

Krey, Matthias; Michaelowa, Axel; Deodhar, Vinay

**Working Paper**

## Financing Structures for CDM Projects in India and Capacity Building Options for EU-Indo Collaboration

HWWA Discussion Paper, No. 247

**Provided in Cooperation with:**

Hamburgisches Welt-Wirtschafts-Archiv (HWWA)

*Suggested Citation:* Krey, Matthias; Michaelowa, Axel; Deodhar, Vinay (2003) : Financing Structures for CDM Projects in India and Capacity Building Options for EU-Indo Collaboration, HWWA Discussion Paper, No. 247, Hamburg Institute of International Economics (HWWA), Hamburg

This Version is available at:

<https://hdl.handle.net/10419/19219>

**Standard-Nutzungsbedingungen:**

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

**Terms of use:**

*Documents in EconStor may be saved and copied for your personal and scholarly purposes.*

*You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.*

*If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.*

# **Financing Structures for CDM Projects in India and Capacity Building Options for EU-Indo Collaboration**

**Vinay Deodhar  
Axel Michaelowa  
Matthias Krey**

HWWA DISCUSSION PAPER

**247**

Hamburgisches Welt-Wirtschafts-Archiv (HWWA)  
Hamburg Institute of International Economics

**2003**

ISSN 1616-4814

Hamburgisches Welt-Wirtschafts-Archiv (HWWA)  
Hamburg Institute of International Economics  
Neuer Jungfernstieg 21 - 20347 Hamburg, Germany  
Telefon: 040/428 34 355  
Telefax: 040/428 34 451  
e-mail: [hwwa@hwwa.de](mailto:hwwa@hwwa.de)  
Internet: <http://www.hwwa.de>

The HWWA is a member of:

- Wissenschaftsgemeinschaft Gottfried Wilhelm Leibniz (WGL)
- Arbeitsgemeinschaft deutscher wirtschaftswissenschaftlicher Forschungsinstitute (ARGE)
- Association d'Instituts Européens de Conjoncture Economique (AIECE)

# **HWWA Discussion Paper**

## **Financing Structures for CDM Projects in India and Capacity Building Options for EU-Indo Collaboration**

**Vinay Deodhar\***  
**Axel Michaelowa**  
**Matthias Krey**

HWWA Discussion Paper 247  
<http://www.hwwa.de>

Hamburg Institute of International Economics (HWWA)  
Neuer Jungfernstieg 21 - 20347 Hamburg, Germany  
e-mail: [hwwa@hwwa.de](mailto:hwwa@hwwa.de)

\* Vinay Deodhar has been a guest researcher of Hamburg Institute in August 2003. Views expressed are personal and not to be attributed to any organization that he may be associated within any capacity.

A major part of our insights concerning Indian CDM development was collected during a CDM capacity building programme on behalf of GTZ.

This paper was prepared within the Programme International Climate Policy

Edited by the Department World Economy  
Head: PD Dr. Carsten Hefeker

# Financing Structures for CDM Projects in India and Capacity Building Options for EU-Indo Collaboration

## ABSTRACT

The Clean Development Mechanism (CDM) under the Kyoto Protocol to the UN Framework Convention on Climate Change (UNFCCC) enables industrialized countries to meet a part of their emission reduction requirements through purchase of emission reduction credits from projects in developing countries. Various studies have concluded that India is likely to be one of the major countries supplying such projects. However, in order that a large number of high-quality CDM projects is developed and result in Certified Emission Reductions as specified by the international CDM Executive Board, the institutional set up in the Indian finance sector has to be suitably geared up. So far, banks and financial institutions have not developed procedures for efficient financing of CDM projects. A necessary condition for an in-depth involvement of the financial sector is the development of transparent and effective approval rules by regulators both on the central and state level as well as improved project development capacity of the private sector. Then conventional and novel financing instruments such as project finance for large projects, Special Purpose Vehicles, CDM funds or CDM bonds could become attractive to banks. Such a set up helps in reducing the permit credit risks and political risks considerably.

This discussion paper describes the current status of the CDM stakeholders in India, assesses risk perspectives of CDM projects and provides suggestions for approaches these stakeholders may adopt in order that projects from Indian promoters are able to capture a sizeable share of emerging competitive CDM market. It also defines options for capacity building support from EU countries.

JEL-Classification: Q 25, O13

Keywords: International Climate Policy, CDM, Financial Institutions, India

Vinay Deodhar, [vinay\\_deodhar@yahoo.com](mailto:vinay_deodhar@yahoo.com)

Axel Michaelowa

Hamburg Institute of International Economics, Programme International Climate Policy,  
[axel.michaelowa@hwwa.de](mailto:axel.michaelowa@hwwa.de)

Michael Krey, [mootias@gmx.de](mailto:mootias@gmx.de)

# 1 Background

Anthropogenic climate change has become visible in the past two decades. Thus the community of nations, especially the developed ones, have negotiated actions to reduce the emissions of greenhouse gases (GHG), which are the main cause of global warming. Under the United Nations Framework Convention on Climate Change (UNFCCC) and its Kyoto Protocol several innovative mechanisms are available for enabling countries to meet their “target” of GHG emissions in the first commitment period 2008 – 12 at lowest cost. These mechanisms are thus referred to as “Market Mechanisms” and provide for transactions between two nations. Under one of the mechanisms called Clean Development Mechanism (CDM), the government or a company of one of the developed nations having a GHG reduction target can invest in a project developed by an entity in a developing country. The investor receives certified emission reductions (CERs) verified by an independent accreditation agency. The CERs can be credited towards the investor’s target. The developing nations called “Host Countries” (HC) have to set up a process of approval of these projects. The HC approval basically ensures that the project meets “Sustainable Development” (SD) criteria decided by the Government of that country.

At present only a few developing countries are in advanced stages of CDM approval institution and project development. Noteworthy among them are the Latin American countries like Costa Rica and Brazil. The large potential CDM hosts like China, India and Indonesia are lagging behind. It is clear that this lag has a negative impact on competitiveness and can only be overcome through quick implementation of targeted policies. Any developing country wishing to embark on a CDM strategy should check:

- whether it could offer an attractive supply of cheap CDM projects. This includes an assessment of the development of the greenhouse gas market. Given that about 100 CDM projects are expected to be submitted for registration in 2003, the larger countries may supply 10 to 20 per year;
- how the synergy between emission reduction and national development goals can be maximized. If a national sustainable development strategy already exists, the better;
- whether it has enough human and institutional capacity to sustain a CDM strategy or could build it up with the help of donors. This requires knowledge about the international CDM rules, the activities of the competitors and contacts to donors.

In the initial phase of discussion on the CDM most observers, even from business (WBCSD 2000) expected the Annex I countries to implement domestic policies that would create an incentive for private sector engagement in CDM projects and induce private companies to directly invest bilaterally or multilaterally (via a fund) into CDM projects in order to take full advantage of “cheap” abatement options before the start of

the first commitment period from 2008-2012. However, Annex I countries seem to lack enthusiasm for the CDM. No governments have set direct incentives for CDM investment. Both governments and private companies seem not to be willing to invest directly in CDM projects due to high perceived risks. Experience from both the PCF and CERUPT shows that the parties in need for CERs prefer to buy CERs before their issuance via an Emission Reduction Purchase Agreement (ERPA) without taking on any risk in CDM project development. Under this situation financing for CDM projects have to come from within the host countries (unilateral projects) if they want to benefit from the opportunities the CDM offers. India is seen as one of the Non-Annex I countries offering the largest potential for CDM development, besides China and Brazil (Point Carbon 2003).

While CER revenue would provide additional cash flow, recent analysis on the basis of forecast market prices of 3 to 5 \$ per t CO<sub>2</sub> (e.g. Jotzo and Michaelowa 2002) show that IRR improvement for a variety of project types (except for those involving mitigation of GHGs other than CO<sub>2</sub>) is expected to be in the range of 0 – 3%. So far India is not prepared for tapping this potential as not much benefits are seen forthcoming by both project developers as well as the Indian financial sector. This enhances the importance of flexible and non bureaucratic clearance procedures by HCs. Investment in CDM projects is still widely regarded as an uncertain process and not worth investment even in project preparation. Since the actual emission reductions from a CDM project depend on its satisfactory performance, the money flow takes place post facto. Thus, the cash flows from the sale of emissions are adjusted annually or bi-annually based on performance and its verification by independent agencies. This project structure is suitable for a project finance transaction. However, the project finance model (or non-recourse or limited recourse based project financing) is in its infancy in India and has only been applied for large size infrastructure projects with a mixed success. Consequently, projects that would be attractive for CDM such as renewable energy and energy efficiency ones need other financing structures. The purpose of this research paper is to assess various financial structures and instruments and review their suitability, preconditions and institutional structures necessary to be put in place by the government of India (GOI) or other stakeholders in order to maximize the flow of carbon investments into India.

