Validation Report

Report for:

Shri Shyam Warehousing and Power Pvt. Ltd.

Validation of CDM project for

Biomass based power project by Shri Shyam Warehousing and Power Pvt. Ltd.

LRQA Reference	:	CDM-MUM-0061710-R01
Date	:	Version 03.1 05/12/2012
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LRQA Business Assurance

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1 Executive Summary

Lloyd's Register Quality Assurance Limited has been contracted by Shri Shyam Warehousing and Power Pvt. Ltd., representing the project participants (PP), to undertake validation of the proposed project activity "Biomass based power project by Shri Shyam Warehousing and Power Pvt. Ltd.". The validation has been performed through a process of document review based on the project design document, version 01 dated 13/04/2011, initially submitted for validation and the subsequent revisions, follow-up interviews with the stakeholders, resolution of outstanding issues and issuance of the validation report.

The project activity involves the installation of a 10 MW biomass based cogeneration power plant in Village Banari, District Janjgir, State Chhattisgarh, India. The purpose of the project activity is to generate electricity and steam by utilising the renewable biomass potential available in the region, thereby reducing GHG emissions. The project activity shall achieve GHG emission reductions by supplying the net electricity generated to the Northern, Eastern, Western, and North-Eastern (NEWNE) grid which is predominantly dependent on fossil fuel based power plants.

The fulfilment of the requirements as set forth in Article 12 of the Kyoto Protocol of the United Nations Framework Convention on Climate Change (UNFCCC), the modalities and procedures for a CDM (CDM M&P) and relevant decisions of the Conference of the Parties, serving as meeting of the Parties to the Kyoto Protocol (COP/MOP) and the Executive Board of the CDM (CDM-EB) have been evaluated and conformance to the validation requirements were confirmed based on the given information. A risk based approach was taken to conduct the validation and corrective action requests (CARs) and clarifications (CLs) were raised for relevant actions by the PP.

The validation team has found through the validation process 6 CARs and 4 CLs. The PP has taken actions and submitted to LRQA the revised project design document and supporting evidence. The validation team is of the opinion that the proposed project activity as described in the project design document Version 08.1 dated 04/12/2012 meets all the relevant UNFCCC requirements for the CDM, as well as the host country's national requirements and if implemented as designed, is likely to achieve the emission reductions and contribute to the sustainable development of the host country. LRQA therefore requests the registration of "Biomass based power project by Shri Shyam Warehousing and Power Pvt. Ltd." to the CDM Executive Board as a CDM project activity.

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Abbreviations

AFBC	Atmospheric Fluidised Bed Combustion
BE	Baseline emissions
BSE	Bombay Stock Exchange
CAPM	Capital Asset Pricing Model
CAGR	Compound Annual Growth Rate
CARs	Corrective action requests
CDM	Clean development mechanism
CDM-EB	Executive board of clean development mechanism
CDM M&P	Modalities and procedures for a clean development mechanism
CDM VVM	CDM Validation and Verification Manual
CEA	Central Electricity Authority
CERs	Certified emission reductions
CLs	Clarification requests
COP/MOP	Conference of the Parties serving as meeting of the Parties to the Kyoto Protocol
CSEB	Chhattisgarh State Electricity Board
CSERC	Chhattisgarh State Electricity Regulatory Commission
DNA	Designated national authority
DOE	Designated operational entity
DPR	Detailed Project Report
DG	Diesel Generator
EF	Emission factor
EIA	Environmental impacts assessment
FAR	Forward action requests
FR	Financial Report
GHG	Greenhouse gas
GSP	Global stakeholders' consultation process
IPCC	Intergovernmental panel on climate change
IRR	Internal rate of return
JMR	Joint Metering Report
KP	Kyoto Protocol of the United Nations Framework Convention on Climate Change
kW / kWh	Kilowatt / Kilowatt hour
LE	Leakage emissions
LoA	Letter of approval
LR	Lloyd's Register
LRQA	Lloyd's Register Quality Assurance Limited
MW / MWh	Mega watt / Mega watt hour
MAT	Minimum Alternate Tax
NCDMA	National Clean Development Mechanism Authority
NCV	Net Calorific Value
NEWNE	Northern, Eastern, Western, and North-Eastern grid
ODA	Official development Assistance
O&M	Operation & Maintenance
PDD	Project design document
PE	Project emissions
PLF	Plant Load Factor
PLR	Prime Lending Rate
PO	Purchase Order
PP	Project participant
PPA	Power Purchase Agreement
QA	Quality Assurance

QC	Quality Control
RBI	Reserve Bank of India
SSC M&P	Simplified Modalities and Procedures for Small-Scale CDM project activities
SWPPL	Shri Shyam Warehousing and Power Pvt. Ltd.
TPH	Tonnes Per Hour
tCO_2e	Tonnes of carbon dioxide equivalent
TG	Turbine Generator
UNFCCC	United Nations Framework Convention on Climate Change
WACC	Weighted Average Cost of Capital

2 Introduction

The Project Participants (PP) represented by Shri Shyam Warehousing and Power Pvt. Ltd., has contracted with Lloyd's Register Quality Assurance Limited (LRQA) to undertake validation of the proposed project activity "Biomass based power project by Shri Shyam Warehousing and Power Pvt. Ltd.". This report summarises the findings of the validation process that has been conducted on the basis of validation requirements of the CDM.

The validation has been undertaken by the team formed of the qualified personnel of LRQA as follows:

Imran Ustad	LRQA Ltd. India	Team Leader CDM Lead Validator
S Saravanan	External Expert	Expert to validation team
Prabodha C Acharya	LRQA Ltd. Asia	Technical Reviewer
Rudra C Padhy	External Expert	Sector expert to Technical Reviewer
Andrew Ritchie	LRQA Ltd.	Decision Maker
Javier Vallejo Drehs	LRQA Ltd.	Technical Reviewer and Decision Maker[1]

Personnel being engaged in a CDM project validation are qualified based on the established procedures of LRQA to assure the resource requirements satisfy all the requirements of competence criteria for an AE/DOE under CDM (CDM-Accreditation Standard Version 04). LRQA is designated as an operational entity and holds the full responsibility of decision-making regarding the validation, in line with the accreditation requirements of the CDM-EB. The certificate of appointment of the team personnel is attached to this report.

2.1 Objective

Validation is the process of an independent third party evaluation of a project activity on the basis of the PDD, against the requirements of the CDM as set out in Article 12 of the Kyoto Protocol, the CDM M&P, the present annex, subsequent decisions made by the COP/MOP and CDM-EB, and other rules applicable to the proposed project activity including the host country's legislation and its specific requirements for sustainable development. The validation follows the requirements of the current version of the CDM validation and verification manual (CDM VVM Version 01.2) to ensure the quality and consistency of the validation work and the report.

2.2 Scope

The scope of validation is an independent and objective review of the project design. Review of the PDD is conducted against the requirements of the Kyoto Protocol, the CDM M&P and relevant decisions of the COP/MOP and the CDM-EB. LRQA follows a risk-based approach in the validation focusing on the identification of significant risks for project implementation and generation of CERs. Validation is not meant to provide any consulting towards the PP, however, the corrective actions requests (CARs) and clarifications (CLs) might provide input for improvement of the project design. A

[1] Post receipt of incomplete submission during information and reporting check (15/11/2012)

validation conclusion shall become final subject to the decision maker's review by LRQA Ltd.

2.3 GHG Project Description

The project activity implemented by Shri Shyam Warehousing and Power Pvt. Ltd. involves the installation of the biomass co-generation power project of capacity 10MW in Village Banari, District Janjgir, State Chhattisgarh, India. The geographical co-ordinates of the project activity are 21^0 59' 51.83" N Latitude and 82^0 31' 04.59"E Longitude.

The project activity intends to generate electricity and steam from biomass (rice husk). The thermal energy (steam) shall be consumed in the adjacent rice mill. The net electricity (after deducting auxiliary consumption) shall be supplied to the connected electricity grid system (NEWNE grid system).

The net electricity supplied from the project activity will displace equivalent electricity from the NEWNE grid which is primarily fossil fuel based and hence will result in reduced greenhouse emissions. The annual net electricity generated by the project is estimated as 64,152 MWh and the annual emission reduction has been estimated as 33,948 tCO_2e.

The project activity is categorised in the sectoral scope 1 – Energy industries (renewable/non-renewable sources). The output capacity of the proposed project activity is $10MW_e$ ($39.5MW_{th}$) and it meets the criteria of Type I of the small scale CDM project activities (SSC).

3 Methodology

3.1 Review of documents

The validation is performed primarily based on the review of the project design document (PDD) and the other supporting documentation.

The PDD version 01 dated 13/04/2011 was initially reviewed. LRQA requested the PP to present supporting information and documents relating to the project design and such additional information and documents were also reviewed by LRQA.

Through the process of the validation, the PDD and the supporting documents of the same were evaluated to confirm the actions taken by the PP to the CARs and CLs issued by LRQA. The documents reviewed by LRQA are listed in Appendix B. LRQA reviewed the final version of the PDD Version 08.1 dated 04/12/2012 to confirm that all changes agreed had been incorporated.

3.2 Site Visit and Follow-up interviews

A site visit and follow-up interviews with the stakeholders were conducted as detailed in the schedule as below:

Date	Location/ Address	Party Interviewed	Subjects Covered	Team Members on Site
09/06/2011	Project Site Village Banari, District Janjgir, State	Project Participant	• Project Idea – Selection of technology • Project boundary issues/discussions • Process description (issues	Imran Ustad & S Saravanan

Date	Location/ Address	Party Interviewed	Subjects Covered	Team Members on Site
	Chhattisgarh, India		related to plant Start-up and operation, mass & energy balance) • Physical identification of Boiler, Turbine Generator, Electrostatic Precipitator, Ash handling system, Biomass Weigh Bridge etc. • Performance of Boiler, Turbine Generator, PLF of power plant, Electrostatic Precipitator, Ash handling system, Biomass Weigh bridge • Biomass Storage yard (Type of Biomass Stored) • Grid Interconnection Point, Transformer yard, Metering arrangements (Type, accuracy, make of energy meters Calibration schedule of meters) • Procedures for monitoring & reporting, QA/QC systems, training programme • Other Statutory requirements • Legal Requirements • Projects contribution to sustainable development • Institutional arrangement of data collection and archiving • Record keeping – daily production report, operation log • Provisions for internal audits • Emergency preparedness • Discussion on local stakeholder consultation process • Discussion on Land & site development, Land ownership and land sale deeds • Discussion on environmental impact assessment of the projectViews on the project activity	
09/06/2011	Village Banari, District Janjgir, State Chhattisgarh, India	Local stakeholders	• Discussion on local stakeholder consultation process • Invitation letters issued to local villagers • Representation by stakeholders in stakeholders' consultation meeting • Minutes of meeting – Comments, action taken • Employment of local skilled and unskilled people • Project contribution to	Imran Ustad

Date	Location/ Address	Party Interviewed	Subjects Covered	Team Members on Site
			sustainable development	
09/06/2011	Connected Substation, District Janjgir, State Chhattisgarh, India	Electricity Board	• Power transmission and Distribution • Evacuation of power and Cost of construction of transmission lines • Grid interconnection facility • Procedures for monitoring & reporting • Electricity metering provision (Joint meter reading • Transmission loss • Calibration schedule of meters • Institutional arrangement of data collection and archiving • Record keeping – daily production report, operation log • Emergency preparedness	Imran Ustad & S Saravanan
09/06/2011	Shri Shyam Warehousing and Power Pvt. Ltd. Village Banari, District Janjgir, State Chhattisgarh	Project Participant	• Confirmation of board minutes for investment decision • CDM consideration • Investment decision making process	Imran Ustad

A full list of persons interviewed is shown in Appendix C.

For details of all the findings of the desk review and site visit, please refer to the Validation Protocol and Findings in Appendix F.

3.3 Resolution of clarification and corrective action requests

LRQA applies the risk based approach aimed at focusing on high risk issues to the validation results while not omitting any part of the mandatory processes.

Findings identified in the process are indicated under the titles corrective action requests (CARs) and clarification requests (CLs) and forward action requests (FARs). CARs and CLs require the PP to take relevant actions. Criteria for judging items as CAR or CL are as follows:

Corrective action request (CAR):

- the project participants have made mistakes that will influence the ability of the project activity to achieve real, measurable additional emission reductions
- the CDM requirements have not been met, or
- there is a risk that emission reductions cannot be monitored or calculated.

Clarification request (CL):

- information is insufficient or not sufficiently clear to determine whether the applicable CDM requirements have been met.

FARs are to be raised to highlight issues related to project implementation that require review during the first verification of the project activity. FARs do not relate to CDM requirements for registration.

CARs and CLs are to be resolved or closed out if the PP modifies the project design, rectifies the PDD or provides adequate additional explanations or evidence that satisfies the concerns. If this is not completed, the project activity cannot be recommended for registration to the CDM Executive Board.

For details of the nature of the issues raised, the nature of the responses provided, the means of validation of such responses and the resulting changes in the PDD or supporting annexes please refer to the Validation Protocol and Findings in appendix F.

3.4 Internal quality control

A technical review by a qualified person independent from the validation team and a review by an authorised decision maker were conducted before the submission of the validation report to the PP and before requesting the registration of the project activity.

4 Validation protocol and conclusions

This section provides an overview of the validation activities undertaken by LRQA in order to arrive at the final validation conclusions and opinion. It includes general conclusions based on the Clean Development Mechanism Validation and Verification Manual Version 01.2. Further details in relation to each element of the protocol and each finding are shown in the Validation Protocol and Findings – Appendix F.

