



VALIDATION REPORT

7.5 MW GRID-CONNECTED BIOMASS POWER PROJECT, BY RAVI KIRAN POWER PROJECTS PRIVATE LIMITED IN INDIA

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DET NORSKE VERITAS



VALIDATION REPORT

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DET NORSKE VERITAS
CERTIFICATION LTD

Palace House
3 Cathedral Street
London SE19DE
United Kingdom
Tel: +44 (0)20 7357 6080
Fax: +44 (0) 20 7407 1239
<http://www.dnv.com>

Summary:

Det Norske Veritas Certification Ltd. (DNV) has performed a validation of the “7.5 MW Grid-Connected Biomass Power Project, by Ravi Kiran Power Projects Private Limited” 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 documents, 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 23 February 2007 meets all relevant UNFCCC requirements for the CDM is eligible as category I.D small-scale CDM project activity and correctly applies the approved simplified baseline and monitoring methodology AMS-I.D version 10. Hence, DNV requests the registration of the “7.5 MW Grid-Connected Biomass Power Project, by Ravi Kiran Power Projects Private Limited” project as CDM project activity.

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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
DPR	Detail project report
EB	Executive Board of UNFCCC
EPC	Equipment procurement and construction
GHG	Greenhouse gas(es)
GWP	Global Warming Potential
kWh	Kilo Watt hour
MW	Mega Watts
MNES	Ministry of Non-conventional energy sources
MoEF	Ministry of Environment and Forest
IREDA	Indian Renewable Energy Development Agency Limited
IPCC	Intergovernmental Panel on Climate Change
IRR	Internal rate of return
KPTCL	Karnataka state Power Transmission Corporation Limited.
KREDL	Karnataka Renewable Energy Development Limited
MP	Monitoring Plan
N ₂ O	Nitrous oxide
NGO	Non-governmental Organisation
ODA	Official Development Assistance
PPA	Power Purchase Agreement
PDD	Project Design Document
UNFCCC	United Nations Framework Convention on Climate Change



1 INTRODUCTION

Ravikiran Power Projects Private Limited has commissioned Det Norske Veritas Certification Ltd. (DNV) to perform a validation of the “7.5 MW Grid-Connected Biomass Power Project, by Ravi Kiran Power Projects Private Limited” project in India (hereafter called “the project”). 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 consists of the following personnel:

Astakala Vidyacharan	DNV India	Team Leader, GHG auditor
Praveen N. Urs	DNV India	GHG auditor
C. Kumaraswamy	DNV India	Technical reviewer
K. Venkata Raman	DNV India	CDM Validator
Michael Lehmann	DNV Norway	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/ 5/. The validation team has, based on the recommendations in the Validation and Verification Manual / 4/ 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 is a 7.5 MW (gross) capacity, grid connected biomass based power project. The project is located in the Karnataka state of India, and was commissioned in July 2005. The project utilises the surplus available renewable biomass, rice husk and other agricultural residues in the Koppal district of Karnataka region for generation of electricity and export to the state electricity board grid. It uses a condensing type steam turbo generator with a matching boiler of



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travelling grate type technology, capable of firing multiple fuels. The technology used is indigenous.

The project activity reduces the anthropogenic GHG emissions by displacing fossil fuel based electricity generation with renewable biomass based power generation. The project thereby helps in reducing power deficit in the state of Karnataka and also contributes towards conservation of natural resource like coal.

The project is expected to result in emission reductions of 24 061 tonnes of CO₂ per year during the crediting period of 10 years.

2 METHODOLOGY

The validation consists of the following three phases:

- I a desk review of the project design documents
- 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 / 4/. 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 “7.5 MW Grid-Connected Biomass Power Project, by Ravi Kiran Power Projects Private Limited” 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
The requirements the project must meet.	Gives reference to the legislation or agreement where the requirement is found.	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.	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.

Validation Protocol Table 2: Requirement Checklist				
Checklist Question	Reference	Means of verification (MoV)	Comment	Draft and/or Final Conclusion
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.	Gives reference to documents where the answer to the checklist question or item is found.	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.	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.	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.

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
If the conclusions from the draft Validation are either a Corrective Action Request or a Clarification Request, these should be listed in this section.	Reference to the checklist question number in Table 2 where the Corrective Action Request or Clarification Request is explained.	The responses given by the project participants during the communications with the validation team should be summarised in this section.	This section should summarise the validation team's responses and final conclusions. The conclusions should also be included in Table 2, under "Final Conclusion".

Figure 1 Validation protocol tables



2.1 Review of Documents

The PDD / 1/submitted by the Ravikiran Power Projects Private Limited (version 1 dated 4th September 2006 and version 2 dated 23 February 2007) and additional background documents related to the project design and baseline such as the grid emission calculation / 2/, emission reduction calculations, local stakeholders responses and the monitoring plan were assessed as a part of the validation.

2.2 Follow-up Interviews

On 30 November 2006, DNV performed interviews with representatives of Ravikiran Power Projects Private Limited and local stakeholders to confirm selected information and to resolve issues identified in the document review. The main topics of the interviews are summarised in Table 1.

Table 1 Interview topics

Interviewed organisation	Interview topics
Ravikiran Power Projects Private Limited	<ul style="list-style-type: none"> ➤ Further clarifications 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, barriers due to prevailing practice or other barriers. ➤ Clarifications on establishment of baseline, monitoring plan and emission reduction calculations. ➤ Resources, training needs and procedures for operation and maintenance. ➤ Benefits from CDM registration.
Biomass suppliers	<ul style="list-style-type: none"> ➤ Availability of biomass ➤ Cost of biomass ➤ Benefits due to project activity
President Chicjanthakal village	<ul style="list-style-type: none"> ➤ Local employment ➤ Benefits to the local community due to project ➤ Impact on local environment
Environment Engineer Pollution control Board, Koppal region	<ul style="list-style-type: none"> ➤ Environmental performance of the project ➤ Any complaints on project on environmental front

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 initial validation identified three corrective action request and ten requests for clarification. These requests were presented to the project participants in DNV's draft validation report and the project participants were invited to provide a response to these requests. The project participants' response, which included the submission of a revised PDD dated 23 February 2007, addressed the corrective action request and requests for clarification to DNV's satisfaction.



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To guarantee the transparency of the validation process, the concerns raised by DNV and the responses given by the project participant are documented in the validation protocol in Appendix A to this report.

2.4 Internal Quality Control

The draft validation report including the initial validation findings underwent a technical review before being submitted to the project participants. The final validation report underwent another technical review before requesting registration of the project activity. The technical review was performed by a technical reviewer qualified in accordance with DNV's qualification scheme for CDM validation and verification.

3 VALIDATION FINDINGS

In the following sections the findings of the validation are stated. 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 23 February 2007.

3.1 Participation Requirements

The project activity is being proposed as a unilateral project by Ravikiran Power Projects Private Limited, which is the only project participant from the host country India. India meets all participation requirements, and the DNA of India has approved the project with a letter of approval dated 29 December 2006 and has provided confirmation that the project assists in achieving sustainable development.

