



VALIDATION REPORT

4.5 MW BIOMASS (LOW DENSITY CROP RESIDUES) BASED POWER GENERATION UNIT OF MALAVALLI POWER PLANT PVT LTD, INDIA

REPORT No. 2005-9065

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DET NORSKE VERITAS



VALIDATION REPORT

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Approved by: Einar Telnes Director	Organisational unit: DNV Certification, International Climate Change Services
Client: Mallavalli power plant private Limited	Client ref.: Mr. Kolluru Krishan

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Summary:
Det Norske Veritas Certification Ltd. (DNV) has performed a validation of the “4.5 MW Biomass (low density crop residues) based Power Generation unit of Malavalli Power Plant Pvt Ltd” project (hereafter called “the project”) in India on the basis of UNFCCC criteria for the CDM, as well as criteria given to provide for consistent project operations, monitoring and reporting. UNFCCC criteria refer to Article 12 of the Kyoto Protocol, the CDM modalities and procedures, the simplified modalities and procedures for small-scale CDM project activities and the subsequent decisions by the CDM Executive Board. This validation report summarizes the findings of the validation. The validation consisted of the following three phases: i) a desk review of the project design and the baseline and monitoring plan, ii) follow-up interviews with project stakeholders and iii) the resolution of outstanding issues and the issuance of the final validation report and opinion. In summary, it is DNV’s opinion that the project, as described in the project design document of February 2006, meets all relevant UNFCCC requirements for the CDM, is eligible as category *I.D* of small-scale CDM project activity and correctly applies the approved simplified baseline and monitoring methodology for type I.D small-scale CDM project activities (AMS-I.D.) Hence, DNV requests the registration of the “4.5 MW Biomass (low density crop residues) based Power Generation unit of Malavalli Power Plant Pvt Ltd” project as CDM project activity.

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Report title: 4.5 MW Biomass (low density crop residues) based Power Generation unit of Malavalli Power Plant Pvt Ltd in India	
Work carried out by: Chandrashekara Kumaraswamy, Subhendu Biswas	
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Appendix A Validation Protocol



Abbreviations

CAR	Corrective Action Request
CDM	Clean Development Mechanism
CEA	Central Electricity Authority
CEF	Carbon Emission Factor
CER	Certified Emission Reduction
CH ₄	Methane
CL	Clarification request
CO ₂	Carbon dioxide
CO _{2e}	Carbon dioxide equivalent
DNV	Det Norske Veritas
DNA	Designated National Authority
EIA	Environmental Impact Assessment
ESP	Electro Static Precipitator
GHG	Greenhouse gas(es)
GWP	Global Warming Potential
IPCC	Intergovernmental Panel on Climate Change
KSPCB	Karnataka State Pollution Control Board
MoEF	Ministry of Environment & Forests
MP	Monitoring Plan
MPPL	Malavalli Power Plant Pvt Ltd
MVP	Monitoring and Verification Plan
N ₂ O	Nitrous oxide
NGO	Non-governmental Organisation
ODA	Official Development Assistance
PDD	Project Design Document
SPM	Suspended Particulate Matter
UNFCCC	United Nations Framework Convention on Climate Change



1 INTRODUCTION

Malavalli Power Plant Pvt Ltd. has commissioned Det Norske Veritas Certification Ltd. (DNV) to validate the “4.5 MW Biomass (low density crop residues) based Power Generation unit of Malavalli Power Plant Pvt Ltd” in Karnataka, India. This report summarises the findings of the validation of the project, performed on the basis of UNFCCC criteria for small-scale CDM projects, as well as criteria given to provide for consistent project operations, monitoring and reporting.

The validation team consisted of the following personnel:

Mr Kumaraswamy Chandrashekhara	DNV Bangalore	GHG Auditor and Project Manager
Mr Subhendu Biswas	DNV Kolkata	GHG Auditor
Mr Einar Telnes	DNV Oslo	Technical Reviewer, Energy Sector Expert

1.1 Validation Objective

The purpose of a validation is to have an independent third party assess the project design. In particular, the project's baseline, monitoring plan, and the project's compliance with relevant UNFCCC and host Party criteria are validated in order to confirm that the project design, as documented, is sound and reasonable and meets the identified criteria. Validation is a requirement for all CDM projects and is seen as necessary to provide assurance to stakeholders of the quality of the project and its intended generation of certified emission reductions (CERs).

1.2 Scope

The validation scope is defined as an independent and objective review of the project design document (PDD). The PDD is reviewed against the criteria stated in Article 12 of the Kyoto Protocol, the CDM modalities and procedures as agreed in the Marrakech Accords, the simplified modalities and procedures for small-scale CDM project activities and the relevant decisions by the CDM Executive Board, including the approved baseline and monitoring methodology AMS-I.D. The validation team has, based on the recommendations in the Validation and Verification Manual /6/ employed a risk-based approach, focusing on the identification of significant risks for project implementation and the generation of CERs.

The validation is not meant to provide any consulting towards the project participants. However, stated requests for clarifications and/or corrective actions may have provided input for improvement of the project design

1.3 Description of Proposed CDM Project

The project activity is a 4.5 MW (gross) capacity cogeneration project by Malavalli Power Plant Pvt Ltd (MPPL), which utilizes available low-density crop residues and other biomass residue from the region for generation of power. The plant is located in Kirugaval village in Malavalli Taluka of Mandya District, in the state of Karnataka. The power generated is sold to the state grid.

The objective of the project is to reduce anthropogenic GHG emissions by displacing fossil fuel based electricity generation with environmentally sustainable resource such as low-density crop



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residues (cane trash, toppings of plantation wood and coconut fronds) and thereby indirectly help in reducing the power deficit in the state of Karnataka and also contribute towards natural resources conservation such as coal. The power project comprises one condensing steam turbo generator unit with a matching boiler of travelling grate type, capable of firing multi fuels. The boiler has been specifically designed to burn 100% agricultural residue and use of coal has not at all been envisaged. The technology used in the project activity is indigenously available in India.

While the project emissions are nil, baseline emissions are calculated to be 0.766 kgCO₂ per kWh. The project is expected to result in annual average emission reductions of 20 691 tonnes of CO₂ per year during the first seven year crediting period envisaged.

2 METHODOLOGY

The validation consisted of the following three phases:

- I a desk review of the project design and the baseline and monitoring methodology
- II follow-up interviews with project stakeholders
- III the resolution of outstanding issues and the issuance of the final validation report and opinion.

In order to ensure transparency, a validation protocol was customised for the project, according to the Validation and Verification Manual /6/. The protocol shows in transparent manner criteria (requirements), means of verification and the results from validating the identified criteria. The validation protocol serves the following purposes:

- It organises, details and clarifies the requirements a CDM project is expected to meet;
- It ensures a transparent validation process where the validator will document how a particular requirement has been validated and the result of the validation.

The validation protocol consists of three tables. The different columns in these tables are described in Figure 1.

The completed validation protocol for the “4.5 MW Biomass (low density crop residues) based Power Generation unit of Malavalli Power Plant Pvt Ltd” is enclosed in Appendix A to this report.

Findings established during the validation can either be seen as a non-fulfilment of validation protocol criteria or where a risk to the fulfilment of project objectives is identified. Corrective Action Requests (CAR) are issued, where:

- i) mistakes have been made with a direct influence on project results;
- ii) validation protocol requirements have not been met; or
- iii) there is a risk that the project would not be accepted as a CDM project or that emission reductions will not be certified.

The term Clarification may be used where additional information is needed to fully clarify an issue.



