carbon emissions trading markets (such as the CDM) may enable improved cost-effective technologies in the longer run (14).

Several studies have used model-based approaches to examine policy alternatives to address the complex interlinkages of economic growth, technology development and power sector reforms (2-4,7,8). They call for policies that promote advanced technologies, supported by initiatives directly aimed at minimizing CO2 emissions.

Opportunities for GHG mitigation also exist in other power-intensive sectors of economic activity such as iron and steel, cement, brick making, agriculture and transport. Making efficiency improvements in these sectors would reduce the releases of CO2 emission from coal use, while improved efficiencies in road transport, fertilizers, etc. would help minimize CO2 from the use of oil (15-17).

Forestry Options in Carbon Sequestration

GHG emission mitigation can also be achieved if the extent and capacity of carbon sinks are enhanced. This can be achieved by
maintaining structural and functional integrity of natural forests, and through reforestation and biomass conservation measures (18). Slowing deforestation and expanding revegetation offer two cost effective carbon sequestration options. The offset potential through sequestration is projected to range from 23 million tonnes to 175 million tonnes per year if options that enable natural regeneration of partially degraded forests, community woodlots, timber forestry and agro-forestry are used (19).

Activities Implemented Jointly

The Activities Implemented Jointly (AIJ) Pilot Phase is an experimental mechanism negotiated under the Climate Change Convention. The mechanism intends to provide learnings for subsequent CDM projects. A Task Group on Activities Implemented Jointly was constituted by the Ministry of Environment and Forests, Government of India. The Group recommended five major projects in areas of greenhouse gas stabilization (10). Besides providing the opportunity of learning by doing, these projects also are intended to demonstrate the effectiveness of certain technologies.

A project demonstration of direct reduced iron process for making steel with investment support from Japan is being hosted by Essar in Gujarat. Also supported by Japan is a project on energy recovery from waste gas and liquid at IPCL (Indian Petrochemicals Corporation Limited), Vadodara. The Andhra Pradesh State Electricity Board is hosting a project on integrated agricultural demand side management with investment support from the World Bank. A biomass gassification project is being carried out at 20 sites by Development Alternatives with support from the Netherlands. A US-funded project on tamarind orchard agro-forestry is based in Karnataka (20). Learnings from these projects will guide the development of an appropriate framework of action for when CDM comes into force.

Financial Support

Funds to support climate change mitigation activities are available from several sources (21). A key funder is the Global Environmental Facility (GEF) which provides new and additional grant and concessional funding (up to US$10 million per project) to meet incremental costs for projects in focal areas leading to greenhouse gas abatement. The GEF is managed by the World Bank, the United Nations Development Programme (UNDP) and the United Nations Environment Programme (UNEP). In India the GEF fund is administered by the UNDP.

The GEF portfolio includes support for ongoing innovation, experimentation, demonstration, replicability and catalyzing complementary actions that have a multiplier effect. Since its establishment in 1991, a total of US$5.7 billion has been allocated for climate change activities (22). The GEF and the World Bank's Carbon Investment Fund also support improving carbon sinks.

USAID provides support to India in areas of energy, industry, urban activities and increased environmental protection. Projects supported by USAID have led to a reduction of two million tones of CO2 by power plants of the National Thermal Power Corporation and the Gujarat Electricity Board.

ICICI offers loans and equity investments made available for clean technology opportunities in India.

(For additional information on world-wide funding opportunities, see FCCC/TP/1997/1, Trends of financial flows and terms and conditions employed by multinational lending institutions; Technical paper on terms of transfer of technology and know-how. www.ipcc.ch).

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Forthcoming Events

11-15 September 2000

Twelfth Session of the Subsidiary Bodies to the UNFCCC, Bonn, Germany.

Contact: UNFCCC Secretariat, PO Box 260124 D-53153 Bonn, Germany.
Tel +49 228 815 1000 Fax +49 228 815 1999
Email secretariat@unfccc.de Web www.unfccc.de

15-18 September 2000

Prime Minister AB Vajpayee's visit to the United States of America.

18-20 September 2000

Coastal Environment 2000: Environmental Problems in Coastal Regions, Las Palmas de Gran Canaria, Spain.

Contact: Sally Walsh, Coastal Environment 2000, Wessex Institute of Technology, Ashurst Lodge, Ashurst, Southampton, SO40 7AA, UK.

Tel +44 238 029 3223 Fax +44 238 029 2853
Email Slwalsh@wessex.ac.uk

18-20 October 2000

Second Environmental Conference on Industry and Environmental Performance: Euro Environment 2000, Aalborg, Denmark.

Contact: Euro Environment 2000 Secretariat, PO Box 149, DK-9100 Aalborg, Denmark.

Tel +45 99 35 55 55 Fax +45 99 36 80
Email euro@akkc.dk Web www.akkc.dk/environment

24-25 October 2000

World Trade Organization Committee on Trade and Environment Geneva, Switzerland.

Contact: Sabrina Shaw, Secretary of the CTE, WTO, 154 rue de Lausanne, 1211 Geneva 21, Switzerland.

Email Sabrina.shaw@wto.org
Web www.wto.org/wto/environ/te030.htm

13-24 November 2000

Sixth Conference of the Parties to the UN FCCC
The Hague, The Netherlands.

Contact: UN FCCC Secretariat, P.O. Box 260 124, D-53153 Bonn, Germany.

Tel +49 228 815 1000 Fax +49 228 815 1999
Email secretaruat@unfccc.de Web www.unfccc.de

23-26 November 2000

2000 International Environment and Renewable Energy Exhibition and Symposium, Beijing, China.

Contact: Yong Zhang, CERE'2000 Organizing Committee Secretariat, No.1 Sandaojie, Jianguomenwai, Chaoyang District, Beijing 1000022, People's Republic of China.