3.2 Project Design

The project has a rated capacity of 7.5 MW and exports electricity to the Karnataka state electricity grid, which forms a part of southern regional electricity grid of India.

The technology used is available in India and no transfer of technology is envisaged. The biomass based power plant generates electricity utilizing the available renewable biomass in the region, which will be primarily rice husk along with other agricultural waste available in the surrounding region. It has been verified from survey documentation on biomass availability (in Koppal district of Karnataka state) by Zenith corporate services (p) limited, that surplus biomass was available when the project was conceptualized and that the project activity does not lead to any leakage effects elsewhere due to the usage of fossil fuel.

The project consists of a straight condensing type steam turbo generator coupled with matching boiler of travelling grate type technology capable of firing multiple fuels. The capacity generation of boiler is 27 tones of steam per hour at a pressure of 65 kg/cm² and a temperature of 485⁰C equivalent to 24.6 MW thermal.

The project results in reduction of GHG emissions by capacity addition to the grid, which is dominated by fossil fuel based power generators. The added advantage of the project will be in terms of additional income generated for the farmer and also in terms of jobs generated by the



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project. The technology applied is deemed current good practice and is not expected to be replaced within the crediting period.

The project starting date is mentioned and confirmed to be 12 November 2002 with the signing of an agreement between Ravikiran Power Projects Private Limited and Sri Ram EPC Limited for turnkey equipment procurement and construction (EPC). The expected operational lifetime of the project is 25 years. A fixed crediting period of 10 years, starting from the date of registration of the project with UNFCCC as a CDM project is considered.

The validation did not reveal any information that indicates that the project can be seen as a diversion of official development assistance (ODA) funding towards India.

3.3 Baseline Determination

Since the project installed capacity is less than 15 MW, the project is eligible as type I small-scale CDM project activity and can apply the simplified baseline methodology. The project applies the baseline methodology stipulated for category I.D of the “simplified modalities and procedure for small scale CDM project activity” (AMS-I.D version 10), which is applicable to grid connected renewable electricity generation projects and includes biomass projects. The application of AMS-I.D is justified as the project generates electricity using biomass and displaces grid electricity. The thermal output of the project activity is 24.6 MW_{th} which is less than the 45 MW_{th} limits specified for the AMS I D methodology.

As the project activity exports power to the Andhra Pradesh state electricity grid, which forms a part of southern region electricity board, the baseline for the project activity is the function of the generation mix of southern region grid. The selection of the southern region grid as the grid system boundary for the project activity is in line with the CDM EB guidance for large countries such as India. Using the methodology available for small-scale project activities as applicable for category I.D, the “weighted average emissions (in kg CO₂ e/kWh) of the current generation mix” emission coefficient for southern grid of India has been used. For estimating the emission reductions for the project, emission factor 0.780 kg CO₂ e/kWh for the 2004-05 as estimated by the Central electricity authority of India (CEA) has been taken from the official web site. The baseline emission factor for the rest of the crediting period will be taken ex-post from the CEA website.

3.4 Additionality

As per the Attachment A to Appendix B of simplified modalities and procedures for small scale CDM project activities, the project demonstrates additionality through the existence of the prevailing practice and other barriers.

DNV was able to verify that the project activity was considered as a CDM project prior to implementation, through the minutes of meeting of the organisation’s board of directors held on 16 June 2002.

DNV could verify from the Karnataka Renewable Energy Development Limited (KREDL) website, that the power generation using renewable biomass sources was not representing any prevailing practice at the time of project conceptualisation. It was also verified (by the licence granted by the Government of Karnataka for the project) that the project activity started off in September 2001 and that there was only one project of 4.5 MW capacity operating (registered as a CDM project now) and one 7.5 MW installed capacity project under implementation in the



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Karnataka region. This confirms that power generation using non-conventional sources was not a common practice in spite of governmental promotions like tax holidays, subsidies etc.

It was verified that the project faced financial barriers. The project participant signed the power purchase agreement (PPA) with Karnataka power trading corporation limited (KPTCL) in June 2002. The tariff given in the original PPA was the Ministry of non conventional energy sources (MNES) suggested tariff of INR 2.25 with an escalation of 5% each year with base year as 1994-95. The PPA was terminated unilaterally by KPTCL in July 2003, even before commissioning of the project, and a new tariff of INR 2.80 with an escalation of 2% was offered. Since the construction activity had commenced after the project's financial closure, the project construction was continued and the project was commissioned. After challenging the termination of original PPA in the high court, the project participant had to sign a supplementary agreement with KPTCL. According to the revised tariff, the project is eligible for INR 3.10 for first 6 MW and INR 2.85 for remaining 1.5 MW generated. It was demonstrated that these fluctuations in tariff structure have created significant uncertainties with regard to the financial viability of the project.

It was verified that the project activity had an IRR of 11.82% without considering any CDM benefits, which improved to 16.07% on considering CDM revenues. The weighted average cost of capital of the project is 16.96%. The lower IRR establishes that the project was not viable even with low raw material cost and attractive tariff rates at the time of project conceptualisation. A sensitivity analysis also indicates that the project is not financially viable on normal investment terms without considering CDM revenues. The excel worksheets of the financial calculations have been verified and are reasonable. The IRR of the project activity worked out with the tariff rates at the time of the request for review by the EB, have also been verified to be at 13.93%, which is also below the benchmark.

The increase in biomass prices from conceptual stage to operation stage is also claimed as an investment barrier. Though surplus biomass in the region was available at the time of project initiation, the availability was purely related to the seasonal conditions and crop patterns in the region and storage for longer periods at site could reduce the calorific value of the biomass. Due to this, the fluctuations in biomass prices are high, becoming a potential main deterrent for the project by increasing generation costs. This was confirmed through plant records and invoices of biomass purchases.

Based on the above, it is substantiated that the project faces barriers compared to normal generation sources and thus is deemed additional.

3.5 Monitoring Plan

The project applies AMS-I.D baseline and monitoring methodology. The amount of biomass and fossil fuel consumption are monitored apart from electricity generated and exported to the KPTCL grid.

The baseline emission is being calculated as the product of the electricity supplied to the grid and the grid emission factor of the southern regional grid, which is calculated ex-post each year using the data from the CEA official website.

Direct emission due to the combustion of coal, if necessary (based on the net caloric value) as fuel is considered for the project emissions. The project receives its requirement of coal (of a



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specific grade) from a single supplier on the directions of KREDL. (Please see discussion below on this).

Maintenance and calibration of electricity meters are carried out as per the internal procedures and in accordance with the power purchase agreement with KPTCL. All data will be archived in paper/electronic form until two years after the crediting period.

While board of directors is responsible for project management, the members of CDM committee are responsible for data recording, archiving and reporting. Procedures for internal audits, performance reviews and corrective actions have also been established. The provided monitoring plan is adequate to provide the necessary information for the calculation of electricity generated, fuel consumed and analysis of the biomass used.