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Validation Protocol Table 1: Mandatory Requirements for CDM Project Activities			
Requirement	Reference	Conclusion	Cross reference
<i>The requirements the project must meet.</i>	<i>Gives reference to the legislation or agreement where the requirement is found.</i>	<i>This is either acceptable based on evidence provided (OK), a Corrective Action Request (CAR) of risk or non-compliance with stated requirements or a request for Clarification (CL) where further clarifications are needed.</i>	<i>Used to refer to the relevant checklist questions in Table 2 to show how the specific requirement is validated. This is to ensure a transparent Validation process.</i>

Validation Protocol Table 2: Requirement Checklist				
Checklist Question	Reference	Means of verification (MoV)	Comment	Draft and/or Final Conclusion
<i>The various requirements in Table 1 are linked to checklist questions the project should meet. The checklist is organised in seven different sections. Each section is then further sub-divided. The lowest level constitutes a checklist question.</i>	<i>Gives reference to documents where the answer to the checklist question or item is found.</i>	<i>Explains how conformance with the checklist question is investigated. Examples of means of verification are document review (DR) or interview (I). N/A means not applicable.</i>	<i>The section is used to elaborate and discuss the checklist question and/or the conformance to the question. It is further used to explain the conclusions reached.</i>	<i>This is either acceptable based on evidence provided (OK), or a Corrective Action Request (CAR) due to non-compliance with the checklist question (See below). A request for Clarification (CL) is used when the validation team has identified a need for further clarification.</i>

Validation Protocol Table 3: Resolution of Corrective Action Requests and Requests for Clarification			
Draft report corrective action requests and requests for clarifications	Ref. to Table 2	Summary of project participants' response	Final conclusion
<i>If the conclusions from the draft Validation are either a Corrective Action Request or a Clarification Request, these should be listed in this section.</i>	<i>Reference to the checklist question number in Table 2 where the Corrective Action Request or Clarification Request is explained.</i>	<i>The responses given by the project participants during the communications with the validation team should be summarised in this section.</i>	<i>This section should summarise the validation team's responses and final conclusions. The conclusions should also be included in Table 2, under "Final Conclusion".</i>

Figure 1 Validation protocol tables



2.1 Review of Documents

The PDD /1/ submitted by Malavalli Power Plant Pvt Ltd. in its previous versions and the final version dated 13 February 2006 and additional background documents related to the project design and baseline were assessed as a part of the validation.

2.2 Follow-up Interviews

In the period of 15 October 2005, DNV performed interviews with representatives of Malavalli Power Plant Pvt Ltd. The main topics of the interviews are summarised in Table 1.

Table 1 Interview topics

Interviewed organisation	Interview topics
Malavalli Power Plant Pvt Ltd. - Mr Krishan – Managing Director - Mr Sekhar – Project Manager	<ul style="list-style-type: none"> ➤ Clarifications of the comments identified in the document review ➤ Clarifications of the stakeholders comments process ➤ Understanding of the material issues that may impact the CER generation ➤ Systems in place to ensure the proper implementation of the project

2.3 Resolution of Clarification and Corrective Action Requests

The objective of this phase of the validation was to resolve any outstanding issues which needed to be clarified for DNV's positive conclusion on the project design. The Corrective Action Requests and requests for Clarification raised by DNV Certification Ltd., presented to the project participants in DNV's draft validation report of 25 October 2005 (rev. 1) were resolved during communications between the Client and DNV. To guarantee the transparency of the validation process, the concerns raised and responses given are documented in the validation protocol in Appendix A.

Since modifications to the project design were necessary to resolve DNV's concerns, the Client decided to revise the PDD and resubmitted the PDD, last on 13 February 2006. After reviewing the revised PDD, DNV issued this final validation report and opinion.



3 VALIDATION FINDINGS

The findings of the validation are stated in the following sections. The validation criteria (requirements), the means of verification and the results from validating the identified criteria are documented in more detail in the validation protocol in Appendix A.

The final validation findings relate to the project design as documented and described in the revised and resubmitted project design documentation dated 13 February 2006.

3.1 Participation Requirements

The project participants are Malavalli Power Plant Pvt Ltd. Bangalore of India and myclimate of Switzerland. All participating Parties, i.e. India as the host Party and Switzerland as the Annex I Party, have ratified the protocol and established DNA's as per the participation requirements for the CDM. The DNA's of India and Switzerland have also accorded approval to the project /2/, /3/.

The project contributes to sustainable development of the region by providing benefits such as employment generation during construction and operation of the project, ensuring environmental wellbeing and aid in bridging the gap between demand and supply of power. The DNA of India has provided confirmation that the project assists in achieving sustainable development /2/.

3.2 Project Design

The project activity is a 4.5 MW (gross) capacity grid connected biomass based renewable energy power plant with high-pressure steam turbine configuration. The technology used in the project activity is indigenously available in India and no transfer of technology is envisaged. The power plant has one condensing steam turbo generator unit with a matching boiler of travelling grate type capable of firing multiple fuels and produces steam at 22 tonnes per hour. The project design and engineering reflects good practice. Auxiliary plant facilities such as biomass storage and handling systems, ash handling system, air pollution control devices and air and cooling water systems have also been envisaged.

The expected operational lifetime of the project activity is 25 years and the starting date of the project activity is April 2000. A renewable crediting period of seven years has been chosen with the starting date of the first crediting period as 1 August 2001.

3.3 Project Baseline

The project applies one of the simplified baseline methodologies proposed for the small-scale project activity category I.D, i.e., for renewable energy that displaces electricity from the grid. The simplified baseline is the electricity consumption times the relevant emission factor calculated as the kWh produced by the renewable generating unit multiplied by an emission coefficient (measured in kgCO₂/kWh).

The application of simplified baseline methodology AMS-I.D is justified as the project is displacing grid power.

As the project activity is feeding power to Karnataka state electricity grid which is a part of southern region electricity board, the baseline for this project activity is the function of the



generation mix of the southern region grid. Using the methodology available for small-scale project activities as applicable for category I.D, the simple weighted average of current generation mix (in kgCO₂equ/kWh) of the southern grid of India has been used for the calculation of baseline. The generation data for the year 2001 (the year in which the present project started its generation) is considered as the basis for designing the baseline and has been estimated to be 0.7659 kg CO₂e / kWh.

3.4 Additionality

The project activity primarily demonstrates additionality through the existence of the following two barriers:

Investment Barriers: The project activity is utilizing low density crop residues and its comparatively lower rating of 4.5 MW (as compared to a standard 8 MW rating biomass based power plant) has led to MPPL incurring higher costs of generation and thereby has had to suffer substantial financial costs and losses since 2001. Comparison data with the standard 8 MW biomass based power plant has been provided: This justifies and conclude that an 8 MW rice husk/bagasse/wood cum coal fired power plant would have been an economically more attractive alternative for the project developers than the proposed project activity.

Technological Barriers: The project activity requires firing of low density crop residues as primary fuel, which calls for technological innovations related to fuel beneficiation systems as well as implementation of a 100% ash utilization scheme. This involves the production of organic fertilizer and distribution of the same to farmers from whose fields the crop residues were collected. It has been confirmed that this has resulted in the project incurring a loss of INR 34.77 million from August 2001 to March 2003 (during the plant operations stabilisation phase).

Barriers due to prevailing practice: Prevailing practice has been the continued reliance of the state grid primarily on thermal and hydro sources. It is claimed that MPPL is one of the earliest organisations to opt for biomass based power plant. MPPL hence encourage the involvement of the local community in the crop residues supply chain as well as other initiatives related to organic fertilizer production and electricity distribution.

Other barriers: Shortfalls to the tune of INR 22.18 Million in anticipated project funding and INR 11.18 Million from shortfall in receipts from KPTCL (as on March 2005) have rendered the project unviable to continue operations. In the absence of the funding from CDM, claims that the project proponent has no other option than shutting down operations of the plant appears justified.

It has also been argued that MPPL visited SENTER in April 2001 and also obtained the CERUPT tender documents, but same could not be successfully pursued on account of lack of clarity in procedural approvals at that time.

Therefore, in the absence of CDM funds, it is apparent that MPPL would not have envisaged such a non-standard biomass plant and would not continue operation with recurring losses.

3.5 Monitoring Plan

The selected monitoring methodology is in line with the monitoring methodology for small-scale CDM project activity category I.D – Renewable energy generation for a grid. The monitoring will involve metering the electricity generated and sold to the grid. The CO₂ emission reductions due to the project are directly linked to the electricity generated and supplied by the project to the



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state grid. The project monitoring and maintenance responsibilities are also clearly specified. The monitoring methodology will give opportunity for real measurements of achieved emission reductions.

