



VALIDATION REPORT

“6 MW RENEWABLE ENERGY GENERATION PROJECT BY VARAM POWER PROJECTS” PROJECT IN INDIA

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DET NORSKE VERITAS



VALIDATION REPORT

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Summary:

Det Norske Veritas Certification Ltd. (DNV) has performed a validation of the “6 MW renewable energy generation project by Varam Power Projects” 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.

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.

Based on the recommendation made by the Executive Board, at its 29th meeting, this validation report has been revised to be in line with the responses forwarded to the ‘request for review’.

In summary, it is DNV’s opinion that the project, as described in the project design document version 2 of dated 15 September 2006 and version 03, dated 12 December 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 AMS-I.D version 09. Hence, DNV requests the registration of the “6 MW renewable energy generation project by Varam Power Projects” as CDM project activity.

Report No.: 2006-9063	Subject Group: Environment	
Report title: “6 MW Renewable energy generation project by Varam Power Projects” Project in India		
Work carried out by: Astakala Vidyacharan Chandrashekara Kumaraswamy		
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[Appendix A Validation Protocol](#)

***Abbreviations***

AP	Andhra Pradesh
APERC	Andhra Pradesh Electricity Regulatory Commission
APPCB	Andhra Pradesh Pollution Control Board
APTRANSCO	Andhra Pradesh Transmission Company
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CEA	Central Electrical Authority
CEF	Carbon Emission Factor
CER	Certified Emission Reduction
CH ₄	Methane
CL	Clarification request
CO ₂	Carbon dioxide
CO ₂ e	Carbon dioxide equivalent
DNV	Det Norske Veritas
DNA	Designated National Authority
DPR	Detail Project Report
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
MP	Monitoring Plan
NEDCAP	The Non-Conventional Energy Development Corporation of Andhra Pradesh
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

Varam Power Projects Private Limited has commissioned Det Norske Veritas Certification Ltd. (DNV) to validate the “6 MW Renewable energy generation project by Varam Power Projects” (hereafter called “the project”) in 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 consists of the following personnel:

Chandrashekara Kumaraswamy	DNV, India	Team Leader, GHG auditor
Astakala Vidyacharan	DNV, India	GHG auditor
K.Venkata Raman	DNV, India	Technical verifier

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 / 5/ activities and the relevant decisions by the CDM Executive Board, including the approved baseline and monitoring methodology AMS-I.D version 09. 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 6 MW (gross) capacity grid-connected biomass based power project. The project was commissioned in December 2001. The project utilises the available biomass in the region, such as rice husk, jute sticks, cotton stalks, prosopis juliflora etc, for generation of electricity. This is exported to the Andhra Pradesh state electricity grid, which forms a part of the Southern regional grid. The project also uses coal as a support fuel along with renewable biomass. It uses a condensing type steam turbo generator with a matching boiler of travelling grate technology capable of firing multiple fuels. The technology used in the project is indigenous.



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The objective of the project is to reduce anthropogenic GHG emissions by displacing fossil fuel based electricity generation with renewable biomass. The project thereby helps in reducing the power deficit in the state of Andhra Pradesh and also contributes towards conservation of natural resource like coal.

Based on ex-post baseline emission factor determined, the project is expected to result in emission reductions of 22 377 tonnes of CO₂ per year during the ten year crediting period.

2 METHODOLOGY

The validation of the project started in the month of December 2005 with hosting of the PDD on the UNFCCC website and inviting stakeholders' comments.

The validation consists 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 / 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 "6 MW Renewable energy generation project by Varam Power Projects" project 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 Varam Power Projects Private limited (version 1 dated 28 December 2005, version 02 dated 15 September 2006, and version 03 dated 12 December 2006) and additional background documents related to the project design and baseline such as baseline calculation data, local stakeholders comments and the monitoring plan were assessed during the validation.

2.2 Follow-up Interviews

On 21 March 2006, DNV performed interviews with representatives of Varam 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
Varam 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.
Environment Engineer APPCB Vijayanagaram division	<ul style="list-style-type: none"> ➤ Over all impact of Varam Power Projects on local environment ➤ Job opportunities ➤ Any complaints on project
Ex-President - Budumuru (neighbouring village)	<ul style="list-style-type: none"> ➤ Impact on local environment ➤ Job opportunities ➤ Any concerns during project stage.
Local Administrators	<ul style="list-style-type: none"> ➤ Overall impact of project ➤ Revenue benefits to village ➤ Job opportunities, direct, indirect
Biomass suppliers	<ul style="list-style-type: none"> ➤ Availability of biomass ➤ Cost of biomass ➤ Benefits due to project activity
Surrounding farmers	<ul style="list-style-type: none"> ➤ Impact due to project emissions on crops ➤ Benefits out of 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 initial validation identified two corrective action requests and seven 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 15 September 2006, addressed the corrective action requests and requests for clarification to DNV's satisfaction.

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.

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 15 September 2006.

3.1 Participation Requirements

The project activity is being proposed as a unilateral project by Varam Power Projects Private Limited, which is the only project participant. The host Party, India meets all participation requirements, and the DNA of India has approved the project with a letter of approval dated 2 August 2006 and has provided confirmation that the project assists in achieving sustainable development.

3.2 Project Design

The project has a rated generation capacity of 6 MW and aims to export the electricity to the Andhra Pradesh state electricity grid, which is part of the southern regional electricity grid. The project is connected to APTRANSCO grid through 132/33 KV substation which is located about 2.0 km away from the project.

The technology used is available in India and no transfer of technology is envisaged. The biomass based power plant generates electricity utilizing the available biomass in the region, which will be primarily rice husk along with jute sticks, cotton stalks, and some quantities of juliflora. The rice husk, jute sticks, used in the project are renewable biomass. It has been verified from official survey documentation on biomass availability, that surplus biomass is available in the region and that the project activity will not lead to leakage effects elsewhere due to the usage of fossil fuel by the diversion of biomass to the project.

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 64 kg/cm² and a temperature of 485⁰C equivalent to 21.4 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 project. The technology applied is deemed current good practice and is not expected to be replaced within the crediting period.



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The project implementation was started on 9 May 2000 with a letter of intent for the design, engineering and manufacturing of travelling grate boiler issued by Varam Power Projects Private Limited to ISGEC John Thompson, Noida, for the design, engineering and manufacturing of travelling grate boiler and accessories. The expected operational lifetime of the project is estimated around 25 years and a fixed crediting period of 10 years has been chosen with the starting date of crediting period as 01 January 2002.