3.6 Calculation of GHG Emissions

Direct onsite emissions are restricted to the use of fossil fuel coal in the boiler, when used during shortfall in rice husk supply. The emissions due to transportation of biomass have been estimated at 558 t CO₂/year and constitute around 2.3% of the total annual emission reduction. It has been argued that the same types of GHG emissions occur during transportation of coal from coal mines for which transport distances are much longer. Hence, emissions due to transportation of biomass in comparison are considered negligible and therefore not considered. Emissions due to consumption of diesel in the site are also calculated as 70t CO₂/year, and considered negligible after estimating based on actual consumptions so far.

In accordance with AMS-1.D the biomass power plant may co-fire fossil fuels. As per the guidelines of the KREDL the project can use coal up to 25% as support fuel. To arrive at a conservative ex-ante GHG emission reduction estimates, it was assumed that the project will co-fire about 7500 tons of coal per annum (10% of total fuel requirement) resulting in annual project emissions of 11186 t CO₂. It was verified from plant records that during the first two years of plant operation, no coal was used. The CO₂ emissions due to the usage of about 7500 t of coal per annum (considering an average net calorific value of about 3800 kcal/kg) will be within the threshold limit of 60 kt as specified by the small-scale CDM modalities. The emissions resulting from use of coal is incorporated as project emissions and the use of coal during the crediting period will be monitored and the project emissions calculated accordingly. There are no leakages due to biomass cultivation for the project as the required biomass is dependant on suppliers alone and project does not have any biomass growing activity for the project. Leakage due to competing biomass is not applicable as the surplus biomass available for the project.

3.7 Environmental Impacts

The environmental impacts of the project are sufficiently assessed. The project's environmental impacts relate to the emission of suspended particulate matter, nitrogen oxides, sulphur dioxide and the generation of fly ash. An electrostatic precipitator has been installed to control the emission of suspended particulate matter. It was verified from the records that the project adheres to the stipulations of the state pollution control board. Ash collected is disposed for manufacturing of bricks. Procedures for handling environment impacts due to post emergency scenarios like generation of effluent and debris are addressed as a part of emergency preparedness.



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As per the local regulations, an EIA is not required for projects costing less than USD 22 million, which is the case for this project.

3.8 Comments by Local Stakeholders

The comments from local stakeholders like local village inhabitants, biomass suppliers and local NGOs were invited through personal communications. No adverse comments were received from local stakeholders.

4 COMMENTS BY PARTIES, STAKEHOLDERS AND NGOS

The PDD dated 04 September 2006 was made publicly available on DNV's climate change website (www.dnv.com/certification/climatechange) and Parties, stakeholders and NGOs were through the CDM website invited to provide comments during a 30 days period from 07 September 2006 to 06 October 2006.

One comment was received on 09 September 2006. The comment received (in unedited form) is given in the below text box.

Comment by: [Kumar, SWL](#)

Inserted on: 2006-09-09

Subject: Comments

Comment: Where do the project proponent sell the power if PPA discontinued?

If fuel linkages are very costly.

How the 85% PLF would be achieved considering other factors like -

- a) No buyer / termination of PPA.
- b) no committed fuel linkages.

Why KPTCL is not discontinuing others PPA which are commissioned at the time of project activity

The project participants' response:

The project proponent executed Power purchase Agreement initially with KPTCL in June, 2002 based on MNES tariff structure for biomass based power projects. Subsequently, in July 2003 KPTCL informed the termination of old PPA unilaterally and advised the project proponents to sell the power to utility at a low tariff. The tariff proposed by the utility is highly uneconomical and could severely affect the viability of the project. After a long negotiation, KPTCL agreed for power purchase by entering in to a supplementary agreement for sale of power with a condition that the Distribution Company will pay Rs. 3.1/kWh up to 6 MW and only, and at Rs.2.85/kWh for the remaining 1.5MW. The project proponent had to agree for the above condition in order to operate the plant.

The location of the biomass Power plant is selected based on surplus availability of biomass. There is no practice of taking fuel linkages for biomass based power projects. The fuel being



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biomass no binding contracts could be executed with farmers as well as other suppliers of biomass such as rice millers etc.,

While estimating the PLF at 85%, it was not envisaged that the PPA will be terminated or that fuel linkage has to be obtained. The estimation is based on the technical assumption that the plant can perform up to 85% of the Installed capacity.

After termination of the old PPA, the project proponent entered into a new supplementary agreement with KPTCL for sale of power. However, according to the new agreement, the project proponent can avail the earlier tariff only for the proportionate power from 6 MW and for the remaining 1.5 MW the tariff fixed by KPTCL is applicable. The project is currently exporting power and availing tariff based on supplementary agreement.

KPTCL has discontinued the power purchase agreements executed by them not only for this project but also for similar biomass based power projects proposed in the state of Karnataka. All the other plants are also seeking carbon credits so overcome barriers.

It is also not practical to have committed fuel linkages for this project. The fuel being biomass to be procured from farmers and rice millers, these suppliers would like to take the opportunity to get higher prices as new demand is created for these fuels by setting up the biomass based power plants. The linkage may be possible in respect of fuels such as coal etc., as they have regulated markets

How DNV has considered the comment received in its validation:

During the validation DNV has confirmed that KPTCL has terminated the PPA signed during project conceptualised and subsequently a supplementary agreement has been signed considering dual rate for the power purchased. INR 3.10 per unit is applicable up to 6 MW and INR 2.85 per unit for the remaining 1.5 MW exported. It is confirmed that the biomass availability is abundant based on survey reports and subsequent interactions with local stakeholders, ensuring that project can achieve PLF as desired. It was also confirmed that there are no fuel linkages for the procurement of biomass.

5 VALIDATION OPINION

Det Norske Veritas Certification Ltd. (DNV) has performed a validation of the “7.5 MW Grid-Connected Biomass Power Project, by Ravi Kiran Power Projects Private Limited” project at the Marlanhalli village, Koppal District, Karnataka, India on the basis of UNFCCC criteria for the Clean Development Mechanism and host country criteria, as well as criteria given to provide for consistent project operations, monitoring and reporting.

The review of the project design documentation and the subsequent follow-up interviews have provided DNV with sufficient evidence to determine the fulfilment of stated criteria.

The project participant is Ravikiran Power Projects Private Limited. The host Party India meets all participation requirements and the DNA of India approved the project on 29 December 2006. No annex I Party is yet identified.

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The validation has confirmed that the project is eligible as category I.D small-scale CDM project activity and correctly applies the simplified baseline and monitoring methodology AMS-I.D version 10. The determination of the baseline is well elaborated, transparent and sufficiently supported with facts. The selected baseline scenario is reasonable for the selected 10 year crediting period. Moreover, an analysis of the barriers facing the project demonstrates that project is not a likely baseline scenario.

The project contributes to sustainable development by generating renewable energy, providing benefits such as employment generation during construction and operation of the project, ensuring environmental well being and aid in bridging the gap between demand and supply of power. The DNA of India has confirmed that the project assists in achieving sustainable development and has accorded the approval for the project on 29 December 2006.

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

The project results in the reduction of GHG emissions those are real, measurable and give long-term benefits and that are additional to what would have occurred in the absence of the project.