The protocol is structured based on the main validation requirements as follows:

- Approval by the Parties involved
- Participation requirements
- Project design document
- Project description
- Baseline and monitoring methodology
  - Applicability of the selected methodology
  - Project boundary
  - Baseline identification
  - Algorithms and/or formula used to determine emission reductions
- Additionality of a project activity
  - Prior consideration of the CDM
  - Identification of alternatives
  - Investment analysis
  - Barrier analysis
  - Common practice analysis
- Monitoring plan
- Local stakeholder consultation
- Environmental impacts.

4.1 Approval

A CDM project shall be approved by the Parties involved.

The host Party of the proposed project is India. India ratified the Kyoto Protocol on 26/08/2002. The Designated National Authority (DNA) is the National Clean Development Mechanism Authority (NCDMA) established in the Ministry of Environment and Forests (MoEF), Government of India. A letter of approval from the host country dated 19/04/2011, reference number 4/14/2010-CCC has been received. The LoA received from the host country has been provided in the Appendix B. This

letter of approval confirms the contribution of the project activity “Biomass based power project by Shri Shyam Warehousing and Power Pvt. Ltd.” to the sustainable development of India.

The Annex I Party is the United Kingdom of Great Britain and Northern Ireland. The United Kingdom of Great Britain and Northern Ireland ratified the Kyoto Protocol on 31/05/2002. The Environment Agency is the Designated National Authority for the CDM. A letter of approval from the Annex I Party, reference number EA/ALPte/03/2012 dated 18/04/2012 has been received.

For details relating to this section, please refer to the Validation Protocol in Appendix F.

4.2 Participation requirements

Shri Shyam Warehousing and Power Pvt. Ltd. is a private entity having its registered office in India.

Agrinergy Pte Ltd. is a private entity having its registered office in Singapore.

The contact details of the PPs are correctly provided in Annex 1 of the PDD.

Participation in the project activity of the PP has been authorised, as confirmed in the LoA issued by the DNA of the Party concerned. The team confirmed that no entities other than the authorised entity are indicated as project participant in the PDD.

For details relating to this section, please refer to the Validation Protocol in Appendix F.

4.3 Project design document

The PDD was checked and confirmed as complete against the Guidelines for completing the simplified project design document (CDM-SSC-PDD) and the form for proposed new small scale methodologies (CDM-SSC-NM) referring to the latest version applicable to the validation – for small scale CDM project.

A valid form of the CDM-PDD is used that is the current form as available on the CDM website.

For details relating to this section, please refer to the Validation Protocol in Appendix F.

4.4 Project description

The project activity involves the installation of a biomass power plant of 10 MW capacity connected to the NEWNE grid system in the host country, India, to displace the predominantly fossil fuel based power generation and thereby reducing the GHG emissions.

The location of the project activity was confirmed as Village Banari, District Janjgir, State Chhattisgarh, India as given in the section A.4.1.4 of the PDD. The geographic coordinates of the project activity were confirmed as 21^0 59’ 51.83” N Latitude and 82^0 31’ 04.59”E Longitude.

The co-generation power plant involves a biomass-based boiler of 50 TPH capacity at

68 kg/cm^2 pressure and a steam turbine generator of 10 MW capacity. The project activity shall use rice husk (which is designated as carbon neutral) and does not result in a net increase in GHG emissions. Rice husk utilised in the project activity will be sourced within 75 kilometres radius of the project site.

The pre-project scenario involved two rice husk based steam generation boilers of capacity 3 TPH and 4 TPH which shall be replaced by the project activity. The thermal energy (steam) shall be consumed in the adjacent rice mill. The net electricity (after deducting auxiliary consumption), estimated to be 64,152 MWh/year, shall be supplied to the connected electricity grid system (NEWNE grid system). Net electricity supplied will displace the grid electricity which is predominantly fossil fuel based, thereby reducing the GHG emissions.

The description of the project activity has been confirmed through the site survey, interview and review of documents. The technical specifications of the project provided in the PDD were confirmed during the site survey and also from the technical specifications provided by the technology supplier. The PP had also presented project approvals, purchase orders and power purchase agreement (PPA) (Refer Appendix B of the validation report).

The accuracy and completeness of the project description was validated by document review including offer letter from the technology supplier, purchase orders, tariff order, PPA, interview, and field survey.

LRQA confirms that the project description included in the PDD is accurate and complete. This description provides the reader with a clear understanding of the precise nature of the project activity and the technical aspects of its implementation.

Sustainable development

The host Party's DNA confirmed the contribution of the project activity to the sustainable development of the host Party.

Small scale CDM criteria

The project generates electricity from the renewable energy sources and thus displaces electricity from the NEWNE grid system. The project involves the installation of a biomass co-generation plant having an installed capacity of 10 MW, which is less than 15MW. The validation team confirmed the total capacity of the project through the investment decision, necessary approvals, purchase orders and Power Purchase Agreement (PPA). From the interview of the PP, the validation team has confirmed that the PP does not intend to increase the generation capacity of this project through the entire crediting period of the project.

Thus, the validation team confirmed that the total size of the project will remain under 15MW, the limits of small-scale project activity Type I "Renewable energy project activities with a maximum output capacity equivalent to up to 15 MW (or an appropriate equivalent)" during every year of the crediting period. Hence, LRQA confirms that the project activity satisfies the criteria set out for use of the SSC M&P with respect to Type I activities.

For details relating to this section, please refer to the Validation Protocol in Appendix F.

4.5 Baseline and monitoring methodology

Applicability of the selected methodology to the project activity

The project activity applied the approved baseline and monitoring methodology:
AMS-I.C "Thermal energy production with or without electricity" Version 19. AMS-I.C Version 19 is the current version at the time of completion of this report.

LRQA confirms that the selected methodology is applicable to this project activity. The project applicability was confirmed against each condition in the approved methodology selected. Appendix F includes the list of each applicability condition, the steps taken to validate each one and the conclusions about its applicability to the proposed project activity.

For details relating to this section, please refer to the Validation Protocol in Appendix F.

Project boundary

The project boundary has been validated through documentation review of the PPA, interview and field survey. This information was substantiated via cross-check with the CO_2 baseline database Version 5.0 which was the latest version available at the time of submission of the PDD for validation. Through the processes undertaken, the validation team confirmed that the identified project boundary, the selected sources and the gases were justified for the project activity and they meet the requirements of the approved methodology.

For details of whether any discrepancy was identified, and the processes taken, e.g. issued CAR or requested clarification of, revision to or deviation from the approved methodology for approval by the CDM-EB before completion of the validation, please refer to the Validation Protocol in Appendix F.

Baseline identification

The baseline scenario identified in the PDD has been assessed against the requirements in the approved methodology AMS-I.C "Thermal energy production with or without electricity" Version 19. LRQA can confirm that the procedure included in this methodology to identify the most reasonable baseline scenario, has been correctly applied.

The steps taken to assess the baseline identification are described in the Validation protocol in Appendix F.

LRQA confirms that:

- All the assumptions and data used by the project participant are listed in the PDD, including their references and sources;
- All documentation used is relevant for establishing the baseline scenario and correctly quoted and interpreted in the PDD;
- Assumptions and data used in the identification of the baseline scenario are justified appropriately, supported by evidence and can be deemed reasonable;
- Relevant national and/or sectoral policies and circumstances are considered and listed in the PDD;
- The approved baseline methodology has been correctly applied to identify the most reasonable baseline scenario and the identified baseline scenario reasonably represents what would occur in the absence of the proposed CDM project activity.

Algorithms and/or formula used to determine emission reductions

LRQA has confirmed that the steps taken and the equations applied to calculate project emissions, leakage, baseline emissions and emission reductions comply with the requirements of the approved methodology AMS-I.C "Thermal energy production with or without electricity" Version 19. The steps taken to assess the algorithms and/or

formulae used to determine emission reductions are described in the Validation protocol in Appendix F.

LRQA confirms that:

- All assumptions and data used by the project participant are listed in the PDD, including their references and sources;
- All documentation used by project participant as the basis for assumptions and source of data is correctly quoted and interpreted in the PDD;
- All values used in the PDD are considered reasonable in the context of the proposed CDM project activity;
- The baseline methodology has been applied correctly to calculate project emissions, baseline emissions, leakage and emission reductions;
- All estimates of the baseline emissions can be replicated using the data and parameter values provided in the PDD.

4.6 Additionality of a project activity

The project additionality was demonstrated by the PP using the simplified modalities and procedures for small-scale CDM project activities; a simplified baseline and monitoring methodology listed in Appendix B may be used for a small-scale CDM project activity if the project participant is able to demonstrate to a designated operational entity that the project activity would otherwise not be implemented due to the existence of one or more barrier(s) listed in Attachment A of Appendix. B as follows:

- Investment barrier
- Technological barrier
- Barrier due to prevailing practice
- Other barriers

The PP has presented the financial unattractiveness of the project activity through investment barrier for which the PP has applied the benchmark analysis. Since the baseline for the project activity is electricity supplied by the grid which is outside the direct control of the project developer, the choice of benchmark approach for demonstration of additionality is relevant.

The steps taken to assess the investment analysis are described in the Validation protocol in Appendix F.

Prior consideration of CDM

The start date for the project activity is 29/01/2010, the earliest date on which the agreement for purchase of the boiler was entered into between Shri Shyam Warehousing & Power Pvt. Ltd. and Hari Machines Limited and thereby the PP has committed to expenditures related to implementation of the project. LRQA has validated the start date in accordance with Glossary of CDM terms Version 06 through the review of purchase orders for project equipment, regulatory approvals and the power purchase agreement.

The project activity started after 2 August 2008. The PP has informed the Host Party designated national authority (DNA) and the UNFCCC secretariat in writing of the commencement of the project activity and of their intention to seek CDM status. Such notification was made to UNFCCC secretariat and to NCDMA on 29/05/2010, which is within six months of the project activity start date. Through the process of validation, LRQA confirms that the proposed project activity complies with the requirement of the Guidelines on the demonstration and assessment of prior consideration of the CDM

Version 04.

The steps taken to assess the prior serious consideration of the CDM are described in the Validation protocol in Appendix F.

Investment analysis

The investment analysis option has been used to demonstrate the additionality of the proposed project activity. LRQA confirms that the PDD provided evidence that this project activity would not be economically or financially feasible without the revenue from the sale of CERs.

The PP has shown that the project activity is additional by demonstrating that the financial returns of the proposed CDM project activity would be insufficient to justify the required investment.

For assessing the additionality of this project activity, LRQA has complied with the latest version of the "Guidance on the Assessment of Investment Analysis" as provided by the CDM Executive Board.

For details about the validation of the parameters used in the financial calculations, please refer to the Validation protocol in Appendix F.

LRQA confirms that the underlying assumptions for the investment analysis are appropriate and that the financial calculations are correct.

4.7 Monitoring Plan

The PDD includes a Monitoring Plan based on the approved monitoring methodology AMS-I.C "Thermal energy production with or without electricity" Version 19.

LRQA confirms that the Monitoring Plan described in the PDD complies with the requirements in the Monitoring Methodology and that the PP will be able to apply this Monitoring Plan following the monitoring arrangements described in it.

For details about the validation of the Monitoring Plan, please refer to the Validation protocol in Appendix F.

4.8 Local stakeholder consultation

The PP invited Local Stakeholders to comment on the proposed project activity on the 20/09/2010 prior to the publication of the PDD on the UNFCCC website. The local stakeholder consultation meeting was held at the project site, Village Banari, District Janjgir, State Chhattisgarh and the following persons and entities attended the stakeholders meeting.

1. Mr. L. Agarwal	Director, Shri Shyam Warehousing & Power Pvt. Ltd.
2. Mr. Ashish Agarwal	Shri Shyam Warehousing & Power Pvt. Ltd.
3. Mr. Ram Lal	Local villager, Village Banari
4. Mr. Sundar Lal	Local villager, Village Banari
5. Mr. Ganesh Ram	Local villager, Village Banari
6. Mr. Ram Ratan	Local villager, Village Banari
7. Mr. SiyaRam	Local villager, Village Banari
8. Mr. Sukh Dev	Local villager, Village Banari
9. Mr. Latel Ram	Local villager, Village Banari

10. Mr. S K Shrivastav	Local villager, Village Banari
11. Mr. Anil Kumar Shrivastav	Local villager, Village Banari
12. Mr. Shrikant Sharma	Local villager, Village Banari
13. Mr. Manan Singh	Local villager, Village Banari
14. Mr. Ahik D	Local villager, Village Banari
15. Mr. Alok	Local villager, Village Banari

LRQA confirms that the stakeholder consultation process targeted stakeholders and was appropriate for identifying stakeholders' opinions about the project and collecting their views.

For details about the steps taken to assess the adequacy of the Stakeholder consultation, please refer to the Validation protocol in Appendix F.

4.9 Environmental impacts

LRQA has confirmed that, as per the host country regulations, the project activity does not require Environmental Impact Assessment (EIA) to be conducted.

For details, please refer to the Validation protocol in Appendix F.

4.10 Summary of Changes

Significant changes made to the original PDD published for Global Stakeholder Consultation Process are summarised below. The PDD Version 01 dated 13/04/2011 was modified and several changes occurred as a result of the validation process. The PDD Version 08.1 dated 04/12/2012 includes all these changes.

For details about the results of the responses to CARs, discussions on revisions to project documentation and the detailed changes to the PDD resulting from the validation process, please refer to the Validation Findings Log in the Validation Protocol in Appendix F.