To this end this discussion paper is structured as follows. Chapter 2 gives an overview the current financing options for CDM-like projects and the current status of CDM Project Financing in India. Chapter 3 elaborates on the risks a CDM project is exposed to. A differentiation is made between conventional project risk and particular risks of

CDM projects. Subsequently, chapter 4 discusses necessary conditions for a successful financing of CDM projects in India to which the governmental as well as private stakeholders could contribute. Chapter 5 makes detailed suggestions for how to achieve sustainable financing of CDM project in India on the basis of the discussion in chapter 3 and chapter 4. Subsequently, chapter 6 highlights concrete options for capacity building activities in India. Finally, chapter 7 elaborates on the institutional links between both international governmental and private actors that could facilitate sustainable financing of CDM projects in India.

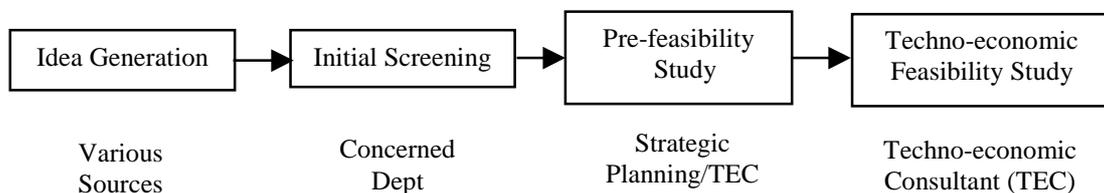
## 2 Current Status

### 2.1 Typology of Financing Structures for CDM Eligible Projects

Conventionally, the projects eligible for CDM investments have been making use of standard financial instruments offered by banks/financial institutions (FIs).

#### 2.1.1 Equity financing

Equity funds are basically company owners' funds raised either through a fresh share issue or brought in through reinvestment of profits. At any point of time the cash generating companies are looking for possible projects for investment so as to improve their profitability. The prime criterion for the investment in projects is incremental revenue from them. The project that does the best in terms of return on capital will have priority in the use of equity capital. However, many companies have policies that fix a base rate of return below which the money will be invested in short term deposits or other safe securities. This "hurdle" rate effects management decisions. The decision making process follows the below mentioned steps:



The return on investment target varies from company to company and so does the risk appetite. Many organizations have also policies by which they prefer certain sectors. This may be on account of higher risk perception or a policy not to diversify into unrelated sectors. Generally, investments to upgrade own operations or to get a new captive power supply would be most attractive as they improve the overall operational efficiency of the company.

The policies towards clean energy projects do not follow a focused approach. There is no or very little distinction made between these and other projects. The Indian industry weighs these projects from the fiscal benefits that they qualify for against the hurdles that have to be cleared to have the power purchase agreement, transaction costs for mobilization of subsidies by the Ministry of Non-conventional Energy Sources (MNES) etc.

It has been observed, for various reasons, large corporate entities shun the clean energy projects, especially the renewable energy-based projects. The main reason is the small size of investments involved in them that leads to a higher overhead percentage. However, this trend is changing gradually especially with a higher sensibility to the energy cost leading to energy efficiency projects. Thus, Tata Iron & Steel Company has in fact converted many of its efficiency and de-bottlenecking projects into carbon offset projects and is currently negotiating with some Japanese investors<sup>1</sup>. As the carbon market matures, the carbon investments in CDM projects by such credit worthy Indian companies may be in the form of equity capital. The risk perception by the global investors and ability of absorbing the liability of these companies is higher.

### ***2.1.2 Venture capital and Special Mutual Funds***

The mutual funds sector has been developing progressively in India in the last decade or so. Many professional fund managers with collaboration with international fund managers have floated several funds in the last two years. Some of these have specialized in selected sectors like pharmaceutical and telecommunications. Similarly, venture capital funds have grown over the past decade and half. There are some venture capital funds that specialize in the energy sector. A CDM fund would be feasible as the CDM market picks up. At present the awareness about UNFCCC and market mechanisms like CDM among the existing Mutual and Venture Capital fund managers is poor.

### ***2.1.3 Corporate finance***

The current trend among the banks is to consider a corporate entity as a whole for credit rating. The investments considered by banks/FIs include apart from capital investments, other fund requirements like even payments for Voluntary Retirement Schemes. The main security for the corporate loans would be the balance sheet. The institution would conduct a due diligence of the company's operations and accord it a credit rating. Based

---

<sup>1</sup> Presentation on TISCO's efforts on climate change mitigation projects by Mr. R. P. Sharma, Sr. Manager, TISCO

on the rating and the risk premium practices the applicable rate would be decided. Here, the actual investments in individual purposes would be left to the concerned company. The financial institutions could consider CDM projects as a part of investment programs of the corporate clients. However, separate monitoring and verification of these projects would be essential.

#### ***2.1.4 Lending***

Some years back the development finance institutions (DFIs) were engaged in pure lending for concrete projects. The process involved a detailed appraisal of the promoter, market for the product/service, project cost, profitability etc. Today only few of the long term lending institutions like, PFC, IREDA, IDFC and select banks are engaged in this activity. However, the majority of the renewable energy based projects that have been cleared in India have been able to get loans from these institutions. This is mainly due to the mandates and subsidies given by the Government to the above FIs promoted by it. These institutions are already considering CDM benefits that a project may be able to obtain. They are, however, grappling with the suitable manner in which CER revenues can be integrated into the profitability analyses of the CDM projects.

Another major lending instrument is debenture issued by companies. These are debt instruments which are issued through public or limited offer. Normally such instruments are rated by rating companies CRISIL or ICRA. Similarly, large corporate houses raise money in the financial market by issuing commercial paper as their credit rating enables them borrowing on short term at market rates. There are many such companies, which enjoy a good standing in the market and on the bourses.

#### ***2.1.5 Merchant financing – Lease/Equipment finance***

Though not prevalent in case of CDM eligible projects, this could be one possible route for investors, especially those supplying equipment/technology. Here the assets leased out remains on the balance sheet of the lessor, who is able to claim depreciation benefits. Obviously the implicit interest rates would be higher than in the case of equity and likely also corporate financing.

#### ***2.1.6 Project Finance***

This route is emerging mainly for infrastructure projects, which involve large investments and whose revenue accrues during a long period (15 –20 years). Essentially this future income stream is securitized and funding is provided to the proponent, who could be a specially floated new entity or Special Purpose Vehicle (SPV). Underlying

the income stream is a contract or a concession, that provides comfort to the lenders and strategic investors. This structure is most suitable for CDM projects as the CERs accrue from year to year and an emission reduction purchase agreement (ERPA) would be the underlying contract.

## **2.2 Banking sector structure**

The structure and operation of the banking system in the developing countries is crucial for speedier implementation of CDM projects. The Indian banking system has undergone several changes in the recent past. The development banking system which financed long term projects with long term financial instruments has almost been dismantled as the funding sources for them have become more short term. The asset - liability mismatch between fund sources and the lender widened. The present banking system relies on short term deposits and saving account deposits. A portion of these which is basically the dormant portion is used for lending operations. Even then the loan duration has come down from earlier 8 – 10 years to 3 – 5 years. The banks have or are in process of developing their own credit rating system. The largest bank - State Bank of India - has developed a system, which is likely to adopted by other smaller banks, with minor modifications. The commercial banks in India have large pools of investible funds. After meeting the statutory liquidity criteria of RBI these funds could be available for medium term lending. While many banks invest these funds in money markets, some large size banks have started financing energy/infrastructure projects for utilizing these funds effectively.

## **3 CDM project development in India**

The CDM project development process in India picked up in early 2002, when the Netherlands government tender CERUPT was announced. About 17 projects sought approval from the focal Ministry of Environment and Forests (MOEF). Since there was no formal approval authority, MOEF convened an ad hoc group of officials from key concerned ministries like MNES, MOP etc. and the group accorded HC approval to 12 projects, which were submitted to CERUPT. Six projects of these were accepted by the Netherlands in the initial screening and ultimately five were provided with an ERPA. Similar clearances were also provided for projects interested in submission to the Finland tender, and one-off deals.

Another set of projects to which approvals were given or are in progress are the projects prepared/assisted by IDFC for submission to the PCF under an MOU they entered into

with the World Bank in October 2002. The World Bank will be relying on IDFC for the promoter due diligence. The initial investment of \$ 10 million has been fixed.

Moreover, the political process to set up the Designated National Authority under the name of CDM National Authority (CDMNA) has been started in early 2003. This agency will be the authority to accord HC approvals in future.

During early 2003, the GOI decided to separate out the approval and capacity building and appointed the MOEF and the Planning Commission for these two activities respectively. The Planning Commission convened a Task Force with a broad representation. Besides the concerned ministries, the Task Force members include industry associations, research institutions, consultants, representatives from steel industry and financial institution (IDFC). The Task Force is vested with preparation of an Action Plan for capacity building and operationalization of CDM in India. It has met several times and responsibilities for preparing parts of the report have been allocated.

During discussions held on the subject at the Prime Minister's Office (PMO), it was decided to keep the structure of the CDMNA sleek and transparent. It was also suggested that as CDM will attract foreign investment, the working style of the CDMNA should be similar to that of the Foreign Investment Promotion Board (FIPB).