Tel +86 10 651 57760 0r 651 55027 Fax +86 10 651 58442
Email cisc@midwest.com.cn Web www.ciscexpo.orgcn.net

10-16 December 2000

Acid Rain 2000: 6th International Conference on Acid Deposition, Tsukuba, Japan.

Contact: Secretariat of Acid Rain 2000, C/o International Communications Specialists, Inc., Sabo Kaikan-bekkan, 2-7-4, Hirakawa-cho, Chiyoda-ku, Tokyo 102-8646, Japan.

Tel +81 3 3263 6474 Fax +81 3 3263 7077
Email acid2000@ics-inc.co.jp

Glossary

Additionality It refers to the issue of whether greenhouse gas emissions reduction or sequestration in a Joint Implementation or Clean Development Mechanism project occurs over and above the baseline and constitutes a new reduction that would not have otherwise occurred in absence of the project.

Annex I Parties Industrialized countries belonging to the Organization for Economic Cooperation and Development (OECD) and countries designated as Economies in Transition under the Framework Convention on Climate Change (FCCC), that pledged to reduce their greenhouse gas emissions to 1990 levels by the year 2000.

Annex II Parties The rich countries listed under this FCCC annex have a special obligation to help developing countries with financial and technological resources. They include the 24 original OECD members and the EU.

Annex B Parties Industrialized countries which have limitation or reduction targets under the Kyoto Protocol.

Baseline An emission baseline is a hypothetical emission reference representing the estimated level of greenhouse gas emissions that would have been emitted in the absence of the process improvement tasks aimed at minimizing emissions.

Bubble The EU proposal for differentiated reductions within the Union, which allows members inside the bubble to have commitments as diverse as an increase in emissions by 40 per cent to a cut of 30 per cent.

Cap In the context of regulatory standards for emissions, cap implies the maximum level of emissions allowed. In the context of tradable units, the term refers to the extent to which certified emission reduction units can be used for accounting for commitments.

Certified Emission Reductions (CERs) Verified and authenticated units of greenhouse gas reduction from abatement or sequestration projects, and certified by an entity authorized under the Clean Development Mechanism.

Clean Development Mechanism (CDM) Mechanism under the Kyoto Protocol for trading in emission reductions between industrialized and developing countries through joint projects.

Climate Change According to FCCC usage, a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods. According to IPCC usage, climate change which occurs because of internal changes within the climate system or in the interaction between its components, or because of changes in external forcing either for natural reasons or because of human activities.

Common but Differentiated Responsibilities FCCC formulates different responsibilities for industrialized and developing countries. It requires industrialized countries to commit themselves to actions to reduce their contributions to the global net emissions and to enable developing countries to adequately address climate change without hindering their national development goals and objectives. Developing countries, meanwhile, are to commit themselves to appropriate action, though it is recognized that their net emissions must grow to accommodate their development needs.

Conference of Parties The supreme body of the UNFCCC. It comprises all countries (170+ in November 1999) that have ratified the Convention.

Credits Units used for the measurement (e.g., in tonnes of CO_2 equivalent) in transfer and acquisition of emission reductions associated with Joint Implementation and Clean Development Mechanism projects.

Differentiation The approach under which Annex I countries adopt an overall target and then share it among themselves instead of all of them adopting a uniform target.

Emissions timeline Time (number of years) over which emission credits resulting from a Joint Implementation or Clean Development Mechanism project accrue.

Emissions Trading Mechanism under the Kyoto Protocol where countries with emission commitments may trade emission allowances with other parties. It is a market-based approach to competitively reduce pollution loads.

First Commitment Period The 2008-2012 deadline for Annex 1 countries to meet their Kyoto Protocol commitments.

Flexibility Mechanisms The three mechanisms created under the Kyoto Protocol to give Annex I countries the "flexibility" in meeting their targets by achieving or acquiring reductions more cheaply in other countries than at home. These are the Clean Development Mechanism (CDM), joint implementation (JI) and International Emissions Trading (IET).

Global Environment Facility (GEF) Mechanism that provides grants and concessional loans to eligible countries for incremental costs of measures to achieve agreed global environmental benefits in the areas of climate change, biological diversity, international waters, and ozone depletion. The World Bank, the United Nations Development Programme and the United Nations Environment Programme act as the three implementing agencies for GEF.

Greenhouse Effect A natural effect that traps heat in the atmosphere (troposphere) near the earth's surface. Some of the heat flowing back toward space from the earth's surface is absorbed by water vapour, carbon dioxide, ozone, and several other gases in the lower atmosphere and then radiated back toward the surface of the earth.

Greenhouse Gases (GHGs) Gases in the lower atmosphere that cause the greenhouse effect. Water vapour, carbon dioxide, nitrous oxide, methane and ozone are the primary greenhouse gases in the earth's atmosphere. If the atmospheric concentrations of these greenhouse gases

rise and are not removed by other natural processes, the average temperature of the lower atmosphere will gradually increase.

Hot Air Countries like Russia and Ukraine have low emissions today as compared to 1990 because of their economic collapse after the demise of the Soviet Union. Since they have agreed to stabilize at 1990 levels, which they are unlikely to reach by 2010, they can easily sell off these emissions--called "hot air"--which they would not emit until 2010.

Joint Implementation (JI) Mechanism under the Kyoto Protocol for an industrialized country to acquire emission reduction units (ERUs) when it helps finance projects that reduce emissions in another industrialized country.

Kyoto Protocol An international agreement adopted at the Third Conference of Parties (COP-3) to the UNFCCC held in December 1997 in Kyoto, Japan. The Kyoto Protocol commits Annex I Parties to individual, legally-binding targets to limit or reduce their greenhouse gas emissions, adding up to a total cut of at least 5 per cent from 1990 levels in the period 2008-2012. The individual targets for Annex I parties are listed in the Protocol's Annex B. In order to enter into force, the Protocol must be ratified (or adopted, approved, or acceded to) by 55 parties to the Convention, including Annex I Parties accounting for 55 per cent of carbon dioxide emissions from this group in 1990. As of October 1999, 16 countries had ratified the Protocol, of which Norway is the only Annex I country so far.