Item	Description	Value in PDD GSP	Value in PDD RfR	CAR/CL
1.	Change in project boundary: The DG set and the Import-Export electricity are now depicted in the project boundary graph	-	-	CAR02
2.	Change in the grid emission factor	0.9032 tCO_2/MWh	0.8400 tCO_2/MWh	CAR03
3.	Ex Ante Emission reductions	36,879 tCO_2e/year	33,948 tCO_2e/year	CAR03
4.	Changes in the Monitoring Plan	-	-	CAR05
5.	Change in the Version of the applied methodology AMS I.C	Version 18. validity till 18/02/2012	Version 19	-

Item	Description	Value in PDD GSP	Value in PDD RfR	CAR/CL
6.	Correction in unique coordinates for project activity	Long: 21º 59' 40" N Lat: 82º 34'25"E	Long: 21º 59' 51.83" N Lat: 82º 31' 04.59"E	CL01
7.	Change in the benchmark calculation	13.07%	13.02%	CL04
8.	Change in the MAT value	19.93%	11.33%	CL04
9.	Change in the IRR calculation	10.77%	11.08%	CL04
10.	Change in the crediting period selected	7 years renewable	10 years fixed	-
11.	Build margin is now fixed for the entire crediting period.	-	-	-

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5 Comments by parties, stakeholders and NGOs

In line with the requirement of the Procedures for Processing and Reporting on Validation of CDM project activities, the PDD is to be made publicly available for 30 days subject to confidentiality provisions agreed with the PP, to enable comments to be received from Parties, stakeholders, and UNFCCC accredited NGOs on the validation and registration requirements.

The PDD was made publicly available in accordance with the requirements of the procedure for the period from 12/05/2011 to 10/06/2011 and the same was confirmed from the below weblink:

https://cdm.unfccc.int/Projects/Validation/DB/KY2QYUU0XFFPGIPQB24Q3T71TZGODH/view.html

Three comments were received during the period. The comments received have been taken into consideration as detailed in Appendix D of this report.

Earlier, the PP had web-hosted a PDD Version 1 dated 15/10/2010 applying AMS-ID during 02/02/2011 to 03/03/2011. The web hosted PDD is available on https://cdm.unfccc.int/Projects/Validation/DB/EL8LJ6PND7JQWPPNBJGII6BNEWAIHB/view.html.

One comment was received during the period. The comment received has been taken into consideration as detailed in Appendix D of this report.

However, during the initial validation site visit, it was confirmed that the project is a co-generation project and cannot apply AMS-I.D. Hence, the PP later submitted a revised PDD applying AMS-I.C and was web hosted during 12/05/2011 to 10/06/2011.

6 Validation Opinion

LRQA has undertaken the validation of the proposed project activity "Biomass based power project by Shri Shyam Warehousing and Power Pvt. Ltd." based on the requirements of CDM as set out in Article 12 of the Kyoto Protocol, the CDM M&P, the present annex, subsequent decisions made by the COP/MOP and CDM-EB, and the other rules applicable to the proposed project activity including the host country's legislation and its specific requirements for sustainable development.

The project activity involves the installation of a 10 MW biomass based cogeneration power plant in Village Banari, District Janjgir, State Chhattisgarh, India. The purpose of the project activity is to generate electricity and steam by utilising the renewable biomass potential available in the region, so there will be no GHG emissions. The project activity shall achieve GHG emission reductions by supplying the net electricity generated to the Northern, Eastern, Western, and North-Eastern (NEWNE) grid which is predominantly dependent on fossil fuel based power plants.

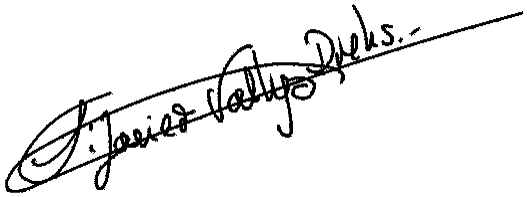
The project activity is categorised in the sectoral scope I–Energy Industries (renewable /non-renewable sources). The installed capacity of the proposed project is 10MW and it meets the criteria of Type I of the small scale CDM project activities (SSC). The estimated GHG emission reduction from the project activity is 33,948 tCO_2e per annum during the fixed crediting period of 10 years.

In order to arrive at the final validation conclusions and opinion, LRQA carried out review of project documents, assessment of compliance with and application of the approved baseline and monitoring methodology as well as the approved methodological tools and physical on-site assessment of the project site and interviews of the local stakeholders. There was no project component or issues excluded from the validation.

Through the validation process, the validation team identified 6 CARs and 4 CLs. The PP has taken action on the raised issues and submitted to LRQA the revised PDD and other supporting evidence. LRQA reviewed the response and actions taken by the PP, and all the findings were closed through the process.

The validation team is of the opinion that the proposed project activity conforms to all the relevant UNFCCC requirements for the CDM as well as the host country's national requirements, and if implemented as designed, is likely to achieve the validated emission reductions of 33,948 tCO_2e and contribute to the sustainable development of the host country. Therefore LRQA requests the registration of "Biomass based power project by Shri Shyam Warehousing and Power Pvt. Ltd." to the CDM Executive Board as a CDM project activity.

Decision Maker



Javier Vallejo Drehs

CDM Quality Manager

05/12/2012

7 Appendices

7.1 Appendix A: Letter of approval for the project by the host and investing country DNA

Letter of Approval from the Ministry of Environment and Forests (MoEF), Government of India (Host Country DNA) No: 4/14/2010-CCC dated 19/04/2011.

Letter of Approval from Environment Agency (Annex I party DNA) Ref No. EA/ALPte/03/2012 dated 18/04/2012

7.2 Appendix B: List of documents reviewed

Category A documents (documents prepared by the PP)

Ref No.	Title/Source / Organisation
1.	PDD Version 1 dated 15/10/2010 applying AMS-I.D, initially web-hosted during 02/01/2011 to 03/03/2011
2.	PDD (for project activity) Version 1 dated 13/04/2011, Version 1.1 dated 14/10/2011, Version 2 dated 19/01/2012, Version 3 dated 07/03/2012, Version 4 dated 26/03/2012 and Version 5 dated 15/06/2012, Version 6 dated 06/08/2012, Version 07 dated 28/08/2012, Version 07.1 dated 06/09/2012, Version 07.2 dated 12/09/2012, Version 08 dated 27/11/2012 and Version 08.1 dated 04/12/2012
3.	Benchmark calculation sheet Version 1 dated 13/04/2011, Version 1.1 dated 14/10/2011 and Version 2 dated 07/03/2012
4.	IRR-Emission reduction calculation sheet Version 1 dated 13/04/2011, Version 1.1 dated 14/10/2011, Version 2 dated 19/01/2012, Version 3 dated 07/03/2012, Version 4 dated 26/03/2012 and Version 5 dated 15/06/2012 and Version 6 dated 06/08/2012, Version 06.1 dated 06/09/2012, Version 7 dated 27/11/2012 and Version 8 dated 04/12/2012
5.	Minutes of meeting of the Board of Directors of Shri Shyam Warehousing and Power Pvt. Ltd. dated 10/10/2009
6.	Detailed Project Report dated October 2008
7.	Letter from Chhattisgarh State Renewable Energy Development Agency (CREDA) confirming the Biomass assessment report and the surplus availability of biomass in the region
8.	Consent to establish the project activity issued by Chhattisgarh Environment Conservation Board dated 06/05/2010
9.	CERC tariff order dated 15/01/2008
10.	CERC tariff order dated 28/12/2011
11.	Heat and Mass Balance Diagram (HMBD); drawing no. CB012-00-3-003
12.	Certificate of analysis for Coal dated 04/02/2011
13.	Certificate of analysis for rice husk dated 04/02/2011
14.	No Objection Certificate issued by Boiler Inspectorate dated 08/11/2010

Ref No.	Title/Source / Organisation
15.	Offer letter for supply of turbine generator dated 16/02/2009
16.	Offer letter for supply of transformer dated 02/09/2010
17.	Offer letter for supply of boiler dated 21/01/2010
18.	Purchase order for supply of boiler dated 29/01/2010
19.	Purchase order for supply of turbine dated 02/02/2010
20.	Power Purchase Agreement between Chhattisgarh State Electricity Board and Shri Shyam Warehousing and Power Pvt. Ltd. dated 19/12/2007
21.	Email from PP to UNFCCC and Host Party DNA dated 29/05/2010 intimating on prior consideration of CDM
22.	Certificate from Chartered Accountant confirming the O&M expenses for two boilers of 3 TPH and 4 TPH capacity dated 26/08/2011
23.	Certificate from Chartered Engineer confirming the O&M expenses for two boilers of 3 TPH and 4 TPH capacity dated 05/08/2011
24.	Letter from ARK Engineering & Consultancy dated 15/09/2011 mentioning the surplus rice husk generation from adjacent rice mill plant of PP
25.	Quotation for coal from Power City Coal Pvt. Ltd. dated 18/09/2008
26.	Quotation for rice husk from Alok Agrawal dated 16/08/2008
27.	Work order to conduct biomass assessment for project activity dated 11/03/2009
28.	Work order for preparing DPR for project activity dated 14/08/2008
29.	Notice in newspapers ‘Nayi Duniya’ and ‘Dainik Bhaskar’ dated 11/09/2010 informing local stakeholders about the project activity
30.	Minutes of local stakeholder consultation meeting dated 20/09/2010
31.	Application for loan to Bank of India dated 22/02/2010
32.	Application for loan to United Bank of India dated 16/11/2009
33.	Loan sanction letter from Bank of India dated 15/06/2010
34.	Loan sanction letter from United Bank of India dated 18/01/2010
35.	Payment of power purchase by Chhattisgarh Power Distribution Co. Ltd. for the month of May 2012
36.	Coal procurement for the month of June 2012 certified by Chartered Accountant Bhura Jayant and Associates.
37.	Modalities of Communication dated 24/06/2011
38.	Certificate from Chartered Engineer dated 12/10/2012 on the pre-project boiler lifetime
39.	Boiler inspection records as per Indian Boiler Act for pre-project boilers of 3TPH and 4TPH since commissioning
40.	Commissioning certificate for boiler no. CG/459 (4TPH) confirming boiler commissioning on 26/11/2008
41.	Commissioning certificate for boiler no. MP/4370 (3TPH) confirming boiler

Ref No.	Title/Source / Organisation
	commissioning on 22/08/1997
42.	Historical electricity consumption data for the years Financial years 2008-09, 2009-10 and 2010-11 (April to March)

Category B documents (other documents referenced)

1. AMS-I.C Thermal energy production with or without electricity, Version 18 and Version 19.
2. "Tool to calculate the emission factor for an electricity system" Version 02
3. "Tool to calculate the emission factor for an electricity system" Version 02.2.1
4. CO_2 Baseline Database for the Indian Power Sector, User Guide Version 5.0
5. User guide version 5.0 CO_2 baseline database for Indian power sector.
6. http://cea.nic.in/reports/planning/cdm_co2/cdm_co2.htm
7. Clean Development Mechanism Small Scale Project design document form (CDM-SSC – PDD)
8. Guidelines for completing the Simplified Project Design Document (CDM-SSC-PDD) and the Form for proposed new small scale methodologies (CDM-SSC-NM) Version 05
9. Guidelines on the Assessment of Investment Analysis version 05
10. Guidelines on the Demonstration and Assessment of prior consideration of the CDM (Version 04)
11. Guideline for the reporting and validation of plant load factors (Version 01)
12. Clean Development Mechanism Validation and Verification Manual (Version 1.2)
13. Eligibility Criteria for Host Country Approval, National CDM Authority, Ministry of Environment & Forests
14. Notification by Ministry of Environment & Forests dated 01/12/2009
15. Notification by Ministry of Environment & Forests dated 01/12/2009
16. Central Electricity Authority (Installation and Operation of Meters) Regulations, 2006
17. TAC order http://iib.gov.in/IRDA/tac/tariffs/AIFT2001.pdf
18. Glossary of CDM terms (Version 06)
19. "Tool to determine the remaining lifetime of equipment Version 01"

7.3 Appendix C: List of persons interviewed

Shri Shyam Warehousing and Power Pvt. Ltd. (Project Participant)

Mr. Liladhar Agrawal	Director
Mr. Ramesh Kumar Agrawal	Director

Rajiv Kumar Singh	General manager

Chhattisgarh State Pollution Control Board

Dr C B Patel	Scientist, CSPCB
Mr. S K Verma	Junior Scientist, CSPCB

Chhattisgarh State Electricity Board

Mr Ishwari Nigam	Assistant Engineer
Mr. Sumit Suryavanshi	Operator
Mr. Ashok Singh	Operator

Local villagers/stakeholders

Mr. Raj kumar Suryavanshi	Carpenter, Dhara village
Mr. Guruji	Foreman, Jangjir town
Mr. Pralhad	Contractor (construction), Mohanpur village
Mr. Ramesh Kumar Yadav	Labourer, Jandgir town
Mr. Latel Ram	Farmer
Mr. Rajni	Farmer
Mr. Radheshyam	Farmer
Mr. A Agrawal	Biomass supplier, Janjgir
Mr. Vishnu Agrawal	Biomass/coal supplier, Janjgir

ARK Engineering and Consultancy

Mr. G Shridhar	Technical Expert

Union Bank of India

Mr. Ranjit Ranjan Das	Manager

Agrinergy Pte Ltd.

Ms Bhawna Singh	Manager, Agrinergy Pte Ltd.

Agrinergy Consultancy Pvt. Ltd.

Mr. Pankaj Kumar	Senior Consultant
Ms Rashmi Ranjan	Consultant

7.4 Appendix D: How due account has been taken to the public input made to the validation requirements

The PDD was made publicly available in accordance with the requirements of the Procedures for processing and reporting on validation of a CDM project activity for the period of 12/05/2011 to 10/06/2011 as per

https://cdm.unfccc.int/Projects/Validation/DB/KY2QYUU0XFFPGIPQB24Q3T71TZGODH/view.html

Three comments were received during the period and the comments were made publicly available.