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 Project Baseline

Since the projects 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 09). The simplified baseline methodology AMS-I.D is applicable for 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 it displaces the grid electricity.

As the project activity is feeding power to Andhra Pradesh 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 southern region grid. The selection of the southern region grid as the grid system boundary for the project activity is in line with the recent 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 calculated. The baseline emission factor is for the years 2002-03 to 2005-06 is estimated at 0.819, 0.841, 0.795 and 0.739 kg CO₂ e/kWh respectively. The baseline emission factor for the rest of the crediting period will be calculated ex-post. The calculation worksheets for the years 2002, 2003, 2004 and 2005 have been verified by DNV.

While actual heat rates of all power plants have been used and IPCC default values have been used for emission factors fossil fuels such as diesel, naphtha and natural gas. The completeness of the set of power plants as well as the correctness of the reported heat rates and electricity generation data has been verified. All data has been sourced from data published by the Central Electricity Authority.

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 CDM revenues were considered at the time of project conceptualisation. Minutes of organisation’s board of directors meeting for year 2000 held on 9 January 2000 was verified as evidence for this claim. Discussion on possibilities of making the project as a CDM project was part of the assessed minutes of meetings.

DNV could verify that the power generation using renewable sources like biomass is not a prevailing practice and there was only one project of 2.75 MW operational and a few projects



equivalent to 16.5 MW installed capacity (based on renewable biomass as a source fuel) under implementation at the time of conceptualisation of the project. This confirms that power generation using non-conventional sources was not a common practice in spite of governmental promotion for such projects at the stage of project initiation.

Detailed IRR calculations with all assumptions have been presented to DNV for verification, during validation of the project. After a thorough review of all the documents, assumption and calculations submitted, DNV has come to conclusion, that the project is not viable, with an IRR of 12.67%, and a payback period of 8 years. This improves to 16.29% on considering CDM revenues, thereby establishing that the project is not viable even with the low cost of raw material. Assumptions and detailed calculations presented have been reviewed and accepted by DNV. The IRR scenario (3) also indicates that, with the present electricity tariff, the project would have a IRR of 6.53% only.

Being one of the first projects to venture into power production using varied biomass as fuel, the project proponent had envisaged the technological barriers due to variation in biomass fuel compositions and lack of operating knowledge/experience with biomass fuel. DNV has been able to confirm that the technological barrier due to the use of varied biomass fuel used resulted in unstable plant operation due to machinery failure. This has been verified through assessment of plant log books and analysis reports of various biomass fuels used in the boiler operations. It is evident that being an early project, in utilization of varied biomass and coupled with the lack of experience in handling this; the plant had a high percentage of mechanical outages in the year of commissioning (2002).

DNV could confirm on the surplus biomass availability in the Srikakulam region (where the project is located) to be around 44,600 tons/year, based on biomass assessment studies prior to the project implementation and subsequent studies from other independent agencies like the Administrative staff college of India (ASCI through “Socio-economic Impact of Biomass power plants”). Though the biomass is available in surplus, the project proponent has had to depend on suppliers like rice millers and other farmers for sourcing the biomass. It was confirmed by DNV through the stakeholder interactions, that this biomass was disposed through uncontrolled burning or left to decay, before this project was implemented and also that the demand for biomass was seen as a business opportunity by farmers and rice millers, leading to prices rise and fluctuations. Sourcing of biomass at higher price than that envisaged results in increased cost of generation and economical un-viability. DNV could confirm this through interactions with suppliers, local farmers, and also based on plant records. Due to this the fluctuations in biomass prices are high, becoming a potential main deterrent for the project by increasing operational costs.-

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. Since the project also co-fires coal, the amount of biomass and fossil fuel is monitored apart from electricity generated and supplied to the grid.

It has been verified that the project participant provides the monthly fuel consumption (coal and biomass) data to NEDCAP as a mandatory requirement.



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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 each year ex-post for the crediting period.

Direct emissions due to the usage of coal (based on the carbon content of the coal) as fuel are considered as project emissions. The project participant receives the requirement of a specific grade of coal from a single supplier on the directions of NEDCAP. Periodical monitoring of the net calorific value and carbon content in coal is done by external laboratories. The consumption of coal is monitored through operational log and cross verification is done with coal receipt data. Based the data recorded, project emissions are calculated and deducted from total CERs.

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

While the board of directors of Varam Power Projects Private Limited is responsible for project management, the general manager of plant is 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, the fuel consumed and analysis of the biomass used.

3.6 Calculation of GHG Emissions

Direct onsite emissions are restricted to the use of fossil fuels in the boiler, when used during shortfall in rice husk supply.

In accordance with AMS-I.D the biomass power plant may co-fire fossil fuel. As per the guidelines of the Non-conventional Energy Development Corporation of Andhra Pradesh Limited, (NEDCAP) the project can use coal up to 25% as support fuel. To arrive at the ex-ante GHG emission reduction estimates for the years 2005 onwards, a 10% co-firing of coal (about 8600 tons of coal per annum) was assumed. For the period 2002 to 2004, the actual average quantity of coal used (about 4% maximum) was considered. The CO₂ emissions due to the usage of 6000 t of coal per annum (considering 50% carbon content) will be within the threshold limit of 15 kt as specified by the small-scale CDM modalities. The emissions resulting from use of coal is incorporated as project emissions and the capacity of the unit including coal and biomass is 6 MW.

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.

Uncertainty is expected to be only on account of non availability of biomass. The substitute will be usage of coal up to the limits specified, and the monitoring of coal has been addressed in the PDD.

The project replaces fossil fuel-based electricity generation. Baseline emissions are determined to be each year *ex-post*, and the project is expected to result in emission reductions of 223,771 tonnes of CO₂, during the 10 years of fixed crediting period under the following criteria.

3.7 Environmental Impacts

The environmental impacts of the project are sufficiently assessed. The project's environmental impacts relate to suspended particulate matter, nitrogen oxides and sulphur dioxide emissions as



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well as the generation of fly ash. An electrostatic precipitator (ESP) has been installed and the project is designed to adhere to the stipulations as per the state pollution control board. Ash collected is disposed for manufacturing of fly ash 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.

As per the MoEF, 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 of 28 December 2005 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 31 December 2005 to 29 January 2006.

One comment was received on *date*. The comment received (in unedited form) is given in the below text box.