Leakage occurs if actual emission reductions (or increase in sinks) from a project results in emissions increasing (or sinks decreasing) elsewhere. It occurs if the system boundaries do not capture all emission efforts of a project.

Non-Annex I Parties Developing countries with no stabilization or reduction commitments under FCCC.

Precautionary Principle Principle 15 of the Rio Declaration, the precautionary principle, states: Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation. Article 3(3) of the FCCC endorses the precautionary principle as an element of international law and emphasizes the essential connection between environmental protection and economic development. Rather than imposing a set of environmental standards or policies, the Convention sets up a process of negotiation that is expected to continue, aided by a systematic, long-term programme of scientific research to re-evaluate the adequacy of commitments.

Quantified Emission Limitation and Reduction Objectives (QELROs) Legally binding targets and timetables under the Kyoto Protocol for the limitation or reduction of greenhouse gas emissions for industrialized countries.

Sinks Land, forests and oceans which absorb carbon dioxide and act as its reservoirs. Under the Kyoto Protocol, industrialized countries can include changes in net emissions (calculated as emissions minus removals of carbon dioxide) from certain activities in the land-use change and forestry (LUCF) sector. This is being negotiated.

Supplementarity Post-Kyoto, it still remains to be determined whether industrialized countries

can meet their entire commitments through the flexibility mechanisms, or whether trading should "supplement" domestic action.

United Nations Framework Convention on Climate Change (UNFCCC) Also called the Climate Change Convention, it is the centerpiece of global efforts to combat global warming. It was adopted in June 1992 at the Earth Summit in Rio de Janeiro, and entered into force on 21 March 1998. The Convention's primary objective is the stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic (manmade) interference with the climate system. Such a level should be achieved within a time frame sufficient to allow ecosystems to adapt naturally to climate change to ensure that food production is not threatened and to enable economic development to proceed in a sustainable manner.

Value of credits The monetary value resulting from the supply and demand of emission credits derived from Joint Implementation and Clean Development Mechanism projects, and from International Emissions Trade reduction options.

Websites

Climate Change Secretariat

www.unfccc.de This is the website of the Climate Change Secretariat. Official documents of the Untied Nations Framework Convention on Climate Change (UNFCCC) can be accessed here. Important related websites include:

www.unfccc.de/resource/docs.html
www.unfccc.int/text/siteinfo/newsite.html
www.unfccc.int/

www.ipcc.ch provides information on the special reports of the Intergovernmental Panel of Climate Change (IPCC) and links to other sites including the working groups and the Data Distribution Center

www.ipcc.ch/links.htm

Governmental Bodies

www.nic.in provides the directory of the Government of India websites.

http://envfor.nic.in is the website of the Ministry of Environment and Forests, Government of India. The Annual Report section of the site contains information for the year 1999-2000, which makes special reference to Climate Change related tasks.

http://powermin.nic.in and **http://mnes.nic.in** are the sites of Ministry of Power and the Ministry of Non-Conventional Energy Sources, Govt. of India respectively.

www.state.gov/www/global/global_issues/climate/index.html is the Government's special site on Climate Change. Key speeches and remarks, submissions to the UNFCCC, IPCC, the US-India joint statement on energy and environment can be located at this site. Links to other relevant sites include:

www.nacc.usgcrp.gov on US National Assessment;
www.epa.gov/globalwarming the Environment Protection Agency's site on global warming;
http://globalchange.gov on US Global Change data and information system;
www.gcrio.org/ipcc/qa/cover.html leading to the United Nations Environment Programme/ World Meteorological Organization (UNEP/WMO) site.

www.usaid.gov/press/releases/2000/fs20000084.htm contains India-specific information on climate change programs of the USAID.

Emissions Trading

www.cantor.com Site of Cantor Fitzgerald, a brokerage firm, provides insights into greenhouse gas trading. The associated site is **www.cantor.com/press_releases.htm**

www.climateservices.com Site of Trexler and Associates Inc., deals with climate change risk management and offset strategies in implementing greenhouse gas reduction commitments.

www.emissions.org and **www.emissions.org/links.html** link to emissions trading initiative and tracking system reports.

www.epa.gov/acidrain/trading.html deals with the sulphur dioxide emissions trading programme with reference to market activity

www.etei.org provides details on cap and trade of emissions. A Handbook on Emissions Trading is also presented at this site.

www.gert.org deals with a Canadian Initiative on greenhouse gas emissions reduction.

www.natsource.com also deals with emerging trends in emissions trading.

Joint Implementation

www.ji.org provides valuable information on the Joint Implementation Initiative. This is the site of the International Utility Efficiency Partnerships Inc., the USAID and the US Energy Agency. Extensive sub-links are available.

Funding Sources

www.gefweb.org deals with the Global Environment Facility and leads on to its operational policies, projects, etc.

www.prototypecarbonfund.org of the World Bank discusses project-based emission transactions including Joint Implementation and Clean Development Mechanism, through local and regional funds.

Debates, Policy Analyses and Information Support

www.ceeindia.org is the site of the Centre for Environment Education. Information on greenhouse gas abatement mechanisms and opportunities will soon be available at
www.ceeindia.org/greenhousegases

www.cii.online.org is the site of the Confederation of Indian Industry. Industry-specific aspects of climate change is available at
www.ciionline.org/climatechange/index.html

www.cleantechindia.com of FICCI focuses on climate-friendly technology as part of its Environmental Information Centre.

www.cnie.org leads to Congressional Research Service issue briefs and publications on global climate change.

www.cseindia.org is the site of the Centre for Science and Environment dealing extensively with policy debates and advocacy.

www.ficci.com is the site of the Federation of Indian Chambers of Commerce and Industry (FICCI).

www.pewclimate.org provides extensive information on greenhouse gas inventory issues, economics of climate change etc.

www.teriin.org is the site of the Tata Energy Research Institute which leads on to **www.ccasia.teri.res.in** focussing on Climate Change specially in Asia.

www.wri.org of the World Resources Institute leads to its special section on Climate Change issues.