Comments received have been taken into consideration as follows:

Ref N.	GSC Comment	Answer from PP	Assessment from the validation team
1	It is evident from the PDD that the values are consistent and it is definitely forged and cooked up values to show a non CDM project as a CDM project. What is this? DoE to check the Detailed Project Report and Feasibility Report which is submitted to the other agencies and Banks by Project owner and ensure that the values match with the DPR/FR submitted to DoE also. After careful study of PDD it is found that DPR/FR is in different versions made and submitted with different purposes to different agencies which is totally unacceptable, illegal and unethical. PP/Consultant may show some undertaking letter from bank manager to DoE stating that both DPR's are same. These kinds of letters should not be accepted and entertained by DoE. While collecting the DPR/FR from banks and other agencies, all DPR/FR pages should be counter signed by Banks and other agencies so that the real DPR/FR given to other parties by the PP/Consultant is same as the one submitted to DOE. In this particular project there is clear cut evidence that DPR/FR values are changed/ fabricated mischievously and intentionally. This must be probed fully. DOE must take a written undertaking from the PP/Consultant about the list of parties to whom this DPR/FR is submitted and for what purposes. Then DOE should cross check with all the parties and confirm that the same DPR/FR is submitted to all the parties correctly without any changes. DOE must not accept any reports and undertakings from PP/Consultant. DOE must make independent evaluation and use totally different parties without informing the PP or Consultant to cross check the facts. DOE to write to the	All the input values are considered from DPR, reason why values are consistent in the PDD. DPR which was available at the time of investment decision and DPR which was submitted to bank, provided to DoE. How the gentleman who commented inferred that different version of DPR made and submitted to different agencies with different purposes, PP unable to understand as web hosted PDD does not have these details. PP also unable to understand the logic and basis behind the comment of gentleman that DPR/ FR values are changed. There is no FR for this project activity, only DPR. Language of comments itself suggest that comment was not meant for this project or gentleman has just made general statement without knowing the details. DPR was submitted to bank only for sanction of loan and copy of which provided to DoE.	The validation team had confirmed that the DPR dated October 2008 submitted by the PP during validation was the same version as submitted to the bank for debt financing. This was confirmed from interview with the bank officials and the acknowledged copy of the DPR stamped and signed by the bank 'Union Bank of India'. The same DPR version was submitted to LRQA based on which the validation was performed. The validation team confirmed from interview with the PP that the DPR was primarily made with a purpose for investment decision making by the PP and for sourcing debt financing from the bank. The validation team also interviewed the party who had prepared the DPR 'ARK Engineering and Consultancy' and confirmed the authenticity of the DPR version submitted by the PP is the same as the final version issued by ARK Engineering and Consultancy. The validation team interviewed the bank official from Union Bank of India and confirmed that the DPR version submitted to LRQA was the same as evaluated by the bank for debt financing. The banks, prior to funding any project, perform an independent assessment on the technical details of the project and its financial viability prior to sanctioning the loan amount. Hence, the validation team confirmed from the interview and acknowledgment from the bank that the DPR version provided to the validation team is the same as submitted to the bank based on which the debt financing was provided by the bank.

Ref N.	GSC Comment	Answer from PP	Assessment from the validation team
	party who prepared the DPR/FR which is submitted to the banks and other agencies and the same is verified against the one submitted to the DOE by PP/Consultant. This project is a fabricated and fake CDM project and must be rejected by the DOE right away. DOE should not support this kind of projects otherwise CDM EB should suspend this DOE for at least one year. Submitted by: zhong zhou li		Apart from submitting the DPR to the bank, the team also confirmed that the DPR is also submitted to the Chhattisgarh State Pollution Control Board (CSPCB) to obtain the 'Consent to Establish'. However, the CSPCB only reviews the technical aspects of the project and not the financial aspects including the project viability. The validation team interviewed officials from the CSPCB during the site visit and confirmed that the PP had received the Consent of Establish as per the requirement specifying the technical details as mentioned in the DPR dated October 2008. As stated above LRQA cross-checked with the two entities that received the DPR and confirmed that the same DPR was submitted to all the parties correctly without any changes.
2	If you carefully read through the PDD it is confirmed that this is not a genuine CDM project at all. What is the exact project cost? The project cost is covering what? The machinery is second hand purchased or fresh and new from an OEM? In either case DOE to check all the quotations, proposals, purchase orders, invoices, way bills, transport bills, proof of payments like bank statements. DOE to check with banks by way of written confirmation the amount transacted, to whom the money is paid, when the money is paid, is the party paid is the correct party as shown in the purchase orders. It is very clear that the values, party names, dates are fabricated and misrepresented in this project. DOE should terminate their contract for this project immediately. This is the only way out to protect the value of CDM process. It looks like PP is purchasing second hand or second quality equipment by inflating the purchase order values and invoices. This must be probed thoroughly and real values to taken for additionality calculation. Then I'm sure the additionality is not there at all in this project. How is the base line defined in this project? Base line is hypothetically defined with no proper evidences and proper justification. DOE cannot take the base line as suggested by the PDD. Please note that there are no emissions beyond the real and factual base line. This project definitely qualifies for zero CER's, not even one CER. DOE cannot assume values and things as giving by this PP. Whatever values are considered	Copies of all quotations, purchase orders, invoices and payment receipts have been provided to DoE to check the actual project cost incurred. Information / Justification related to baseline provided to DoE. The comments made by gentleman are vague and baseless. All project related information and supporting documents provided to DoE as sought by them.	The project is installation of a Greenfield co-generation power plant as confirmed from the review of purchase orders, site visit and interview with PP. In accordance with AMS-I.C version 19 paragraph 19(e) the most reasonable baseline scenario for the project activity is "Electricity is imported from the grid and/or produced in an on-site captive power plant using fossil fuels (with a possibility of export to the grid); steam/heat is produced from biomass". The PP has correctly applied the baseline scenario to the proposed project activity. The details of the validation of all input values are detailed in the validation protocol, section 6c.

Ref N.	GSC Comment	Answer from PP	Assessment from the validation team
	throughout the project in all documents including the real DPR (not the one prepared for CDM, the one given to the banks and others), they must be validated, verified and double checked. Do not ask PP for DPR. Ask the parties who have been given DPR by the PP. Get directly from the bank and others by each page of the DPR and Feasibility report signed. Such document can be considered as a real DPR or FR. This project is genuinely a fabricated, false and misinterpreted project with no base line and additionality. Submitted by: alexander		
3.1	Dear Sir, With respect to this project, please consider the following comments: From the information given it is not possible for any reader to calculate financial indicator and arrive at the same results. Two important parameters, viz., tariff and NCV of rice husk have not been given. Surprisingly, NCV of rice husk does not even form part of monitored parameters! It is proper that this PDD is re webhosted giving all information. EB should take note of this as all projects are now webhosted with little or no information as it enables them to change the input figures to make the project additional during validation	Tariff and NCV are now included in the PDD. Even if it was not part of PDD, it is publicly available data and DoE can validate whether these input values were valid at the time of investment decision.	Tariff rate and calorific value of rice husk and coal is now included in the revised PDD. Monitoring plan of the revised PDD is in accordance with AMS-I.C. The PDD was web-hosted as per the relevant procedures and the changes made to the PDD are done through CAR and CLs raised during the validation process. The details of validation of the tariff are provided in section 6c of the protocol and those related to monitoring of NCV of rice husk in section 7 of the protocol.
3.2	As per publicly available information (Pollution control Board clearance), 60% of the rice husk requirement is to be met from in house generation and 40% from purchases. DOE should ensure that the same cost is not taken for the rice husk for purchases and in house generation. In the case of own generation, transportation cost is nil. Since transportation cost constitutes almost 50% the cost of husk consumed from the factory should not be more than Rs.600 / MT. DOE should check the quantity of rice husk generated by the company based on last 3 years record.	Pollution Board Clearance accorded to project dated 06/05/2010 does not have any condition that 60% of the rice husk requirement is to be met from in house generation and 40% from purchases. Copies of clearances provided to DoE. Cost of rice husk considered based on quotation from rice husk supplier and price quoted by them is excluding freight. One P.O. by KVK Bio Energy Pvt. Ltd. (located very near to project activity) to one of the supplier is also provided which mentions the price of rice husk INR 1525/- per MT without transportation charges.	Validation team confirmed that there is no requirement for generating part of the rice husk requirement from in house generation. The validation team reviewed the consent of establish granted by the Pollution Control Board. The state level environmental impact assessment authority in their clearance (Vide reference number 97/SEIAA-CG/EC/BBPP/JANJ-CHAP/28/10 dated 06/05/2010[2]) very clearly stated that the rice husk to be sourced from nearby Rice Mills. The details of the validation of all input values, including that of the rice husk are detailed in the validation protocol, section 6c.
3.3	Again as per publicly available information (fifth meeting of State level Expert Appraisal Committee Chhatisgarh held on 24/05/2008) the cost of the project is only Rs.42 crore. Even CERC has recommended a cost of Rs.4 crore / MW only. The cost has been increased by 25% to make the project additional. This cost is very	Project cost mentioned in the Pre feasibility report and Form-1 was 42 crores which were just estimate and even DPR was not ready by that time. Pre feasibility report submitted to obtain Environmental clearance from SEIAA much before investment decision. Total project cost can be verified by DPR and loan sanction letters, copies of which	The project cost considered by the PP was validated to be reasonable and appropriate. Further, the PP had informed the bank on the project cost based on which the project has received debt financing. Also, the actual project cost incurred by PP as on 17/03/2012 was confirmed to be INR 524.298 million. The details of

[2] http://seiaacg.org/ecgranted/Shyam%20Warehosing%206-5-2010.pdf

Ref N.	GSC Comment	Answer from PP	Assessment from the validation team
	high. Number of projects has been registered at much lower cost.	provided to DoE.	the validation of all input values, including that of the investment cost are detailed in the validation protocol, section 6c.
3.4	The WACC of 13.07% will result in considering >25% return on equity. CERC has recommended only 16% ROE. Even the latest guidelines on Investment analysis (Annex 13, EB 61) provides for only 11.75% return on equity. This return is very high. This is done only to make the project additional	Investment analysis carried out as per latest EB guidelines on assessment of investment analysis. As per paragraph 15, Annex 5, EB 62, "If the benchmark is based on parameters that are standard in the market, the cost of equity should be determined either by: (a) selecting the values provided in Appendix A; or by (b) calculating the cost of equity using best financial practices, based on data sources which can be clearly validated by the DOE, while properly justifying all underlying factors. The values in the table in Appendix A may also be used, as a simple default option, if a company internal benchmark is used. As PP has not used company internal benchmark, PP opted for option (b) and calculated the benchmark based on parameters that are standard in the market.	The benchmark is validated in accordance with the 'Guidelines on assessment of investment analysis'. All the parameters considered for benchmark calculation are based on publicly available information that are standard in the market. Please refer section 6c of the protocol for details.
3.5	When other biomass based power projects have considered calorific value of 4000 – 4500 kcal/kg. for coal, on what basis the project developer has considered only 3502 kal/kg?	Calorific values of coal and biomass considered based on laboratory analysis report and copies of which provided to DoE.	The average calorific value of 3,230 kcal/kg considered in the project activity is deemed appropriate. The validation team confirmed the individual calorific values from laboratory test reports. Also, the CSERC tariff order dated 15/01/2008 mentions a average calorific value of 3300 kcal/kg.
3.6	This is a part of an existing profit making company. The project is entitled for 100% depreciation in the first year (80% accelerated depreciation plus 20% additional depreciation) as it is a biomass project based on agricultural waste (see Income Tax rules and sec. 32 of IT Act). Hence, the tax saving enjoyed by parent company should be taken into account as notional income in computing IRR. After all it is for this purpose (to save tax) that this project is set up	All applicable national relevant policies and guidelines of Host country including Income Tax rules considered for investment analysis.	Validation team confirmed that the revised financials correctly apply the accelerated depreciation in accordance with the IT rules.
3.7	The project is entitled to tax holiday for 10 consecutive years in the first 15 years. DOE should ensure that the tax savings and tax holiday are taken into account in IRR calculation.	Tax rebate in first 10 years has been considered in the financials.	Tax holiday has been correctly applied in the investment analysis in accordance with the IT rules.
3	When these are taken into account and the ROE is reduced to 16%, the project will be non additional. Yours sincerely Karthikeyan Submitted by: Karthikeyan	Justification is added as above. Also, PP has calculated the project IRR and compared against Weighted Average Cost of Capital (WACC).	Validation team confirmed the input values used for calculating the project IRR to be in accordance with the "Guidelines on the Assessment of Investment Analysis" Version 05. The benchmark for the project activity is based on Weighted Average Cost of Capital (WACC).

Earlier, the PP had web-hosted a PDD Version 1 dated 15/10/2010 applying AMS-ID during 02/01/2011 to 03/03/2011. The web hosted PDD is available on

https://cdm.unfccc.int/Projects/Validation/DB/EL8LJ6PND7JQWPPNBJGII6BNEWAIHB/view.html. However, during initial validation site visit, it was confirmed that the project is a co-generation project and cannot apply AMS-I.D. Hence, the PP later submitted revised PDD applying AMS-I.C and was web hosted during 12/05/2011 to 10/06/2011.