Details of the data to be collected, the frequency of data recording and its format are clearly described and deemed to be adequate.

The authority and responsibility for project management, monitoring, measurement, review and reporting has been clearly established. Similarly, the procedures for calibration and maintenance, performance reviews, internal auditing, corrective actions, etc. are also clearly specified and deemed good practice.

Since the renewable energy technology is not transferred from any other location, leakage has not been considered in this case. While there are no project emissions, indirect emissions have been considered, such as due to transportation of bio-mass material. These have been estimated to be 514 t CO₂/year and are considered negligible.

No extensive initial training is needed for the operation and maintenance of this type of technology. Training has been sufficiently administered to the personnel operating the plant and is thus not addressed in the PDD, which is deemed reasonable.

3.6 Calculation of GHG Emissions

While there are no project emissions, the PDD addresses the only source of leakage activity as that contributed by GHG emissions outside the project boundary such as transportation of biomass within a 50 km radius to MPPL. These have been estimated to be 514 t CO₂/year and are deducted from the emission reduction claim.

The project will partly displace fossil fuel-based electricity generation. The methodology complies with one of the approaches proposed for category I.D project activities. The weighted average emissions of the current generation mix, for the year 2001 has been taken for the southern region grid system. The baseline emission co-efficient has been derived from the data, as published by the Central Electricity Authority (The Ministry of Power, Government of India), on annual energy generation from all coal, gas and diesel power generation systems in the southern grid and the net heat rates for the fuel, IPCC default values have also been used, where applicable. The calculations are transparently documented and appropriate assumptions regarding expected amounts of electricity generated have been used to forecast emission reductions. While the project emissions are zero, emission reductions are equal to the baseline emissions, estimated to be 144 840 tCO₂ during the first seven years of the crediting period.

3.7 Environmental Impacts

The environmental impacts of the project are sufficiently assessed as those restricted to SPM, Nitrogen Oxides and Sulphur Dioxide apart from generation of fly ash. An ESP has been envisaged and installed and the project is designed to adhere to the stipulations as per the Karnataka State Pollution Control Board (KSPCB). Ash collected is utilised for organic fertiliser manufacture.

As per the MoEF, an EIA is not required for projects costing less than USD 22 Millions, as is the case with the proposed project activity. The project has all the necessary approvals from the KSPCB.



3.8 Comments by Local Stakeholders

Under Indian Legislation, local stakeholder consultation process for such biomass based power projects is not warranted. MPPL has organised meetings and direct consultation with identified stakeholders as Local community / administrative authorities comprising of Village Panchayat, District Commissioner and Biomass Suppliers; Customer (KPTCL); Licensing and regulatory authorities like KREDL, KSPCB (Karnataka State Pollution Control Board), MoEF (Ministry of Environment & Forest) and CGWB (Central Ground Water Board) and The Electrical Inspectorate. All identified stakeholders have welcomed the project and no adverse comments have been received

4 COMMENTS BY PARTIES, STAKEHOLDERS AND NGOS

The PDD was made publicly available on www.dnv.com/certification/climatechange and Parties, stakeholders and NGOs were through the CDM website invited to provide comments during the period 3rd September 2005 to 2nd October 2005.

One comment was received on 20th September 2005. The comment received (in unedited form) is given in the below text box.

Comment by: Axel Michaelowa, Hamburg Institute of International Economics (HWWA)

Inserted on: 2005-09-20

Subject: Barrier test is unconvincing

Comment: The barrier test is unconvincing due to the following issues:

- Investment barriers: At the time of construction, 4-5 MW was the standard size. Larger sizes became relevant only at later points in time. The losses incurred during the first years have nothing to do with the decision to build the plant (and apparently variable costs were lower than revenues, otherwise the plant would have stopped operation)
- Technology barriers. These are true but the anticipation of covering revenue losses through CDM revenues is artificial (see below)
- Shortfall in funding and CDM contribution to overcome this: As the plant had been completed August 1, 2001 (building start must have been done at least a year earlier), a visit of MPPL chairman to SENTER just 4 months earlier cannot have changed the funding situation. As construction of the plant was achieved, sufficient funding must have been available without any expected CDM revenues. As the project participants did not bother to participate in CERUPT and only went for DNA approval in early 2005, this is a clear case of "jumping on the CDM bandwagon" ex post.
- The argument that the plant would close now if it does not get CDM funds reminds strongly of the argumentation of the avoided fuel switch in the context of NM 29 which has not been accepted by the CDM EB.
- On the baseline: The regional grid should be used instead of the state grid.

**The project participants' response:*****INVESTMENT BARRIER (UNIT SIZE)*****A) UNIT RATING OF MPPL PILOT PROJECT:**

MPPL goal was to pioneer the firing of low density crop residues in Biomass Power Plants.

Considering the issues related to the establishment of sustainable biomass supply chain as well as to limit the capital investment, the plant was originally sized as 3.375 MW.

However, the pre-construction engineering made it evident that such a small size unit would prove operationally uneconomical. An iterative process was adopted to optimize Plant Construction Cost (Rs/kW) & Crop Residues Supply Chain (tons/day) as well as Plant Operations Cost (Rs/kWh). This led to the plant size being sequentially uprated from 3.375 MW to 3.875 MW to 4.0 M to 4.5 MW. In this connection, please find attached copies of Government orders issued by the Energy Department, Government of Karnataka.

- * Government order No. DE 17 NCE 98, Bangalore dated 21/05/98 approving plant capacity of 3.375 MW
- * Government order No. DE 17 NCE 97, Bangalore dated 28/11/98 approving enhancement of plant capacity from 3.375 MW to 3.875 MW.
- * Government order No. DE 17 NCE 98, Bangalore dated 4/08/99 approving enhancement of plant capacity from 3.875 MW to 4.0 MW.
- * Government order No. DE 109 NCE 99, Bangalore dated 13/06/2000 approving enhancement of plant capacity from 4.0 MW to 4.5 MW.

The above clearly demonstrates that the plant size was primarily governed by the “pilot project” consideration of minimizing

- ***Daily requirement of Crop Residues***
- ***Pilot Project Capital Cost***

B) STANDARD RATINGS OF INDIAN BIOMASS POWER PLANT

India has long history of Biomass Power Plants since there are 400 operating sugar mills apart from Paper mills / Food processing units, which have Biomass fired Steam / Power generating units.



Standalone biomass power plants, based on rice husk/wood, were introduced, post Power Sector Reforms, in mid 1990's. The unit ratings were initially 6 MW and later ramped up to 7.5 MW/8 MW to optimise

- Plant heat rate
- Plant O & M cost (since staff & Administration costs remains the same notwithstanding the unit rating)

In year 2000, when MPPL commenced plant construction, it would have been both technically feasible and economically logical to have put up a 7.5 MW Power Plant firing rice husk or wood.

TECHNOLOGY BARRIERS (CDM CONTRIBUTION FOR SHORTFALL IN FUNDING)

A) PLANT CONSTRUCTION PHASE

MPPL Promoter AMBIENCE was also a Promoter of Netpro Renewable Energy and a participant in DESI Power. These companies have put up 50 KWe/100 KWe Biomass Gasifier based Power Plants as AIJ projects between 1998 to 2000. As such, MPPL Promoters were fully aware of market mechanisms under Kyoto Protocol.

MPPL had an understanding with a Consultant for obtaining CDM revenues and the visit to SENTER in early 2001 was in this connection. However, it became apparent that without Government of India communicating its policy approvals and putting in place administrative mechanisms, it would not be possible to get DNA approval. As such, cash flows through CDM contribution was anticipated to be delayed.

As a back up, funding support was sought from Government of Karnataka in the form of

- Equity participation to the extent of Rs. 16.8 million
- Subsidy to the extent of Rs. 10.0 million

In this connection, please find attached letter from Karnataka Renewable Energy Development Ltd. (a unit under the Energy Department of Government of Karnataka)

- Letter reference No.KRED/03/MPPPL/00/1082 dated October 19th, 2000 related to Equity Participation
- Letter reference No.KRED/03/MPPPL/01/1398 dated November 20th, 2001 related to subsidy.