Selected Articles Published after Briefings

CEE launches awareness drive to open up market

By Our Environment Correspondent

AHMEDABAD: International efforts to control the emissions of noxious gases, which lead to greenhouse effect and cause global warming, are likely to open new market opportunities through trading of emission rights among different countries.

A presentation on "Market opportunities through climate change mitigation" was organised here on Thursday by the Centre for Environment Education (CEE) in the backdrop of the sixth session of the Conference of Parties (COP-6) to the United Nations Framework Convention on Climate Change, currently going on at the Hague in the Netherlands.

The CEE has launched an initiative to bring awareness about the global climate change, need for abatement of greenhouse gas emissions, international negotiations about the mechanism to reduce such emissions and market opportunities in doing so.

Besides holding a number of seminars and presentations at several places, the CEE has also developed a website and information kit about the subject in collaboration with GreenCOM, the environment education and communication project of the United States Agency for International Development (USAID).

The scientific evidences have made it clear that the earth's climate was changing and the atmosphere was warming because of release of various heat-absorbing gases into the atmosphere—mainly through burning fossil fuels. It is believed that the global warming up will give rise to atmospheric and oceanic currents producing violent storms, drought and floods and other not-yet-predictable weather events.

The United Nations in 1988 set up an Intergovernmental Panel on Climate Change (IPCC)—an official scientific body consisting of leading atmospheric scientists to investigate climate change. Its report states that at the root of the climate change phenomena were human activities, mainly burning of fossil fuels. When burnt, they release what are called greenhouse gases (GHGs).

Most scientists agree that the earth's mean temperature has risen by at least 0.6 degree celsius over the last 120 years. Global warming will lead to a rise in mean sea levels as water expands when heated. The earth's average sea level is expected to rise by about 50 cm by 2100, flooding many low-lying islands and coastal areas. Some of them, such as many islands of the Maldives and large parts of southern Bangladesh, may even become permanently submerged.

It is estimated that just to stabilise the levels of carbon dioxide (CO_2) in the atmosphere at their current levels, current global emissions will have to be cut by 60 to 80 per cent.

Recognising climate change as a serious global problem, countries of the world got together to discuss what could be done to check the threat. TOI/A / 24.11.00

The environment as commodity

The far-reaching economic strategic and environmental implications of the issues relating to climate change make it imperative that India's policy-makers present their case effectively at the Conference of Parties to the FCCC in The Hague.

SUDHA MAHALINGAM

A YEAR ago, the Washington D.C.-based Cantor Fitzgerald Brokerage set a new record in the ever-innovative world of global commerce when it announced the sale of 2,800,000 tonnes of carbon credits and options. The seller was IGF Insurance Company, the fourth largest crop insurance company in the United States, and the buyer, a Canadian consortium representing 10 energy firms. The credits were for an anticipated reduction in atmospheric carbondioxide, to be achieved through innovative agricultural techniques which some American farmers had pledged to undertake. The transaction heralded the successful commodification of yet another abstract concept, the environment – not unlike other commodified concepts such as Trade-Related Intellectual Property Rights.

The transaction owes its genesis to the Kyoto Protocol of 1997, an international environment accord signed under the aegis of the United Nations Framework Convention on Climate Change (FCCC). The Protocol is committed to reducing emissions of carbon and other greenhouse gases (methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons and sulphur hexafluoride) that cause global warming. The culpability of greenhouse gases in global warming being an established fact, the U.N. FCCC is trying to convince the international community first to put a cap on the emissions and eventually reduce them. The five Conference of Parties to the U.N. FCCC have discussed the problem of global warming at length and arrived at the consensus that something needs to be done urgently. The Kyoto Protocol set certain targets for emission reduction. The forthcoming Sixth Conference of Parties (CoP) to the FCCC, to be held in The Hague in November, will discuss ways and means to achieve reduction targets in a time-bound manner.

However, no consensus has emerged on the targets and the ways and means to achieve them. Industrialised countries have jointly agreed that by 2008-2012, they will reduce emission levels to 5 per cent below the 1990 levels. Developing countries have been exempted from making a firm commitment to this effect. However, they are "required" by the U.S. to make some voluntary commitments – a contradiction in terms, which has irked India and other countries, especially when the U.S. itself has not ratified the Kyoto Protocol. Even more controversial and elusive are the ways and means by which the emission reductions are proposed to be achieved. Market-based mechanisms for the purpose will come up for discussion at the conference.

What exactly are these market-based mechanisms? The Kyoto Protocol has identified the market as the most suitable mechanism for inducing the international community to adhere to targets. The introduction of the market concept automatically puts the private sector at the forefront of the exercise. Carbon-emitting industries such as power and transportation are given targets for emission reductions. Since markets respond better to commercial/financial incentives, the Kyoto Protocol has devised the Clean Development Mechanism (CDM). The CDM allows firms in developed (Annex B) countries to set up projects in developing (non-Annex B) countries in order to reduce emissions. In return, the firms earn credits which they can use to fulfil their own reduction obligations. Such flexibility has been allowed on the premise that the cheaper cost of achieving reductions in developing countries as compared to the already low-emitting developed countries will act as an incentive for compliance. It has been computed that it would cost $175 to reduce carbon emissions by a tonne in the U.S., $400 in Japan and just $25 in India. Commercial prudence would dictate that investments flow into cheaper countries.

Prima facie, it sounds good. After all, the industrial countries would be paying to clean up the environment in developing countries. But then, watch out for the fine print. Now that the industrial countries have already agreed on their reduction targets, the heat will be turned on the developing countries to commit to reduction targets. The forthcoming CoP is expected to initiate moves in this direction. Once they commit themselves to reduction targets, the developing countries will have to shop for carbon credits. Since the cheaper credits would have already been appropriated by the firms of the developed countries, the poorer countries will have to turn to more expensive options.