One comment was received during the web-hosting and has been taken into consideration as follows:

Ref N.	GSC Comment	Answer from PP	Assessment from the validation team
4.1	Prime lending rate chosen as benchmark is not appropriate as per investment analysis guidelines.	The project proponents have now calculated WACC as per paragraph 12 of the latest version of the investment guideline – "*12. **Guidance:** In cases where a benchmark approach is used the applied benchmark shall be appropriate to the type of IRR calculated. Local commercial lending rates or weighted average costs of capital (WACC) are appropriate benchmarks for a project IRR*	The comment is found irrelevant as the PP has chosen WACC as benchmark in accordance with guidance 12 of "Guidelines on the Assessment of Investment Analysis Version 05"
4.2	The source for input values chosen is documented in the PDD.	The source of all input values is documented in Section B.5 of the PDD.	Revised PDD contains source of all input values those are validated in the section 6c of the validation protocol below.
4.3	Generation based on PLF and no of operating hours of the plant should be included for the sensitivity analysis.	Sensitivity analysis in Section B.5 has been performed on the PLF of the project which already includes the operating hours of the project activity.	PLF is considered for sensitivity analysis. As PLF is linked to the generation and number of hours, considering PLF as sensitivity variable is deemed appropriate.
4.4	When was the board meeting and investment decision , chronology of events not discussed in the PDD.	Since the start date of the project activity is after 2nd August 2008, the project proponents have to follow Annex 13, EB 62 and only notify the Designated National Authority (DNA) of India and the UNFCCC within 6 months of the start date about their intention to seek CDM status. The guidelines do not require a chronology of events. The dates of board meeting and investment decision have been added in Section B.5 of the latest version of the PDD.	Revised PDD contains the investment decision date wherein the PP decided to invest in the project activity during board meeting. The guidelines do not require a chronology of events.
4.5	Leakage due to transportation of biomass into the project activity is not calculated.	In accordance of the footnote of the methodology AMS I.C, since the transport of biomass is from within 200 kilometres, the emissions related to transport of biomass can be neglected. Hence leakage emissions in this case can be neglected.	As per AMS-I.C 'If biomass residues are transported over a distance of more than 200 kilometres due to the implementation of the project activity then this leakage source attributed to transportation shall be considered, otherwise it can be neglected.' PP conducted a biomass assessment study in the study area of 75 kilometres around the project site. Validation team confirmed that the biomass assessment study was performed by an independent party and was approved by the nodal agency 'Chhattisgarh State Renewable Energy Development Agency' (CREDA). As all the biomass fuel will be available from within 75 km radius of project site and is in surplus of more than 25%, there are no leakage emissions to be considered.

Ref N.	GSC Comment	Answer from PP	Assessment from the validation team
4.6	Qbiomass,y,i is not biomass fired into the boiler. Actually it is biomass procured from the supplier. Biomass that is fired should be monitored. No of trucks, distance travelled, load/truck should be recorded for the calculation of leakage.	The parameter has been revised to $B_{biomass,y}$ which corresponds to Net quantity of biomass consumed in year *y*. Also in accordance of the footnote of the methodology AMS I.C, since the transport of biomass is from within 200 kilometres, the emissions related to transport of biomass can be neglected. Hence leakage emissions in this case can be neglected.	Net quantity of biomass consumed in year shall be monitored on wet basis by weighbridge installed at the factory and adjusted from moisture content. The weighing system shall be subjected to calibration by external agency, at least annually. Also, the total quantity of rice husk consumed shall be cross-checked with annual energy balance. This is in accordance with AMS-I.C.
4.7	The basis of taking boiler efficiency as 75% is not correct. Pls. clarify.	The PDD has been revised in Section A.4.2.	CL03 item (vii) was raised. Validation team confirmed the offer letter for boiler and the technical specifications which state the boiler efficiency as 80 +/- 2 %. Hence, it is appropriate to consider 80% as the boiler efficiency. Also, the change in boiler efficiency results in a higher IRR which is conservative.
4.8	During tripping of turbine due to emergency, electricity will be imported. This aspect is not discussed in the PDD.	The same has now been included in the monitoring section of the PDD.	The electricity import on account of auxiliary consumption are accounted while calculating net electricity supplied to the grid based on which the emission reductions will be calculated
4.9	Gross generation, auxiliary consumption, in-plant consumption of electricity should be monitored if not possible indirectly.	The energy meter is a two way meter which measures both export and import. The same has been clarified in the PDD.	The methodology does not require monitoring of Gross generation, auxiliary consumption, in-plant consumption of electricity directly. The net electricity supplied to grid shall be monitored using two way electronic trivector meters capable of monitoring electricity export and import.
4.10	Steam generation, pressure of steam temperature of steam, feed water inlet temperature should be monitored on hourly basis.	The parameters are not applicable as per the applied methodology.	Though the project is a co-generation project, the PP shall claim emission reductions only based on the electrical energy supplied to grid. Hence, the parameters Steam generation, pressure of steam temperature of steam, feed water inlet temperature are not applicable as per the applied methodology AMS-I.C version 19.
4.11	Auxiliary fuel that will be consumed should be monitored. Submitted by: Fernandis	Auxiliary consumption is included in the electricity exported to the grid. The exported electricity is monitored to arrive at the ER.	There is no consumption of any auxiliary fuel in the project activity. The electricity import used for auxiliary consumption, shall be accounted while calculating the net electricity supplied to grid.

7.5 Appendix E: Certificate of Appointment

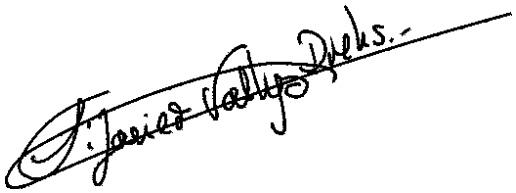
Validation of "Biomass based power project by Shri Shyam Warehousing and Power Pvt. Ltd."

We hereby certify that the following personnel have engaged in the validation process that has fully satisfied the competence requirements of the validation of the CDM project activity.

Name of Person	Assigned Roles
Imran Ustad	Team Leader
S Saravanan	External sector expert
Prabodha C Acharya	Technical reviewer
Rudra C Padhy	External sector expert to Technical Reviewer
Andrew Ritchie	Decision maker
Javier Vallejo Drehs	Technical Reviewer and Decision maker

Signed by

Decision Maker



Javier Vallejo Drehs

CDM Quality Manager

05/12/2012

7.6 Appendix F: Validation Protocol and findings log

	Validated situation	Conclusion
SECTION 1. Approval		
Host Country Approval		
1. Has the Host country DNA provided a written approval?	Yes ☒ No ☐ NA☐ CAR 01 was raised to confirm the availability of LoA from Host party DNA. PP has submitted the LoA dated 19/04/2011 (Ref No: 4/14/2010-CCC) issued by the host party DNA.	~~CAR01~~ OK
2. Confirm that the letter has been issued by the Party's DNA and is valid for the proposed CDM project activity under validation	Yes ☒ No ☐ NA☐ The LoA dated 19/04/2011 (Ref No: 4/14/2010-CCC) is issued by the Ministry of Environment & Forests, Government of India, which is the designated national authority (DNA) of the host country as per http://cdm.unfccc.int/DNA/index.html?click=dna_forum. The LoA is issued and valid for the proposed project activity.	OK
3. Mention the means of validation employed to assess the authenticity of the Letter of Approval. Indicate the source of the LoA (e.g. PP or directly from the DNA)	The LoA was made available by the PP. The LoA was also compared with those of other approval cases issued by the DNA. The team confirmed the authenticity of the letter issued.	OK
4. Does the written Letter of Approval confirm the following: (a) The Party is a Party to the Kyoto Protocol (including ratification); (b) Participation is voluntary; (c) The proposed CDM project activity contributes to the sustainable development of the country; (d) It refers to the precise proposed CDM project activity title in the PDD being submitted for registration.	Yes ☒ No ☐ NA☐ The LoA confirms: (a) The Host Country Party has ratified the Kyoto Protocol in August 2002. (b) The participation is voluntary. (c) The project contributes to sustainable development in the Host Country. (d) The LoA indicates the precise title of the proposed project activity as indicated in the PDD.	OK

	Validated situation	Conclusion
5. Is the letter of approval unconditional with respect of (a) to (d) above	Yes ☒ No ☐ NA☐	OK
6. Does the LoA from the host party acknowledge the bundle activity (if applicable)	Yes ☐ No ☐ NA☒	NA
Annex I Party Approval		
7. Has the Annex I country DNA provided a written approval?	Yes ☒ No ☐ NA☐ CAR 01 was raised to confirm the availability of LoA from Annex I party DNA. PP has submitted the LoA dated 18/04/2012 (Ref No: EA/ALPte/03/2012) issued by the Annex I party DNA. United Kingdom of Great Britain and Northern Ireland is the Annex I party.	OK ~~CAR 01~~
8. Confirm that the letter has been issued by the Party's DNA and is valid for the proposed CDM project activity under validation	Yes ☒ No ☐ NA☐	OK
9. Mention the means of validation employed to assess the authenticity of the Letter of Approval Indicate the source of the LoA (e.g. PP or directly from the DNA)	The LoA was made available by the PP. The LoA was also compared with those of other approval cases issued by the DNA. The team confirmed the authenticity of the letter issued.	OK
10. Does the written Letter of Approval confirm the following: (e) The Party is a Party to the Kyoto Protocol (including ratification); (f) Participation is voluntary; (g) It refers to the precise proposed CDM project activity title in the PDD being submitted for registration.	Yes ☒ No ☐ NA☐ The LoA confirms: (a) The Party has ratified the Kyoto Protocol on 31st May 2002. (b) The participation is voluntary. (c) The LoA indicates the precise title of the proposed project activity as indicated in the PDD.	OK
11. Is the letter of approval unconditional with respect of (a) to (c) above	Yes ☒ No ☐ NA☐	OK

	Validated situation	Conclusion
Host Country and Annex I Party Approval		
12. Do any of the Letters of Approval contain additional specification of the project activity? Like: - PDD Version number - Validation report version number Make sure that the request for registration is made on the basis of the documents specified in any of the letters.	The LoA does not refer to any specific version number of the PDD or validation report.	OK

		Validated situation		Conclusion
SECTION 2. Participation				
1	Confirm that the PPs are listed in a tabular form in section A.3 of PDD and that this information is consistent with the contact details provided in Annex 1 of the PDD and with the contact details in the MoC.	Host Party PP name in PDD/ A.3	Shri Shyam Warehousing and Power Pvt. Ltd.	OK
		Host Party PP name in PDD/ Annex 1	Shri Shyam Warehousing and Power Pvt. Ltd.	
		Host Party PP name in MoC	Shri Shyam Warehousing and Power Pvt. Ltd.	
		Annex 1 Party PP name in PDD/ A.3	Agrinergy Pte Ltd	
		Annex 1 Party PP name in PDD/ Annex 1	Agrinergy Pte Ltd	
		Annex 1 Party PP name in MoC	Agrinergy Pte Ltd	
2	Confirm that each of the PP has been approved by at least one Party involved	Yes ☒ No ☐ NA☐ Both the project participants i.e. Shri Shyam Warehousing and Power Pvt. Ltd. and Agrinergy Pte Ltd. have been approved by the respective parties involved (India and UK)		OK
3	Confirm that no entities other than those approved as PP is included in section A.3 of PDD.	Yes ☒ No ☐ NA☐ Shri Shyam Warehousing and Power Pvt. Ltd. and Agrinergy Pte Ltd. are the only PPs as indicated in the PDD		OK
4	Ensure that the approval of participation has been issued from the relevant DNA and if in doubt verify this with the corresponding DNA.	The letter of approval (LoA) dated 19/04/2011 has been issued by host country DNA. The Designated National Authority (DNA) is the National Clean Development Mechanism Authority (NCDMA) established in the Ministry of Environment and Forests (MoEF), Government of India. The letter of approval (LoA) dated 18/04/2012 has been issued by Annex I party DNA. The Designated National Authority (DNA) for Annex I party is the Environment Agency.		OK

	Validated situation	Conclusion
5 Has the MoC been completed as per the latest "Procedures for MoC between the project participants and the Executive Board"? - No modifications to the template/form should be made and each document should be clearly dated - Title of the project and names of project participants and focal points should be fully consistent with those indicated in all other project documentation - Focal point scopes should be clearly and correctly indicated - Contact details and specimen signatures of focal point entities including those of project participants in Annex 1 should be correctly entered. Only one telephone, fax, e-mail contact should be entered per authorized signatory. In cases where additional contact details are included, only the first indicated information will be taken into account and only the official business address of the proposed entity should be provided on the F-CDM-MOC form. - The Statement of Agreement in Section 3 should be signed by one authorized signatory for each project participant; signatures made available in Section 3 should correspond to those indicated in the related Annex 1 document; focal point entities who are not designated as project participants should not sign Section 3.	Yes ☒ No ☐ NA☐ MoC dated 24/06/2011 was submitted by the PP. • Shri Shyam Warehousing and Power Pvt. Ltd. and Agrinergy Pte Ltd. shall be joint entities in accordance with the MoC form F-CDM-MOC and the requirements of the procedures. • No modifications were made to the template and date is clearly specified • Title of project and names of project participant and focal point is consistent with other project documents shared/submitted by PP • The information is filled in accordance with the MoC form F-CDM-MOC and the requirements of the procedures.	OK

	Validated Situation	Conclusion
SECTION 3. Project design document		
1. Is the project activity Small Scale or Normal Scale	Normal Scale ☐ Small Scale ☒ Bundled Small Scale ☐ (cross as appropriate)	OK
2. Has the PDD used the latest template and guidance from the CDM Executive Board available on the UNFCCC CDM Website? Check outputs from the completeness check.	Yes ☒ No ☐ Guideline for completing the simplified project design document (CDM-SSC-PDD) Version 05 (EB34, Annex 9 and template of CDM-SSC-PDD Version 03 (EB28, Annex 34), which are the current versions for VVM track available in UNFCCC website are used.	OK