Unfortunately, the above anticipated funding to the extent of Rs. 26.8 million did not materialize and only an amount of Rs. 4.62 million was received (as equity) leading to project funding shortfall of Rs. 22.18 million.

By that time, MPPL pilot project was in advanced stage of implementation and hence there was no other option but to continue with the project through additional funding support from MPPL's Promoters, AMBIENCE, as follows

- Rs. 15.1 million enhanced equity contribution
- Rs. 10 million unsecured loan

The above actions facilitated the plant construction ... but quite clearly there was a project funding gap.

B) PLANT OPERATIONS STABILISATION PHASE

MPPL pilot project sought to pioneer the firing of low density Crop Residues as primary fuel of a Biomass Power Plant.

This required establishment of Crop Residues Supply Chain (120 tons/day), development of reliable fuel beneficiation systems and Boiler design modifications/O & M protocol establishment (to overcome slagging/corrosion that results from firing low density crop residues).

Period August 2001 to March 2003 was hence operations stabilization phase. During this period MPPL suffered losses of Rs. 37.77 million.

MPPL would have greatly benefited from CDM contribution during this phase. However, lack of movement in Government of India procedures precluded MPPL from pursuing this option.

The above financial crisis was managed through support from the project lenders, IREDA as follows

- Rs. 9.2 million funded interest term loan
- Extension to moratorium for loan repayment up to June 2004.

The above facilitated plant continued operations ... but clearly there was a funding gap.

C) URGENT NEED FOR CDM CONTRIBUTION IN 2005

MPPL's pilot project with small unit rating of 4.5 MW has a factually higher operating cost.



The above operating cost, without CDM contribution, could have been managed if KPTCL had honoured its Power Purchase Agreement which had been signed on September 5th, 2000. Attached is Article 5 of the Power Purchase Agreement which clearly stipulates an annual 5% escalation over the tariff applicable for the previous year as per guidelines issued by the Union Ministry of Non Conventional Energy Sources.

KPTCL did not honour this provision from the 2nd year of operations itself (Indian fiscal year FY 2002-03). MPPL appealed to the Regulator and the award went in favour of MPPL. In this connection, please find attached Karnataka Electricity Regulatory Commission letter No.N/20/02/1700 dated October 17th, 2002.

Unfortunately, the following year onwards (Indian fiscal year FY 2003-04) KPTCL once again refused to honour the Power Purchase Agreement. The accumulated overdues on this account to MPPL is around Rs. 14 million, thereby creating acute liquidity crisis for MPPL.

As KPTCL shows no signs of honouring the PPA terms, MPPL also faces the prospect of continued negative cash flow resulting from escalating costs without corresponding revenue adjustments. In such a situation MPPL would undoubtedly be forced to close down its operations.

The urgent need for CDM contribution even in 2005 is to

- ***overcome liquidity crisis***
- ***have supplementary cash flow in addition to KPTCL payments***

How DNV has considered the comment received in its validation:

Supporting evidence provided to sustain the project proponent's response have been verified and together with the arguments presented by the project proponent and clarifications provided for the CL raised under the Additionality section, these are deemed justified and accepted. The southern regional grid has been considered for the baseline emission factor calculation.



5 VALIDATION OPINION

Det Norske Veritas Certification Ltd. (DNV) has in the period August 2005 to February 2006 performed a validation of the “4.5 MW Biomass (low density Crop Residues) based Power Generation unit of Malavalli Power Plant Pvt Ltd” project in Karnataka, India, proposed for registration as small-scale CDM project activity.

The validation is performed on the basis of UNFCCC criteria for small-scale CDM project activities, as well as criteria given to provide for consistent project operations, monitoring and reporting.

The project activity envisages utilization of the available low-density crop residues (cane trash/coconut fronds) and other biomass fuels in the region for generation of power and is exported to the state grid.

The project participants are Malavalli Power Plant Pvt Ltd of Karnataka, India and myclimate of Switzerland. Both participating Parties, i.e. India as the host Party and Switzerland as the Annex I Party meet the relevant participation requirements for the CDM and have approved its voluntary participation in the project.

The project will contribute to sustainable development by providing benefits such as employment generation during construction and operation of the project, ensuring environmental wellbeing and aid in bridging the gap between demand and supply of power. DNV has also received confirmation by the DNA of India that the project activity assists it in achieving sustainable development.

The validation did not reveal any information indicating that the project can be seen as a diversion of ODA funding towards India.

An analysis of the presented barriers demonstrates that the proposed project activity is not a likely baseline scenario. Emission reductions attributable to the project are hence additional to any that would occur in the absence of the project activity. The determination of the baseline is transparent. The project applies one of the options given by the simplified baseline methodology proposed for category I.D project activities, i.e. for renewable energy that displaces electricity, the simplified baseline is the electricity consumption times the relevant emission factor calculated as the kWh produced by the renewable generating unit multiplied by an emission coefficient (measured in kgCO₂/kWh).

The monitoring plan provides for the monitoring of gross power produced, auxiliary power consumed and net electricity supplied of the project. Detailed responsibilities and authorities for project management, monitoring and reporting and QA/QC procedures have also been addressed.

By displacing fossil fuel based grid power, the project results in reductions of CO₂ emissions that are real, measurable and give long-term benefits to the mitigation of climate change. Project emissions are zero and the baseline emissions are forecasted using reasonable assumptions.

A local stakeholder consultation process has been carried out by the project participants. DNV published the PDD on the DNV Climate Change website and comments by Parties, stakeholders and UNFCCC accredited NGOs were invited through the CDM website. One comment was received on this call.



VALIDATION REPORT

In summary, it is DNV's opinion that the "4.5 mw biomass (low density crop residues) based power generation unit of Malavalli Power Plant Pvt Ltd, India, as described in the PDD of 13 February 2006, meets all relevant UNFCCC requirements for the CDM and all relevant host country criteria and correctly applies the baseline and monitoring methodology for category 1.D small-scale CDM project activities. DNV thus requests the registration of the "4.5 mw biomass (low density crop residues) based power generation unit of Malavalli Power Plant Pvt Ltd" project in Karnataka, India as a CDM project activity.



REFERENCES

Documents provided by the project proponent that relate directly to the project:

- /1/ MPPL - *Clean Development Mechanism Project Design Document - 4.5 MW Biomass (low density Crop Residues) based Power Generation unit of Malavalli Power Plant Pvt Ltd* - of August 2005, November 2005, January 2006 and February 2006
- /2/ Indian DNA, Host country approval letter, dated March 23, 2005
- /3/ DNA of Switzerland, Letter of Approval, dated February 17, 2006
- /4/ MPPL Communication letter dated February 17, 2006

Background documents related to the design and/or methodologies employed in the design or other reference documents:

- /5/ International Emission Trading Association (IETA) & the World Bank's Prototype Carbon Fund (PCF): *Validation and Verification Manual*. <http://www.vvmanual.info>
- /6/ Appendix B of the simplified modalities and procedures for small-scale CDM project activities: *Indicative simplified baseline and monitoring methodologies for selected small-scale CDM project activity categories*. Version 07: 28 November 2005.

