IRIS KYOTO Workshop
Bangalore, India, November 4th 2003

Draft Minutes

This workshop was intended to developpers of innovative projects. In total 6 projects were presented :

- Distribution efficiency Projects, GUBBI and Bhoruka projects, EEEC
- Agricultural Efficiency, EEEC
- Micro Hydel, TIDE
- Biomass for rural electrification, BERI
- Solar geysers, TATA BP Solar

Two additional projects, not presented on the day of the workshop, are as well proposed to the consortium for further analysis if adequate :

- Co-generation system using Bagass and oil
- Bangalore Mass Rapid Transit project

Infrastructure Development Finance Company Ltd, financial partner of many of these developpers, was represented.

Content

The workshop was divided in two sessions 1) on the context of the CDM and the presentation of the IRIS KYOTO project and 2) on the presentation of some potential CDM projects developped in India and the evaluation of some potential risks. For the later phase, a risk analysis template was to be filled in for each project.

The most advanced project todate is the Gubbi project from EEEC. The perticipants looked therefore more closely to this project. All the presentations are available on the IRIS Kyoto website password protected. The Managing Directors of the Bangalore Mass Rapid Transit and of TATA-BP solar were visited the day after the workshop and a summary of the discussions is provided in this report.

1. CONTEXT OF THE CDM AND PRESENTATION OF THE IRIS KYOTO PROJECT

Govinda Rao, Director of EEEC, presented the CDM and the Indian context. The DNA is represented by the Ministry of Environment and Forests. From the provisionnal aproval criteria of the Indian DNA, it can be noticed that high tech technologies would be prefered in CDM projects. The IDFC representative, participating to comittees for the Indian DNA, mentionned that clear CDM policies are on the way.
RE projects benefit at the moment of a advantageous buyback rate which is not bareable by the utilities. Energy efficiency is more cost effective in India. RE is more a long term option which is incompatible with the high financial problems encountered by the utilities presently.

Anjali Shanker, Director of IED, presented the IRIS Kyoto project. Many enabling activities are initiated to facilitate the development of JI/CDM projects. An example is GEF funds used as a guarantee for a geothermal project in Eastern Europe. The guarantee hold only on the risk of finding a hot source.

Jeremey Doyle, from ESD, presented CDM funds and initiatives and the EU Emissions reduction scheme. He mentionned as well an ESD venture, taking the risk of developing a CDM project documentation for the customer and being paid on a success fee basis.
The question of the emissions market covered by the EU ETS was asked. EU emissions represent around 10% of world emissions. Of this amount, 50% is concerned by the EU ETS with a 6% cap on JI and CDM credits. Furthermore each country inside the EU has to meet its emission target independently of the EU ETS.

2. PRESENTATION OF POTENTIAL CDM PROJECTS AND EVALUATION OF RISKS

2.1. Electricity distribution improvement and energy efficiency in the agricultural sector, Gubbi and Shorapur

2.1.1. Electricity distribution situation in the agricultural sector

Power for agricultors is free, farmer has no incentive to buy more efficient water pumps
The agricultural sector represents 30% of the consumption and provide only 3% of the revenues to the utility. At Kanartaka, line losses are in the range of 35%
annual generation: 500 BU (billion units), thereof 125 BU losses
9/10 of the line length is low voltage, 1/10 high

2.1.2. Aim of the project in order to overcome these problems

- substitute low voltage grid by high V.
- remote switching in the meters which are in the transformers -> (i) stop illegal consumpt. and (ii) paying users get power, (iii) not all the users have to be switched off
- more savings on pump sets as on line losses
- O+M by Bhoruka (=concesionnary for construction)
- Energy efficient pumpsets will be proposed at a subsidised price to the farmers who wish to
- Most of the energy savings are on pumpsets and not line losses as pumpsets efficiency can go from 20% to 40-45%.
- Assumption that 40% of the farmers will buy the pumpsets (if assumption would go down to 10% then the main savings wold be on line losses reduction)
- The revenues of the project would correspond to the increased income from electricity comsumption
- The utility will pay for the distribution lines improvements
- EEEC will maintain the lines and perform the metering (franchising the line)

Delhi utility project on the same model already exists.