	Validated situation	Conclusion
SECTION 4. Project description		
1. Describe the process undertaken to validate that the description of the proposed CDM project activity as contained in the PDD sufficiently covers all relevant elements, is accurate and that it provides the reader with a clear understanding of the nature of the proposed CDM project activity.	The project activity involves installation of a co-generation power plant to utilise the biomass for electrical and thermal power generation at the premises of the rice mill of Shri Shyam Warehousing and Power Pvt. Ltd. The co-generation power plant involves a biomass based boiler of 50 TPH capacity at 68 kg/cm^2 pressure and a steam turbine generator of 10 MW capacity. The project activity shall use rice husk (which is designated as carbon neutral) and does not result in a net increase in GHG emissions. Rice husk utilised in the project activity will be sourced within 75 kilometres radius of the project activity. Validation team confirmed by reviewing the approved biomass assessment report that rice husk is available in surplus in the study area of 75 kilometres radius of the project activity. The pre-project scenario involved two steam generation boilers of 3 TPH and 4 TPH located at the adjacent rice mill, which shall be replaced by the project activity. Net electricity supplied by the project activity will displace the grid electricity which is predominantly fossil fuel based, thereby reducing the GHG emissions. PP shall not claim emission reductions due to the use of steam in the rice mill. During the process of validation, LRQA confirmed the capacity, unique identification of the project activity, estimated power generation/supply, arrangement for evacuation of electricity generated, technical specifications, date of commissioning, arrangements for O&M and necessary clearances for setting the project activity. The list of documents reviewed during the course of the validation is presented under Appendix B. The technical details of the project activity as provided in the PDD were confirmed with technical brochures from the suppliers and validation site visit. However, CL02 had to be raised as the project description under section A.4.2 only mentioned about electricity generation and not co-generation. In response, the PP included the details of steam generation as well. The detail of steam generation/consumption has now been summarised in the section A.4.2 of the PDD.	OK ~~CL02~~

	Validated situation	Conclusion
	Validation team confirmed the technical specifications of the project activity from the Heat and Mass Balance Diagram (HMBD). Hence, CL was closed The description of the project activity was validated based on review of the PDD and supporting documents, physical site visit and field interviews that included the technical specification from suppliers, offer documents from technology suppliers and purchase orders issued by PP.	
2. Confirm that the physical site inspection reflects the description in the PDD of the proposed CDM project activity.	The validation team conducted a site visit and confirmed the consistency of the described project activity in the PDD and the actual implementation. It could be confirmed that the project activity was under installation phase during the time of the site visit. Site visit confirmed the pre-project scenario which involved two boilers of 3 TPH and 4 TPH. The project activity will replace the existing boilers and displace the electricity from the connected grid system. The location of the project activity was confirmed as Village Banari, District Janjgir, State Chhattisgarh, India as given in the section A.4.1.4 of the PDD. The geographic coordinates of the project activity as stated under section A.4.1.4 were confirmed by the validation team i.e. 21^0 59' 51.83" N Latitude and 82^0 31' 04.59"E Longitude. The expected lifetime of the project activity is 20 years which is appropriate for the project type. The validation team confirmed the appropriateness of the project description in the PDD by reviewing project documentation and conducting the site assessment. However, CL01 was raised as the unique coordinates of the project activity mentioned under section A.4.1.4 represents agricultural fields on cross-checking in Google Earth. In response, the PP submitted correct geo-coordinates and the CL was closed. Please refer findings log section at the end of the report for details.	~~CL01~~ OK
3. If the team did not undertake a physical site inspection, describe the justification as approved by the CDM Quality Manager. (VVM 01.2: 60-61) Describe briefly the physical site inspection: Travel details and installations, facilities and buildings visited.	Team conducted a physical site visit during 09/06/2011. The team travelled to the project site on 08/06/2011 and returned back on 10/06/2011. Imran Ustad and S Saravanan represented the validation team during the site visit. The project activity was under installation stage during the site visit and was not commissioned. The validation team visited the project site (under construction/installation), interviewed the local stakeholders and the PP.	OK

	Validated situation		Conclusion
4. If the proposed CDM project activity involves the alteration of an existing installation or process, ensure that the project description clearly states the differences resulting from the project activity compared to the pre-project situation.	Pre-project	Project activity	OK
	The pre-project scenario involved two boilers of 3 TPH and 4 TPH.	The project activity is a new Greenfield project. The project activity will replace the existing two boilers of 3 TPH and 4 TPH.	
5. Potential public funding for the project from Parties in Annex I shall not be a diversion of official development assistance (ODA).	The project activity is funded by equity and debt financing and does not involve any public funding. The validation team has confirmed the project financing structure from interview with the PP and loan sanction letters. The details of project funding were also discussed during the site visit and it was confirmed through the interviews conducted with the senior management that the project was funded through equity and debt and did not involve any diversion of ODA.		OK
6. If the project activity is a small scale one, confirm that it is not a debundled component of a large scale project, in accordance with appendix C of the simplified M&P for SSC CDM project activities and the Guidelines for assessment of de-bundling for SSC project activities.	The site visit and interviews with the PP confirmed that the project activity is the first project for the PP and there is no CDM registered project of the same category & technology as the project activity within 1 km of the project boundary. The project activity satisfies the criteria of Appendix C of the simplified M&P for SSC-CDM project activities; hence the team confirmed that the project activity is not a debundled component.		OK

	Validated situation	Conclusion
SECTION 5. Baseline and monitoring methodology		
1. Has the baseline and monitoring methodologies selected by the project participants been previously approved by the CDM Executive Board, i.e. does it appear on the methodologies page of the UNFCCC website?	Yes ☒ No ☐ NA☐ Approved methodology for "Thermal energy production with or without electricity" Version 19 is applied for the proposed project activity, which is the current version at the time of completion of validation. Hence, the PP has applied the Version 19 of the methodology for the project activity appropriately. The methodology refers to the 'Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion', Version 2 (Annex 11 to EB 41)	OK
2. If the project activity is a Small Scale one; does it qualify within the threshold of the three possible types of small scale projects? Confirm information provided in the PDD.	The co-generation power plant involves a co-fired boiler of 50 TPH capacity at 68 kg/cm^2 pressure and a steam turbine generator of 10 MW capacity. The validation team confirmed the capacity of the boiler from the offer document for the boiler dated 21/01/2010 and the purchase order for the boiler dated 29/01/2010. The capacity of the turbine generator was confirmed from the offer document for the turbine dated 16/02/2009 and the purchase order for the turbine dated 02/02/2010. The team also conducted a site visit and interviews with the site personnel to confirm the project details. As the emission reductions from the cogeneration project activity are to be claimed solely on account of electrical energy production, the validation team confirmed that the total installed electrical energy generation capacity of the project equipment of the cogeneration unit does not exceed 15 MW. From the interview of the PP, the validation team has confirmed that the PP does not intend to increase the generation capacity of this project through the entire crediting period of the project. Thus, the validation team confirmed that the total size of the project will remain under the limits of small-scale project activity Type I "Renewable energy project activities with a maximum output capacity equivalent to up to 15 MW (or an appropriate equivalent)" during every year of the crediting period. Hence, LRQA confirms that the project activity satisfies the criteria set out for use of the SSC M&P with respect to Type I activities.	OK

	Validated situation	Conclusion
3. If the project activity is a Small Scale one; which approved small scale methodology does the project apply? Confirm that the SSC meth is applied in conjunction with the general guidelines to SSC CDM methodologies.	Approved methodology "Thermal energy production with or without electricity" AMS.I.C Version 19 has been applied to the proposed project activity which is appropriate for the project type. The team also confirmed that the SSC Methodology is applied in conjunction with the General guidelines to SSC CDM methodologies Version 17, EB61 Annex 21 for the proposed project activity.	OK
4. Determine whether the methodology selected is applicable to the project activity including that the used version is valid Describe steps taken to assess the relevant information contained in the PDD in the table below	The proposed project activity was confirmed to meet the applicability conditions of the selected methodology and methodological tool as given below; • Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion, Version 2 EB 41 The team confirmed that the methodology selected is applicable and the version used for the proposed project activity is valid. Steps taken to assess the applicability of the methodology are detailed below:	OK

No.	Applicability conditions in the AMS.I.C Version 19	Information in the PDD	Steps taken to assess PDD information	Conclusion
1	This category comprises renewable energy technologies that supply users with thermal energy that displaces fossil fuel use. These units include technologies such as solar thermal water heaters and dryers, solar cookers, energy derived from renewable biomass and other technologies that provide thermal energy that displaces fossil fuel.	The project activity involves the installation of a renewable biomass based cogeneration system that displaces fossil fuel use.	The project activity derives energy from co-fired (biomass and coal) co-generation system that provides thermal & electrical energy. The net electricity supplied to the grid shall displace equivalent electricity from the grid system which is predominantly fossil fuel based. Thus the project activity displaces fossil fuel. The project activity description was confirmed through review of Detailed Project Report dated October 2008, offer documents dated 21/01/2010 (boiler) and 16/02/2009 (turbine generator), purchase orders dated 29/01/2010 (boiler) and 02/02/2010 (turbine generator) and through site visit interviews. The PP confirmed that they intend to fire rice husk along with coal fines as fuel.	OK

No.	Applicability conditions in the AMS.I.C Version 19	Information in the PDD	Steps taken to assess PDD information	Conclusion
			The team confirmed that the type of biomass used in the project activity (rice husk) is in line with definition of renewable biomass as per the EB23, Annex18.	
2	Biomass-based co-generating systems consisting of steam generator(s) and steam turbine(s) are included in this category. For the purpose of this methodology, "cogeneration" shall mean the simultaneous generation of thermal energy and electrical and/or mechanical energy in one process. Project activities that produce heat and power in separate element process (for example, heat from a boiler and electricity from biogas engine) does not fit under the definition of co-generation project.	The project activity is a biomass based cogeneration plant producing both heat and electricity.	The project is a combined heat and power (co-generation) system. This was confirmed by the validation team through review of Detailed Project Report dated October 2008, offer documents dated 21/01/2010 (boiler) and 16/02/2009 (turbine generator), purchase orders dated 29/01/2010 (boiler) and 02/02/2010 (turbine generator) and through site visit interviews.	OK
3	Emission reductions from a biomass cogeneration system can accrue from one of the following activities: (a) Electricity supply to a grid; (b) Electricity and/or thermal energy (steam or heat) production for on-site consumption or for consumption by other facilities; (c) Combination of (a) and (b).	The project is a biomass based co-generating system that supplies electricity (i) to the grid, (ii) thermal energy to the existing facilities. The project activity claims for emission reductions only from the supply of electricity to the grid. Thus satisfies this criterion.	The project is a combined heat and power (co-generation) system. The thermal energy (steam) shall be consumed in the rice mill. The net electricity (after deducting captive consumption and auxiliary consumption) shall be supplied to the connected electricity grid system (NEWNE grid system). This was confirmed by the validation team during the site visit of the project plant, review of Detailed Project Report dated October 2008 and interviews of the technical staff and PP representative.	OK
4	The total installed/rated thermal energy generation capacity of the project equipment is equal to or less than 45 MW thermal (see paragraph 6 for the applicable limits for cogeneration project activities).	The project activity is a cogeneration system and it solely claims for emission reductions from electrical energy production. The total installed capacity is 10MW which is below the small scale specified limit of 15MW.	The project is a combined heat and power (co-generation) system; hence, this is not applicable. The project activity shall claim emission reduction solely based on the electricity displaced from the connected grid system. Validation team confirms this approach in accordance with paragraph 6(c) below. This is confirmed by the validation team	OK

No.	Applicability conditions in the AMS.I.C Version 19	Information in the PDD	Steps taken to assess PDD information	Conclusion
			through review of Detailed Project Report dated October 2008, offer documents dated 21/01/2010 (boiler) and 16/02/2009 (turbine generator), purchase orders dated 29/01/2010 (boiler) and 02/02/2010 (turbine generator) and through site visit interviews.	
5	For co-fired systems, the total installed thermal energy generation capacity of the project equipment, when using both fossil and renewable fuel shall not exceed 45 MW thermal (see paragraph 6 for the applicable limits for cogeneration project activities).	The project activity is a co-fired system uses both fossil and renewable fuel in the production of electricity with the total thermal installed capacity of 39.5MW_{th} which is less than the 45MW_{th}. Hence, satisfies this criterion[3].	The project is a combined heat and power (co-generation) system involving co-firing. The project activity shall consume rice husk (biomass) and coal fines (fossil fuel). The total thermal installed capacity is confirmed as 39.5MW_{th}. As the project shall claim the emission reductions solely on account of the electrical energy production, the small scale limit for the project activity was confirmed as per paragraph 6(c) below. Whilst the project activity proposes to co-fire biomass (rice husk) and coal, PP has mentioned 'the project activity is not a co-fired system' while justifying applicability condition 5 of AMS I.C version 18. PP revised the PDD to indicate the project activity as a co-fired system using both fossil fuel and renewable fuel. Hence, CL was closed.	OK ~~CL03~~
6	The following capacity limits apply for biomass cogeneration units: (a) If the project activity includes emission reductions from both the thermal and electrical energy components, the total installed energy generation capacity (thermal and electrical) of the project equipment shall not exceed 45 MW thermal. For the purpose of calculating this capacity limit the conversion factor of 1:3 shall be used for converting electrical energy to thermal energy (i.e. for	The project activity fulfils the condition specified in the paragraph 6(c) because it solely claims for emission reductions from the electrical energy production. The total installed capacity is 10MW which is below the small scale specified limit of 15MW.	The project is a combined heat and power (co-generation) system and involves co-firing of biomass (rice husk) and coal. The emission reductions of the cogeneration project activity are solely on account of electrical energy production (i.e. no emission reductions accrue from thermal energy component). The total installed electrical energy generation capacity of the project	OK

[3] MWth calculation provided in financial spread sheet.