Persons interviewed during the validation, or persons contributed with other information that are not included in the documents listed above:

- /7/ MPPL – Mr K. Krishan – Managing Director
MPPL – Mr Sekhar – Project Manager

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APPENDIX A

VALIDATION PROTOCOL FOR SMALL-SCALE CDM PROJECT ACTIVITIES

Table 1 Mandatory Requirement for Small Scale Clean Development Mechanism (CDM) Project Activities

Requirement	Reference	Conclusion	Cross Reference/ Comment
1. The project shall assist Parties included in Annex I in achieving compliance with part of their emission reduction commitment under Art. 3	Kyoto Protocol Art. 12.2	OK	Table 2, Section E.4.1
2. The project shall assist non-Annex I Parties in achieving sustainable development and shall have obtained confirmation by the host country thereof	Kyoto Protocol Art. 12.2, Simplified Modalities and Procedures for Small Scale CDM Project Activities §23a	OK	Table 2, Section A.3
3. The project shall assist non-Annex I Parties in contributing to the ultimate objective of the UNFCCC	Kyoto Protocol Art. 12.2.	OK	Table 2, Section E.4.1
4. The project shall have the written approval of voluntary participation from the designated national authority of each party involved	Kyoto Protocol Art. 12.5a, Simplified Modalities and Procedures for Small Scale CDM Project Activities §23a	OK	Approval from the Indian DNA as per letter issued on Mar. 23 rd 2005 and from Swiss DNA dt 17 February 2006 is available.
5. The emission reductions should be real, measurable and give long-term benefits related to the mitigation of climate change	Kyoto Protocol Art. 12.5b	OK	Table 2, Section E.1 to E.4
6. Reduction in GHG emissions must be additional to any that would occur in absence of the project activity, i.e. a CDM project activity is additional if anthropogenic emissions of greenhouse gases by sources are reduced below those that would have occurred in the	Kyoto Protocol Art. 12.5.c, Simplified Modalities and Procedures for Small Scale CDM Project	OK	Table 2, Section B.2.1

Requirement	Reference	Conclusion	Cross Reference/ Comment
absence of the registered CDM project activity	Activities §26		
7. Potential public funding for the project from Parties in Annex I shall not be a diversion of official development assistance	Decision 17/CP.7	OK	The project is being proposed as a unilateral project.
8. Parties participating in the CDM shall designate a national authority for the CDM	CDM Modalities and Procedures § 29	OK	DNA of India: National Clean Development Mechanism Authority, Ministry of Environment and Forests. DNA of Switzerland: Swiss Agency for Environment, Forests and Landscape, Economics and Climate section.
9. The host Party and the participating Annex I Party shall be a Party to the Kyoto Protocol	CDM Modalities and Procedures § 30, 31b	OK	India ratified Kyoto Protocol on 26 August 2002 and Switzerland ratified the Kyoto protocol on 09 July 2003.
10. The participating Annex I Party's assigned amount shall have been calculated and recorded	CDM Modalities and Procedures §31b	OK	Switzerland's assigned amount is 92% of the emissions in 1990.
11. The participating Annex I Party shall have in place a national system for estimating GHG emissions and a national registry in accordance with Kyoto Protocol Article 5 and 7	CDM Modalities and Procedures §31b	OK	Switzerland has a national system for estimating GHG emissions and a national registry
12. The proposed project activity shall meet the eligibility criteria for small scale CDM project activities set out in § 6 (c) of the Marrakesh Accords and shall not be a debundled component of a larger project activity	Simplified Modalities and Procedures for Small Scale CDM Project Activities §12a,c	OK	Table 2, Section A.1
13. The project design document shall conform with the Small Scale CDM Project Design Document format	Simplified Modalities and Procedures for Small Scale CDM Project Activities, Appendix A	OK	.
14. The proposed project activity shall confirm to one of the project categories defined for small scale CDM	Simplified Modalities and Procedures for Small	OK	Table 2, Section A.1.3 B & D

Requirement	Reference	Conclusion	Cross Reference/ Comment
project activities and uses the simplified baseline and monitoring methodology for that project category	Scale CDM Project Activities §22e		
15. Comments by local stakeholders are invited, and a summary of these provided	Simplified Modalities and Procedures for Small Scale CDM Project Activities §22b	OK	Table 2, Section G
16. If required by the host country, an analysis of the environmental impacts of the project activity is carried out and documented	Simplified Modalities and Procedures for Small Scale CDM Project Activities §22c	OK	Table 2, Section F
17. Parties, stakeholders and UNFCCC accredited NGOs have been invited to comment on the validation requirements and comments have been made publicly available	Simplified Modalities and Procedures for Small Scale CDM Project Activities §23b,c,d	OK	The PDD was published on 3 rd September 2005 on http://www.dnv.com/certification/climatechange . Parties, stakeholders and NGO's were through the web site invited to provide comments until 2 nd October 2005. One comment was received during this period.

Table 2 Requirements Checklist

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
A. Project Description The project design is assessed.					
A.1. Small scale project activity It is assess whether the project qualifies as small scale CDM project activity.					
A.1.1. Does the project qualify as a small scale CDM project activity as defined in paragraph 6 (c) of decision 17/CP.7 on the modalities and procedures for the CDM?	/1/	DR	Yes, the project qualifies as a small scale CDM project type I (Renewable energy projects), category D (Renewable electricity generation for a grid). . The small scale CDM projects under this category have an eligibility limit of 15 MW and the unit is of 4.5 MW capacity and thus qualifies as a small scale CDM project.		OK
A.1.2. The small scale project activity is not a debundled component of a larger project activity?	/1/	DR	No similar Projects under the same project proponent are registered in the previous 2 years, Neither are there any other projects under the same category / technology with project boundary within 1 km of this project activity , thus this project is not a debundled component of a large project.		OK
A.1.3. Does proposed project activity confirm to one of the project categories defined for small scale CDM project activities?	/1/	DR	The project confirms to Type I (Renewable energy projects) category I.D (Renewable energy projects)		OK

* MoV = Means of Verification, DR= Document Review, I= Interview

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
A.2. Project Design Validation of project design focuses on the choice of technology and the design documentation of the project.					
A.2.1. Are the project's spatial (geographical) boundaries clearly defined?	/1/	DR, I	The project is located in Kirugaval village, Malavalli taluka, in the state of Karnataka, India		OK
A.2.2. Are the project's system (components and facilities used to mitigate GHG's) boundaries clearly defined?	/1/	DR, I	The project boundary covers fuel storage, travelling grate type boiler, condensing steam turbo generator unit and related accessory equipments, in addition to the electricity grid.		OK
A.2.3. Does the project design engineering reflect current good practices?	/1/	DR, I	Yes, the project design engineering reflects good practices. The boiler is designed to burn 100% agricultural residue (cane trash, coconut fronds, toppings of plantation wood, corn cob/maize stalks). The turbine is of condensing cum extraction type. The particulate emissions from the plant are controlled by the use of high efficiency (99%) Electrostatic Precipitators.		OK
A.2.4. Will the project result in technology transfer to the host country?	/1/	DR	The technology is already available in the country and thus no technology transfer is envisaged in the project.		OK
A.2.5. Does the project require extensive initial training and maintenance efforts in order to work as presumed during the project period? Does the project make provisions for meeting training and maintenance needs?	/1/	DR, I	The project will require minimal additional training for project maintenance since the primary technologies applied in this project are already established in India and technology transfer to the host country is not called-for. Moreover, the project owners MPPL is experienced in the field of establishing biomass power projects		OK

* MoV = Means of Verification, DR= Document Review, I= Interview

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Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
A.3. Contribution to Sustainable Development The project's contribution to sustainable development is assessed					
A.3.1. Will the project create other environmental or social benefits than GHG emission reductions?	/1/	DR, I	The project benefits the local population in form of socio-economic upbringing and has also been recognised by the Government of Karnataka for its sustainable development contribution. The "Grameen Abhivrudhi Mandal" set up by MPPL also imparts rural entrepreneurial skills in the local population and also educates the local population on aspects of electricity conservation and ground water preservation.		OK
A.3.2. Will the project create any adverse environmental or social effects?	/1/	DR	No adverse effects as a result of the project are envisaged.		OK
A.3.3. Is the project in line with sustainable development policies of the host country?	/1/	DR	The project has been evaluated with regards to the sustainable development policies of the Indian government and has been approved by the Designated National Authority vide letter dated 23 rd Mar'05.		OK
A.3.4. Is the project in line with relevant legislation and plans in the host country?	/1/	DR	The project has all necessary clearances/ approvals from regulatory bodies like KSPCB, KREDL, KPTCL, MNES etc. Host country clearance for the project is also available.		OK

* MoV = Means of Verification, DR= Document Review, I= Interview

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
B. Project Baseline The validation of the project baseline establishes whether the selected baseline methodology is appropriate and whether the selected baseline represents a likely baseline scenario.					
B.1. Baseline Methodology It is assessed whether the project applies an appropriate baseline methodology.					
B.1.1. Is the selected baseline methodology in line with the baseline methodologies provided for the relevant project category?	/1/	DR	Yes. The project applies one of the simplified baseline methodologies proposed for the small-scale project activity category I.D, i.e., for renewable energy that displaces electricity the simplified baseline is the electricity consumption times the relevant emission factor calculated as the kWh produced by the renewable generating unit multiplied by an emission coefficient (measured in kgCO ₂ /kWh).		OK
B.1.2. Is the baseline methodology applicable to the project being considered?	/1/	DR	Justification for selection of emission coefficient as the weighted average of the current generation mix as appropriate for this project and not the average of the "approximate operating margin" and the "build margin" is not given in the PDD.	GL-1	OK