Comment by: [Rajaram velayudhan, individual](#)

Inserted on: 2006-01-29

Subject: debatable additionality

Comment: Investment Barrier:

The investment barrier states that "The plant had to be shut down on number of occasions" under these circumstances it becomes quiet imperative to see the CER generation of the project in the retrospective crediting period, during those period while the PDD stated it has faced the barrier of frequent shut down has registered the highest generation which I feel is contradictory in what stated in the PDD vs. Actual and also the computation carried out for the future also has taken the most genuine PLF factor of 80 % which holds too good for a biomass based power plant.

The capital investment for the project would be 24 crores at 4 crores per MW and the equity would be 30% of it hence the project of the capital investment, on account of the operational track record the project capital would be paid back with in a period of two years.

As there is big drop in the IRR, it would also become necessary for the Project proponent to explain does the computation has taken care of the subsidies, depreciation,taxholidays,MAT etc as announced by the MNES India in their policy statement beyond considering only the cost of the fuel.

Technological barrier:



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In page no 14 the project proponent has stated that the conversion efficiency is very low compared to fossil fuel energy where as while considering the project emission from the burning of the fossil fuel in the CER calculation it has not reflected as stated by the PP in page no 22 of the document.

The coal consumption considered is 10 % on the total fuel used in the plant, where as else stated in the PDD if the conversion efficiencies are not the same how one could assume that the power output in proportionate with 10%

For reference the kg/kwh of both the fuel can be considered to establish the argument ,To generate unit of electricity the requirement of coal would be 0.76 against 1.16 for biomass (both the values are at theoretical basis) under those circumstance the direct assumption of 10% project emission on account of energy generation would not be right. The designed station heat rate should be considered or for example for a typical Indian coal the CEF would be 1.35 per kg (most conservative for typical Indian sub bituminous coal).

Then the project emission on account of coal should be 11216 not as considered in the PDD as 3590 which is highly un-amicable and non conservative.

If the calculation is right then the additionality argument doesn't hold as such with respect to conversion efficiencies and other barriers

Prevailing practice and institutional barrier:

It makes some one to think!! being unconducive state for investment by the time the project has been initiated or being thought of how could still the state being number one in terms of biomass projects.

Baseline Emission Factor:

I personally believe that there are certain pertaining issues needs to be considered on the scale of conservativeness while considering the baseline emission factors.

Inconsistency in the baseline assumption and non conservative baseline

The section E.1.2.4 states that the "Calculation of the project GHG emissions reductions applies a weighted average emissions factor for all thermal plants that are operational on the Southern grid of India as of March 2005".where as the generation data considered is for the year 2003 -04 not 2004 -05.

The conservativeness is debatable in this value of two reasons.

1. Heat rate
2. Year of consideration

Heat Rate: The heat rate considered is too high and the source for that data is 2001-02 which



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would be appropriate if the baseline emission factor would have considered the generation data of that particular year or if any latest sources are not available. As the starting date of the project activity falls within that time period if the CEF value would have been that then it would be the most conservative value.

The latest data available with the CEA "Performance Review of thermal power stations 2004-05 Section 13" mentioned average heat rate for the southern region is 2707 for the year 2003 -04 and 2700 for the FY 2004-05.

As because the Project developer has considered the generation data at the time of submission of PDD for the year 2005 (even though not considered correctly) the SHR should be accordingly to that of the latest source available not the earlier one.

For Example

The SHR for the following plants are compared

Kothagudem plant SHR considered in PDD is 3357 against 2594

Vijayawada plant SHR considered is 2639 against 2435

Rayalseema 2662 against 2288

Ramagundam 3239 against 2723

So the appropriateness would be average SHR of the region (or) the IPCC default SHR (if sources are not available) which substantially reduces the CEF for the region.

Year of consideration:

The actual starting date of the project activity is 1st Jan 2002 where as the baseline considered was for the year 2005 as mentioned in the PDD even though that is not true(it is for 2004).

The methodology I.D states that on option b that "The weighted average emissions (in kg CO₂equ/kWh) of the current generation mix" but it has not stated as how it has stated in the ACM 0002 Version 4 pg no 6.

Under this assumption the appropriate year of baseline selection would be weighted average emission at the time of the generation or 3 year average on most recent statistics not the current generation mix at the time of PDD submission.

As per the assumptions made by the Project proponent

The CEF value for 2005 (as stated in PDD) would be not the one represented with high SHR as assumed as 848 should be lesser than value assumed. The actual values should be less as else where explained in the comments by considering the appropriate SHR at present values and is the highest value from the starting date of the project activity.



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In my opinion the following should be rectified before being submitted for further processes.

Warm regards

Rajaram Velayudhan

The project participants' response:

In the PDD actual generation is given for only three years 2002, 2003 and 2004 and highest generation was recorded only in the second year i.e. in 2003. It can be seen from the generation data that the PLF during the first year is only at 68.3%. Only during the second year the plant has been operated at a higher PLF of 88.9%. During the third year the PLF is at 84.2%. During this period project participants have seen rise in biomass prices, compared to that prevailed at the time of project design and hence, the plant was deliberately run at higher load factors, (only intermittently and not continuously such that the operational safety and lifetime of the equipment is not affected due to overloading), only to maintain the economic viability of the project at high biomass prices. As a result higher generation was recorded. For prospective years, the PLF has been assumed as 80% based on the restriction imposed by the state power utility and due to the barriers anticipated from the biomass front. Log sheets of the turbine and the boiler are furnished as evidence supporting frequent shutdowns.

As explained in the response above, the operational track record of the previous three years is not the representative to that of future years. Hence, the pay back period of two years is not possible. Even IREDA while appraising the project has fixed the repayment period as 10 years with a moratorium of 3 years. The sensitivity analysis prepared for the company assuming tariff suggested by MNES and based on prevailing price of biomass, the payback period worked out to 7.89 years without considering GHG income.

While computing the IRR, the project participants have taken care of subsidies, depreciation, tax holidays, MAT etc. IRR computation has been enclosed for verification. The IRR has been prepared with two alternatives. In the first case IRR is prepared considering the actual position with respect to tariff being paid by the utility, cost of biomass etc., and the detailed assumptions and calculations are furnished. In the second case which is considered as the best case considering the likely scenario for the project with respect to biomass and the tariff suggested by MNES. Calculations underlying the two alternatives are enclosed as per the validation protocol.