The total emission reductions from the project are estimated to be on the average 24,061 tCO₂e per year over the selected 10 year crediting period. The emission reduction forecast has been checked and is deemed likely that the state amount is achieved given that the underlying assumptions do not change.

The monitoring plan makes sufficient provision for monitoring relevant project and baseline emission indicators. Responsibilities and authorities for project management, monitoring and reporting and QA/QC procedures have also been addressed.

A local stakeholder consultation process has been carried out by the project participant. DNV published the PDD on the DNV Climate Change web site and comments by Parties, stakeholders and UNFCCC accredited NGOs were invited through the CDM web site. One comment was received and DNV has taken due account of this comment in its validation of the project.

In summary, it is DNV's opinion that the project, as described in the project design document of 23 February 2007, meets all relevant UNFCCC requirements for the CDM, is eligible as category I.D small-scale CDM project activity and correctly applies the approved simplified baseline and monitoring methodology AMS-I.D. Hence, DNV requests the registration of the "7.5 MW Grid-Connected Biomass Power Project, by Ravi Kiran Power Projects Private Limited" project as a CDM project activity.



REFERENCES

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

- / 1/ Ravikiran Power Projects Private Limited: CDM 7.5 MW Grid-Connected Biomass Power Project, by Ravi Kiran Power Projects Private Limited, Karnataka version 01 dated 4 September 2006. and version 02 dated 23 February 2007.
- / 2/ Ravikiran Power Projects Private Limited: Baseline calculations and grid emission factor.
- / 3/ Ministry of Environment and Forest (DNA of India): Letter of Approval dated 29 December 2006.

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

- / 4/ International Emission Trading Association (IETA) & the World Bank's Prototype Carbon Fund (PCF): *Validation and Verification Manual*. <http://www.vvmanual.info>
- / 5/ 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 10: dated 23 December 2006.
- / 6/ Revised 1996 IPCC guidelines for national green house gas inventories – Reference manual (volume 3)

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

- | | |
|-----------------------|----------------------------------|
| / 7/ Mr. Mahesh Kolli | Director, Ravikiran Power |
| Mr. Tirumala Raju | Project Manager, Ravikiran Power |
| Mr. Murthy | General Manager, Ravikiran Power |
| Mr. A. Mohan Reddy | Director, Zenith Energy |



APPENDIX A

VALIDATION PROTOCOL FOR SMALL-SCALE CDM PROJECT ACTIVITIES

Table 1 Mandatory Requirements 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	The project has been proposed as a unilateral project	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	CAR1	Table 2, Section A.3 The Host country approval is obtained on 29 December 2006.
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	CAR1	The Host country approval is obtained through letter dated 29 December 2006.
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 absence of the registered CDM project activity	Kyoto Protocol Art. 12.5.c, Simplified Modalities and Procedures for Small Scale CDM Project Activities §26	OK	Table 2, Section B.2.1
7. In case public funding from Parties included in Annex I	Decision 17/CP.7,	OK	The project is being

Requirement	Reference	Conclusion	Cross Reference/ Comment
is used for the project activity, these Parties shall provide an affirmation that such funding does not result in a diversion of official development assistance and is separate from and is not counted towards the financial obligations of these Parties.	CDM Modalities and Procedures Appendix B, § 2		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
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
10. The participating Annex I Party's assigned amount shall have been calculated and recorded	CDM Modalities and Procedures §31b	Annex I Party has not been identified yet	The project is being proposed as a unilateral project
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	Annex I Party has not been identified yet	The project is being proposed as a unilateral project
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	

Requirement	Reference	Conclusion	Cross Reference/ Comment
14. The proposed project activity shall confirm to one of the project categories defined for small scale CDM project activities and uses the simplified baseline and monitoring methodology for that project category	Simplified Modalities and Procedures for Small Scale CDM Project Activities §22e	OK	Table 2, Section A.1.3, B and D
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 Local stake holders are consulted by the project proponent
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 be made publicly available on www.dnv.com/certification/climatechange and Parties, stakeholders and NGOs will through the CDM website be invited to provide comments during the 30 day period from 07 September 2006 to 06 October 2006. One comment was received.

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	The project comprises a 7.5 MW power generation unit using renewable energy as source of fuel. The project qualifies as Type I, Category D small scale CDM project and as the generation capacity is below the stipulated limit of 15 MW.		OK
A.1.2. The small scale project activity is not a debundled component of a larger project activity?	/ 1/	DR	No, the project participant does not propose another biomass plant. The project participant has not registered any small scale CDM project in the last 2 years and the project boundary is not within 1 km radius of any other proposed small scale CDM 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	Yes. the project conforms to the category I.D for small scale CDM projects. The project is a grid connected renewable electricity generation unit (Biomass).		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/ / 7/	DR I	The boundaries are clearly defined. The spatial boundary of the project includes the project site (up to the evacuation point of electricity to state grid) and includes biomass collection and storage. The project is located at Marlanhalli Village, Gangavathi Taluk, Koppal District, Karnataka state, India. Grid connection point to KPTCL will be Gangavathi substation, approximately 1.5 Km from the project.		OK
A.2.2. Are the project's system (components and facilities used to mitigate GHG's) boundaries clearly defined?	/ 1/ / 7/	DR I	Components including storage of biomass material and the generation unit are included in the project boundary. For the calculation of the baseline emission factor the power plants generating and exporting to the Karnataka state electricity grid are included in the system boundary.		OK
A.2.3. Does the project design engineering reflect current good practices?	/ 1/ / 7/	DR I	Yes, the project design engineering reflects good practices. The boiler is designed to burn 100% agricultural residues. The turbine is of condensing type.		OK
A.2.4. Will the project result in technology transfer to the host country?	/ 1/	DR	No technology transfer is involved to the host country, Since technology is available in the host country.		OK

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

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
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/ / 7/	DR I	Yes, the project will require trained and qualified manpower in order to work as presumed during the project period. Qualified personnel as per statutory requirements in India should carry out the boiler operations. However the certificates of qualification of the personal operating the boiler need to be presented for verification.	CL1	OK
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/ / 7/	DR I	Yes, the project is providing benefits such as generating employment, ensuring environmental wellbeing and in bridging the gap between demand and supply of power.		OK
A.3.2. Will the project create any adverse environmental or social effects?	/ 1/ / 7/	DR I	No. A valid consent for operation for the project has been presented for verification. During the site visit, using woody biomass as a fuel has been observed. A clarification as how the issue is being dealt with and mechanism to ensure continual supply of permitted biomass material for the project needs further elaboration. Also the mechanism of demonstration that, the used biomass is renewable in nature needs to be elaborated.	CL2	OK
A.3.3. Is the project in line with sustainable development policies of the host country?	/ 1/	DR	Approval from the DNA of India has not been obtained.	CAR1	OK
A.3.4. Is the project in line with relevant legislation and plans in the host country?	/ 1/	DR	As in A.3.2	CL3	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/ / 7/	DR I	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). The project uses biomass and supply electricity to the grid dominated by fossil fuel based generation units. The baseline emission coefficient is calculated using the weighted average emission of current generation mix approach.		OK
B.1.2. Is the baseline methodology applicable to the project being considered?	/ 1/ / 7/	DR I	AMS ID is applicable to renewable energy projects and as the project is a biomass based power plant it conforms to this methodology as applicable to the project.		OK