* MoV = Means of Verification, DR= Document Review, I= Interview

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
<p>B.2. Baseline Determination</p> <p>It is assessed whether the project activity itself is not a likely baseline scenario and whether the selected baseline represents a likely baseline scenario.</p>					
<p>B.2.1. Is it demonstrated that the project activity itself is not a likely baseline scenario due to the existence of one or more of the following barriers: investment barriers, technology barriers, barriers due to prevailing practice or other barriers?</p>	/1/	DR	<p>The PDD demonstrates additionality primarily through the existence of the following barriers:</p> <p>Investment Barrier: As a consequence of the project utilizing low density crop residues and its comparatively lower rating of 4.5 MW has led to MPPL incurring substantial financial costs and losses</p> <p>Technological barrier: Firing of low density crop residues as primary fuel has required various technological innovations related to fuel beneficiation systems and the implementation of a 100% ash utilization scheme involving the production of organic fertilizer and distributing it to farmers from whose fields the crop residues were collected has resulted in the project incurring loss of Rs. 34.77 million between August 2001 to March 2003 (plant operations stabilisation phase)</p> <p>Barriers due to prevailing practice: being the continued reliance of the State grid primarily on thermal and hydro sources. It is claimed that MPPL is one of the earliest organisations to opt for biomass based power plant and encourage involvement of the local community in the crop residues supply chain as well as initiatives related to organic fertilizer production and electricity</p>	GL-2	OK

* MoV = Means of Verification, DR= Document Review, I= Interview

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
			<p>distribution</p> <p>Other barriers: Shortfalls to the tune of INR 22.18 Million in anticipated project funding and INR 11.18 Million from shortfall in receipts from KPTCL (as on March 2005) have rendered the project unviable to continue operations.</p> <p>It has also been argued that MPPL visited SENTER in April 2001 and also obtained the CERUPT tender documents, but same could not be successfully pursued on account of lack of clarity in procedural approvals at that time.</p> <p>However, it remains to be more clearly demonstrated that the project would not have occurred anyway. Substantiation by way of:</p> <ul style="list-style-type: none"> - Comparison between the financially viable 8 MW Bagasse based plant and the project activity. - How many such low capacity biomass plants are operating in India, and especially in India 		
B.2.2. Is the application of the baseline methodology and the discussion and determination of the chosen baseline transparent and conservative?	/1/	DR	The baseline scenario considered is the simple weighted average of current generation mix (in kgCo ₂ equ/kWh) of southern grid of India		OK
B.2.3. Are relevant national and/or sectoral policies and circumstances taken into account?	/1/	DR	Yes, national policy favours the renewable energy.		OK
B.2.4. Is the baseline selection compatible with the available data?	/1/	DR	The generation data for the year 2001 (the year in which the present project started its generation) is considered as the basis for designing the baseline and the source has been the : <i>Ministry of Non-</i>		OK

* MoV = Means of Verification, DR= Document Review, I= Interview

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
			<i>conventional Energy Sources, India (Annexure II C: Baseline Estimation Details southern region)</i>		
B.2.5. Does the selected baseline represent the most likely scenario describing what would have occurred in absence of the project activity?	/1/	DR	Yes, thermal power plants or hydro power plants are the most likely scenarios in the southern part of India.		OK
C. Duration of the Project / Crediting Period It is assessed whether the temporary boundaries of the project are clearly defined.					
C.1.1. Are the project's starting date and operational lifetime clearly defined?	/1/	DR	Yes the project starting date is April 2000 and the expected operational life time is 25 years.		OK
C.1.2. Is the assumed crediting time clearly defined (renewable crediting period of seven years with two possible renewals or fixed crediting period of 10 years with no renewal)?	/1/	DR	Yes, A renewable crediting period has been chosen, with the start date of the first renewable period as 01/08/2001.		OK
D. Monitoring Plan The monitoring plan review aims to establish whether all relevant project aspects deemed necessary to monitor and report reliable emission reductions are properly addressed.					
D.1. Monitoring Methodology It is assessed whether the project applies an appropriate monitoring methodology.					
D.1.1. Is the selected monitoring methodology in line with the monitoring methodologies	/1/	DR	Yes, The monitoring methodology – Metering the electricity generated by the renewable technology -		OK

* MoV = Means of Verification, DR= Document Review, I= Interview

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
provided for the relevant project category?			adopted for the project activity is in accordance with Category I.D. contained in Appendix B of the simplified M&P.		
D.1.2. Is the monitoring methodology applicable to the project being considered?	/1/	DR	Yes.		OK
D.1.3. Is the application of the monitoring methodology transparent?	/1/	DR	Yes, the application of the monitoring methodology is simple and transparent.		OK
D.1.4. Will the monitoring methodology give opportunity for real measurements of achieved emission reductions?	/1/	DR	Yes.		OK
D.2. Monitoring of Project Emissions It is established whether the monitoring plan provides for reliable and complete project emission data over time.					
D.2.1. Are the choices of project emission indicators reasonable?	/1/	DR, I	Since the project is renewable energy based, there will be no project emissions. However, no indirect emissions have been considered, such as due to transportation of biomass material. It was apparent during the site visit that sugarcane trash was being transported from a distance of 50 KM and coconut fronds as far away as 150 KM. If significant, these emissions must be monitored.	GL-3 CAR-4	OK

* MoV = Means of Verification, DR= Document Review, I= Interview

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
D.3. Monitoring of Leakage It is assessed whether the monitoring plan provides for reliable and complete leakage data over time.					
D.3.1. If applicable, are the choices of leakage indicators reasonable?	/1/	DR, I	In the case of small-scale CDM project activities using biomass, leakage, including potential effects on biomass availability for other users, shall be considered (See E.2.1) and, if significant, leakage effects must be monitored.	CL4 CAR 4	OK
D.4. Monitoring of Baseline Emissions It is established whether the monitoring plan provides for reliable and complete project emission data over time.					
D.4.1. Is the choice of baseline indicators, in particular for baseline emissions, reasonable?	/1/	DR	Yes, the baseline indicators have been chosen in line with the small-scale methodologies approved by the CDM EB As the boiler installed has the capability of multi feed, i.e., it can use coal as an alternate fuel in case of shortage of biomass material, monitoring data should include consumption of coal in the project boundary also in case of future usage and accounting in the baseline emissions.	CL5	OK
D.4.2. Will it be possible to monitor / measure the specified baseline emission indicators?	/1/	DR	Yes. The data will be recorded at the project site.		OK
D.4.3. Do the measuring technique and frequency comply with good monitoring practices?	/1/	DR	Yes, techniques do comply with good industry practice.		OK
D.4.4. Are the provisions made for archiving	/1/	DR	Yes, the data will be archived in paper form and		OK

* MoV = Means of Verification, DR= Document Review, I= Interview

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Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
baseline emission data sufficient to enable later verification?			archived until two years after verification		
D.5. Project Management Planning It is checked that project implementation is properly prepared for and that critical arrangements are addressed.					
D.5.1. Is the authority and responsibility of project management clearly described?	/1/	DR, I	Yes, The Director is responsible for project management		OK
D.5.2. Is the authority and responsibility for registration monitoring measurement and reporting clearly described?	/1/	DR, I	Yes, shift in charge is responsible for data recording and the plant manager for archiving and reporting.		OK
D.5.3. Are procedures identified for training of monitoring personnel?	/1/	DR	Yes, The Plant Manager is responsible for recording is identified for training. .		OK
D.5.4. Are procedures identified for emergency preparedness for cases where emergencies can cause unintended emissions?	/1/	DR	Emergencies like fire in storage area can cause unintended emission. The emergency preparedness in such situation needs to be elaborated.	GL-6	OK
D.5.5. Are procedures identified for calibration of monitoring equipment?	/1/	DR	The MP does not describe procedures for calibration of instruments to be used. Procedures for calibration must be defined to ensure later verification of CERs	GL-7	OK
D.5.6. Are procedures identified for maintenance of monitoring equipment and installations?	/1/	DR	Yes, the project developer is responsible for the maintenance of monitoring equipment.		OK
D.5.7. Are procedures identified for monitoring, measurements and reporting?	/1/	DR	Yes		OK
D.5.8. Are procedures identified for day-to-day records handling (including what records to keep, storage area of records and how	/1/	DR	Yes, the plant manager is responsible.		OK