Calorific values of biomass residues range between 3500 to 4400 kcal/kg except for rice husk whose calorific value is 3200 kcal/kg. Hence, the average calorific value of biomass materials is assumed as 3800 kcal/kg. The project participant's source fossil fuels (coal) from Singareni Collieries Company Ltd. and the calorific value of coal is around 3800 kcal/kg which is matching with that of average calorific value of biomass fuels. Hence, the percentage of coal consumption is considered as a discount factor for the generation eligible for baseline emissions or CERs and the actual coal consumption is monitored ex post.

However, the project participants now considered the baseline emissions from the total power exported to the grid and deduct the emissions occurring from the consumption of coal by the

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project activity, as project emissions, so that there is no need to consider the discount factor for the eligible generation. Actual quantity of fuels used by the project and the calorific value for coal will be monitored each year of the crediting period. The PDD has been revised accordingly. Low conversion efficiency is when compared to the technology level between biomass power generation and fossil fuel based power generation. Significant conversion efficiency can be seen only between 100% biomass fired power plant and 100% fossil fuel fired power plant of higher capacity. Whereas in the project case, the coal consumption is very limited that too when sufficient biomass is not available or to maintain the stability of operation conditions. Hence, low conversion efficiency will not influence the baseline estimation or CERs from the project activity, but the same has been projected as perceived barrier for investment in the biomass power sector.

Establishing biomass power projects in Andhra Pradesh has started primarily only in the year 2000. At the time of envisaging the project in May 2000 there was only one project operating in Andhra Pradesh with a capacity of 2.75 MW established prior to the year 2000 and three projects having a capacity of 16.5MW were under implementation. . All the subsequent biomass projects came to be established only after year 2000 along with the project promoted by Varam Power Projects (P) Ltd., Therefore the project activity is one of the first few projects started in the state of Andhra Pradesh.

Clearly, with the encouragement given by various institutions such as MNES, NEDCAP, IREDA, APTRANSCO etc. to promote renewable energy development in the state of Andhra Pradesh, many entrepreneurs came forward for investing in biomass power development, in spite of several anticipated barriers. However, it has been demonstrated that their anticipation of hardships and barriers have been true when biomass prices have been increased substantially, when the supply of biomass residues deteriorated due to poor results of agriculture, when the tariff has been reduced by APTRANSCO, when restriction on PLF has been imposed, etc. That is why, in other words, learning from the experiences of project developers in the Andhra Pradesh State, no other state has seen such a high installed capacity from biomass power plants.

The baseline considered for the project activity is in accordance with the SSC baseline methodology I.D. Version 9. As per 9.b of I.D V.8., the emission factor shall be the weighted average emissions of current generation mix, accordingly to which current generation mix is interpreted as the one prevailing at the time of submitting the PDD. At the time of submitting the PDD for validation, the most recent year for which the annual data is available is 2004-2005, hence the same has been considered in the PDD and a constant baseline has been considered for the purpose of indicating the anticipated emission reductions from the project activity. However, it has been clearly shown in Section D.3 of PDD, the grid emission factor is considered for ex post monitoring during the year the generation occurs, hence, the generation data published by CEA for the same year will be considered for estimating the emission reductions from the project activity.

With regard to the heat rates, the project participants have considered a more aggregated data published by the Ministry of Non-conventional Energy Sources, Govt. of India. The CEA has published a report "Performance Review of Thermal Power Stations 2004-05". (Source http://www.cea.nic.in/god/opm/Thermal_Performance_Review/0405/start.pdf) This report considered a very small sample group of 40 thermal power plants and only 10 thermal power plants in the Southern Region. CEA has calculated average station heat rates of only 10 power plants and projected as an average of the entire southern region. Project Participants have considered this as inappropriate since the southern region has 44 thermal power plants and all



thermal power plants are not comparable with those selected by CEA. Out of all the thermal power plants in the southern region some of the plants have larger heat rates than the aggregated average values, hence, project participants felt that the aggregated heat rates specified by MNES better represent the baseline situation. However, project participants have now revised the baseline estimation considering the heat rates of 10 thermal power plants those considered by CEA for performance review and MNES heat rates for the remaining thermal power plants. Also, the grid emission factor is re-calculated using the yearly generation data for the previous years and the same is attached herewith for verification.

How DNV has considered the comment received in its validation:

DNV has verified the initial operational data and concludes the project participant's claim of frequent shutdowns during initial years.

Details of IREDA estimations on payback period and IRR/sensitivity analysis while sanctioning have also been verified by DNV which is around 8 years with out considering CDM revenue. It has been confirmed that the calculations consider all subsidies, tax holidays, MAT while concluding on IRR for the project.

DNV has verified the calculations of revised project emissions calculated based on actual coal consumption for previous years and 10% of coal consumption for future credits as a conservative option, as the project is allowed to use coal as a support fuel up to 25%.

DNV could verify that the power generation using renewable sources like biomass is not a prevailing practice and there were only one project of 2.75 MW operational and few projects equivalent to 16.5 MW capacity that are based on renewable biomass as a source fuel, were under implementation during the period of conceptualisation this project, thereby confirming that power generation using non-conventional sources is not a common practice in spite of governmental promotion for such projects at the stage of project initiation.

DNV raised a clarification on method of calculation of baseline factor and verified the revised baseline emission factor for southern grid and completeness of the set of power plants as well as the correctness of the reported heat rates and electricity generation data has been verified. All data has been sourced from data published by the Central Electricity Authority and MNES.

The grid emission factor will be calculated ex-post each year based on generation data and can be verified time to time during verification process.



VALIDATION OPINION

Det Norske Veritas Certification Ltd. (DNV) has performed a validation of the “6 MW Renewable energy generation project by Varam Power Projects” Chilkapalem village, Etcheria Mandal, Srikakulam District, Andhra Pradesh, 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 Varam Power Projects Private Limited. The host Party India meets all participation requirements and the DNA of India approved the project.

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 version09. 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 will contribute 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 02 August 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 22,377 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 15 September 2006, 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



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baseline and monitoring methodology AMS-I.D. Hence, DNV requests the registration of the “6 MW Renewable energy generation project by Varam Power Projects” as a CDM project activity.