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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>	<p>/ 1/</p> <p>/ 7/</p>	<p>DR</p> <p>I</p>	<p>As per the Attachment A to Appendix B, the project has been analysed in light of other barriers (financial and institutional related) and barriers due to prevailing practice.</p> <p>The main barrier perceived is the barrier due to prevailing practice. However the data source to demonstrate the prevailing practice needs to be provided. Also the scenario prevailing at the time of project conceptualisation needs further elaboration.</p> <p>To substantiate the Investment barrier analysis a more detailed report on the IRR/NPV of the project is required to be evaluated for further clarity, including assumptions mentioned in the PDD and used while arriving at mentioned IRR.</p> <p>Details of sensitivity analysis considering all assumptions need to be provided for verification.</p> <p>Also evidences supporting the information under Tariff conditions mentioned, like unilateral termination of PPA, original PPA, and supplementary agreement with KPTCL need to be furnished for supporting this argument.</p> <p>The copy of survey on biomass availability with in radius of 50 Km of plant, also documents demonstrating increase in biomass price need to</p>	<p>CL3</p> <p>CL4</p>	<p>OK</p> <p>OK</p>

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Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
			be furnished for verification. The identified institutional barrier is mainly based on the fluctuations in the price of electricity. A sensitivity analysis is required to show that even a positive fluctuation in electricity price charges in future would make the project non-viable.	CL5	OK
B.2.2. Is the application of the baseline methodology and the discussion and determination of the chosen baseline transparent and conservative?	/ 1/ / 7/	DR I	The baseline scenario considered is the southern India electricity grid power generation. This is justified for countries like 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	Yes. All the data used for calculating baseline emission factor is sourced from official website of central electricity authority of India, which is considered authentic for the baseline scenario.		OK
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. In absence of the project activity, the equivalent power would have been drawn from southern grid.		OK
C. Duration of the Project / Crediting Period It is assessed whether the temporary boundaries of the project are clearly defined.	/ 1/				
C.1.1. Are the project's starting date and operational lifetime clearly defined?	/ 1/	DR	The start date of project activity is considered as dated 12 November 2002, when the agreement was signed between Ravikiran power projects and Sri Ram EPC limited for start of works. The expected lifetime of the project activity is		OK

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Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
			defined as 30 years.		
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/ / 7/	DR I	As the CDM project activity does not seek retroactive credits, the start date of crediting period, which is mentioned as 1 June 2005, needs to be revised. Fixed crediting period of 10 years has been chosen for the project activity.	CAR-2	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 provided for the relevant project category?	/ 1/	DR	Yes, The monitoring methodology – Metering the electricity generated by the renewable technology - adopted for the project activity is in accordance with Category I.D. contained in Appendix B of the simplified M&P.		OK
D.1.2. Is the monitoring methodology applicable to the project being considered?	/ 1/	DR	The project is a renewable energy generation project and thus the monitoring requirement under category I.D. is used in this project. Since the project is allowed to co-fire coal with biomass, the amount of biomass and fossil fuel is monitored apart from electricity generated and supplied to grid. However during site visit it has been observed that	CL-6	OK

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

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
			the project possesses, a 200 KVA diesel generator, and emissions due to operation of DG set is not captured as a project emission.		
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	The monitoring methodology is through metering. A separate GHG audit team for periodic monitoring and review of data has been formed. This is expected to give real time results. The implementation of effectiveness has to be checked, as evidence of GHG audit team is to be given.	CL7	OK
D.2. Monitoring of Project Emissions It is established whether the monitoring plan provides for reliable and complete project emission data over time.	/ 1/				
D.2.1. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for estimation or measuring the greenhouse gas emissions within the project boundary during the crediting period?	/ 1/		Since project is allowed to co-fire coal, and the project also consumes through import from grid, when the project is not operational, are considered as project emissions. However emissions due to operation of DG set is not apparent in the monitoring plan. This needs explained.	CL6	OK
D.2.2. Are the choices of project GHG indicators reasonable?	/ 1/	DR	The choice of indicators is sufficient to monitor the CO ₂ the relevant GHG. CH ₄ can get generated due to biomass storage, but since the storage of biomass does not exceed 6		OK

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Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
			months, it is assumed negligible.		
D.2.3. Will it be possible to monitor / measure the specified project GHG indicators?	/ 1/	DR	Yes it is possible with the data being monitored.		OK
D.2.4. Will the indicators give opportunity for real measurements of project emissions?	/ 1/	DR	Yes.		OK
D.3. Monitoring of Leakage If applicable, it is assessed whether the monitoring plan provides for reliable and complete leakage data over time.	/ 1/				
D.3.1. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for determining leakage?	/ 1/		Since the energy generating equipment is not transferred from another activity and no existing equipment is transferred to another activity, no leakage needs to be considered. Also no biomass is cultivated specifically for the project, hence no leakage effect due to biomass.		OK
D.4. Monitoring of Baseline Emissions It is established whether the monitoring plan provides for reliable and complete project emission data over time.	/ 1/				
D.4.1. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for determining baseline emissions during the crediting period?	/ 1/		Yes, the baseline indicators have been chosen in line with the small-scale methodologies approved by the CDM EB.		OK
D.4.2. Is the choice of baseline indicators, in particular for baseline emissions, reasonable?	/ 1/	DR	The choice of indicators is sufficient to monitor the CO ₂ emissions, the relevant GHG.		OK
D.4.3. Will it be possible to monitor / measure the	/ 1/	DR	Yes, techniques do comply with good industry		OK

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

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
specified baseline indicators?			practice.		
D.4.4. Will the indicators give opportunity for real measurements of baseline emissions?	/ 1/	DR	As in D.1.4	CL7	OK
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/ / 7/	DR 	The authority and responsibility for Project Management has been clearly described.		OK
D.5.2. Is the authority and responsibility for registration monitoring measurement and reporting clearly described?	/ 1/ / 7/	DR	The PDD addresses the formation of a special group who will have assigned responsibilities for monitoring of all the parameters. Evidence of this team need to be provided.	CL7	OK
D.5.3. Are procedures identified for training of monitoring personnel?	/ 1/ / 7/	DR 	A procedure for training of monitoring personnel needs to be elaborated.	CAR3	OK
D.5.4. Are procedures identified for emergency preparedness for cases where emergencies can cause unintended emissions?	/ 1/ / 7/	DR 	Emergencies like fire in storage area can cause unintended emission. The emergency preparedness in such situation needs to be elaborated.	CL8	OK
D.5.5. Are procedures identified for calibration of monitoring equipment?	/ 1/ / 7/	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 though records of calibrations of various instruments have been provided as evidences.	CL9	OK
D.5.6. Are procedures identified for maintenance of monitoring equipment and installations?	/ 1/ / 7/	DR 	As in D.5.3	CAR3	OK