Meanwhile, the industry, Financial Institutions and several consultants have been actively involved in the promotion of CDM projects. Besides the IDFC deal with the World Bank outlined above, the Netherlands based Rabo Bank operates under a similar deal with the Dutch government and thus is looking for CERs. The bank has opened a cell in India and also engaged Winrock International India to conduct a technical analysis of project proposals from India. However, exact details of this arrangement are not known.

### ***3.1 Financial system awareness about CDM***

The awareness about CDM in the financial sector has been growing in the recent past especially since 1998, when major outreach programmes were launched by bilateral agencies like USAID, notably the Greenhouse Gas Pollution Prevention Project's Climate Change Supplement. Thus the banking sector capacity has been improving. This happened at the same time as many of the banks have started development of special innovative financial products, to succeed in the fierce competition. Many banks such as ICICI Bank rely on catering to each business deal in a unique manner and offer specially developed products to suit to the needs of the off taker. Some of the products that have become common are securitization, credit enhancements through trusts, etc.

This will help the CDM projects in many ways, as the banks will be able to assess and cater to the needs of the project proponents. Some banks like SBI, Syndicate Bank, Bank of Baroda etc. have formed separate groups to finance energy efficiency, solar PV and environmental projects. The institutions like IREDA, Power Finance Corporation also lay stress on GHG abatement from the projects being funded by them. Nevertheless, in general, the level of awareness of CDM remains low and is concentrated in a few FIs at present, but is growing.

However, awareness about CDM projects has not grown among insurance companies in India. Though the bulk of the business in this sector so far was in the state owned general insurance, the situation is fast changing with several private insurance companies that have formed joint ventures with international insurance companies. They have begun providing insurance products for industrial projects. However, so far no specific products like weather derivatives or those required for GHG market are ready.

It is understood that the GOI has been reviewing insurance in the context of disaster management and is examining possibility of a unified legislation. It has very recently constituted a high level Task Force on Insurance and Climate Change. (Financial Express August 17, 2003). The Task Force is responsible for:

- Identification of specific national needs and concerns relating to insurance and other related issues arising from adverse impacts of climate change
- Development of strategies and approaches related to insurance and risk assessment in the context of climate change and extreme weather events in various sectors
- Preparation of an approach paper on the theme 'Climate Change and Insurance'

## 4 Risk Considerations in CDM Project Financing

The risk exposure of investments is of high concern for *equity investors* in CDM project and lenders that give credit for CDM projects. This chapter distinguishes between two general types of risk sources of CDM projects in India.

Initially, section 4.1 briefly discusses the risks involved in the underlying project; i.e. the risk of conventional project development for selected potential CDM project types. This section also gives evidence of risk involved in conventional project development in sectors attractive for CDM development. Subsequently, section 4.2 provides the

theoretical basis for the further discussions in this paper by introducing the particular risks involved in CDM projects. Section 4.3 generally discusses options for covering risks in CDM project development.

#### ***4.1 Risks of Conventional Project Development***

In India the main potential for CDM project development lies in renewable energy technologies, energy efficiency in the industry sector, waste to energy projects and highly efficient clean energy technologies in the power plant sector (combined-cycle natural gas, supercritical and Integrated Gasification Combined Cycle coal power plants). There is ample anecdotal evidence that some of the project types outlined above are subject to high risks during their project development. This is especially the case for projects that require a power purchase agreement (PPA) and projects that need a reliable fuel supply arrangement.

The project types that rely on a PPA are the grid-connected renewable energy (RE) technologies (wind, small hydro and biomass) as well as waste to energy projects that produce electricity. In 1994, the Ministry of Non-Conventional Energy Sources (MNES) issued guidelines that recommend to the states to require their State Electricity Boards (SEB) to pay 2.25 Rs./kWh (for base year 1994-95) for electricity from renewable energy technologies with an annual escalation rate of 5%. If all states would have followed that guideline electricity from renewable energy would receive 3.66 Rs/kWh in 2003.

As the state electricity boards that buy power from the grid-connected RE power plants are not in good financial health, they cannot afford to pay the tariffs recommended by the MNES. Moreover, the SEBs argue that the gap between sales and the purchase prices of power is widening and is currently at Rs. 1.10 per kWh (Planning Commission, compilation of Annual Reports of SEBs 2002). Hence not all states have followed the recommendations. Currently, each state offers a different tariff. In the state of Tamil Nadu for example project developers receive a tariff of Rs. 2.70 per kWh but no escalation in the rate. The experience of a renewable energy project developer in the state of Himachal Pradesh that faces a power surplus is much different. Here the SEB is prepared to pay only 1.8 Rs/ kWh which makes the project not bankable. Thus, the project developer engaged in negotiations with the neighbouring states Delhi and Punjab that are still on-going. However, around 20% of each kWh produced will be lost through royalty payments and wheeling charges to the HPSEB and POWERGRID. What is most important to highlight is that it took the SEB of Himachal Pradesh 18 months to approve the sale to the third party.

The electricity from larger private power projects such as medium to large-scale hydro as well as all large scale power plants must be either sold to the SEBs or in case of power plants bigger than 1,000 MW that supply electricity to more than one SEB (“mega-power projects”) can be sold to the Power Trading Corporation (PTC). The latter company ensures that payment for the electricity is guaranteed even if the SEBs fail to pay up. In the former case the project has to rely on the payments from the SEBs which represents a great risk to investors as all SEBs are virtually bankrupt (IEA 2002, p. 66ff.) The incidents surrounding the Dabhol Power Project are good evidence of the risks that large-scale power projects face. Dabhol Power Company, of which ENRON was the major shareholder, planned to install a 2,184 MW combined-cycle gas power plant supplying electricity to the state of Maharashtra, before the announcement of the “mega-power policy”. After a 740 MW unit was commissioned the project was stalled as the Maharashtra SEB defaulted on its payments with the explanation that the price of electricity was too high (4.8 Rs/kWh) (IEA 2002, p. 71f.). A solution to the deadlock has not been found. Generally, one could expect the prices for electricity from conventional coal power plants to be much lower. However, as only high-efficiency coal power plants (supercritical and IGCC) can be expected to be eligible CDM projects, prices will not be significantly lower than the Dabhol Power Project. So far not a single private power project that was fully commissioned was a “mega-power project”. The IEA (2002) study suspects that this is due to the non transparent and inefficient process for obtaining project clearance (IEA 2002, p. 77). The major reason for this was the elaborate three tier security mechanism desired by the IPPs, which is not acceptable to the SEBs and GOI.

Another important risk issue is the fuel supply that is of special concern for biomass projects. Experience from insiders in the Indian biomass market has shown that waste biomass availability might be high on paper but that most of that waste biomass is not applicable for energy generation purposes due to its low quality. The past years have seen a steady increase in the prices for “quality” waste biomass that even forced biomass energy projects to shut down because the higher than expected biomass prices resulted in non-viability of the projects. Biomass projects that rely on energy crops generally carry less risks as long as the water supply for irrigation purposes can be sustained throughout the year. Moreover, since agro-residue collection is not an organised business (except in case of rice husk, which is generated in industry i.e. rice mills) enforceable forward sales agreements cannot be entered into.

A very important project type that received much attention from project developers in India was waste to energy from municipal solid waste (MSW); around 10 such projects are planned as CDM projects.. In 2000, the Ministry of Environment and Forests (MOEF) introduced legislation that required each municipality to identify potential locations for sanitary landfill sites in order to replace the prevailing open dump sites. This was seen as a good opportunity to apply waste to energy technologies to these new sites. Identified technologies have been pyrolysis (gasification) of waste or methane capture and the burning of the gases in a turbine/engine in order to produce electricity. Latest developments at the forerunner waste gasification project of the World Bank, the SWERF project in Tamil Nadu, suggest that waste gasification projects might face the risk of not getting environmental clearance from the SPCBs (State Pollution Control Boards) or at least have to go through very lengthy procedures (see The Hindu, 2002). Initially the SWERF project was expected to take off in 2001. The project has also been facing resistance from green NGOs. The recent trend in MSW to energy projects is to develop small size biomethanation projects ( with capacities of 20 – 40 tonnes per day of biodegradable matter), the technology for which is available within the country.

Energy efficiency projects in the industry can be estimated to have a low risk as not many variables depend on external factors (e.g. EIA should be more straightforward if a process is changed or high-efficiency equipment installed). However, experience has shown that the financially strong industrial companies are not prepared to invest in energy saving measures that have a payback period higher than 2 years because they have access to a variety of more beneficial projects. In general, these small projects are accorded lowest priority and if at all are implemented with internal resources. Other industrial companies lack financial resources and the financing of energy-efficiency projects in such companies can be a risky business. (Kaupp 1998, p. 7ff.)