No.	Applicability conditions in the AMS.I.C Version 19	Information in the PDD	Steps taken to assess PDD information	Conclusion
	renewable project activities, the maximal limit of 15 MW(e) is equivalent to 45 MW thermal output of the equipment or the plant); (b) If the emission reductions of the cogeneration project activity are solely on account of thermal energy production (i.e. no emission reductions accrue from electricity component), the total installed thermal energy production capacity of the project equipment of the cogeneration unit shall not exceed 45 MW thermal; (c) If the emission reductions of the cogeneration project activity are solely on account of electrical energy production (i.e. no emission reductions accrue from thermal energy component), the total installed electrical energy generation capacity of the project equipment of the cogeneration unit shall not exceed 15 MW.		equipment of the cogeneration unit is 10 MW and does not exceed 15 MW. This is confirmed by the validation team through review of Detailed Project Report dated October 2008, offer documents dated 21/01/2010 (boiler) and 16/02/2009 (turbine generator), purchase orders dated 29/01/2010 (boiler) and 02/02/2010 (turbine generator) and through the site visit interviews.	
7	The capacity limits specified in the above paragraphs apply to both new facilities and retrofit projects. In the case of project activities that involve the addition of renewable energy units at an existing renewable energy facility, the total capacity of the units added by the project should comply with capacity limits in paragraphs 4 to 6 and should be physically distinct from the existing units.	The project activity involves the installation of 10MW biomass cogeneration system at the adjacent rice mill. It is physically distinct from the existing units as a new set of equipments have been installed as part of the project activity which are not connected to the existing equipments.	The project activity is a Greenfield project activity and is not a retrofit project which was confirmed by the validation team during the site visit and document review of the purchase orders as mentioned in condition no.6 above. The total installed/rated capacity of the project was already mentioned in the condition no.6 above.	OK
8	Project activities that seek to retrofit or modify an existing facility for renewable energy generation are included in this category.	The project activity is a new power plant and does not involve retrofit or modification of an existing facility.	The project activity is a Greenfield project activity and is not a retrofit project which was confirmed by the validation team during the site visit and document review of the purchase orders as mentioned in condition no.6 above.	OK
9	New Facilities (Greenfield projects) and project activities involving capacity additions compared to the baseline scenario are only eligible if they comply with the related and relevant requirements in the "General Guidelines to SSC CDM methodologies".	The proposed project activity is a Greenfield renewable energy project and meets all the related and relevant requirements of the "General Guidelines to SSC CDM methodologies".	The project activity is a Greenfield project activity and does not involve any capacity addition which was confirmed by the validation team during the site visit and document review of the purchase orders as mentioned in condition no.6 above.	OK

No.	Applicability conditions in the AMS.I.C Version 19	Information in the PDD	Steps taken to assess PDD information	Conclusion
10	If solid biomass fuel (e.g. briquette) is used, it shall be demonstrated that it has been produced using solely renewable biomass and all project or leakage emissions associated with its production shall be taken into account in emissions reduction calculation.	The project activity is not using biomass fuel in briquette form.	The PP intends to use rice husk and coal fines. The team confirmed through the review of the project information including offer documents, purchase orders, technical project report, interview with the PP's representatives that the PP would not use any charcoal based biomass for the project activity.	OK
11	Where the project participant is not the producer of the processed solid biomass fuel, the project participant and the producer are bound by a contract that shall enable the project participant to monitor the source of the renewable biomass to account for any emissions associated with solid biomass fuel production. Such a contract shall also ensure that there is no double-counting of emission reductions.	The project activity does not involve use of solid biomass fuel such as briquette and hence this criterion is not applicable.	The project activity does not use processed solid biomass. Hence, this criterion is not applicable.	OK
12	If electricity and/or steam/heat produced by the project activity is delivered to a third party i.e. another facility or facilities within the project boundary, a contract between the supplier and consumer(s) of the energy will have to be entered into that ensures there is no double-counting of emission reductions.	The steam produced is used for captive consumption by the adjacent rice mill and not delivered to another facility or facilities within the project boundary.	The steam produced by the project activity is used in the adjacent rice mill and is not delivered to any other facility/facilities within the project boundary and hence this condition is not applicable. Also, the PP shall not be claiming emission reductions from the use of steam. The net electricity generated by the project activity shall be supplied to the connected grid system. This was confirmed by the validation team during the site visit of the project plant and interviews of the technical staff and PP representative.	OK
13	If the project activity recovers and utilizes biogas for power/heat production and applies this methodology on a stand alone basis i.e. without using a Type III component and applies this methodology, any incremental emission occurring due to the implementation of the project activity (e.g. physical leakage of the anaerobic digester, emissions due to inefficiency of the flaring), shall be taken into account either as project or leakage emissions.	The project activity does not recover and utilize the biogas for power heat production and hence this criterion is not applicable to the project activity.	The project activity does not utilise biogas as confirmed from the technical specifications of the project. The project shall utilise rice husk and coal fines. Hence, this criteria is not applicable.	OK

No.	Applicability conditions in the AMS.I.C Version 19	Information in the PDD	Steps taken to assess PDD information	Conclusion
14	Charcoal based biomass energy generation project activities are eligible to apply the methodology only if the charcoal is produced from renewable biomass sources provided: (a) Charcoal is produced in kilns equipped with methane recovery and destruction facility; or (b) If charcoal is produced in kilns not equipped with a methane recovery and destruction facility, methane emissions from the production of charcoal shall be considered. These emissions shall be calculated as per the procedures defined in the approved methodology AMS-III.K. Alternatively, conservative emission factor values from peer reviewed literature or from a registered CDM project activity can be used, provided that it can be demonstrated that the parameters from these are comparable e.g. source of biomass, characteristics of biomass such as moisture, carbon content, type of kiln, operating conditions such as ambient temperature.	The project activity is not charcoal based biomass energy generation and hence this condition is not applicable.	The project activity shall use rice husk and coal fines as fuel in the co-fired boiler. The team confirmed through the review of the Detailed Project Report dated October 2008, offer documents dated 21/01/2010 (boiler) and 16/02/2009 (turbine generator), purchase orders dated 29/01/2010 (boiler) and 02/02/2010 (turbine generator) and through the site visit interviews. The PP would not use any charcoal based biomass for the project activity.	OK

	Validated situation	Conclusion
5. Confirm that any specific guidance provided by the CDM Executive Board in respect to an approved methodology has been correctly applied.	The approved methodology specifies clear criteria to check the applicability conditions and each condition was checked as detailed above.	OK
6. If a determination regarding the applicability of the selected methodology to the proposed CDM project activity can not be made, request clarification of the methodology in accordance with the guidance provided by the CDM Executive Board Describe the clarification request and response.	NA	-

	Validated situation	Conclusion
7. If the Validation Team determines that the proposed CDM project activity does not comply with the applicability conditions of the methodology the Team may proceed by means of requesting revision to or deviation from the methodology in accordance with the guidance provided by the CDM Executive Board. Describe the request for revision or deviation and approval by the CDM Executive Board.	NA	-
8. If there are any GHG emissions occurring within the proposed CDM project activity boundary, which are not addressed by the applied methodology and which are expected to contribute more than 1% of the overall expected average annual emissions reductions as a result of the implementation of the project but a determination is made that the approved methodology(ies) is/are applicable to the project activity, provide here information about them in relation to the applicability criteria and justify the determination.	The validation of the project activity did not reveal any other greenhouse gas emissions occurring within the proposed project activity boundary as a result of the implementation of the proposed CDM project activity which is expected to contribute more than 1% of the overall expected average annual emission reduction, which are not addressed by AMS-I.C Version 19. This is in accordance with paragraph 77 of CDM VVM (Version 01.2).	OK

	Validated situation	Conclusion
SECTION 5a. Project boundary		
1. Does the project boundary include physical, geographical site of the industrial facility, processes or equipment that are affected by the project activity?	Yes ☒ No ☐ NA☐	OK
2. Confirm that all sources and GHGs required by the methodology have been included within the project boundary. Describe here if any emission source that will be affected by the project activity and is not addressed by the approved methodology, has been identified. In such case request clarification of, revision to or deviation from the methodology in accordance with EB guidance. Use the table below for this purpose:	All sources and GHGs required by the methodology have been included within the project boundary. Emissions from diesel consumption used for the DG set and emissions due to import of power from the grid to meet the auxiliary consumption have been appropriately considered in the project boundary. CAR 02 was raised as the project boundary did not include provision of DG set and import of grid electricity. In response, the PP revised the PDD so as to include the DG set and provision for electricity import as part of project boundary. Also, the section B.6.1 and B.6.3 were updated accordingly. Hence, CAR 02 was closed.	OK ~~CAR 02~~

	Validated situation	Conclusion
SECTION 5b. Baseline identification		
1. Determine whether the PDD provides a verifiable description of the identified baseline scenario, including a description of the technology that would be employed and/or the activities that would take place in the absence of the proposed CDM project activity.	The PDD provides the description of the identified baseline scenario which would have been undertaken in the absence of the proposed project activity and in line with the applied methodology requirements.	OK
2. Confirm that any procedure contained in the methodology to identify the most reasonable baseline scenario, has been correctly applied.	Yes ☒ No ☐ NA☐ In accordance with AMS-I.C version 19 paragraph 19(e) the most reasonable baseline scenario for the project activity is "Electricity is imported from the grid and/or produced in an on-site captive power plant using fossil fuels (with a possibility of export to the grid); steam/heat is produced from biomass" The PP has correctly applied the baseline scenario to the proposed project activity. Since this baseline scenario is prescribed by the approved methodology, this is acceptable in accordance with the requirements of clause 105 of CDM VVM version 01.2.	OK
3. Check each step in the procedure described in the PDD to identify the baseline scenario against the requirements of the methodology. (Note that if the methodology requires use of tools, i.e. such as the tool for the demonstration and assessment of additionality and the combined tool to identify the baseline scenario and demonstrate additionality, the guidance in the methodology shall supersede it in the tool.)	As confirmed above.	OK

	Validated situation	Conclusion
4. Based on financial expertise and local and sectoral knowledge, determine whether all scenarios that are considered by the project participants including those required by the methodology, are reasonable in the context of the proposed CDM project activity and that no reasonable alternative scenario has been excluded. Use the table below for this purpose. Use the same reference as in the methodology, when available.	Since this baseline scenario is prescribed by the approved methodology, this is acceptable in accordance with the requirements of clause 105 of CDM VVM version 01.2. Evaluation of each baseline scenario as per the methodology is provided in the below table.	OK

Scenario Ref.	Description in the PDD: applicable non applicable.	Cross-checking	Validation Opinion
19 (a): Electricity is imported from a grid and thermal energy (steam/heat) is produced using fossil fuel	Not applicable, fossil fuel was not used for generating steam/heat in the past.	• Certificate from independent Chartered Engineer dated 12/10/2012 confirming the technical details of the rice husk based steam boilers. • Onsite visit wherein the team confirmed the existing boilers of 3TPH and 4TPH were being fired by rice husk.	Not applicable. Team confirmed that the boilers used in the pre-project scenario are biomass based
19 (b): Electricity is produced in an on-site captive power plant using fossil (with a possibility of export to the grid) and thermal energy (steam/heat) is produced using fossil fuel	Not applicable, electricity and thermal energy were not produced using fossil fuel in the past.	• Certificate from independent Chartered Engineer dated 12/10/2012 confirming the technical details of the rice husk based steam boilers. • Onsite visit wherein the team confirmed the existing boilers of 3TPH and 4TPH were being fired by rice husk.	Not applicable. Team confirmed that the boilers used in the pre-project scenario are biomass based
19 (c): A combination of (a) and (b)	Not applicable	Not applicable as above	Not applicable as above
19 (d): Electricity and thermal energy (steam/heat) are	Not applicable, electricity and thermal energy were not produced using fossil fuel in the past.	• Certificate from independent Chartered Engineer dated 12/10/2012 confirming the technical details of the rice husk	Not applicable. Team confirmed that the boilers used in the pre-project scenario are

Scenario Ref.	Description in the PDD: applicable non applicable.	Cross-checking	Validation Opinion
produced in a cogeneration unit using fossil fuel (with a possibility of export of electricity to a grid/other facilities and/or thermal energy to other facilities)		based steam boilers. • Onsite visit wherein the team confirmed the existing boilers of 3TPH and 4TPH were being fired by rice husk.	biomass based
19 (e): Electricity is imported from a grid and/or produced in an on-site captive power plant using fossil fuels (with a possibility of export to the grid); steam/heat is produced from biomass	Applicable, Electricity was imported from the grid and thermal energy was produced from rice husk.	• Sample electricity bills in the pre-project scenario confirming the import of electricity from grid • Certificate from independent Chartered Engineer dated 12/10/2012 confirming the technical details of the rice husk based steam boilers. • Onsite visit wherein the team confirmed the existing boilers of 3TPH and 4TPH were being fired by rice husk.	**Applicable.** Team confirmed that the PP imported electricity from grid and the steam for use in rice mill was being produced by biomass using the biomass based boilers of 3TPH and 4TPH.
19 (f): Electricity is produced in an on-site captive power plant using biomass (with a possibility of export to a grid) and/or imported from a grid; steam/heat is produced using fossil fuel	Not applicable, electricity was not exported to the grid historically and steam/heat was not produced using fossil fuel.	• Sample electricity bills in the pre-project scenario confirming the import of electricity from grid • Certificate from independent Chartered Engineer dated 12/10/2012 confirming the technical details of the rice husk based steam boilers. • Onsite visit wherein the team confirmed the existing boilers of 3TPH and 4TPH were being fired by rice husk.	Not applicable. Team confirmed that the PP imported electricity from grid and the steam for use in rice mill was being produced by biomass using the biomass based boilers of 3TPH and 4TPH.
19 (g): Electricity and thermal energy (steam/heat) are produced in a biomass fired cogeneration unit (without a possibility of export of electricity either to a grid or to other	Not applicable, thermal and electrical energy were not produced in a biomass fired cogeneration unit.	• Sample electricity bills in the pre-project scenario confirming the import of electricity from grid • Certificate from independent Chartered Engineer dated 12/10/2012 confirming the technical details of the rice husk based steam boilers. • Onsite visit wherein the team confirmed	Not applicable. Team confirmed that there was no biomass fired cogeneration unit in the pre-project scenario. The electricity was being imported from gird, while the steam was generated in biomass based boilers of 3 TPH and 4TPH.