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Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
D.5.7. Are procedures identified for monitoring, measurements and reporting?	/ 1/ / 7/	DR I	AS in D.5.3	CAR3	OK
D.5.8. Are procedures identified for day-to-day records handling (including what records to keep, storage area of records and how to process performance documentation)	/ 1/ / 7/	DR I	As in D.5.3	CAR3	OK
D.5.9. Are procedures identified for dealing with possible monitoring data adjustments and uncertainties?	/ 1/ / 7/	DR I	As in D.5.3	CAR3	OK
D.5.10. Are procedures identified for internal audits of GHG project compliance with operational requirements as applicable?	/ 1/ / 7/	DR I	Procedures for internal audits have not been established.	CAR3	OK
D.5.11. Are procedures identified for project performance reviews?	/ 1/ / 7/	DR I	Procedures for performance reviews have not been established.	CAR3	OK
D.5.12. Are procedures identified for corrective actions?	/ 1/	DR	No.	CAR3	OK

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

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
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 ex-ante estimated 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 fossil 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 sources been evaluated?	/ 1/	DR	The project only identifies CO ₂ as the relevant GHG as other GHGs like CH ₄ are considered as negligible.		OK
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 are complying with the good practices.		OK
E.1.4. Are the calculations documented in a complete and transparent manner?	/ 1/	DR	Yes. All the data used is sourced from official web site of CEA.		OK
E.1.5. Have conservative assumptions been used?	/ 1/	DR	Yes. The weighted average of current generation mix is a conservative assumption for the project.		OK
E.1.6. Are uncertainties in the project emissions estimates properly addressed?	/ 1/	DR	Yes.		OK

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Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
<p>E.2. Leakage</p> <p>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 and estimated ex-ante.</p>					
<p>E.2.1. Are leakage calculation required for the selected project category and if yes, are the relevant leakage effects assessed?</p>	/ 1/ / 7/	DR I	<p>Since the energy generating equipment is not transferred from another activity and no existing equipment is transferred to another activity, no leakage needs to be considered. Regarding the leakages due to transportation, it is argued that the same types of GHG emissions occur during transportation of coal from coal mines for which transport distances are much longer. Hence, emissions due to transportation of biomass in comparison have been considered negligible and have not been considered.</p> <p>However this needs to be justified with facts and figures. Also applicable leakages as per SSCWG “general guidance on leakage of biomass power projects” need to be addressed in PDD.</p>	CL-10	OK
<p>E.3. Baseline GHG Emissions</p> <p>The validation of ex-ante estimated baseline GHG emissions focuses on transparency and completeness of calculations.</p>					
<p>E.3.1. Are the baseline emission boundaries clearly defined and do they sufficiently cover sources for baseline emissions?</p>	/ 1/ / 7/	DR I	<p>The baseline emissions are defined in accordance with Type I.D in the CDM small-scale methodology scheme.</p>		OK

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

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
E.3.2. Are all aspects related to direct and indirect baseline emissions captured in the project design?	/ 1/ / 7/	DR I	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. All sources that are part of southern grid are considered for calculations.		OK
E.3.4. Do the methodologies for calculating baseline emissions comply with existing good practice?	/ 1/	DR	Yes.		OK
E.3.5. Are the calculations documented in a complete and transparent manner?	/ 1/	DR	Yes.		OK
E.3.6. Have conservative assumptions been used?	/ 1/	DR	Yes.		OK
E.3.7. Are uncertainties in the baseline emissions estimates properly addressed?	/ 1/	DR	Yes.		Ok
E.4. Emission Reductions Validation of ex-ante estimated emission reductions.	/ 1/				
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, The project is expected to result in emission reductions of 240610 tonnes of CO2 per year during the ten year crediting period.		OK
F. Environmental Impacts It is assessed whether environmental impacts of the project are sufficiently addressed.	/ 1/				
F.1.1. Does host country legislation require an analysis of the environmental impacts of	/ 1/	DR	Though as per the MoEF, an EIA is not required for projects costing less than USD 22 Millions, as is		OK

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Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
the project activity?			the case with the proposed project, the project proponent has conducted an environment impact study for the project. According to which no abnormal effects are envisaged due to project activity.		
F.1.2. Does the project comply with environmental legislation in the host country?	/ 1/	DR	The project has all relevant legislative and statutory clearances.		OK
F.1.3. Will the project create any adverse environmental effects?	/ 1/	DR	The environmental impacts, the project is likely to create, such as effects of suspended particulate matter, Nitrogen oxides and Sulphur dioxide apart from generation of fly ash.		OK
F.1.4. Have environmental impacts been identified and addressed in the PDD?	/ 1/	DR	Yes.		OK
G. Comments by Local Stakeholder Validation of the local stakeholder consultation process.	/ 1/				
G.1.1. Have relevant stakeholders been consulted?	/ 1/	DR	Yes.		OK
G.1.2. Have appropriate media been used to invite comments by local stakeholders?	/ 1/	DR	The comments from local stakeholders were invited through personal communication.		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	It is not required for the given size of the project.		OK
G.1.4. Is a summary of the comments received provided?	/ 1/	DR	Yes the comments received from the stakeholders are summarised.		OK

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Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
G.1.5. Has due account been taken of any comments received?	/ 1/	DR	No adverse comments were received from local stakeholders.		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>The Host country approval is yet to be confirmed.</p>	<p>Table1 No.2 & 4 A.3.3</p>	<p>Host country approval received from DNA is enclosed.</p>	<p>Approval from DNA of India dated 29 December 2006 has been presented and accepted.</p> <p>The CAR is closed.</p>
<p>CAR-2</p> <p>As the CDM project activity does not seek retroactive credits, the start date of crediting period, which is mentioned as 1 June 2005, needs to be revised.</p>	<p>C.1.2</p>	<p>The Starting date of crediting period has been revised to 1st April 2007 since by that date project is expected to be registered as CDM project activity.</p>	<p>OK, The CAR is closed.</p>
<p>CAR-3</p> <p>Procedures for 1) training of monitoring personnel, 2) maintenance of monitoring equipment 3) possible adjustments in data monitored 4) for internal audits 5) day-to-day records handling (including what records to keep, storage area of records and how to process performance documentation) 6) for dealing with possible monitoring data adjustments and uncertainties 7) Performance review 8) corrective actions need to be elaborated.</p>	<p>D.5.3 D.5.6, D.5.9 D.5.10 D.5.11 D.5.12</p>	<p>Procedures for training of monitoring personnel, maintenance of monitoring equipment, possible data adjustments in data monitoring, internal audits, day to day records handling, data adjustments and uncertainties, performance review and corrective actions are enclosed.</p>	<p>All procedures presented are reviewed and accepted.</p> <p>The CAR is closed.</p>
<p>CL-1</p> <p>The project will require trained and qualified manpower in order to work as presumed during the project period. Qualified personnel as per statutory requirements in India should carry out the boiler operations.</p>	<p>A.2.5</p>	<p>Certificates in respect of Qualification of personal operating the boiler are enclosed for verification. Apart from these periodical trainings on operational procedures are conducted as a part of internal trainings.</p>	<p>The complementary information provided has been reviewed and accepted.</p> <p>The CL is closed.</p>