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Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
to process performance documentation)					
D.5.9. Are procedures identified for dealing with possible monitoring data adjustments and uncertainties?	/1/	DR	Yes, the uncertainties are adjudged to be low.		OK
D.5.10. Are procedures identified for internal audits of GHG project compliance with operational requirements as applicable?	/1/	DR	Procedures for internal audits have been established.		OK
D.5.11. Are procedures identified for project performance reviews?	/1/	DR, I	Procedures for project performance reviews are not clearly addressed.	CL-8	OK
D.5.12. Are procedures identified for corrective actions?	/1/	DR, I	Procedures for corrective actions are not clearly addressed.	CL-8	OK
E. Calculation of GHG emission It is assessed whether all material GHG emission sources are addressed and how sensitivities and data uncertainties have been addressed to arrive at conservative estimates of projected emission reductions.					
E.1. Project GHG Emissions The validation of predicted project GHG emissions focuses on transparency and completeness of calculations.					
E.1.1. Are all aspects related to direct and indirect project emissions captured in the project design?	/1/	DR	Direct onsite emissions are restricted to the use of fuel in the boiler. Indirect emissions, such as due to energy consumed during construction and transportation have been considered as negligible.		OK
E.1.2. Have all relevant greenhouse gases and	/1/	DR	Yes		OK

* MoV = Means of Verification, DR= Document Review, I= Interview

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
sources been evaluated?					
E.1.3. Do the methodologies for calculating project emissions comply with existing good practice?	/1/	DR	The calculations are in line with the methodology laid down as per approved methodologies for Renewable electricity generation for the grid and thus is complying with the good practices		OK
E.1.4. Are the calculations documented in a complete and transparent manner?	/1/	DR	Yes.		OK
E.1.5. Have conservative assumptions been used?	/1/	DR	The auxiliary power consumptions and internal efficiencies are taken care of as the calculations are on the actual amount of power exported. Thus the calculations is conservative in nature		OK
E.1.6. Are uncertainties in the project emissions estimates properly addressed?	/1/	DR	The biomass plant has a multi feed boiler but coal is not envisaged to be used in the same. But monitoring the biomass consumption and a concrete action plan to ascertain availability of the biomass at all time is required. Clarification for the same is sought.	GL-9	OK
E.2. Leakage It is assessed whether there leakage effects, i.e. change of emissions which occurs outside the project boundary and which are measurable and attributable to the project, have been properly assessed.					
E.2.1. Are leakage calculation required for the selected project category and if yes, are the relevant leakage effects assessed?	/1/	DR	In the case of small-scale CDM project activities using biomass, leakage shall be considered, including potential effects on biomass availability for other users.	GL-4	OK

* MoV = Means of Verification, DR= Document Review, I= Interview

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
E.3. Baseline GHG Emissions The validation of predicted baseline GHG emissions focuses on transparency and completeness of calculations.					
E.3.1. Are the baseline emissions boundaries clearly defined and do they sufficiently cover sources for baseline emissions?	/1/	DR	The baseline emissions are defined in accordance with Type I.D in the CDM small-scale methodology scheme.		OK
E.3.2. Are all aspects related to direct and indirect baseline emissions captured in the project design?	/1/	DR	All the emission sources have been captured in the project design.		OK
E.3.3. Have all relevant greenhouse gases and sources been evaluated?	/1/	DR	Yes.		OK
E.3.4. Do the methodologies for calculating baseline emissions comply with existing good practice?	/1/	DR	Yes, as recommended by appendix B of Simplified M&P		OK
E.3.5. Are the calculations documented in a complete and transparent manner?	/1/	DR	Calculations are transparent in nature but the source of the data for calculating the Build margin (given in table 5, page 19 of section B.5.1) needs to be clarified.	GL10	OK
E.3.6. Have conservative assumptions been used?	/1/	DR	The calculations are based on the actual power purchased by KPTCL and is thus data driven and conservative in nature		OK
E.3.7. Are uncertainties in the baseline emissions estimates properly addressed?	/1/	DR	Uncertain scenarios like lack of feedstock for boiler due to weather conditions are not addressed in the PDD.	GL14	OK

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Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
E.4. Emission Reductions Validation of baseline GHG emissions will focus on methodology transparency and completeness in emission estimations.					
E.4.1. Will the project result in fewer GHG emissions than the baseline case?	/1/	DR	The project replaces fossil fuel-based electricity generation. While the project emissions are zero, baseline emissions are calculated to be 0.765 KgCO ₂ per KWh. The project is expected to result in emission reductions of 144 840 tonnes of CO ₂ during the first seven year crediting period		OK
F. Environmental Impacts It is assessed whether environmental impacts of the project are sufficiently addressed.					
F.1.1. Does host country legislation require an analysis of the environmental impacts of the project activity?	/1/	DR, I	As per the MoEF, an EIA is not required for projects costing less than USD 22 Millions, as is the case with the proposed project. While the project has been granted the Consents to Establish, the status of Consents to operate is not evidenced.	CL-12	OK
F.1.2. Does the project comply with environmental legislation in the host country?	/1/	DR	As in F.1.1.		OK
F.1.3. Will the project create any adverse environmental effects?	/1/	DR, I	The environmental effects are restricted to suspended particulate matter, Nitrogen oxides and Sulphur dioxide apart for generation of fly ash. An ESP has been installed and the project is designed to adhere to the stipulations as per the Karnataka State Pollution Control Boards directives. Ash collected is utilised for organic fertiliser		OK

* MoV = Means of Verification, DR= Document Review, I= Interview

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
			manufacture		
F.1.4. Have environmental impacts been identified and addressed in the PDD?	/1/	DR	The environmental impacts of the project are sufficiently assessed.		OK
G. Comments by Local Stakeholder					
Validation of the local stakeholder consultation process.					
G.1.1. Have relevant stakeholders been consulted?	/1/	DR, I	Yes the following relevant stakeholders have been consulted - Local community / administrative authorities comprising of Village Panchayat, District Commissioner and Biomass Suppliers; Customer (KPTCL); Licensing and regulatory authorities like KREDL, KSPCB (Karnataka State Pollution Control Board), MoEF (Ministry of Environment & Forest) and CGWB (Central Ground Water Board); Electrical Inspectorate		OK
G.1.2. Have appropriate media been used to invite comments by local stakeholders?	/1/	DR, I	The views of <i>Local Community / Administrative Authorities</i> were ensured through creation of "Grameena Abhivrudhi Mandali" which has nominees of the Taluka/Grama Panchayats and essentially is a representative body of the local community.		OK
G.1.3. If a stakeholder consultation process is required by regulations/laws in the host country, has the stakeholder consultation process been carried out in accordance with such regulations/laws?	/1/	DR	Not specifically required for such small scale biomass projects under the Indian Legislation.		OK
G.1.4. Is a summary of the comments received provided?	/1/	DR	No summary of the comments are enclosed, the PDD only states that the concerns expressed were addressed. Further clarification regarding the nature of the concern and the steps taken to	GL-13	OK

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Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
			address the same needs to be furnished.		
G.1.5. Has due account been taken of any comments received?	/1/	DR	As in G.1.4	CL-13	OK