But that is not the only concern. Industrial nations have achieved their high levels of development by using up enormous amounts of energy and releasing huge quantities of carbon into the atmosphere in the process. To ask developing countries to freeze their level of energy consumption (from conventional sources) would be unfair. Developing countries rightly believe that by selling emission rights for short-term benefits, they will have to compromise on their long-term economic growth and development.

Besides, the entire thrust of the CDM seems to be to provide the greatest economic efficiency in reducing the emission levels of greenhouse gases. But whether they actually lead to the objective of the Convention, namely, slowing climate change, is the pertinent question. The Delhi-based Centre for Science and Environment argues that climate change can actually be slowed only when the world switches over to zero-carbon technologies (for instance, solar power). But since such options are expensive, projects under the CDM will tend to focus on carbon-technologies, and the developing countries will get trapped in the carbon energy system. The Hague conference

will provide an opportunity for non-Annex B countries to insist that CDM funds should flow only into renewable energy projects.

The conference will also discuss the modalities of the CDM. Developing countries are concerned about the ownership of the emission reduction credits accruing from CDM projects and about whether the government or private entities would be allowed to keep a part of their credits to sell in the market. Hosting CDM projects will help countries like India secure a share of the carbon credits generated by the projects.

MODALITIES of the CDM apart, developing countries, especially India and China, argue that emission entitlements should be based on per capita standards. Every American adds as much carbon to the atmosphere as 19 Indians or 269 Nepalis. Per capita entitlements will give surplus carbon credits to countries at a lower level of development. The possibility of trading these surplus credits will provide developing countries with an incentive to maintain a low-emission development path. In any case, equity demands that those countries whose emission levels were and are high should pay for cleaning up the atmosphere. It also demands that "survival emissions" be treated differently from "luxury" emissions. The latter distinction came to the fore when scientists identified paddy-field methane as a major greenhouse gas after fossil fuel emissions. But the greed of the affluent industrial nations prompts them to duck these obligations and pontificate on a "common but differentiated" responsibility for greenhouse gas abatement to be borne by all countries.

It is such a glib attitude that India and the other G-77 countries will have to tackle at the conference. India, along with the other large and powerful members like China, can set the tone for the discussion. Equity in the CDM is already on the agenda of the conference. An informed, aggressive, pro-active and concerted negotiating strategy alone can break the focussed and persuasive arguments of the Annex B countries. The CDM is a bargaining chip that the G-77 can use to its advantage. Since host-country permission is needed to set up CDM projects, Annex B countries are likely to woo the developing countries. While India did well by not accepting any commitments so far, the Joint Statement on Energy and Environment made by India and the U.S. during President Bill Clinton's visit to India early this year may be misconstrued as India's capitulation to American pressure. India will have to dispel such misunderstanding and enlist the cooperation of its partner countries to use the CDM in order to get the Annex B countries to agree to a per capita emission entitlement. There are arguments that per capita entitlements act as perverse incentives to increase the population. Such arguments can be countered by offering to freeze the global population distribution with reference to an agreed date, beyond which per capita emission entitlements will go down if population increases. India should also explore the possibility of channelling CDM funds to build up domestic research and development capacity in renewable energy projects.

The far-reaching economic, strategic and environmental implications of the debate on climate change make it imperative that India's policymakers be adequately prepared for conference in The Hague. ■

અમદાવાદની સરહદે વટવા-નરોડાની ફેક્ટરીઓ હજારો ટન ઝેરી ગેસ હવામાં છોડે છે

છેલ્લાં ૧૦ હજાર વર્ષ પૈકી '૯૦ના દાયકામાં પૃથ્વીનો ગોળો સૌથી વધુ ગરમ રહ્યો હતો

(પ્રતિનિધિ) અમદાવાદ, ગુરુવાર

છેલ્લાં દસ હજાર વર્ષોમાં વિશ્વભરમાં ૧૯૯૦નો દાયકો સૌથી વધુ ગરમીયુક્ત હતો. એમાંય ૧૯૯૮માં પૃથ્વીનો ગોળો સૌથી વધુ તપી ગયો હતો. ભારતમાં ગરમ હવામાનને કારણે ૧૯૯૮માં એક જ વર્ષમાં ૩૦૦૦ લોકોનાં મોત થયાં હતાં, એમ આજે પર્યાવરણ નિષ્ણાત ડો. મીસ કિરણ બી. છોકારે જણાવ્યું હતું.

બજાર આધારીત વૈશ્વિકરણ દ્વારા વિકાસનું નકારાત્મક પાસું એ છે કે, પર્યાવરણ સામે ગંભીર ખતરો ઊભો થયો છે, એમ જણાવતાં સેન્ટર ફોર એન્વાર્યમેન્ટ એજ્યુકેશનના પર્યાવરણ નિષ્ણાત ગોપીચંદ્રને જણાવ્યું કે, અમદાવાદ શહેરની સરહદે આવેલી વટવા-નરોડાની ફેક્ટરીઓ રોજ હજારો ટન કાર્બન ડાયોક્સાઇડ અને બીજા ઝેરી ગેસ આધારીત વાયુઓ હવામાં છોડે છે. જેથી શ્વાસોચ્છવાસમાં ભારે તકલીફ પડે છે.

ડો. કિરણ છોકારે જણાવ્યું કે, પર્યાવરણની સમતુલા ખોરવાઇ જવાની આડઅસરો ખૂબ છે. ઓછો પાક ઉતરતાં ખોરાકની તંગી અને ભૂખમરો સર્જાશે. પાણીની તંગી ઊભી થશે. બિમારીનું વિષચક્ર ફેલાશે તેમજ રાજકીય પ્રશ્નો પણ ઊભા થશે.