To sum up the above discussion, one should bear in mind that different potential CDM project types face different project development risk due to the specific characteristics of the project. Generally speaking industrial energy efficiency projects as well as wind energy projects (if planned in states with efficient and transparent PPA procedures) face a relatively low project development risk than projects that depend on a reliable biomass fuel supply, as well as projects that are perceived to have a negative impact on the environment (e.g. waste gasification projects).

## 4.2 Risks of CDM projects

The Net Present Value (NPV) of investment projects is the difference between the discounted inflow and the discounted outflow associated with the project. In the context of a CDM investment the following formula expresses this concept.

$$NPV = \sum \frac{R_t - C_t}{(1 + r)^t}$$

Where,

$R_t$  represents the revenue of the CDM project in period  $t$

$C_t$  are the costs of the CDM project in period  $t$

$r$  is the discount rate

$T$  is the crediting lifetime of the CDM project

The following table shows the different components of the NPV of CDM projects and their affiliated risk factors that Janssen (2001) has found out to be the most important in CDM project development.

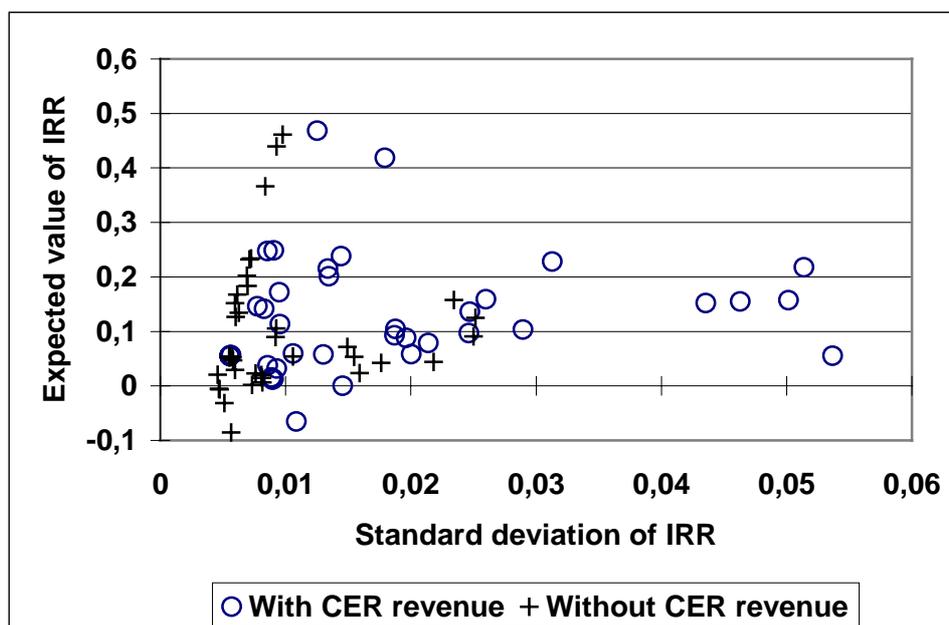
**Table 1: Risk Components of CDM Projects**

<b>Risk Component</b>	<b>Source in the Carbon Component of CDM Project</b>
<b>Uncertain revenues</b>	<p><b>CER quantity risk</b></p> <ul style="list-style-type: none"> <li>- <i>Baseline risk</i>: baseline may need to be adjusted during the crediting period due to technological innovation, new host country energy or environmental policy</li> <li>- <i>Baseline emissions risk</i>: changes in the activity level resulting from uncertain demand, technological under performance, business interruption, etc.</li> </ul> <p><b>CER price risk</b>: Uncertain market price for CERs</p>
<b>Uncertain costs</b>	<p><b>Abatement Costs</b>: Uncertain investment costs and fuel prices</p> <p><b>Transaction Costs</b>: Uncertain market transaction costs and project cycle costs</p>
<b>Uncertain crediting lifetime</b>	Uncertainty if renewal of the crediting period will be possible after 7 (or 14) years
<b>Uncertain discount rate</b>	Problems in determining the relationship between the project risk and general market risk

Source: Janssen 2001, p. 77ff.

Matsuhashi et al. (2002) have done an analysis on which effect a high volatility of CER prices has on the IRR of 42 CDM and JI projects and their standard deviation. With the help of a Monte Carlo Simulation they showed that the more a CDM project relies on the CER value to make it viable the more it is affected by CER price risks. Figure 1 shows how risk (and revenue) of the project mounts when revenue from CERs are included.

**Figure 1:** Expected values and standard deviations in IRR of 42 CDM and JI projects



Source: Matsushashi et al. (2002)

As shown in Table 1, CER price risk besides other risks must be considered as one of the major risk sources of CDM projects. Now, being aware of the effect risk has on the attractiveness of investing of financing CDM projects the question is how the different uncertainties and their risk components can be effectively minimised. One possible way of reducing risk is risk management. It aims at reducing the standard deviation in the distribution of the revenue (IRR) of an investment project. In the next chapter, besides risk management a number of additional measures to reduce uncertainty in CDM project development are discussed.

#### 4.3 Options for Minimising Uncertainties in CDM Investment

In this section, we first of all briefly discuss in how far insurance and risk diversification can play a role in reducing risk of CDM projects. Secondly, we show how far ERPAs can contribute to risk mitigation in financing of CDM projects. Thirdly, we outline how host country governments can effectively contribute to a reduction of risk in CDM project development. Finally, possibilities for reducing the risk of non-approval by the host country and non-validation and certification by the Operational Entities (OEs) are briefly outlined.

#### **4.3.1 *The Role of Insurance in Financing CDM Projects***

Insurance in theory could be a suitable vehicle for reducing risk. However, insurance companies require that they “*can pool a large number of independent and identically distributed events that can give rise to a loss*” (Janssen 2001, p. 167). Janssen (2001) has elaborated on the insurability of the risk components included in Table 1 and concludes that the only risk source that could be insurable in the future is baseline emissions risk via a conventional business interruption insurance (Janssen 2001, p. 170f.). Such an insurance which usually covers the loss in operating profits in the event of loss of production of the primary product could be applied to the profits from the sale of CERs as well. After having done so a loss in production that would also result in a loss of CERs given the relative nature of baselines for CDM projects (activity level) would be insured.

Insurance companies would not be willing to insure all other risk sources as they would either simultaneously affect a high quantity of CDM projects (crediting lifetime risk, baseline risk) or are price risks that are generally not insurable (if one does not count options as an insurance) as it is the case with CER price risk and uncertain costs (Janssen 2001, p. 166ff.).

#### **4.3.2 *The Role of Insurance for Lenders (Debt Capital Investors) in CDM projects***

In addition, insurance covers exist for risks that are tied to specific project stakeholders like debt capital investors, like technological risks or equipment failure risks. The latter is basically an arrangement by which an insurer guarantees to a creditor the payment of principal and interest of debt. Such arrangements are specifically tied to the interest of debt investors, but not to the project value in general (Janssen 2001, p. 174).

#### **4.3.3 *The Potential of Portfolio Risk Diversification of Investments in CDM Projects***

Generally, investment risks will be reduced by investing a given budget into different assets instead of just one. Janssen (2001) showed that risk diversification is a suitable tool for minimising risks of investment in CDM projects either by defining sub-classes of CDM projects for targeting intra-asset risk diversification or via naive risk diversification (Janssen 2001, p. 188ff.). In the former case risk can be diversified along different sub-classes of CDM projects. The highest risk diversification potential is achieved when one classifies and diversifies along the sectors and sources (energy; industrial processes; agriculture; sinks and waste), the technology (energy-efficiency improvement; fuel switching; decarbonization, CO<sub>2</sub> storage and sequestration and switching to renewable energy) and the host countries. In the latter case one will

achieve considerable risk reduction in the portfolio once CDM projects are chosen of which the risk does not perfectly positively correlate. In both cases baseline emissions risk and cost uncertainties are successfully diversified (Janssen 2001, p. 191ff.).

#### ***4.3.4 The Role of Emission Reduction Purchase Agreements (ERPAs)***

ERPAs serve the underlying agreement for securing the CER revenue for the sellers and CERs for the purchasers. Thus, ERPAs reduce the risk burden of Indian CDM investments as they eliminate the permit price risk (at least in the case of punctual delivery). However, ERPAs proposed so far (e.g. CERUPT) are buyer centric. (see Box 1) The draft CERUPT ERPA calls for delivery of at least 70% CERs, failing which the sellers have to pay a fine amounting to 23% of value of the CERs offered annually for each month of non-delivery. Thus, the ERPA itself may have implications on risk in the investment (the standard deviations of the IRR increase) as penalties apply in the case of non-delivery.

#### ***4.3.5 The Role of the Host Country Government in Reducing Uncertainty in CDM Project Development***

Host countries can effectively reduce the uncertainty in transaction costs and permit quantity risk. As discussed above, the set up of the DNA - CDM National Authority is currently underway.