Draft report corrective action requests and requests for clarification	Ref. to Table 2	Summary of project participants' response	Final conclusion
However the certificates of qualification of the personal operating the boiler need to be presented for verification.			
<p>CL-2</p> <p>During the site visit, using woody biomass as a fuel has been observed.</p> <p>A clarification as how the issue is being dealt with and mechanism to ensure continual supply of permitted biomass material for the project needs further elaboration. Also the mechanism of demonstration that, the used biomass is renewable in nature needs to be elaborated.</p>	A.3.2	<p>The biomass availability in the project region is in surplus. According to the Biomass Assessment Study carried out by the proponent, the total availability of biomass in the region (50 km radius) is 1.63 million tonnes. The surplus biomass available after consumption for local purposes is 1.16 million tonnes. Where as the biomass requirement of the 7.5 MW biomass power project is only 0.07 mt. Hence, it can be stated that project activity may not suffer due to lack of biomass resources.</p> <p>The project has been utilizing various biomass residues as primary fuel for power generation such as Rice Husk, Crop Residues and woody biomass. The woody biomass used as fuel is Juliflora. Juliflora is a renewable biomass. While harvesting the wood from Juliflora, only stems and branches are removed so that the plant will grow again within the next three years. With respect to ensuring continuous supply of biomass fuels required for the project activity and its procurements, it is directly supervised by the managing director. He supervises the</p>	<p>The complementary information provided has been reviewed and accepted. Surplus availability of biomass confirms continuous use of permitted biomass. Since each type of biomass used is monitored separately, monitoring of emissions due to non-renewable component can be calculated separately, if used.</p> <p>The CL is closed.</p>

Draft report corrective action requests and requests for clarification	Ref. to Table 2	Summary of project participants' response	Final conclusion
		<p>procurement by giving directions to the biomass procurement manager based on the prices existing in the market. Rice husk is procured directly from the millers. He monitors the procurement programme closely, so that the plant should have uninterrupted supply of fuels required.</p> <p>There are procedures in place with respect to acceptance of biomass fuels. The procurement division takes guidance from Managing Director in accepting the biomass fuels. A notice is kept at the office and also at the plant entry gate, informing the types of biomass materials to be accepted and permitted to enter into the plant premises. Any variety that is not permitted or not in the list of acceptable types will be rejected</p>	
<p>CL-3</p> <p>The main barrier perceived is the barrier due to prevailing practice. However the data source to demonstrate the prevailing practice needs to be provided. Also the scenario prevailing at the time of project conceptualisation needs further elaboration.</p>	B.2.1	<p>The data source for commissioning dates of biomass based power projects in Karnataka is available at the website of Karnataka Renewable Energy Development Agency (KREDL) at the following web link-</p> <p>http://www.kredl.kar.nic.in/VentureBiomassCogen.htm</p> <p>The project proponents had started efforts to proceed with the project</p>	<p>The relevant information provided has been reviewed and accepted.</p> <p>The CL is closed.</p>

Draft report corrective action requests and requests for clarification	Ref. to Table 2	Summary of project participants' response	Final conclusion
		<p>activity in the year 2001. At that time, there was no single power plant under operation based on biomass resources. Subsequently, in July 2001 one biomass based power project was commissioned with an installed capacity of 4.5 MW. The project activity has commenced project implementation in the year 2002. All the other biomass projects in the state are established only after the year 2003. Hence, the scenario prevailing at the time of project conceptualization stage shows negligible capacity of biomass based power generation in the state of Karnataka which clearly depicts that the activity is not a common practice.</p>	
<p>CL4</p> <p>To substantiate the Investment barrier analysis a more detailed report on the IRR/NPV of the project is required to be evaluated for further clarity, including assumptions mentioned in the PDD and used while arriving at mentioned IRR.</p> <p>Details of sensitivity analysis considering all assumptions need to be provided for verification.</p> <p>Also evidences supporting the information under Tariff conditions mentioned, like unilateral termination of PPA, original PPA, and supplementary agreement with KPTCL need to be furnished for supporting this</p>	B.2.1	<p>The assumptions considered to evaluate the IRR and sensitivity analysis of the project activity are mentioned in a table form in section B3 of the PDD.</p> <p>Documentary evidences for unilateral termination of PPA, original PPA, and supplementary agreement are enclosed for verification.</p> <p>The copy of "Biomass assessment study" on the availability of biomass resources within 50Km radius from the plant site is enclosed for verification.</p>	<p>The IRR calculations along with assumptions have been reviewed and the complementary information provided on additionality have been reviewed and accepted.</p> <p>The CL is closed.</p>

Draft report corrective action requests and requests for clarification	Ref. to Table 2	Summary of project participants' response	Final conclusion
<p>argument.</p> <p>The copy of survey on biomass availability with in radius of 50 Km of plant, also documents demonstrating increase in biomass price need to be furnished for verification.</p>		<p>The documentary evidences for increase in biomass price (biomass purchase receipts) are enclosed for verification.</p>	
<p>CL-5</p> <p>The identified institutional barrier is mainly based on the fluctuations in the price of electricity. A sensitivity analysis is required to show that even a positive fluctuation in electricity price charges in future would make the project non-viable.</p>	B.2.1	<p>A sensitivity analysis has been carried out including a scenario considering positive fluctuation in electricity price and the same are furnished in the PDD.</p> <p>Even a positive fluctuation in electricity price indicated that the IRR is still below the bench mark.</p>	<p>The calculations on sensitivity analysis has been reviewed and accepted.</p> <p>The CL is closed.</p>
<p>CL-6</p> <p>However during site visit it has been observed that the project possesses, a 200 KVA diesel generator, and emissions due to operation of DG set is not captured as a project emission.</p>	D.1.2 D.2.1	<p>DG set is being used only in emergency situation. During the year 2005-06 as per the log book maintained, the DG set is operated for 50 hours, resulting in consumption of 600 litres of diesel and the corresponding emissions are 1.6 tCO₂ / annum. Even if consider the consumption of diesel for the entire activity including onsite transport for biomass and other purposes, the total emissions from the usage of diesel is only 70 tCO₂/year. Since the diesel consumption and resultant emissions are negligible, the same were not considered under project emissions.</p>	<p>The revised monitoring plan has been reviewed and accepted.</p> <p>The CL is closed.</p>
<p>CL-7</p>	D.1.4	<p>The audit team periodically monitors the parameters like fuel analysis, fuel</p>	<p>The complementary information provided has been reviewed and</p>