વૈશ્વિક ગરમી પ્રદૂષણને આભારી છે, જે પર્યાવરણ અને કુદરતી હવામાનના

'૯૮માં સૌથી વધુ ગરમીના કારણે ભારતમાં ૩ હજાર મોત

ચક્રને છિન્નભિન્ન કરી નાખે છે.

તેમણે આજે પર્યાવરણ અંગેના એક સેમિનારમાં પત્રકારોને માહિતી આપતાં જણાવ્યું કે, ગ્લોબલ વોર્મિંગ ઇફેક્ટના કારણે સમગ્ર વિશ્વમાં હવામાનનું ઋતુચક્ર ખોરવાયું છે. ડો. કિરણ છોકારે જણાવ્યું કે, હિમાલય રોજના ૧૫ સે.મી. જેટલો પીગળે છે તેમજ ગંગોત્રી શિખર પ્રતિવર્ષ ૧૮ મીટર જેટલો પીગળે છે. અલબત્ત ગ્રીન હાઉસ ઇફેક્ટના કારણે પૃથ્વી પર શીતળતા જળવાઇ રહે છે. વાતાવરણમાં કાર્બન ડાયોક્સાઇડના નિર્ધારિત પ્રમાણ કરતા ૮૦ ટકા કાર્બન ડાયોક્સાઇડ વધુ નોંધાયો છે. આ સ્થિતિ માટે જુદા જુદા હેતુ માટે વપરાતાં ગેસનું બળતણ તેમજ વ્યાપક પ્રમાણમાં નીકળતો ધૂમાડો જવાબદાર છે. ખેતીવાડી મારફત મિથેન ગેસ નીકળે છે. ઔદ્યોગિક એકમો દ્વારા સલ્ફર ઓક્સાફ્લોરાઇડ નીકળે છે.

'વાતાવરણના ફેરફારમાં ઘટાડા મારફત બજારની તકો' વિષે આજે તા. ૨૩મીના રોજ સેન્ટર ફોર એન્વાર્યમેન્ટ એજ્યુકેશન (સીઇઇ) ખાતે એક ખાસ સેમિનાર યોજાયો હતો. જેમાં યુએન ફ્રેમવર્ક કન્વેન્શન ઓન ક્લાઇમેટ ચેન્જ (યુએનએફસીસીસી) વિષે તાજેતરમાં હેગ ખાતે આયોજિત કોન્ફરન્સ ઓફ પાર્ટીઝ (કોપ-૬)ના છઠ્ઠા સેશન અંગેની માહિતી આપવામાં આવી હતી. આવતીકાલે 'unfccc.com' નામની વેબસાઇટ પણ ખુલ્લી મૂકવામાં આવી રહી છે. જેમાં ગ્લોબલ વોર્મિંગ અને ગ્રીન હાઉસ ઇફેક્ટની તમામ વિગતો જોવા મળશે.

आता प्रदूषणाचाही व्यवसाय करता येणार!

व्यापार प्रतिनिधीकडून

मुंबई, रविवार — होय, आता प्रदूषणाचाही व्यवसाय करता येणार आहे! वसुंधरेवरील प्रदूषणाचा बोजा कमी करण्यासाठी ही नवीन तरतूद करण्यात येणार आहे. जागतिक स्तरावर झालेल्या क्योटो करारानुसार उद्योगांना प्रदूषण नियंत्रणाचे नवीन नियम पाळावे लागणार असून त्यात प्रदूषणाचा व्यवसाय करणारी मुभा देण्यात आली आहे. टीडीआर (ट्रेडेबल डेव्हलपमेंट राईट) प्रमाणे हा व्यवसाय होणार आहे.

थोडक्यात म्हणजे, ठरवून दिलेल्या प्रमाणापेक्षा एखादा प्रकल्प प्रदूषण कमी करीत असेल तर हे कमी असलेले प्रमाण तो अधिक प्रदूषण करणाऱ्या प्रकल्पास विकू शकतो. हा व्यवसाय उद्योगा प्रमाणेच आंतरराष्ट्रीय पातळीवर दोन देशांमध्येही होऊ शकतो. अशा व्यवसायास परवानगी दिल्याने प्रदूषण कमी करण्याचा प्रयत्न करणाऱ्या उद्योगांना किंवा देशांना आर्थिक मोबदला मिळू शकेल.

जगभर प्रदूषणाचा भस्मासुर वाढत असल्याने पर्यावरण धोक्यात आले आहे. त्याचे दुष्परिणाम सध्या दिसू लागले आहेत. त्यापैकी प्रमुख म्हणजे १९९८ मध्ये जगात तपमानाचे प्रमाण वाढले होते. जुलै महिना विश्वभर दाहक ठरला तर भारतात त्यासाली उष्मेने तीन हजार बळी घेतले. हिमालयावरील बर्फ वितळण्याचे प्रमाण वाढले आहे. हे सर्व संकेत सुरू झाले असल्याने पर्यावरण रक्षणासाठी व्यापक प्रयत्न सुरू करण्यासाठी हा करार करण्यात आला आहे.

पंतप्रधान अटलबिहारी वाजपेयी पुढील महिन्यात अमेरिकेस जात असून त्यावेळी उद्योग उभारणीसंबंधी करार करताना त्यांनी कमी प्रदूषण करणाऱ्या कंपन्यांना प्राधान्य द्यावे यादृष्टीने जनजागृती करण्यासाठी अहमदाबाद येथील सेंटर फॉर एन्व्हायर्मेन्ट एज्युकेशनतर्फे आयोजित करण्यात आलेल्या एका प्रशिक्षण शिबिरात ही माहिती देण्यात आली.