##### ***Box 1: Harrowing experiences of a Climate Change Mitigation Project Promoter***

The recent experience of one CERUPT project developer is eye opening. The project developer and the consultant guiding the project developer had to pass through uncertainties at all the stages. Since the project, a biomass based power project in the state of Maharashtra, was already under formulation when the tender was announced, some changes were necessary in the project structure. Again, since one of the tender requirements was that the project must be contingent upon the money to be received from CERUPT investor, project financing became significantly uncertain and the Indian FIs that were considering the proposal became cautious. Additional expenses were incurred in preparing documentation, which could have become a sunk cost had the project not been accepted. The GOI approval process was uncertain to the extent that the HC approval was accorded just a day prior to the submission deadline. This was followed by the due diligence at various levels. Finally, the ERPA terms provide for penalties @ 2.5% of the total carbon committed and many other clauses that may erode the benefits that the project hopes to achieve

In order to minimise frustration and uncertainty in transaction costs on the side of the CDM project developers the host country should ensure minimisation of delay in the approval process, guarantee transparency and apply a simple procedure and fee structure for approval of each category, if any, during the operation of the DNA. A number of host countries, among which is India, consider taxation of CERs. Possibility of such

taxes will increase the CER quantity risk. It is also of great importance that the host country legally defines the “product” CER and sets up rules and procedures for the CERs to be transferred out of the country.

The procedures of the DNA must allow for publicly available transparent rules and procedures and automatic approval if specific deadlines are not kept. Costa Rican experience with AIJ projects has shown that it is imperative to have a single unit DNA responsible for the solicitation and approval of projects (Michaelowa 2002). It had full decision autonomy and professional permanent staff. Therefore it could avoid a blockade through conflicting interest of different ministries that affected several AIJ projects in Eastern Europe and led to high transaction costs for project developers (Lile et al. 1998).

#### ***4.3.6 Reducing the Risk of Non-approval by the Host Country and Non-Validation by the Operational Entities (OEs)***

The recent EB decisions on the first baseline methodologies submitted to the EB have shown that the EB is committed to ensure additionality of CDM projects. In the future the validator will validate the project on the basis of the methodologies approved by the EB. Considering this, it does make sense for the project developers to review their potential CDM project in the light of strong additionality criteria. A good indicator for strong additionality is the so called “Gold Standard” developed by the World Wide Fund for Nature (WWF). It is publicly available and suggests guidelines for the additionality screen (environmental, investment and financial additionality), baseline development, procedure of the Environmental Impact Assessment (EIA) and the public consultation process. The guidelines should also help to receive host country approval given that the project falls into the sectoral and technological priority of the host country.

## **5 Necessary conditions for successful Financing of CDM projects**

Any new mechanism - especially financial one - leads to development of new financial commodities. In recent times, the financial intermediaries operate on wafer thin margins and so rely on developing new and innovative financial products that gives them a competitive edge over others. Currently, the Indian economy is characterized by abundant availability of cash searching for attractive investment opportunities from creditworthy promoters. A recent survey of the financial institutions suggested that a major part of the banking portfolio is affected by non-performing assets in the system. In order to move towards international best practices and ensure greater transparency

the regulator, Reserve Bank of India has decided to toughen the procedures of qualifying the performance of assets and those for provisioning for them. According to the new norms, a loan asset will be characterized as a non-performing asset if the default persists for 90 days. Therefore, while operationalizing any new mechanism, these factors have to be taken in consideration.

CERs resulting from a CDM project are a classic example of commoditisation of environmental performance improving the business-as-usual situation. We have described risks and problems for financing of CDM projects in India. In the following necessary features of the financing system in India are discussed

### **5.1 *Financial structures***

As the market based mechanisms under the Kyoto Protocol move towards certainty, the international bodies on accounting standards have begun taking note and preparing for suitable accounting standards. For example, the International Financial Reporting Interpretations Committee of (IFRIC) of the International Accounting Standards Board circulated draft interpretation on Emission Rights (IFRIC 2003). The interpretation is still under consideration and expected to be finalized soon. However, the interpretation is pertinent mainly to the companies in the Annex I countries with a cap. The interpretation defines an approach to qualify the emission rights as *Intangible Assets* or *Contingent Liability* under different circumstances. Since India does not have a cap for emissions and the international carbon market is not directly accessible to CDM participants, the accounting standards for the emission rights for Indian companies will be different. An approach for preparing accounting standards for CERs is suggested later. As discussed earlier, carbon investment in the project is likely to be year-on-year values of CERs sold. Consequently, an off-balance sheet structure is likely to be preferred. However, other conventional structures involving owners' equity to be brought in up front or use of internal cash accruals to finance the project are also not ruled out.

### **5.2 *Institutional set up***

Keeping in mind the above options for the financial structures, the banking sector will play an important role especially in assessing the soundness of project proposals. During the early stage of electric power sector reform when the stress was laid on credit appraisal of the Indian JV partners, local due diligence was considered important. Therefore, the foreign lenders found it easy and acceptable to lend to entities which were appraised by local FIs. A similar situation is likely to prevail, wherein the

international investors may find projects appraised by local FIs/Banks more acceptable. This is already the case in the arrangement between World Bank PCF and IDFC. After a due diligence of IDFC's appraisal mechanism, PCF decided to fast track the project PINs proposed through it.

### **5.3 *Conventional project approval processes and effects on CDM regime***

Currently financing for renewable energy projects which forms one of the main CDM project categories is primarily done by the Indian Renewable Energy Development Agency (IREDA). Other institutions like IDFC, Power Finance Corporation and Rural Electrification Corporation (for bagasse cogeneration/biomass power, Mini hydro), HUDCO (MSW to energy) and several banks like SBI, SBH Syndicate Bank etc. also finance specific projects. MNES offers benefits like interest subsidies through IREDA and many of these banks. IREDA and few of the banks have a set appraisal procedure for the projects. However, in many cases especially IREDA the interest rate is not linked to the entity credit rating as is a global practice, thus increasing default risk. This is likely to reduce the acceptability of the appraisal of these institutions in the eyes of the carbon investors.

In case of the energy efficiency projects which is another major category of CDM projects, the main source of funds is the commercial banks, although IREDA also manages a fund created by ADB. The process of appraisal is more or less same as for conventional debt financing. As mentioned earlier, these projects are considered under the routine investment programmes by the companies.

In order to facilitate the CDM projects expeditiously, there is a need for financial intermediaries, who could have several different forms such as Energy Service Companies, leasing companies, mutual funds oriented towards CDM projects etc.

### **5.4 *Regulatory/administrative set up***

The RE based projects to be taken up in states have to be approved by a nodal agency of the MNES. This approval takes into account the technical feasibility of the proposal, availability of resource e.g. biomass or waster for mini hydro projects to meet the needs of projects as well as resourcefulness of the promoters. This regulatory set up helps basic clearance to the project. It also involves analysis of the sustainability aspects of the project. Based on the approval of the nodal agency the promoters develop the project. At the moment, consultants help the promoters to develop the projects into CDM opportunities and prepare the Baseline/PDD. These are considered by MOEF for

HC clearance. Since many of the projects export surplus or the entire power generated to the state grid, a business regulated by the State Electricity Regulatory Commissions, these also play a crucial role, especially with regard to the tariff fixation. As described earlier, MNES formulated a policy for tariffs to be paid by the SEBs for the RE based power projects. The policy is due for review after completion of ten years i.e. in 2004.

Meanwhile, the GOI synchronized all the rules, procedures and laws governing electric power sector into one act, viz. Electricity Act 2003. Under the provisions of this act, the MOP/GOI will be announcing the power policy which is expected to encompass the RE sector. In view of these developments, the regulatory framework for CDM projects is expected to be more streamlined. The SERCs have a general mandate to encourage efficiency as well as environmentally safe technologies. However, in the face of deteriorating financial health of the SEBs and the growing gap between tariff paid and net average realization from consumers, they do not recommend preferential tariffs to the RE based power. While, this is likely to strengthen the case for CDM eligibility of the RE projects, the financial viability of the project is reduced. It is, therefore, essential that the proposed power policy clearly states tariffs for the RE sector and ownership of CERs.