REFERENCES

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

- / 1/ Varam Power Projects Private Limited: CDM PDD for “6 MW Renewable energy generation project by Varam Power Projects” Project version 1 of 28 December 2005, version 2 of 15 September 2006 and version 03 dated December 2006.
- / 2/ Varam Power Projects Private Limited: baseline calculation for grid emission factors
- / 3/ Ministry of Environment and Forest (DNA of India): Letter of Approval dated 02 August 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 09: 28 July 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. A.V.Narasimham, Managing Director, Varam Power Projects Private Limited
- Mr. B. Govinda Rajulu, Executive Director, Varam Power Projects Private Limited
- Mr. A.V.N. Prasad, Finance Director, Varam Power Projects Private Limited
- Mr. Krishna Murthy, Plant Manager, Varam Power Projects Private Limited
- Mr. P.V.R.N. Murthy - Personal Officer, Varam Power Projects Private Limited

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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 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	CAR1 OK	Written approval from the DNA of India is not received.
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 is used for the project activity, these Parties shall	Decision 17/CP.7, CDM Modalities and	OK	The project is being proposed as a

Requirement	Reference	Conclusion	Cross Reference/ Comment
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.	Procedures Appendix B, § 29		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	As Above	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	
14. The proposed project activity shall confirm to one of	Simplified Modalities and	OK	Table 2, Section A.1.3, B and D

Requirement	Reference	Conclusion	Cross Reference/ Comment
the project categories defined for small scale CDM project activities and uses the simplified baseline and monitoring methodology for that project category	Procedures for Small 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 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 made publicly available on www.dnv.com/certification/climatechange and Parties, stakeholders and NGOs were through the CDM website invited to provide comments during a 30 day period from 31 December 2005 to 29 January 2006. One comment was received, made publicly available and taking into account in DNV's validation of the project.

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 6 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/	DR	Yes, it is 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 Chilkapalem village, Etcheria Mandal, Srikakulam District, Andhra Pradesh, India. The power will be exported to the grid through a 132kV substation managed by APTRANSCO, located at Chilakapalem Village..		OK
A.2.2. Are the project's system (components and facilities used to mitigate GHG's) boundaries clearly defined?	/ 1/	DR	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 southern electricity grid are included in the system boundary.		OK
A.2.3. Does the project design engineering reflect current good practices?	/ 1/	DR	It is not clear from PDD that the technology is used is a current good practice. Clear explanation is required to be included.	CAR-2	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		OK

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

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
			project		
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	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. The certificate of qualification of the personal operating the boiler was evidenced during site visit.		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/	DR	Yes, The project has resulted in direct and in-direct employment opportunity to the local population. The project has also generated an additional revenue stream to farmers on account of supply of biomass.		OK
A.3.2. Will the project create any adverse environmental or social effects?	/ 1/	DR	Andhra Pradesh Pollution Control Board has issued the consent for establishment. As per the consent order the project is permitted to use rice husk/ casuarinas as fuel. During the site visit, and subsequent interviews it was found that wood from mango trees is also being used as a fuel. 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. It has also to be clarified and demonstrated that the woody biomass used is	CL1	OK

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

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
			renewable.		
A.3.3. Is the project in line with sustainable development policies of the host country?	/ 1/	DR	Written Approval from DNA of India is not evidenced.	CAR1	OK
A.3.4. Is the project in line with relevant legislation and plans in the host country?	/ 1/	DR	Yes.		OK
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). 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 of current generation		OK

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

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
			mix approach.		
B.1.2. Is the baseline methodology applicable to the project being considered?	/ 1/	DR	Simplified small scale CDM project category I.D is applicable since the project is a biomass based power plant.		OK
B.2. Baseline Determination It is assessed whether the project activity itself is not a likely baseline scenario and whether the selected baseline represents a likely baseline scenario.					
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?	/ 1/	DR	<p>The main barrier perceived is the barrier due to prevailing practice. At the time of project conceptualisation, only 1% of total generation mix of APTRANSCO was through biomass plants.</p> <p>The evidence for considering CDM revenues for sustainability of the project at the time of project conceptualisation is to be provided.</p> <p>To substantiate the financial barrier analysis a more detailed report on the IRR/NPV of the project is required to be evaluated for further clarity.</p> <p>Policy barrier identified 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 and wheeling charges in future would make the project non-viable.</p>	<p>CL2</p> <p>CL3</p>	<p>OK</p> <p>OK</p>
B.2.2. Is the application of the baseline methodology and the discussion and determination of the chosen baseline transparent and conservative?	/ 1/	DR	<p>The baseline scenario considered is southern grid.</p> <p>The information provided on baseline emission calculation is not transparent. The weighted average of current generation mix is not calculated</p>		

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

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
			clearly, as data considered is not for the baseline year. A clarification is sought in this regard.	CL4	OK
B.2.3. Are relevant national and/or sectoral policies and circumstances taken into account?	/ 1/	DR	Yes, the selection of the weighted average of current generation mix approach is justifiable considering the generation pattern will not change significantly over the crediting period.		OK
B.2.4. Is the baseline selection compatible with the available data?	/ 1/	DR	Clarifications pending on B.2.2	CL4	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	Clarifications pending on B.2.2	CL4	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 start date of the project activity is 9 May 2000 and 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, the crediting period is for 10 years starting from 1 January 2002.		OK

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

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
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	The project falls under category I.D of appendix B of the simplified modalities and procedures for small scale CDM project activities and the monitoring methodology used is in line with the same.		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 co-fires biomass with coal, the amount of biomass and fossil fuel is monitored apart from electricity generated and supplied to grid.		OK
D.1.3. Is the application of the monitoring methodology transparent?	/ 1/	DR	The monitoring methodology is not transparent, as it does not include the monitoring of avg. calorific value of biomass and fossil fuel used.	CL5	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 and a separate CDM audit team for periodic monitoring and also periodic analysis of fuel also plans recording. This is expected to give real time results.		OK

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

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
<p>D.2. Monitoring of Project Emissions</p> <p>It is established whether the monitoring plan provides for reliable and complete project emission data over time.</p>					
<p>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?</p>	/ 1/		As the project activity uses coal as an alternate fuel in case of shortage of biomass material, monitoring data includes consumption of coal in the monitoring plan.		OK
<p>D.3. Monitoring of Leakage</p> <p>If applicable, it is assessed whether the monitoring plan provides for reliable and complete leakage data over time.</p>					
<p>D.3.1. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for determining leakage?</p>	/ 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.		OK
<p>D.4. Monitoring of Baseline Emissions</p> <p>It is established whether the monitoring plan provides for reliable and complete project emission data over time.</p>					
<p>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?</p>	/ 1/		Yes, the baseline indicators have been chosen in line with the small-scale methodologies approved by the CDM EB.		OK