2.1.3. Impact of the project, potential risks

- saved energy is sold to utility (first 6 years)
- price: 540 Rs./Ps/a
- IRR on equity estimated at 35%
- Cost of the project $2 bilion
- asssumption on consumption development: who already paid will consume more, who didnt pay up to now will consume less
- expected CER revenu is about 5% of invest cost () 0,54 moi$ per annum
- Karnataka 40 % (60%) of generation is hydro, rather peak for power, base load by coal plants
- bíggest risk: utility (pay in time?, will be privatised.) Guarantee on the risk that the utility does not honour its contract.
- no official policy on distribution, want to learn from pilot project
- transaction and monitoring cost shared 50/50 with utility
- there are no exact baseline data, only PCF has been approached as buyer
- Uncertainty on the baseline :
    - NOx share in the emissions from traditional power plants might be high. The base is taken as 100% thermal power displaced as hydroelectricity is used first at any time.
    - For the monitoring, the same protocole as the baseline should be used
    - Crop changes is very unprobable so there is not much uncertainty on this side concerning pumping use
- if IDFC is interested: interest rate between 8-9%
- Capacity on CDM is very limited on the authorities and utility side.

2.1.4. Status of the project in the CDM procedure

Deloitte Touche Tohmatsu already made a PDD for this project, with finance from GTZ. PIN approved by the PCF.
1st CERs in 2004

No ERPA needed by the financiers given the viability of the project. This gives the opportunity to sell the CERs on the market price on the year of certification, with most probably a higher price offered than currently proposed by the buyers.

The table below summarises the risks perceived by the participants of the workshops and the potential mitigation measures.

Table: Risk analysis template : Traditional risks

Risks / Factors	Potential impacts on CERs (YES/NO)
Economic risk	From the perspective of the regulator, should the additional revenue of the licencee be passed on to the consumer? (currently the cap on ROE for licencee is 16% but discussion on removing it) >>> in this case not an issue because small project - PILOT
Policy risk	CDM action plan being developed at the central level but application at the State level? There have been cases (Bhoruka) where PPAs have been cancelled because of bank rates coming down and claims that ROE is >12% Still unclear whether the utility wants distribution franchisee or efficiency projects Sharing of CER revenue with the utility: 50:50 (KPTCL) In a ren project, utility wants 70% - is it an option to go to the regulator? Utility breaches its contract on sharing of revenues? *nothing… guarantee fund? Sell the CERs into the futures market at a discount.* [MNES also wants a share for renewable projects]
Political risk **War, civil unrest and expropriation**	NA
Financial risk and project structuring	Project dvt costs born by? – IGEEP till PDD Buyers to bear the development costs.??? M&Verif deducted from rev stream then rev shared Price 2,40 up to… as duration reduced to 5 years IDFC looking at the project on a project financing basis – 8to 9% + 2% - interest in "decentralised infrastructure"
Foreign exchange risk	NA
Technology	Using small scale transformers
Resource	
Delay in completion	Will the utility mobilise the equipment on time? – risk is minimal – equipment is in the stores Contract with utility 2 y gone – complete in 2 months!
Social and environmental	Interest of the agricultural sector ?
Offtake risk	Utility not paying the project owner *but the gvt has given a guarantee for 5 y* Utility being privatised and not honouring previous contract >>> *keep the sprit of privatisation and show savings*

Table: Risk analysis template : CDM related risks

Risks / factors	Potential impacts	Risk assessment	Possible mitigation tools
Kyoto protocol ratification			
Host country ratification			
Designated National Authority (approval procedures and criteria) **Host country agreement to transfer CERs**	Few individual projects have been cleared Want a PDD to look at a project Should be "controllable"		
Local key stakeholder capacity	EEEC has implemented similar pilot projects for DFID and the WB Capacity of farmers to understand their interest? – based on group and one to one interviews, 5 to 10% is easy to achieve – 40%?		
Executive board approval			
Purchaser approval risk	PIN has been approved by PCF Go to other buyers?		
Baseline approval	Availability of data Have measured all the pumpsets (EEEC) – DTT due some due diligence Based on readings and computerised simulations – due diligence Should the State decide to supply for 4000h instead of 2000h, then consumption will increase. Explain it in the PDD and ensure that the EB gives an agreement to "re base" the project.		
Verification protocol			
Emission reduction purchase agreement risk	Still too early Duration of contract? f(volume) EEEC would be interest in selling 10 years in advance, even at a discount, after the first 2 years have been delivered. *Mitigate the risk of utility breach of sharing*		
Market risks			
Adionnality	Project not being accepted		Barrier is due to the prevailing practice

2.2. Micro-hydel project

- Micro integrated hydro electric plants 500 kW down to 10-20 kW for off grid application. To be used 12 hours/day, 4000 hours a year
- to substitute the use of electricity from the grid or from captive Diesel / Kerosene generators (0.(to 1 kW gensets).
- Statistical sampling will be needed
- Project bundling will be necessary
- Check on funds such as Community Development fund

2.3. Biomass energy for Rural India

2.3.1. Context

Rural energy services lack of quality and energy
60% of houses are electrified but with a very unrelyable power supply
Electricity supply rate : 3 Rp/unit