## 6 Detailed Suggestions to achieve sustainable financing of CDM Projects

### 6.1 *Project Specific Financial mechanisms/structures for risk minimization*

From the earlier discussions it is obvious that the off balance sheet structures with no or limited recourse to the parent company are the most feasible structures for CDM projects. Since the main focus of this paper is on commercial financing instruments, the options like subsidies, grants etc. have not been considered. At one point the CDM investors were even expected to bring in equity in such projects. However, with the risk profiles of promoters in developing countries and reduction in the size of offset market this has withered away. Now the only option available is through purchase agreements bringing year to year revenue in exchange with the CERs. However, there still are difficulties for investors from Annex I countries in assessing sellers from developing countries with associated high costs. In view of this, the following options are suggested for financial structures:

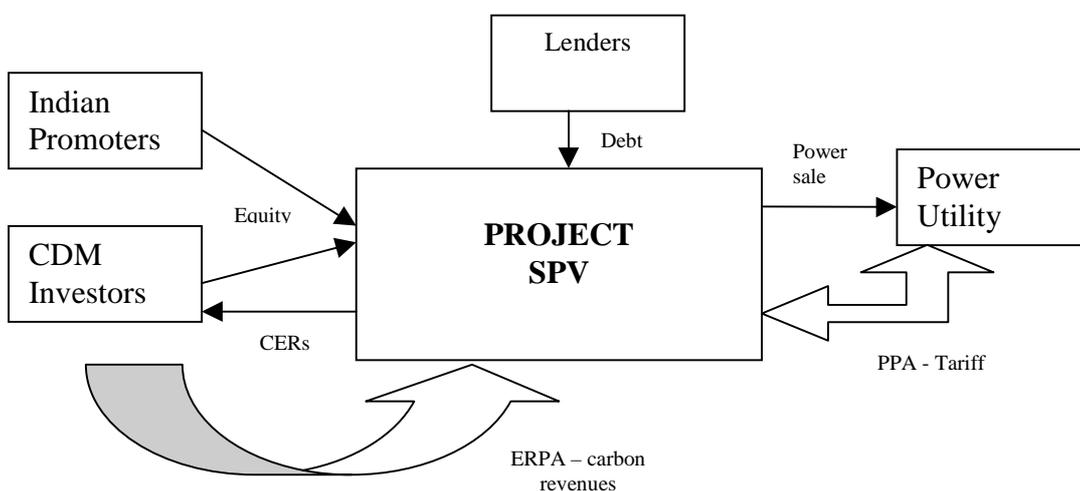
### 6.1.1 Project Based Investments

This is the main form in which the CDM investments are expected to take place. Under this mechanism, the investors in Annex I nations might get involved in the project development at various stages, from promotion or at advanced stage near the financial closure. In the initial phase the process of identification of the projects was facilitated by the country government e.g. The Netherlands for CERUPT tender. However, as the sector matures, direct deals between the project promoters and emission reduction buyers are also expected to take place. The tender route helps in mitigating the political risks to a major extent. Similarly, there is also a trend for adopting bilateral agreements for facilitating trade, which is more in line with current practices. In case of project based investments, which may be facilitated by a focal agency in the investing nation, there could be some preference for sectors, e.g. cement, steel etc. Under this structure, the investors would enter into an ERPA with buyer(s) on a mutually agreed terms. The project risk could be limited by having recourse to the balance sheet of the promoters.

### 6.1.2 Formation of Special Purpose Vehicles

Under this structure, a separate company is promoted for undertaking specific CDM project(s). The CDM investors would have different options. They could invest in a small portion in equity capital, sufficient to possess a voting right, thereby ensuring proper operation of project. Otherwise, they may have an ERPA as in the earlier case. The difference between the direct investment and SPV is that there may be a limited or no recourse to the promoters' balance sheet. The major comfort for risk mitigation for SPV projects would come from underlying agreements like PPA for projects selling power to utility grid.

Another variation of the SPV concept could be an energy Service Company that takes up energy supply or efficiency improvement projects at the client entity. The performance contract would specify ownership of the CERs generated in the project with the ESCO. The CDM investors in turn could invest in the ESCO for purchase of the CERs or buy the CERs year to year. This way the technical and financial risks in the CDM project could be mitigated.



***An Illustrative model:***

**Case of RE based Project to sell power to a state grid:**

**Cost:** 100 Units    **Debt:** 70 Units    **Equity:** 30 Units

**Equity contribution:** Core promoters: 10 Units

Friends/relatives/public: 10 Units

CDM Investors: 10 Units **Total** = 30 Units

**Debt:** Indian/Foreign/multilateral Institutions: 70 Units

**CDM investors:** Nominee on company board (to ensure proper project operation), First right of refusal for purchase of CERs. Shareholders agreement may specify conversion clauses for conversion of equity into CERs at end of target period. This would reduce the credit permit risk considerably.

**Core promoters:** Get up-front equity from CDM investors. Guaranteed buyer for CERs. Easier to prove additionality and convincing HC DNA.

***Project Finance***

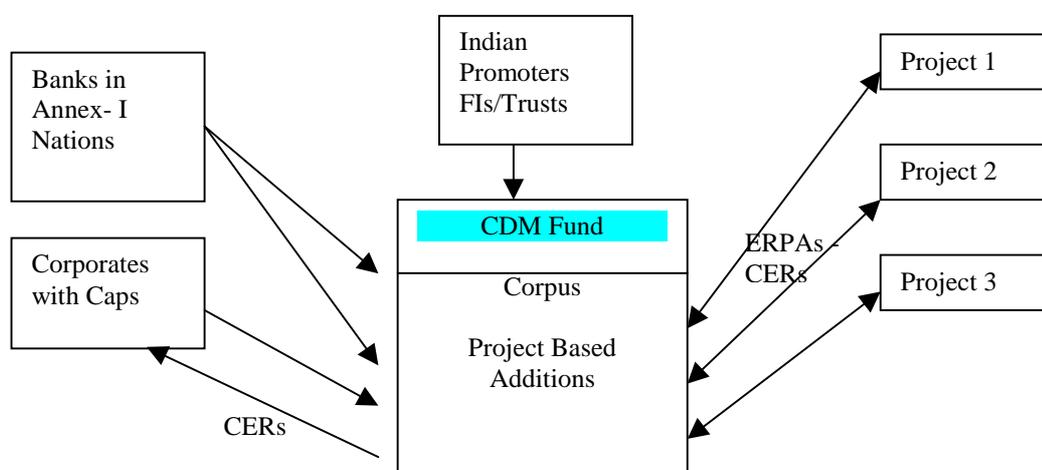
**Structure retained:** Power sale revenue as specified by the PPA CER Revenue as specified by the ERPA. Lender get more comfort by CER revenue and rigorous M&V. This would improve the lenders outlook towards the project, thereby reducing financial risk.

**6.1.3 CDM Funds**

As described earlier, funds, especially mutual funds have been working in India for a long time now. There have been examples of special purpose funds as well. However, so far these funds invest in stock market instruments or bonds floated by companies. The debt funds are yet to develop in India. However, with reduction in money available for long term investments, such debt funds may come up soon. It may be possible to envisage CDM funds with investment from companies/investors from Annex I nations. These funds, to be managed by professional fund managers, or Trusts with specific objectives, would identify suitable CDM projects based on certain predetermined criteria. This would help understand the Indian market and alleviate the risk.

#### 6.1.4 CDM Bonds

Matsuhashi et al. (2003) have suggested the concept of CDM Bonds as a tool to diversify investment in various sectors and countries. This would also enable reduction in baseline risk, certification risk and country risk. Matsuhashi suggests a CDM bond as a kind of securitization. Investment banks or securities companies after their due diligence and project risk assessment may structure them and float CDM Bonds, i.e. project bonds with CER units. These banks would sell these bonds to individual investors, or buyers with caps. It may also be possible to prepare portfolios of the CDM bonds to sell as CDM Fund as discussed earlier.



The above structure of CDM Bonds has an effect of diversifying risks. As has been shown in Janssen 2001, the risk of a portfolio of assets is less than the sum of risks of individual assets, the bond manager would be in a position to spread the risks among the portfolio thereby reducing the overall risk.

#### 6.2 Banks, IBA/RBI

As seen above the different instruments discussed above offer a vast scope for innovative financial engineering. As is happening in the retail business practice, the survival of banks and financial intermediaries largely depends on their ability to devise newer financial instruments to cater well to the needs of customers and responding with speed. Under these circumstances even the thinner margins would make sense. The banks in India have begun to respond to these needs. The CDM market would benefit from the expertise developed on special products development. However, the number of banks which have proper credit/risk rating practices is still low. It is imperative that the entire financial system embraces these practices.

The banks' understanding of CDM projects although growing needs a further boost. The capacity building programs which an author of this paper organized, had mixed results. Many of the institutions like IDFC and its subsidiary IDECK, ICICI Bank, IL&FS, IREDA, HUDCO, PFC as well as a few private banks like Bank of Baroda, were the frontrunners in these programs. However, involvement at higher levels of management is essential. Many banks have begun financing renewable energy and energy efficiency projects, but they still lack awareness about structuring them as CDM projects. However, many banks especially the private banks need to orient to the business of financing CDM type projects. In this connection, besides the capacity building, two major actions are suggested.

First the Reserve Bank of India should co-ordinate with the proposed CDMNA in preparing and linking the credit manual that the banks could adopt. This manual could define in explicit manner the requirement for the bank officials to look into CDM type projects. This could also mean standardizing the risk assessment procedures of all the banks. This would go a long way in standardizing the system and enable the CDM investors to compare and rank different CDM projects.

Second, the Indian Banks Association may prepare a common position of banks and financial sector on various requirements, e.g. accounting standards for treatment of the CER assets (this would implicitly involve the Institute of Chartered Accountants of India and the Dept. Of Company Affairs, Min. of Finance), concessions on stamp duties and taxes on the CER revenues etc. This exercise would streamline the inflows of the CDM investments.