क्योटो करारात प्रदूषण कमी करण्यासाठी प्रामुख्याने तीन उपाय सुचविण्यात आले आहेत. एक म्हणजे प्रदूषण कमी करण्यासाठी उद्योगाप्रमाणेच देशांनी संयुक्त प्रयत्न करणे, स्वच्छता विकास यंत्रणेचा वापर करणे आणि तिसरा आंतरराष्ट्रीय स्तरावर प्रदूषणाचा व्यवसाय करणे, या उपायांचा समावेश आहे. प्रकल्पांतून प्रदूषण होते तसेच नैसर्गिक प्रक्रियेमुळेही वायू बाहेर पडतात. ते 'ग्रीन हाऊस गॅस'या नावाने ओळखले जातात. हे प्रदूषण कमी करायचे म्हणजे त्यास मोठ्या प्रमाणावर खर्च अपेक्षित आहेत. कार्बनचे प्रमाण एक टनाने कमी करण्यासाठी भारतात २५ डॉलर खर्च येतो तर अमेरिकेत त्यासाठी १७५ डॉलर मोजावे लागतात. जपानसारख्या ऊर्जा कार्यक्षम देशांना तर ४०० डॉलर खर्च येतो.

भारतात प्रदूषणाचे प्रमाण कमी करण्यासाठी प्रशिक्षण शिबिरात उपाय सुचविताना 'बँकिंग ऑन बायोमास'चे लेखक डॉ. के. आर. दाते यांनी सौरऊर्जा, पवनऊर्जा आणि जलविद्युतवर भर देण्याचे आवहन केले. तर क्रिसिलचे व्यवस्थापकीय संचालक हेमंत जोशी यांनी सिमेंट, वीज, कागद, कॉस्टिक इत्यादी प्रकल्प अधिक प्रदूषण करणारे असून त्यांचे तंत्रज्ञान बदलणे आवश्यक आहे, अशी सूचना केली. समुद्र किनाऱ्यावर असलेले औष्णिक वीज केंद्र, गॅसवर चालविणे शक्य होईल, असेही त्यांनी यावेळी नमूद केले.

Don of Green Diplomacy

With the clout that the US has in the climate change negotiations, India and the other developing countries may be pressured to make “voluntary” emission limits. And when this happens the low-cost options for emission reductions would have disappeared. These developing countries, already handicapped by limits put to their growth, will have to spend much more for emission reductions, says S. Gopikrishna Warrier.

NO MORE proof is required: environmental diplomacy between India and the US has come to stay.

During the Prime Minister, Mr. Atal Bihari Vajpayee's recent visit to the US, there were enough indications to show that the initiatives launched during the US President Mr. Bill Clinton's India visit were being followed through.

At the White House arrival ceremony, Mr. Clinton called India “an emerging environmental leader, promoting ambitious goals for energy efficiency.” The challenge, he said, was to turn the “common bond” between the two countries into a “common achievement.” For this, “We will continue our work where the world needs both America and India to lead if we are to defeat AIDS, reduce poverty, protect the global environment and open the global economy.”

The joint statement issued after the talks stated that the two leaders recognized “the need for appropriate technology for power generation” as well as “the development and application of clean technologies to address the problems of urban and water pollution.”

“The two leaders expressed satisfaction that the joint consultative group on clean energy and environment met in July and agreed to revitalize and expand energy conservation, while discussing the full range of issues relating to environment and climate change,” the joint statement added.

Mr. Clinton opened his “gift hamper on environment” when he came to India in March. This included a commitment of $45 million to promote more efficient energy production and use in India, and a $25 million assistance from the US Agency for International Development (USAID) for an energy conservation and commercialization project.

The economic sanctions in environment and energy were lifted and $200 million was committed through the export-import bank. Further, during the US Presidential visit, it was announced that the US Department of Energy would resume its collaboration on power sector reforms and run projects on energy efficiency and renewable energy. Similarly, the US Environment Protection Agency (USEPA) would renew its cooperation on air quality management, eco-laws and policies, risk assessment, and reduction of priority pollutants and greenhouse gases (GHGs).

There were initiatives for the private sector too. The US Energy Association would collaborate with the Confederation of Indian Industry to set up the Green Business Centre at Hyderabad. The Joint Consultative Groups on Clean Energy and Environment was also conceptualized.

At this visit, a joint statement on cooperation in energy and environment was signed between the External Affairs Minister, Mr. Jaswant Singh, and the US Secretary of State, Ms. Madeleine Albright. This joint statement spells out the reason for this diplomacy.

It stated that the two countries intended to work together and with other countries, in appropriate fora, towards early agreement on the elements on the Kyoto mechanisms, including the Clean Development Mechanism (CDM), which could offer opportunity for mutually beneficial partnership between developed and developing countries. “CDM could provide important opportunities for economic growth and environmental protection.”

CDM—one of the three flexible mechanisms defined in the Kyoto Protocol—is the bridge on which this diplomacy is built. This mechanism permits American public or private bodies to get Certified Emission Reductions (CERs) for financial or technological assistance to reduce carbon emissions in Indian projects. The CERs could meet the US' emission reduction targets by the end of the decade. Due to lower technology standards a dollar in technology invested in India can give higher carbon mitigation than the same amount invested in the US.

The Protocol—developed at the Third Conference of Parties (COP-3) to the United Nations Framework Convention on Climate Change (UNFCCC) held at Kyoto, Japan, in December 1997—is yet to come into force. To happen, it has to be ratified by at least 55 parties, with industrialised countries forming at least 55 per cent of this.

Of the UNFCCC's 184 members, 29 have ratified it. All of them are developing countries. India has not signed the Protocol. The US signed it in November 1998 but has not ratified it. If the Protocol comes into force, developed countries will be legally committed to cut carbon emissions by 5 per cent by the end of this decade.

The main agenda of the Sixth Conference of Parties (COP-6), to be held at The Hague, Netherlands, November 13-24, is to agree on a plan that will win the ratification by members around the world.

Even before the Protocol has come to force, there is a rush to get CERs from developing countries. China, India and Brazil are seen as the countries with a lot of potential for CDM. The market is not necessarily related to the present carbon emissions of these countries, which is not very high in national and per capita terms.