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

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
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 specified baseline indicators?	/ 1/	DR	Yes, it is possible with the data being monitored.		OK
D.4.4. Will the indicators give opportunity for real measurements of baseline emissions?	/ 1/	DR	Yes.		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/	DR	The authority and responsibility for project management has to be formally described.	CL6	OK
D.5.2. Is the authority and responsibility for registration monitoring measurement and reporting clearly described?	/ 1/	DR	Available but need to be formalised	CL6	OK
D.5.3. Are procedures identified for training of monitoring personnel?	/ 1/	DR	As in D.5.2	CL6	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.	CL6	OK
D.5.5. Are procedures identified for calibration of monitoring equipment?	/ 1/	DR	Calibration of instruments is being done but procedures need to be formalised.	CL6	OK
D.5.6. Are procedures identified for maintenance of monitoring equipment and installations?	/ 1/	DR	Available but need to be formalised.	CL6	OK
D.5.7. Are procedures identified for monitoring,	/ 1/	DR	Available but need to be formalised	CL6	OK

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

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
measurements and reporting?					
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/	DR	Available but need to be formalised	CL6	OK
D.5.9. Are procedures identified for dealing with possible monitoring data adjustments and uncertainties?	/ 1/	DR	As in D.5.7	CL6	OK
D.5.10. Are procedures identified for internal audits of GHG project compliance with operational requirements as applicable?	/ 1/	DR	Procedures need to be formalized.	CL6	OK
D.5.11. Are procedures identified for project performance reviews?	/ 1/	DR	Procedures need to be formalized	CL6	OK
D.5.12. Are procedures identified for corrective actions?	/ 1/	DR	Procedures need to be formalised	CL6	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 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	/ 1/	DR	Direct emissions due to co-firing of coal are captured in the design document.		OK

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

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
project design?			The project participant identifies emissions from off-site transportation of fuels. But the fuel transportation of the power plants considered in baseline can off set these project emissions.		
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 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 are conservative in nature.		OK
E.1.6. Are uncertainties in the project emissions estimates properly addressed?	/ 1/	DR	The project proponent has to account for emissions due to non renewable biomass. (Refer also comments under A.3.2)	CL1	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 and estimated ex-ante.					
E.2.1. Are leakage calculation required for the	/ 1/	DR	Since the energy generating equipment is not		OK

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Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
selected project category and if yes, are the relevant leakage effects assessed?			transferred from another activity and no existing equipment is transferred to another activity, no leakage needs to be considered.		
E.3. Baseline GHG Emissions The validation of ex-ante estimated 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	Yes the baseline emission sources are clearly defined.		OK
E.3.2. Are all aspects related to direct and indirect baseline emissions captured in the project design?	/ 1/	DR	Yes, all aspects related to direct baseline emissions are captured. No significant indirect emissions, hence not captured.		OK
E.3.3. Have all relevant greenhouse gases and sources been evaluated?	/ 1/	DR	Yes, CO ₂ is the relevant greenhouse gas and the sources are evaluated.		OK
E.3.4. Do the methodologies for calculating baseline emissions comply with existing good practice?	/ 1/	DR	Comments reserved till comment under B.2.2 is resolved.	CL4	OK
E.3.5. Are the calculations documented in a complete and transparent manner?	/ 1/	DR	Comments reserved till comment under B.2.2 is resolved.	CL4	OK
E.3.6. Have conservative assumptions been used?	/ 1/	DR	Comments reserved till comment under B.2.2 is resolved.	CL4	OK
E.3.7. Are uncertainties in the baseline emissions estimates properly addressed?	/ 1/	DR	Comments reserved till comment under B.2.2 is resolved.	CL4	OK

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Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
E.4. Emission Reductions Validation of ex-ante estimated emission reductions.					
E.4.1. Will the project result in fewer GHG emissions than the baseline case?	/ 1/	DR	Comments reserved till comments under B.2.2 and section E.3 are resolved.	GL4	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	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.		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	The PDD does not address the likely environmental impacts the project is likely to create, such as effects of suspended particulate matter, Nitrogen oxides and Sulphur dioxide apart for generation of fly ash. Whether the above are in line with the stipulations of the state pollution control also needs to be evidenced.	GL7	OK
F.1.4. Have environmental impacts been identified and addressed in the PDD?	/ 1/	DR	As in F.1.3	GL7	OK

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Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
G. Comments by Local Stakeholder Validation of the local stakeholder consultation process.					
G.1.1. Have relevant stakeholders been consulted?	/ 1/	DR	Yes the following relevant stakeholders have been consulted - Local community / administrative authorities comprising of Village Panchayat, District local administration and Biomass Suppliers; APTRANSCO and other Regulatory Authorities		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	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	Summary of local stakeholder's comments is available.		OK
G.1.5. Has due account been taken of any comments received?	/ 1/	DR	No adverse comments have been received.		OK

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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 Written approval from the DNA of India is not received.</p>	<p>A.3.3</p>	<p>Written approval from DNA is received and copy of the same is enclosed.</p>	<p>Approval from DNA of India dated 2 August 2006 has been evidenced. CAR closed.</p>
<p>CAR 2 It is not clear from PDD that the technology is used is a current good practice. Clear explanation is required to be included</p>	<p>A.2.3</p>	<p>The technology employed in the project activity is Rankin cycle based thermal power generation using biomass residues. The plant & machinery comprises mainly, high pressure and high temperature boiler and a matching steam turbine generator. Steam parameters considered in the project design is 64 ata / 485 °C. The turbine is fully condensing impulse type with a rated capacity of 6 MW. The boiler has a capacity of 27 TPH and the thermal capacity is well below 45 MW. Having examined all the technical parameters IREDA has approved the project.</p> <p>The biomass plant proposed to utilize different types biomass fuels such as rice husk, cotton stalks, red gram stalks, jute sticks, Bagasse and juliaflora. In order to achieve optimum efficiency in the combustion the company has been advised to procure stoker fired travelling grate boiler which can take care of the different types of fuel with different fuel properties. The</p>	<p>The complimentary information provided has been accepted. CAR closed.</p>