### **6.3 Insurance Companies**

At the time of preparing this paper it was reported that the GOI has constituted a Task Force to undertake specific tasks mentioned earlier. The Task Force is based on the recommendations of the World Bank regarding cautions on disaster management and need for unification of legislation on this. Thus, the GOI has recognized the importance of the climate change and its possible impacts on the economy as a whole. The Task Force has therefore to interact with domestic insurance companies as well as international insurance companies. The list of tasks identified for the task force show that insurance is only seen as a vehicle for adaptation to climate change impacts, an attempt should be made to include insurance for mitigation projects as well. Recommendations given by the UNEP – Financial Institutions Initiative (2003)

concerning risk avoidance, reduction, transfer and retention should be taken into account.

The insurance industry in India need to prepare for developing specific products for CDM projects on the one hand and incorporate concerns on environmental sustainability of industrial and urban activities being covered by them. Project insurance is slowly picking up especially with the presence of several multinational insurance companies, who offer such products in their home countries. The insurance industry could develop CDM insurance which can cover the loss of business cover to these projects.

#### **6.4 Role of Government of India**

It is also of great importance that the host country legally defines the “product” CER and sets up rules and procedures for the CERs to be transferred out of the country. It would be advisable that in India the Ministry of Finance (MoF) the Law Ministry and the Ministry of Commerce (MoC) pave the way for the legal definition and the transfer of CERs.

In the light of developments on CDM project promotion in India the following suggestions are made:

##### **6.4.1 CDM – National Authority (CDM NA)**

- The rules and criteria for HC approval of CDM projects must be transparent, business like and publicly available.
- The CDM NA should have high independence and approval authority (Costa Rican example). This would allow transparent and speedy decision making. The NA should have a small full time secretariat staffed by professionals from the fields of energy, environment, finance and urban sectors.
- As far as possible the bureaucrats posted at the DNA should have understanding, interest in the field and should at least serve three years in the place. The above mentioned secretariat would offer continuity to the decision makers.
- The decision making must be time bound as in the case of FIPB. Automatic approval should be accorded to the projects if specific deadlines are not kept.
- The CDM NA must go through issues of adherence to sustainable development criteria of the nation. The other issues like effective use of subsidies and replacement by CER revenues must also be dealt with clearly. In this regard it is essential to co-ordinate with the EB to avoid a clash with international CDM rules.
- CDM NA should not devote a great deal of effort to assess the financial viability of the projects. Since CDM is a market based mechanism, the promoters (sellers of credits) and buyers would naturally go through these issues. Moreover, the domestic lenders and investors would also take care of the economic feasibility aspects.
- The current trend at the CDM EB is to review new methodologies. The additionality definitions mainly depends on the local situation in the HC. Therefore, provision of

data for EB-approved baseline methodologies becomes very crucial. The key departments that collect the data (CEA, planning commission, industry associations) may format the data suitably and post it on the CDM NA website. For ensuring the correctness of data, GOI may even consider third party validation of the data.

- The underlying projects for CDM projects are generally based on RE, energy efficiency or urban sector waste recovery/minimization concepts. Moreover; since the CERs have value only for investors in the developed countries, they will have to be “exported”. Under the existing rules, the revenues from the categories of projects and exports are generally tax exempt. In view of this, there is no logic for taxing the CER revenue. Therefore, it is suggested that the CER revenue should not be taxed, at least while the concessions to the power sector or conservation projects are available.
- The fee structure for the HC approval of CDM projects must be kept simple and low. Government may even consider exemption for some project categories.

#### **6.4.2 Other sector regulators especially State Electricity Regulatory Commissions (SERCs)**

SERCs are one of the most important agencies at the state level in the electric power sector. Power is a concurrent subject, meaning thereby that the states have the responsibilities of administering central policies as well as make policies for their states. The SERCs are mandated to ensure cheaper and reliable power to the consumers in a state. They have also the responsibility of promoting efficient and cleaner resources. In view of the cleaner and sustainable nature of the CDM projects, it is suggested that:

- The Central Electricity Regulatory Commission (CERC) should prepare guidelines/recommendations in respect of power purchase from the CDM projects.
- The SERCs should provide price preference to these projects. If the MNES policy is not a viable option, the best possible and affordable tariff should be accorded to the RE based power. In any case under a merit order system, the SERCs must encourage the clean energy projects (RE, energy efficiency, waste to energy and fuel switch projects).
- The current procedures of approvals for the CDM projects are long and need a high level of input and transaction costs. As such, the promoters spend plenty of time and resources on CDM project development. In view of this, it is suggested that SERCs should not insist on passing the CER benefits through the tariff, at least till such time that the approval process of CDM projects becomes easy. If such stipulations are made the promoters would lose any interest in developing their projects as CDM projects and the country may lose the FDI through this route.
- Another suggestion for the state governments is on the speed and transparency of policy pronouncement. Business risk mainly emanates from the lack of clarity and biased implementation of policies in place. Delay in announcing or lack of clarity in policies leads to higher uncertainty than having even a bad policy in place.
- Lastly, there appears to be a large number of organizations involved in the CDM project promotion. The institutional links are therefore very crucial. Ideally this could be carried out by the CDM NA.

### **6.5 Private sector/Project promoters**

The project developers have shown keen interest in developing and structuring their RE projects as CDM projects. Thus far their efforts have been outstanding. However, the success rate in comparison to the projects under development is poor. The price/revenue expectations from CERs was quite high initially. Since there still is a high degree of uncertainty in the CDM regime and due to lower CER demand than expected, the prices are likely to be lower than projected earlier. In view of this and in order to improve the chances of qualifications of their projects, the following suggestions are made to the promoters:

- CDM being a market mechanism, there are no rules on minimum prices for CERs. Market determines price. It must be kept in mind that under the existing situation, the CER revenue may improve IRR by maximally 5% depending on the nature of projects.
- The estimation of additionality should be done in accordance with the methodologies cleared if available or else must be conservative. As discussed earlier, it is advisable to be on a conservative side while estimating additionality. It is therefore suggested to refer to the Gold Standard developed by the WWF.
- It is advisable to appoint knowledgeable professional consultants to prepare the baseline and PDD documentation as they are expected to be up to date on the developments.
- Promoters must also keep the time frame in the mind while developing CDM projects. The experience so far e.g. CERUPT suggests a project cycle over 1 to 1 ½ years.
- Promoters must themselves or assist the consultant in gathering relevant data for the project category being developed. The certainty of the approval is likely to improve with availability of data.

### **6.6 Contractual Issues**

Carbon purchase contracts are crucial for proper implementation and transfer of CERs to the Annex I party interested in the project. In view of low demand of credits, the Emission Reduction Purchase Agreement (ERPA) which are currently proposed are drafted to suit to the buyers requirements. Therefore, they have severe penalty clauses. These agreements are therefore not acceptable to the promoters and are not likely to be executed in their current form. In order that the carbon transactions do take place, the ERPA has to be on an even keel and spell out an equitable and fair understanding between the parties. The promoters and consultants have to be careful while drafting clauses especially those dealing with penalties, force majeure, liquidated damages, and termination.

It is important to specify and include the basic documents relating to the projected sale of carbon. These may include the validated PDD, baseline and M&V documents approved by CDM EB. Also other crucial agreements, if involved, e.g. PPA, FSA etc. also must be a part by reference of the ERPA. The IETA has prepared a draft heads of agreement document with the help of renowned legal firm Baker & McKenzie (2001) which can form the broad basis.

## 7 Suggestions for concrete capacity building activities

### 7.1 *Capacity Building – Current Programmes*

Since 1998 the awareness about the UNFCCC and market mechanisms for mitigation of GHGs has been growing. Bilateral funding agencies, primarily USAID has been active in promoting these. Initially through their Climate Change Outreach & Awareness task in the years 1998 –99 various climate change centres were created. These were hosted by industry association, Confederation of Indian Industry (CII), NGO - Development Alternatives (DA) and also engaged institutions like IIM, Ahmedabad, ICICI Bank etc. These organizations held several conferences, round tables and other events to inform about the emerging climate change regime internationally. USAID also sponsored a couple of researchers at TERI. These initiatives helped in bringing Indian industry in the focus and initiated the process of project development. The CCCs at CII and DA cumulatively identified around 35 projects that may qualify for consideration under the CDM. However, the expectations that were created especially with respect to the price of offsets was not met due to the slowed development on ratification of the Kyoto Protocol.

USAID continued the outreach from 2000 till date and also offered Technical Assistance (TA) under the climate change supplement of their Greenhouse Gas Pollution Prevention Project. This covered focussed training programs for banking sector, Government of India academy of administration, urban managers handling solid waste disposal and transport planning functions and the CCCs. These TA activities have resulted in increased awareness among the key stakeholders. Also additional round tables and policy exchanges were organized.

Other aid agencies like UNDP, World Bank and ADB as well as bilateral agencies like GTZ, DFID, SDC and Indian NGOs like TERI, industry associations like FICCI, ASSOCHAM and GOI ministries MNES, MOP and MOEF have also organized several workshops and brain storming meets. The COP 8 meeting organized in October 2002

provided a major opportunity for various stakeholders especially allied government departments to keep abreast of the developments on climate change subject.