Table 3 Resolution of Corrective Action and Clarification Requests

Draft report corrective action requests and requests for clarification	Ref. to Table 2	Summary of project participants' response	Final conclusion
<p>CAR 1:</p> <p>Indirect emissions though estimated have not been accounted in the project emissions. The methodology advocates that emissions due to biomass transport be accounted for biomass projects</p>	<p>D.2.1</p>	<p>Transport emissions have now been accounted under project emissions and emission reductions have been revised appropriately in the PDD.</p>	<p>Information provided has been verified and accepted. CAR is closed.</p>
<p>CL 1:</p> <p>Justification for selection of emission coefficient as the weighted average of the current generation mix as appropriate for this project and not the average of the “approximate operating margin” and the “build margin”, is not given in the PDD.</p>	<p>B.1.2</p>	<p>Refer to Page 10 of modified PDD under B.2.</p>	<p>It has been clarified that due to the difficulty in getting data for the operating margins and the fact that this project activity is a small scale activity (4.5 MW) would actually replace an average rather than marginal unit supplied in the grid, weighted average of the current generation mix has been selected for the emission factor calculation. Clarification request is hereby closed</p>
<p>CL 2:</p> <p>However, it remains to be more clearly demonstrated that the project would not have occurred anyway. Substantiation by way of:</p> <ul style="list-style-type: none"> - Comparison between the financially viable 8 MW Bagasse based plant and the project activity. - How many such low capacity biomass 	<p>B.2.1</p>	<p>Refer to: Enclosure 1 - financial comparison of technologies Page 11 of modified PDD under “Investment barrier”. Refer to:</p>	<p>Enclosures 1, 10 and the revised PDD have been verified and accepted. It has been demonstrated that the cost of a 4.5 MW crop residues fired power plant is INR 36.5 Million as opposed to an 8 MW rice husk based plant at INR 31.9. The project activity at 4.5 MW as</p>

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<p>plants are operating in India, and especially in Karnataka</p>		<p>Enclosure 10 – Bagasse based power plants</p>	<p>against the more standard rating (for Biomass Power Plants in India of 7.5 to 8 MW) has resulted in cost of generation due to</p> <ul style="list-style-type: none"> - Approximately 9% higher heat rate (resulting in higher fuel cost of approximately INR 0.20/kWh) - Approximately 10% higher unit capital cost (resulting in approximately INR 0.10/kWh higher capital servicing costs during first 10 years) - Same fixed O & M costs (resulting in approximately INR 0.15/Kwh higher unit O & M costs) - Higher unburnts, lower availability and higher plant O & M costs in view of slagging/corrosion in the Boiler (resulting in approximately INR 0.05/ kWh higher O & M costs). <p>It has also been established that plants existing and put up between 2000 and 2001 have all been bagasse based power plants in sugar plants and all of them are sized more than 4.5 MW. To this extent, the project activity as a stand alone 4.5 MW crop residues fired plant is unique.</p> <p>From the above it is apparent that the project is additional and would not have occurred otherwise.</p>

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			Clarification request is hereby closed
<p>CL 3:</p> <p>No indirect emissions have been considered, such as due to transportation of bio-mass material. It was apparent during the site visit that sugarcane trash was being transported from a distance of 50 KM and coconut fronds as far away as 150 KM. If significant, these emissions must be monitored.</p>	D.2.1	<p>Refer to:</p> <p>Enclosure 2 – fuel consumption, procurement and leakage</p> <p>Enclosure 3 – biomass mapping and supply chain</p> <p>Page 20 of modified PDD under E.1.2.2</p>	<p>Enclosures 2 & 3 have been verified.</p> <p>Indirect emissions due to transportation of biomass have been estimated to be 514 t CO2 emissions per year. This has been considered and is now deducted from claimed emission reductions.</p> <p>CL closed. .</p>
<p>CL 4:</p> <p>In the case of small-scale CDM project activities using biomass, leakage, including potential effects on biomass availability for other users, shall be considered (See E.2.1) and, if significant, leakage effects must be monitored</p>	D.3.1, E.2.1	<p>This clarification has been addressed in CL 3.</p>	<p>As indicated under conclusion for CL 3, Enclosures 2 & 3 have been verified and accepted</p> <p>Clarification request is hereby closed</p>
<p>CL 5:</p> <p>As the boiler installed has the capability of multi feed, i.e., it can use coal as an alternate fuel in case of shortage of biomass material, monitoring data should include consumption of coal in the project boundary also in case of future usage and accounting in the baseline emissions.</p>	D.4.1	<p>Refer to Page 4 of modified PDD under “Technological well being”.</p>	<p>It has been confirmed that the plant has not been built to incorporate any coal handling equipment such as coal bunkers, coal mills, coal conveyers etc. Hence this plant can be operated only using biomass fuels. In case of non availability of biomass, particularly during heavy rains, the plant will shutdown.</p> <p>Clarification request is hereby closed</p>
<p>CL 6:</p> <p>Emergencies like fire in storage area can cause unintended emission. The emergency preparedness in such situation needs to be</p>	D.5.4	<p>Biomass fuel supplies are not stored for more than 2-3 days on-site and a complete fire protection system is installed in the Plant.</p>	<p>Enclosure 4 verified. Complimentary information provided has been accepted.</p>

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elaborated		Refer to: Enclosure 4 – procedures on fire protection system. Hardcopy submitted.	
CL 7: The MP does not describe procedures for calibration of instruments to be used. Procedures for calibration must be defined to ensure later verification of CERs	D.5.5	Refer to: Enclosure 5 – procedures for calibration of instruments. Hardcopy submitted. Page 18 of modified PDD under D.5	Enclosure 5 verified. Complimentary information provided has been accepted.
CL 8: Procedures for Performance Reviews and Corrective Actions shall be clearly addressed	D.5.11, 5.12	Enclosure Set 6 - list of operating policies, circulars during Plant stabilisation period, policy guidelines and MIS report formats. Hardcopies submitted.	Enclosure 6 verified. Complimentary information provided has been accepted.
CL 9: The biomass plant has a multi feed boiler but coal is not envisaged to be used in the same. But monitoring the biomass consumption and a concrete action plan to ascertain availability of the biomass at all time is required. Clarification for the same is sought.	E.1.6	Refer to: Enclosure 7 – biomass availability Enclosure 2 – fuel consumption, procurement and leakage Enclosure 3 – biomass mapping and supply chain	Enclosures 2, 3 and 7 have been verified and are evident that biomass is available in plenty around the plant location and a supply chain has been established in the districts of Mandya, Mysore, Hassan and Chamarajanagar for the supply of coconut fronds, corn cobs, cane trash, tobacco stalk and cotton stalk. Clarification request is hereby closed
CL 10: Calculations are transparent in nature but the source of the data for calculating the Build margin (given in table 5, page 19 of section B.5.1) needs to be clarified	E.3.5	The source of this data is: 1. Generation Report, 2001-02, CEA, Govt. of India. 2. General Review 1998-99, CEA, Govt. of India 3. Preparatory and pre-planning for	Complimentary information provided has been verified and accepted.

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		<p>Geneff Project, Project Report, Tata Energy Research Institute, New Delhi.</p> <p>4. In case of Gas Power plants the net heat rate is taken from generation norms, Report of the working group on Power for 10th Plan, CEA</p> <p>5. Heat rate from http://www.apgenco.com/performance.htm</p>	
<p>CL 11: Uncertain scenarios like lack of feedstock for boiler due to weather conditions are not addressed in the PDD.</p>	<p>E.3.7</p>	<p>This clarification has been addressed in CL 3 and CL 5.</p>	<p>Complimentary information provided has been verified and accepted.</p>
<p>CL 12: While the project has been granted the Consents to Establish, the status of Consents to operate is not evidenced.</p>	<p>F.1.1</p>	<p>Refer to: Enclosure 8 – Copy of Consent to Operate issued by the KSPCB. Hardcopy previously delivered.</p>	<p>Enclosure 8 has been verified and accepted.</p>
<p>CL 13: No summary of the comments are enclosed, the PDD only states that the concerns expressed were addressed. Further clarification regarding the nature of the concern and the steps taken to address the same needs to be furnished</p>	<p>G.1.4, 1.5</p>	<p>Refer to: Enclosure Set 9 – summary of stakeholder consultation. Originals submitted Page 23 of modified PDD under G.2</p>	<p>Complimentary information provided has been accepted.</p>