Draft report corrective action requests and requests for clarification	Ref. to Table 2	Summary of project participants' response	Final conclusion
		<p>other choice available for the company is FBC Boiler. It was felt that that an FBC boiler may achieve better efficiency provided the fuel utilized is rice husk or coal but not for multi fuels. In fact most of the biomass plants established in the state have installed travelling grate boilers.</p> <p>Specifications of boiler and turbine are furnished for verifications.</p> <p>The PDD has been revised incorporating the above.</p>	
<p>CL</p> <p>During the site visit, and subsequent interviews it was found that wood from mango trees is also being used as a fuel.</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. It has also to be clarified and demonstrated that the woody biomass used is renewable.</p>	<p>A.3.2, E.1.6</p>	<p>The operation of biomass plants in Andhra Pradesh is regulated by Non-Conventional Energy Development Corporation of Andhra Pradesh (NEDCAP), the State level nodal agency. NEDCAP monitors important aspects from all biomass power plants such as power generation, fuel consumption etc. by virtue of the license sanctioned to them and the MOU entered with the investors. NEDCAP vide its letter dated 20.01.2005 has informed all project developers by way of a guidance note, the type of biomass residues that can be used by biomass power plants which stated that mango cuttings could also be used as fuel. Documentary evidence is enclosed herewith for ready</p>	<p>Though NEDCAP guidelines suggest to use mango cuttings. It is strongly recommended to monitor all the woody biomass which is non-renewable separately for discounting CERs.</p> <p>This is to be monitored during verification.</p> <p>CL closed.</p>

Draft report corrective action requests and requests for clarification	Ref. to Table 2	Summary of project participants' response	Final conclusion
		<p>reference.</p> <p>The primary biomass residues considered for the project are rice husk, jute sticks and cotton stacks. Biomass management is the most important activity in the power plant. Therefore the procurement of biomass comes under the direct supervision of the Executive Director of the company. It is he who decides the type of biomass to be procured keeping in view the local laws with regard to permitted varieties particularly woody biomass. There are procedures in place with respect to acceptance of biomass fuels. The procurement division takes the guidance from NEDCAP as well as guidelines from the Government in accepting the biomass fuel. 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. A copy of procedure followed by the project proponent while accepting the biomass is enclosed. The notification issued by NEDCAP and the Government with regard to approved biomass fuels is also enclosed separately.</p>	

Draft report corrective action requests and requests for clarification	Ref. to Table 2	Summary of project participants' response	Final conclusion
		<p>In addition to the above, to ensure that only renewable and sustainable biomass residues are used in the project, NEDCAP and Forest Department pays surprise visits to the project for onsite verification. In case of violation, these agencies have the right to cancel license or levy heavy penalty. So far no such violation is happened in the project site.</p>	
<p>CL2 The evidence for considering CDM revenues for sustainability of the project at the time of project conceptualisation is to be provided.</p>	<p>B.2.1</p>	<p>Modalities and procedures for CDM came into existence only towards the end of 2001 as Marrakesh Accords. With the reluctance of US to participate in the Kyoto Protocol, there has been an uncertainty with regard to the coming into force of Kyoto Protocol. Promoters knew of the CDM and its benefits as well as pitfalls through various seminars organized by their advisors in Hyderabad and also through other capacity building programmes. The promoters have chosen the project activity based on the support extended by the State as well as the promotional policies of Ministry of Non-Conventional Energy Sources. During the process of obtaining the licenses, they have developed the understanding that renewable energy projects are significant for the development of rural</p>	<p>The evidence of Minutes of Board of directors meeting for year 2000 and evidence for all subsequent effort mentioned have been assessed and accepted.</p> <p>CL closed.</p>

Draft report corrective action requests and requests for clarification	Ref. to Table 2	Summary of project participants' response	Final conclusion
		<p>areas and that they do not release any green house gases. In one of the informal seminar conducted by their consultants at Hyderabad in early 2000, to a group of project developers, information was provided on earth summit held in 1992 and Kyoto protocol signed by various countries in 1997 and evolution of CDM. During the said meeting a copy of the Kyoto Protocol was also given to all the participants. As the project activity was progressing and before commencement of the project activity, a decision was taken by the board of the Project developer to consider the benefits under Kyoto protocol since no procedures were established in 2000 for claiming the carbon revenue. Copy of the minutes of board meeting is furnished for verification.</p> <p>One significant fact that the project proponents are aware of is that the biomass prices will not remain stable after the establishment of the power plant based on an initial interaction with similar developers in Tamil Nadu and Madhya Pradesh. Even the financial institutions have considered 100% rise in biomass price for sensitivity analysis. The PPA executed with AP Transco, has a specific clause in PPA which</p>	

Draft report corrective action requests and requests for clarification	Ref. to Table 2	Summary of project participants' response	Final conclusion
		<p>reads as below</p> <p>“The company shall be paid the tariff for the energy delivered at the interconnection point for sale to AP Transco at Rs.2.25 paise per unit with escalation at 5% per anum with 1994-95 as base year and to be revised on 1st April of every year up to the year 2003-04. Beyond the year 2003-2004, the purchase price by AP Transco will be decided by Andhra Pradesh Regulatory commission”. There will be further review of purchase price on completion of 10 years from the date of the commissioning of the project, when the purchase price will be re worked on the basis of return on equity, O& M expenses and the variable cost”.</p> <p>Thus the uncertainty is prevailing on this project right from the beginning.</p> <p>Considering several other barriers for biomass power generation and due to the fact that the biomass power generation is in the initial stages of development, project developers sought additional revenues for intervention to alleviate such barriers. With continuous encouragement given by the advisers and various other</p>	

Draft report corrective action requests and requests for clarification	Ref. to Table 2	Summary of project participants' response	Final conclusion
		<p>players in the CDM, project participants have confidence that the project would get additional revenues under CDM.</p> <p>Keeping the above in view, the project participants have taken steps in the year 2002 to proceed with the project development under CDM and have appointed a consultant for CDM, Zenith Corporate Services (P) Ltd. (Hereafter Zenith) who has prepared elaborate documentation for CDM. However, at the time of project implementation and even after the commissioning of the project, the CDM and market for certified emission reductions (CERs) have not evolved fully. Keeping in view the importance of the additional revenues for the sustenance of the project under difficult conditions and barriers, the project developers and Zenith decided to sell the emission reductions generated by the project as verified emission reductions (VERs) till such period the CDM market is clear. Zenith has prepared an estimate of emissions reductions generated by the project during the year 2002 and launched an auction in the international market through world wide web. The auction was launched together with a reputed company Factor Consulting +</p>	