2.3.2. Proposed project

- Substitute diesel engines generating electricity and coal cooking with biomass supplied systems
- GEF/UNDP/Canadian Bank facility financing the development and investment with BERI
- The inhabitants then are encourage to pay for the maintenance and operation
- Management by the community, entreupreneurs and BOO
- Village Forest Community taking the responsabilities on biomass supply from private and Government lands
- Seeds sold to the users to plant on their land
- Surplus power produced sold to the grid, mainly at night.
- Systems from 100 kW to 1 MW
- Dual function : GPL / Biogas
- Estimation : Capital cost recovered over 15 years
- 8 hours supply for the farmers and 12 hours to the grid
- 1 MW saves 12,000 tCO2/yr
- Industrials are interested. 6 biogas bioler manufacturers in India
- Gasifier more user friendly than gaz turbine, no need for high technological knowledge
- No biomass supply agreement are sought. BERI want a free market to be set

2.4. Manufacture and promotion of solar geysers

- geyser cost: 3-4 times conventional electric heater
- main problem is baseline: how many hours of operation, change in usage pattern, displace peak load generation mix? Around 1500 kWh saved / year for 100 litter system (replacing a 2kW conventional geyser).
- how many electric backup needed

- maintenance = performance
- user doesnt want to maintain + doesnt want to change his pattern
- 300$ invest cost per geyser
- estimation: 20% price reduction through CERs
- copper price is actually getting down -> reduce price
- Assumption : market growth sustained at current levels for 3 years and then down to 10% / year.
- Possibility of organising an ESCO type of venture so that not only the increased sales are taken into account but the whole sales.

For small scale projects private funds exist, that can provide finance even if the project is not 'CDMable'. Examples : CO2.com, Climate Care in the UK.

2.5. Bangalore Mass Rapid Transit

The consortium partners visited Mr Nagarajan of BMRT Ltd, Managing Director of BMRP Ltd, who was as well involved before in urban transport management and therefore is very knowledgeable on transport issues. The IRIS Kyoto project had been introduced to his knowledge at the project conception but further explanations were needed.

He was surprised to have had any information / notes from the DNA on CDM. He asked many questions, and the answers showed the complexity of the CDM procedures and the fragility of the Kyoto Protocole.

Nethertheless, Mr Nagarajan though he would consider to participate in the project and will ask the BMRT board opinion. BMRT to be replaced soon by another structure

Relevant information mentionned :
Delhi metro could be a good source of information given ots advance stage of construction
A center for urban transportation to be created
Optimisation of transport is a field Mr Nagarajan is keen on digging further. Need for masterplan
KUIFC did a study 3 years ago
1966 : earliest studies on urban transport management
1980 : buses
1984 : study on the capacity to increase bus transportation
Mobility studies existing
Fly over roads are planned in the city, 106 in total of which 28 are ordered
BDE prepare a transport plan
A project financed by SIDA (Danish cooperation agency)

2.6. TATA-BP solar India PV power plant project

2.6.1. TATA BP Solar presentation

The consortium partners visited the TATA-BP Solar manufacturing plant at the Electronic city. The sales & Marketing manager (Mr Vijaya Kumar) and then the Managing Director received us.

It is one of the biggest production unit in the world (38 MWp produced per year).
The BP solar PV manufacturing organisation is as follows :

- 1 plant in the US for the US market and Latin America
- 1 plant in Spain for the EU market
- 1 plant in Australia for the Australian market
- 1 plant in India for India and the rest of the world

TTA BP solar India will be selling 22 MWp for 2003 in the World + 6 MWp in India of which 4 BIPV projects (see teri.org.com). A PV program has been initiated in India by the Ministry of Non Conventional Energy Resources (MNES website)
The biggest PV power plant in India todate is 200 kWp.

2.6.2. Potential large scale PV power plant projects

The managing director showed an interest in the CDM for large scale PV power plants. Some utilities are environmentally concious and would consider to pay a surplus. With soft loans, it was estimated by them that a 40% subsidy would be needed to be attractive enough.

TATA Power would buy the PV modules from TATA BP Solar to build a power plant and then sell the electricity to utilities. PPA would not be a problem given the long relationship existing between TATA Power and utilities.

A 1MWp plant would cost around 5 MEUR to produce 2 GWh / year
Assuming 2 tCO2 displaced / MWh saved, a 1 MW PV plant would save 4000 tCO2 / year
Over a 10 year period, a 1MWp PV plant would save 40,000 tCO2
To reach the 40% subsidy through CERs only, the tonne of CO2 should be around 50 EUR.

ADEME knows of a project under SYNERGY, lead by FONDEM, on PV projects. An exchange of methodology on these could be useful. Yves Maigne should be contacted.