Draft report corrective action requests and requests for clarification	Ref. to Table 2	Summary of project participants' response	Final conclusion
The monitoring methodology is through metering. A separate GHG audit team for periodic monitoring and review of data has been formed. This is expected to give real time results. The implementation of effectiveness has to be checked, as evidence of GHG audit team is to be given.	D.4.4	consumption, power generation, export and imports of electricity. The active status of GHG audit team can be ensured from the quarterly GHG audit reports. The same were furnished for verification.	accepted. The CL is closed.
CL-8 Emergencies like fire in storage area can cause unintended emission. The emergency preparedness in such situation needs to be elaborated.	D.5.4	Enclosed procedure to deal with emergencies like fire in fuel storage yard.	The complementary information provided has been reviewed and accepted. The CL is closed.
CL-9 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 though records of calibrations of various instruments have been provided as evidences.	D.5.5	The Monitoring procedure (Section D.5 of PDD) now revised to include procedures for calibration of instruments used for monitoring of audit parameters.	The revised PDD has been reviewed and accepted. The CL is closed.
CL-10 Since the energy generating equipment is not transferred from another activity and no existing equipment is transferred to another activity, no leakage needs to be considered. Regarding the leakages due to transportation, it is argued that the same types of GHG emissions occur during transportation of coal from coal mines for which transport distances are much longer. Hence, emissions due to transportation of		The emissions due to transport of biomass is calculated in a conservative manner and are now incorporated in the PDD. However, the emissions in the baseline scenario are expected to be higher than the project activity. Thus excluding the emissions due to transportation is conservative. Leakage emissions due to 'competing	The complementary information provided on leakage of the project activity has been reviewed and accepted. The CL is closed.

Draft report corrective action requests and requests for clarification	Ref. to Table 2	Summary of project participants' response	Final conclusion
<p>biomass in comparison have been considered negligible and have not been considered.</p> <p>However this needs to be justified with facts and figures. Also applicable leakages as per SSCWG "general guidance on leakage of biomass power projects" need to be addressed in PDD.</p>		<p>uses for the biomass' is neglected as the availability of biomass in the region is 25% more than the biomass that is utilized including the consumption of the present project activity and the same is demonstrated in the PDD. The evidence on the surplus biomass availability as shown in the "Biomass Assessment study" is enclosed for verification.</p>	

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APPENDIX B

CERTIFICATES OF COMPETENCE



CERTIFICATE OF COMPETENCE

Michael Lehmann

Qualification in accordance with DNV's Qualification scheme for CDM/JI (ICP-9-8-i1-CDMJi-i1)

GHG Auditor:	Yes		
CDM Validator:	Yes	JI Validator:	Yes
CDM Verifier:	Yes	JI Verifier:	Yes
Industry Sector Expert for Sectoral Scope(s):	Sectoral scope 1,2,3 & 9		
Technical Reviewer for (group of) methodologies:			
ACM0001, AM0002, AM0003, AM0010, AM0011, AM0012, AMS-III.G	Yes	AM0021	Yes
ACM0002, AMS-I.A-D, AM0019, AM0026, AM0029	Yes	AM0023	Yes
ACM0003, ACM0005, AM0033, AM0040	Yes	AM0024	Yes
ACM0004	Yes	AM0027	Yes
ACM0006, AM0007, AM0015, AM0036, AM0042	Yes	AM0028, AM0034	Yes
ACM0007	Yes	AM0030	Yes
ACM0008	Yes	AM0031	Yes
ACM0009, AM0008, AMS-III.B	Yes	AM0032	Yes
AM0006, AM0016, AMS-III.D	Yes	AM0035	Yes
AM0009, AM0037	Yes	AM0038	Yes
AM0013, AM0022, AM0025, AM00379, AMS- III.H, AMS-III.I	Yes	AM0041	Yes
AM0014	Yes	AM0034	Yes
AM0017	Yes	AMS-II.A-F	Yes
AM0018	Yes	AMS-III.A	Yes
AM0020	Yes	AMS-III.E, AMS-III.F	Yes

Høvik, 6 November 2006

Einar Telnes
Director, International Climate Change Services

Michael Lehmann
Technical Director



CERTIFICATE OF COMPETENCE

Kumaraswamy Chandrashekara

Qualification in accordance with DNV's Qualification scheme for CDM/JI (ICP-9-8-i1-CDMJi-i1)

GHG Auditor:	Yes		
CDM Validator:	Yes	JI Validator:	--
CDM Verifier:	Yes	JI Verifier:	--
Industry Sector Expert for Sectoral Scope(s):	Sectoral scope 4 & 5		
Technical Reviewer for (group of) methodologies:			
ACM0001, AM0002, AM0003, AM0010, AM0011, AM0012, AMS-III.G	Yes	AM0021	Yes
ACM002, AMS-I.A-D, AM0019, AM0026, AM0029	Yes	AM0023	Yes
ACM003, ACM0005, AM0033, AM0040	Yes	AM0024	Yes
ACM0004	Yes	AM0027	Yes
ACM0006, AM0007, AM0015, AM0036, AM0042	Yes	AM0028, AM0034	Yes
ACM0007	Yes	AM0030	Yes
ACM0008	Yes	AM0031	Yes
ACM0009, AM0008, AMS-III.B	Yes	AM0032	Yes
AM0006, AM0016, AMS-III.D	Yes	AM0035	Yes
AM0009, AM0037	Yes	AM0038	Yes
AM0013, AM0022, AM0025, AM00379, AMS- III.H, AMS-III.I	Yes	AM0041	Yes
AM0014	Yes	AM0034	Yes
AM0017	Yes	AMS-II.A-F	Yes
AM0018	Yes	AMS-III.A	Yes
AM0020	Yes	AMS-III.E, AMS-III.F	Yes

Høvik, 6 November 2006

Einar Telnes
Director, International Climate Change Services

Michael Lehmann
Technical Director



CERTIFICATE OF COMPETENCE

Astakala Vidyacharan

Qualification in accordance with DNV's Qualification scheme for CDM/JI (ICP-9-8-i1-CDMJi-i1)

GHG Auditor:	Yes		
CDM Validator:	--	JI Validator:	--
CDM Verifier:	--	JI Verifier:	--
Industry Sector Expert for Sectoral Scope(s):	--		

Høvik, 6 November 2006

Einar Telnes
Director, International Climate Change Services

Michael Lehmann
Technical Director

Raman Venkata Kakaraparthi

Qualification in accordance with DNV's Qualification scheme for CDM/JI (ICP-9-8-i1-CDMJi-i1)

GHG Auditor:	Yes		
CDM Validator:	Yes	JI Validator:	--
CDM Verifier:	--	JI Verifier:	--
Industry Sector Expert for Sectoral Scope(s):	--		

Høvik, 6 November 2006

Einar Telnes
Director, International Climate Change Services

Michael Lehmann
Technical Director



CERTIFICATE OF COMPETENCE

Praveen Nagaraje Urs

Qualification in accordance with DNV's Qualification scheme for CDM/JI (ICP-9-8-i1-CDMJI-i1)

GHG Auditor:	Yes		
CDM Validator:	--	JI Validator:	--
CDM Verifier:	--	JI Verifier:	--
Industry Sector Expert for Sectoral Scope(s):	--		

Høvik, 6 November 2006

Einar Telnes
Director, International Climate Change Services

Michael Lehmann
Technical Director