Draft report corrective action requests and requests for clarification	Ref. to Table 2	Summary of project participants' response	Final conclusion
		<p>Management AG and was kept open for bids during the period 17 March 2003 to 17 July 2003. Complete documentation together with the offers received for VERs and the correspondence made with various agencies is available for validation by the DOE. However, due to unattractive price offers and lack of interest in VERs from the buyers the project participants decided to go for the CERs route.</p> <p>The evidence of auction is furnished to emphasize that the project proponents have been looking for opportunities for sale of emission reductions since early days along with several other project developers as one group and that they were aware of the fact that there is a value for these emission reductions. The project proponent along with other similar developer is the only projects(according to their information) who tried the unique auction method to realize additional revenue for these projects by sale of emission reductions.</p> <p>All the above facts demonstrate that the CDM revenues were initially considered at the time of project implementation.</p>	
<p>CL3 To substantiate the financial barrier analysis</p>	<p>B.2.1</p>	<p>The project risks are anticipated by the promoters even at the time of financial</p>	<p>The IRR and sensitivity analysis 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
<p>a more detailed report on the IRR/NPV of the project is required to be evaluated for further clarity.</p> <p>Policy barrier identified 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 and wheeling charges in future would make the project non-viable.</p>		<p>closure based on the following indications.</p> <p>Few power plants based on biomass are established and it was reported that the price of biomass fuels have increased in those areas after the plants are established.</p> <p>Further, while executing the PPA in November 2001, Article 2.2 of the PPA stated the following.</p> <p>“The company shall be paid the tariff for the energy delivered at the interconnection point for sale to AP Transco at Rs.2.25 paise per unit with escalation at 5% per annum with 1994-95 as base year and to be revised on 1st April of every year up to the year 2003-2004, the purchase price by AP Transco will be decided by APERC. There will be further review of purchase price on completion of 10 years from the date of commissioning of the project, when the purchase price will be re worked on the basis return on equity, O&M expenses and the variable cost.”</p> <p>Thus project participants considered changes in prices as well as uncertainty with respect to tariff even at initial</p>	<p>accepted.</p> <p>CL closed.</p>

Draft report corrective action requests and requests for clarification	Ref. to Table 2	Summary of project participants' response	Final conclusion
		<p>stage. At the time of signing of PPA it was known that the tariffs available from Government of India which were endorsed by Government of Andhra Pradesh are available up to 2004 as these regulations had validity for 10 years from their introduction in 1995. Further a regulatory commission has been constituted in the state for regulating tariff etc., of various categories of suppliers of energy.</p> <p>It may kindly be noted that the barriers perceived by the project proponent have become true subsequently as the biomass prices have gone up substantially and the tariff was also reduced.</p> <p>The IRR has been prepared with two alternatives. In the first case IRR is prepared considering the actual position with respect to tariff being paid by the utility, cost of biomass etc., and the detailed assumptions and calculations are furnished. In the second case which is considered as the best case considering the likely scenario for the project with respect to biomass and higher tariff as suggested by MNES.</p> <p>Calculations underlying the two alternatives are enclosed.</p>	

Draft report corrective action requests and requests for clarification	Ref. to Table 2	Summary of project participants' response	Final conclusion
		<p>IRR based on actual position with respect to price of biomass and tariff available for the project activity has worked out to 6.53% without income from sale of emission reductions and including GHG revenue IRR worked out to 10.96%.</p> <p>In the second alternative considering a positive tariff is available from the utility b based on MNES suggested rates, the IRR has worked out to 12.67% with GHG revenue and the same goes up to 16.29% considering GHG income.</p> <p>A detailed explanation on IRR analysis of the project is indicated in the PDD.</p>	
<p>CL4 The information provided on baseline emission calculation is not transparent, as so the weighted average of current generation mix is not calculated clearly, as data considered is not for the baseline year.</p>	<p>B.2.2 B.2.4 B.2.5 E.3.4 E.3.5 E.3.6 E.3.7</p>	<p>An MS Excel sheet is enclosed demonstrating the calculation of baseline emissions.</p> <p>The baseline considered for the project activity is in accordance with the SSC baseline methodology I.D. 9.b. As per 9.b. the emission factor shall be the weighted average emissions of current generation mix, accordingly to which current generation mix is interpreted as the one prevailing at the time of submitting the PDD. At the time of submitting the PDD for validation, the most recent year for which the annual data is available is 2004-2005, hence</p>	<p>Revised calculations on baseline emissions provided have been reviewed and accepted.</p> <p>CL closed.</p>

Draft report corrective action requests and requests for clarification	Ref. to Table 2	Summary of project participants' response	Final conclusion
		the same has been considered in the PDD, only for the purpose of estimation. Actual emission factor calculated for each year and the same is already included in the monitoring plan. Now the PDD was revised incorporating actual emission factors for previous years.	
<p>CL5</p> <p>The monitoring methodology is not transparent, as it does not include the monitoring of avg. calorific value of biomass and fossil fuel used.</p>	D.1.3	The PDD has been revised. The NCV of coal is monitored as required by the formula for calculation of the project emissions. Included in the revised PDD.	The revised monitoring plan has been reviewed and accepted. CL closed.
<p>CL6</p> <p>The authority and responsibility for project management has to be formally described.</p> <p>Procedures for project management covering authority & responsibility, measurement, monitoring, reporting, calibration, maintenance & emergency preparedness to be formalised.</p> <p>Management system procedures related to documentation/record keeping, corrective actions, internal audits & performance reviews also to be formalised.</p> <p>Emergencies like fire in storage area can cause unintended emission. The emergency preparedness in such situation needs to be elaborated</p>	D.5.	The company Varam Power Projects (P) Ltd. is managed by a Board of Directors. There is a full time Managing Director who is assisted by an Executive Director and a General manager. The General Manager is responsible for operation of the project and has under him support staff such as managers, shift in-charges, operators, maintenance personnel etc. Detail procedures are attached for reference.	The procedures furnished have been reviewed and accepted. CL closed.

Draft report corrective action requests and requests for clarification	Ref. to Table 2	Summary of project participants' response	Final conclusion
<p>CL7</p> <p>The PDD does not address the likely environmental impacts the project is likely to create, such as effects of suspended particulate matter, Nitrogen oxides and Sulphur dioxide apart for generation of fly ash. Whether the above are in line with the stipulations of the state pollution control also needs to be evidenced.</p>	<p>F.1.3 F.1.4</p>	<p>The project is not likely to have any adverse environmental impacts and in fact supports sustainable development of the area and the same is recognised by Government of India when the company received host country approval. Brief summary of environmental impacts are indicated in revised PDD.</p>	<p>The complimentary information provided is accepted.</p> <p>CL closed.</p>

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