For instance, in 1998 the total emission was 6.138 billion tons of carbon. Of this, the US figure, with a population of about 250 million, was 1.46 billion tons, and India's figure, with a population of close to a billion, 276 million tons. China, on the other hand, emitted 803 million tons of carbon.

The market is for the carbon these countries are expected to emit in the next 8-10 years, when they use their fossil fuel reserves for economic development. From the point of view of the developed countries, the beauty of the CDM mechanism is that the CERs collected can be banked and used at review time between 2008 and 2012.

This is exactly the aim of the US administration's strategy on the issue of reducing emissions, announced by Mr. Clinton in October 1997. It aims at using low-cost options for reaching the 1990 emission levels by 2008-12, and reductions below 1990 levels in the next five-year period.

More interesting than the emission reduction target (which is less stringent than what later emerged in the Kyoto Protocol) are the methods devised to reach this target. There were five principles to Mr. Clinton's climate-change strategy:

*The policies should be guided by science.

*They should rely on market-based common-sense tools.

*The US should seek win-win solutions.

*Global participation is essential to address the global climate-change problem.

*There must be regular common sense reviews of the economics and science of climate change.

Much carbon dioxide has accumulated in the earth's atmosphere since this strategy was announced (before the Kyoto Protocol), but much of the US' actions on the climate-change issue stems from it.

What the strategy calls “market-based common-sense tools,” perhaps the precursor to the flexible mechanism, is based on the premise that the cost of protecting the environment can be lowered substantially if the power of the market is harnessed. It includes a domestic and international permit trading system for GHG emissions.

The crux, however, is to first exploit the opportunities for win-win reductions. “By emphasizing the importance of an international trading system and joint implementation we take advantage of the low-cost reduction possibilities, wherever they occur—either here or abroad."

This means that the US will work to collect the low-hanging fruit, before others can reach them. It could keep its own low-cost mitigation options in reserve, to be used later (like how it is now releasing oil from its Strategic Petroleum Reserve). A justifiable objective from the American point of view, but not necessarily an equitable proposition for India.

It is here that the pincer begins to bite. Mr. Clinton's administration wants the developing countries—which, under the UN Framework Convention on Climate Change, do not have to make emission cuts—to voluntarily set limits to emission.

In the 1997 document, he had committed that “The US will not adopt binding obligations without developing country participation.” This caveat is still valid since the US has not ratified the Kyoto Protocol. And without the ratification by the largest GHG emitter, the Protocol will not have any relevance.

Climate change is a global problem and requires a global solution, runs the argument in the strategy paper. “Given that developing country emissions will eclipse those from the developed world within several decades, these countries need to do more. Accordingly, the US calls on developing countries to strengthen their existing commitments and to agree that their obligations must increase over time to include binding emission limits.”

With the clout that the US has in the climate change negotiations, India and the other developing countries may well be pressured to make “voluntary” emission limits. And when this happens the low-cost options for emission reductions would have disappeared. These developing countries, already handicapped by limits put to their growth, will have to spend much more for emission reductions.

So much so that there is already work being done to look at CERs or carbon credits from developing countries as depletable resource stocks (Adam Rose et al, Pennsylvania State

University). This would mean that developing countries should form a cartel (OPEC-style) and charge a premium for the CERs.

It is the possibility of such situations that the US-initiated green diplomacy seeks to counter. The 1997 strategy states that in addition to pursuing the agreement in international negotiations, the administration will also pursue bilateral dialogues with key developing countries.

For India, the fallout from this has been the unprecedented importance that Mr. Clinton gave to green issues during his visit to India, and during Mr. Vajpayee's recent visit to the US.

All the projects for which financial support was committed during Mr. Clinton's visit -- clean and renewable energy, energy conservation, monitoring air quality, and reduction of GHGs -- are those related to areas covered by the climate-change negotiations.

It is not as if there are no benefits for India from the CDM. Investments in cleaner technologies always have their positive paybacks to the environment and people's health. Renewable energy technologies, on the other hand, can help reduce the dependence on fossil fuels. Projects for carbon sequestration can help in increasing the vegetation cover.

The point, however, is that enough care needs to be taken to see that the country's future options are not foreclosed merely because the options for immediate carbon credit are alluring.

At the banquet hosted in his honor, Mr. Vajpayee referred to Mr. Clinton as Dada, and thanked him for “rediscovering India.” It is not known in what sense he meant the word dada. Considering Mr. Vajpayee's seniority in comparison to the rather youthful Mr. Clinton, it is unlikely it was in the Bengali sense of the word meaning “elder brother,” nor in the Hindi sense meaning “grandfather.”

Perhaps, Mr. Vajpayee would have jokingly meant, as in Mumbai slang, “the Don.” The Indian negotiators at the climate-change negotiations have to see to it that the joke does not become a reality.

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Related Web Sites

Websites
Market Opportunities Through Climate Mitigation

www.ceeindia.org/greenhousegases
This site was created for the market Opportunities through Climate Change project by the Center for Environment Education (CEE) under contract to GreenCOM. It contains the factsheets given out at the press briefings as well as a summary of the press briefings.

www.ceeindia.org
The home site of CEE.

www.usaid.gov/environment/greencom
Home site of GreenCOM. Includes a description of the project along with descriptions of other GreenCOM projects.

www.cleantechindia.com
By FICCI, the Federation of Indian Chambers of Commerce and Industry. Focuses on climate-friendly technology as part of its Environment Information Centre.

www.ciionline.org/climatechange/index.html
Section of the Confederation of Indian Industry (CII) site dealing with climate change.

www.ccasia.teri.res.in
By the Tata Energy Research Institute. Policy research on climate change in Asia.

www.cseindia.org
For the case against India reducing carbon emissions. By the Center for Science and Enviornment.

www.unfcc.de
The mother of all climate change policy websites. By the UN Framework Convention on Climate Change Secretariat. For primary source material on all international agreements and negotiations.