## **7.2 *Suggestions for possible Capacity Building approaches***

Thus, it can be said that there is adequate awareness about general aspects of climate change and CDM in the country. However, there are still areas where a focussed technical assistance is still required in order to make the CDM investments in Indian projects possible. Few of these and target groups for the TA are described below:

### **7.2.1 *Banks and FIs:***

Barring few names majority of banks especially the private banks are still not the part of CDM project development process. The capacity building in this section needs to be mainstreamed into the existing training set up. It may be noted that all the major private banks have their well established staff training colleges. The bigger banks like SBI group, Bank of India etc. have an elaborate training infrastructure. The RBI has in addition established a Banker's Training College. There are also some specialized institutions like National Institute for Bank Management at Pune. All these institutions could be networked into training programmes directed at informing them trends in risk management tools, climate change related risks to their portfolios in the light of future scenario of targets, market mechanisms – CDM in particular and also project structuring for qualification as CDM. The banks have been looking for investments into the clean energy and technology projects. It may be worth while for the bilateral agencies to develop programs for the bank officials at various levels from operating level to policy/decision making levels.

### **7.2.2 *Insurance Companies:***

The insurance sector is one sector in India where the awareness level is rather low. It is encouraging to note the GOI approach in appointing the Task Force. It may be worth while to co-ordinate with the Task Force and its members to develop capacity building for the insurance sector. One way is to establish links with the UNEP-FII program, which has been a co-operative program between international banks, research institutions and insurance companies. Training module with a focus on insurance companies may also be developed.

### **7.2.3 *Industry:***

While Indian industry is the most informed among stakeholders, there still few issues on which capacity building and institutional links need to be established. There is a high

level of confusion between project level emission reduction and emission trading. Also, some of the stakeholders feel that GOI may be in a position to control the CER price. Some institutions especially research institutions and GOI ministries still feel that social upliftment/community welfare, programmes can directly qualify for CDM investments. All these misconceptions need to be removed. Also, the understanding of sustainable development aspects and extent of need for their quantification needs to be clarified. Similarly the misconceptions about Technology Transfer, which is confused with cross border transfer of advanced technology need be cleared. One more aspect where awareness needs to be created is the operational mechanism for the CDM. It could delve into issues like institutional framework needed for effecting the CER registration and transfer at both national level and the UNFCCC level. The latter issues would also involve the government stakeholders. Moreover, sectorally specialized project document preparation training courses are crucial as baseline and monitoring rules will differ considerably according to project types.

#### **7.2.4 Government, quasi-government and regulatory bodies:**

There are still wide information gaps among these stakeholders, necessitating higher capacity building. These are possibly being addressed by the Planning Commission Task Force. However, few of these are discussed below.

- **Awareness creation among additional concerned ministries:** So far only key ministries like MOEF, MNES, MOP have been involved in debates on climate change. Many other ministries and organizations which are concerned with the subject of climate change are Ministries of Urban and rural Development, Agriculture, Industry, Commerce, Chemicals and Fertilizers, Petroleum & Natural Gas and organizations like CERC, CEA and CPCB. Specialized training/awareness building programs need to be prepared and delivered so as to enable the GOI to facilitate CDM investment in the country. The program should also inform about limitations of CDM, so as not be viewed as a solution to all problems.
- **Awareness creation among state level stakeholders:** As described earlier, several state level organizations play an important role in preparation of a CDM project. Some of these are Transmission, Distribution companies, SERCs in the electricity generation for grid projects, municipalities/urban local bodies and state urban development ministries for urban solid waste and transport projects, irrigation and town planners etc. The understanding of the climate change regime and CDM is slowly percolating to these stakeholders, especially in the states which are proactive. It is essential to reach these in a systematic manner through properly designed programs. While the RE projects selling power may like to receive the best possible tariff and also keep the additional benefits of CDM investments, a balance must be arrived so as

to ensure that the environmentally benign power does not come at a very high cost to the consumer.

The European Union nations should play an important role for capacity building as discussed earlier. Since the EU wide emission trading scheme is likely to be operational by 2005 and it might entertain purchase of credits up to 6 – 8% from CDM route, this becomes very beneficial. As concluded by the Point Carbon survey (2003), India is likely to be a major supplier of CERs and hence making this market most creditworthy will be essential.

There have been various modes adopted for delivering the capacity building programmes. As the training suggested in the foregoing is more oriented towards practical experience and closer to learning by doing, the programmes should be designed to cater to this need. Accordingly, it is suggested that the syllabus and the pedagogy should be designed with a practical leaning. The material may involve a number of project cases ideally from Indian industry or from the developing countries. For the programmes for FIs and insurance companies, it may include working exercises. Since the target group is expected to be experienced officials from all the stakeholders, the courses should encourage discussions, and brain storming.

### **7.3 *Establishing the institutional links***

Many of the bilateral agencies like GTZ, DEFRA, Senter of the EU nations as well as many European banks are getting actively involved in CDM preparation and CER purchase practices. Examples are Rabo Bank of the Netherlands, Dresdner and Deutsche Banks and KfW of Germany, UBS AG and Credit Suisse of Switzerland, Barclays PLC, HSBC UK, BNP France etc. These would play a pivotal role in enabling the EU parties in purchasing CERs from the Non Annex-I countries. It is highly desirable to establish linkages with their Indian counterparts like IDFC, ICICI Bank, Bank of Baroda, SBI to facilitate quicker transactions. These could involve floating joint funds or facilitation through due diligence of the Indian project developers etc.

## **References**

**Anonymous (2002):** TNPCB may not grant nod for waste project. **The Hindu**, Nov 1. URL:<http://www.blonnet.com/bline/2002/11/01/stories/20021101901900.htm>

**Baker & McKenzie; IETA (2002):** Carbon Contracts Cornerstones – Drafting contracts for the sale of project based Emission Reductions, Geneva

**Böhringer, Christoph; Löschel, Andreas (2002):** Climate Policy Induced Investments in Developing Countries. The Implications of Investment Risk. ZEW Discussion Paper No. 02-68. Mannheim.

**Dresdner Bank (2002):** Dresdner Bank and Climate Change Emission Trading as Business Opportunity, Frankfurt

**FICCI (2002):** Innovative funding options for energy efficiency implementation, New Delhi

**Hobley, Anthony (2003):** Legal implications of the CDM on host countries, World Bank PCF Seminar Jan 2003, Washington

**IEA [International Energy Agency] (2002):** Electricity in India. Providing Power for the Millions. Paris

**Janssen, Josef (2002):** Financing Industrial CDM Projects in Asian Countries. Report from the UNIDO Project UC/RAS/01/107: Capacity Mobilisation to Enable Industrial Projects under the Clean Development Mechanism. St. Gallen.

**Janssen, Josef (2001):** Risk Management of Investments in Joint Implementation and Clean Development Mechanism Projects. Bamberg.

**Kaupp, Albrecht (1998):** Indo German Energy Efficiency Project (IG-EEP) als Clean Development Mechanism. Können Dienstleistungen das Klima retten. Bangalore.

**KREDL (2003):** Policy paper on treatment of non-conventional energy projects, Bangalore

**Matsushashi, Ryuji; Fujisawa, Sei; Mitamura, Wataru; Momobavashi, Yutaka; Yoshida, Yoshikuni (2002):** Study on Effective Institutions to make CDM Projects viable. Tokyo.

**Michaelowa, Axel (2003):** Overview of insurance related actions in the context of the impact of the implementation of response measures, mimeo, Hamburg

**Michaelowa, Axel (2002):** The AIJ pilot phase as laboratory for CDM and JI, in: International Journal of Global Environmental Issues, 2, 3-4, p. 267-280

**MoP (Ministry of Power) (2002):** Annual Report 2001/ 2002 of the Ministry of Power, India. New Delhi.

**Pearce, Brian; Ekins, Paul (2001):** International Financial Institutions Enhancing their role in promoting sustainable development, Forum for the Future, DEFRA, London

**Point Carbon (Ed.) (2003):** CDM: A three year forecast. Lysaker

**UNEP FI Australian Advisory Committee on Insurance (2003):** Risk, the environment and the role of the Insurance Industry, Southbank

**WBCSD (2000):** Clean Development Mechanism. Exploring for solutions through learning-by-doing, Geneva

**World Bank ( 2002):** Financing for Sustainable Development, Washington

**WWF [World Wildlife Fund] (2002):** WWF Working with Business and Industry. Consultation on the Gold Standard for Greenhouse Gas Reduction Projects.  
URL:[http://www.panda.org/about\\_wwf/what\\_we\\_do/climate\\_change/what\\_we\\_do/business\\_industry/gold\\_standard.cfm](http://www.panda.org/about_wwf/what_we_do/climate_change/what_we_do/business_industry/gold_standard.cfm)

**Yajnik, Ameer (2003):** Emission Reductions: Linking International and National Legal Regimes, World Bank PCF Seminar Jan 2003, Washington