Scenario Ref.	Description in the PDD: applicable non applicable.	Cross-checking	Validation Opinion
facilities and without a possibility of export of thermal energy to other facilities). This scenario applies to a project activity that installs a new grid connected biomass cogeneration system that produces surplus electricity and this surplus electricity is exported to a grid. The baseline scenario is that the electricity would otherwise have been generated by the operation of grid-connected power plants and by the addition of new generation sources to the grid		the existing boilers of 3TPH and 4TPH were being fired by rice husk.	
19 (h): Electricity and/or thermal energy produced in a co-fired system	Not Applicable as there was no co-fired system on the plant site.	• Sample electricity bills in the pre-project scenario confirming the import of electricity from grid • Certificate from independent Chartered Engineer dated 12/10/2012 confirming the technical details of the rice husk based steam boilers. • Onsite visit wherein the team confirmed the existing boilers of 3TPH and 4TPH were being fired by rice husk.	Not applicable. Team confirmed that there was no co-fired system in the pre-project scenario. The electricity was being imported from gird, while the steam was generated in biomass based boilers of 3 TPH and 4TPH.
19 (i): Electricity is imported from a grid and/or produced in a biomass fired cogeneration unit (without	The proposed project activity is new biomass cogeneration system and electricity generated will be exported to grid. Although there is import of electricity from grid in baseline scenario, the electricity imported from the grid is more than	• Three year historical data on the electricity consumption prior to implementation of the project activity for the Financial years 2008-09, 2009-10 and 2010-11 (April to March)	Not applicable. The team had confirmed during site visit interviews that the electricity import figure was very less as compared to the expected

Scenario Ref.	Description in the PDD: applicable non applicable.	Cross-checking	Validation Opinion
a possibility of export of electricity either to the grid or to other facilities); steam/heat is produced in a biomass fired cogeneration unit and/or a biomass fired boiler (without a possibility of export of thermal energy to other facilities). This scenario applies to a project activity that installs a new biomass cogeneration system that displaces electricity which otherwise would have been imported from a grid.	captive electricity generated using biomass. Hence, this criterion is not applicable	• Detailed Project Report dated October 2008 considered during the investment decision making confirming the estimate electricity generation as 64,152,000 kWh/year.	electricity generation in project activity. The average electricity consumption for the three years 90,677 kWh/year, while the estimate net electricity generation from the project activity is 64,152,000 kWh/year. Thus the net electricity generated in the project is 700 times more than that consumed historically.

5. Determine whether the baseline scenario identified is reasonable by validating the assumptions, calculations and rationales used, as described in the PDD. It shall be ensured that documents and sources referred to in the PDD are correctly quoted and interpreted. Cross check the information provided in the PDD with other verifiable and credible sources, such as local expert opinion. The table above may be used for this purpose.	The baseline scenario is in accordance with the paragraph 19(e) of AMS-I.C version 19. Since this baseline scenario is prescribed by the approved methodology, this is acceptable in accordance with the requirements of clause 105 of CDM VVM version 01.2.	OK

6. Is the identified baseline scenario in line with regulatory or legal requirements and takes into account relevant national and/or sectoral policies?	The identified baseline scenario is in line with the regulatory / legal requirements as prescribed by the applied methodology. The Validation team confirmed that the below benefits were considered in the investment analysis for proving additionality: 1. Tax holiday for 10 consecutive years among the first 15 years as per Income-tax Act, 1961 - Investment analysis considers the benefit of 10 year tax holiday while calculating the IRR. 2. Accelerated depreciation benefit of 80% which can be availed by renewable energy projects as per Section 32 of Income Tax Act 1961 - Investment analysis considers the 80% accelerated depreciation benefits while calculating the IRR. 3. If power generated through non-conventional energy sources is purchased by CSEB then the rate of purchase will be INR 2.25 per unit. For sale of power to a third party, the rates will have to be settled mutually between the generating party and the third party which would purchase the power. (As per POLICY DIRECTIVES ON INCENTIVES TO UNITS GENERATING POWER FROM NON-CONVENTIONAL ENERGY SOURCES IN CHHATTISGARH) – The PP shall sell the electricity to State Electricity Board and has considered the tariff rate of INR 3.18/kWh in the first year to INR 3.83/kWh. 4. There are no regulations in the host country that restrict buying electricity from State Electricity Board. – The baseline for the project activity is generation of equivalent power from the connected grid system (Combined margin emission factor) Hence, the validation team confirmed that the PP has considered the relevant national polices and circumstances relevant to the baseline. CAR 04 was raised as the PDD section B.5 did not summarise the national policies and circumstances relevant to the baseline. In response, the PP submitted a revised PDD mentioning the relevant national and sectoral policies and circumstances relevant to the baseline. Hence CAR 04 was closed.	OK ~~CAR 04~~

7. Is this identification supported by official and/or verifiable documents (e.g. studies, web pages, certificates, etc?	As the baseline scenario is as per the applied methodology, this is not applicable.	NA

	Validated situation	Conclusion
SECTION 5c. Algorithms and/or formulae used to determine emission reductions		
1. Compare the equations and parameters in the PDD to those in the selected approved methodology and determine if they have been correctly applied to calculate project emissions, baseline emissions, leakage and emission reductions. Confirm that adequate justification has been provided for selection between different options.	**Emission reductions** As provided in the methodology, the emission reduction is calculated from the equation: $ER_y = BE_y - PE_y - LE_y$ BE_y: Baseline emissions in the year y (tCO_2e/y) PE_y: Project emissions in the year y (tCO_2e/y) LE_y: Leakage emissions in the year y (tCO_2e/y) ER_y: Emission Reductions in the year y (tCO_2e/y The equation is in line with the equation 13 specified by the methodology and hence acceptable. **Baseline Emissions** : As per paragraph 19 (e), the baseline for the project activity is "Electricity and thermal energy (steam/heat) are produced in a biomass fired cogeneration unit (without a possibility of export of electricity either to the grid or to other facilities and without a possibility of export of thermal energy to other facilities)." According to paragraph 32 of methodology, "For case 19 (e), baseline emissions from the production of electricity that displaces grid electricity import and/or supply electricity to the grid, shall be calculated as per paragraph 20 and 21. Emission reductions from both heat generation are not eligible." As in the absence of the project activity, the electricity would have been produced from the connected NEWNE grid system, the baseline emissions for the project activity are calculated in accordance with paragraph 21 of AMS-I.C version 19 as per which "Baseline emissions for supply of electricity to and/or displacement electricity from a grid shall be calculated as per the procedures detailed in AMS-I.D." **Baseline emissions** According to the methodology AMS.I.D Version 17, for a new grid connected renewable power plant, the baseline emissions are the product of electricity produced by the renewable energy generating unit multiplied by the emission factor	OK ~~CAR03~~

	Validated situation	Conclusion
	of the grid. $BE_y = EG_{BL,y} \times EF_{CO2,grid,y}$ $EG_{BL,y}$ = Quantity of net electricity supplied to the grid by the project activity in year y (MWh). $EF_{CO2,grid,y}$ = CO_2 emission factor of the NEWNE grid in year y (tCO_2/MWh) = Combined margin CO_2 emission factor in year y (tCO_2/MWh). <u>Calculation of the emission factor</u> The baseline emission factor is calculated as a Combined Margin (CM) consisting of Operating Margin (OM) and Build Margin (BM) factors based on data from an official, publicly available source. The CM emission factor (EF) for the displaced electricity was calculated based on the 'Tool to calculate the emission factor for an electricity system' Version 02 (hereinafter referred to as "the tool"), in accordance with the applied methodology. This is the currently active version of the tool available in EB 63. The PP uses the EF for the grid electricity as calculated in CO_2 Baseline Database for the Indian Power Sector published by the Central Electricity Authority (CEA), Ministry of Power, Government of India. The CEA publishes on an annual basis the General Review and the Performance Review of Thermal Power Stations which is used by the majority of CDM project promoters. The database for baseline estimation issued by the CEA has been developed consistently with the availability of data in India. The database is an official publication of the Government of India for the purpose of CDM baselines. The CEA Database Version 5.0 has been applied as it was current at the time of submission of the CDM-SSC PDD for validation. The step wise estimation of the CM EF is provided as below: **Step 1** of the *tool* requires identification of the relevant electric power system. In line with the requirements specified in the tool, the PP has selected the regional grid based on the spatial extent of the power plants that are physically connected through transmission and distribution lines to the project activity. The Indian electricity system is divided into two grids, the Integrated Northern, Eastern, Western, and North-Eastern regional grids (NEWNE) and the Southern grid. Each grid covers several states. Since the project activity is located in the Western region, the selection of the NEWNE grid for the purpose of estimation of baseline emission factor is considered appropriate. Therefore, the validation team confirmed the applicability of Step 1 of	

	Validated situation	Conclusion
	the *tool*. **Step 2** of the *tool* gives the PP an option to include off-grid power plants in the project electricity system. The PP has chosen only grid power plants for analysis. **Step 3** of the *tool* requires selection of a method for estimation of operating margin. Of the four methods provided in the *tool* for calculating the operating margin ($EF_{grid,OM,y}$), the PP has selected simple OM method since the low-cost/must-run resources constitute less than 50% of total grid generation on average of the five most recent years, i.e from 2004-05 to 2008-09. Year — Low-cost/must-run resources of net generation 2004-05 — 16.8% 2005-06 — 18.0% 2006-07 — 18.5% 2007-08 — 19.0% 2008-09 — 17.4% Low operating cost/must run resources include hydro and nuclear. The tool provides two options – (i) ex-ante option and (ii) ex-post option in calculating the simple OM. The PP has chosen the ex-ante option for determining the OM. This choice of ex-ante option, which is based on a 3-year generation-weighted average and is based on the most recent data available at the time of submission of the CDM-PDD to the DOE for validation, was found acceptable in view of the availability of the requisite data vintages. **Step 4** of the *tool* requires the calculation of the operating margin emission factor according to the Simple OM method chosen as per Step 3 above. In validating Step 3, LRQA confirmed the calculations with respect to the OM emission factor for the last three years for the NEWNE Grid and arrived at the following summary:	

	Validated situation	Conclusion

Year	Absolute emissions (including imports) (tCO_2)	Net generation (including imports) (GWh)	Specific emissions (tCO_2/MWh)
2006-07	388,067,225	384,805	1.00847
2007-08	410,083,778	410,124	0.99990
2008-09	430,502,442	427,700	1.00655

EF_{gridOM}= (388,067,225 + 410,083,778 + 430,502,442) / 1000 / (384,805 + 410,124 + 427,700)
= 1.0049 tCO_2/MWh

Step 5 of the *tool* requires calculation of the build margin emission factor.
The CEA database provides a BM value for the NEWNE grid as 0.6751. As part of validation of Step 5 of the tool, LRQA confirmed the BM for the year 2008-09 as per the following summary:

Year	Absolute emissions (tCO_2)	Net Generation (GWh)	Specific emissions calculated (tCO_2/MWh) BM
2008-09	69,297,387	102,589	0.6755

However, PP has considered the BM value from the CEA database i.e. 0.6751 tCO_2/MWh, which results in a conservative value for $EF_{CO2,grid,y}$. This is deemed appropriate by the validation team.

Step 6 of the *tool* requires calculation of the combined margin emission factor as per the following equation:

$EF_{CO2,grid,y} = EF_{grid,OM,y} \times w_{OM} + EF_{grid,BM,y} \times w_{BM}$

	Validated situation	Conclusion

According to the guidance on selecting alternative weights in the tool, the default weights applicable for biomass projects are w_{OM} = 0.5 and w_{BM} = 0.5 for the crediting period have been applied.

The baseline grid emission factor has been calculated as;

$EF_{CO2,grid,y}$ = 0.8400 tCO_2e/MWh (rounded down to four decimal places)

CAR 03 was raised as the data considered for calculating the grid emission factor was not the most recent data available at the time of web-hosting of PDD version 1 dated 15/10/2010 initially submitted for validation on 31/01/2011 and published for global stakeholder consultation during 02 Feb 11 - 03 Mar 11. In response, PP revised the grid emission factor calculations to refer CEA data base version 05. Hence, CAR was closed.

The baseline emissions thus can be estimated as:

$BE_y = EG_{BL,y} \times EF_{CO2, grid,y}$

= 64,152 MWh/year x 0.8400 tCO_2e/MWh

= 53,887 tCO_2e per year

The net electricity supplied to the grid (64,152 MWh/year) is validated as below:

Parameter	Value	Validation opinion
Installed capacity	10 MW	Confirmed from Detailed Project Report and Technical specifications of turbine generator.
Operational days	330	Confirmed from Detailed Project Report
Plant Load Factor	90 %	Confirmed from Detailed Project Report
Gross electricity generation	71,280 MWh/year	Calculated: 10 MW installed capacity x 330 days x 90% PLF
Auxiliary consumption	10% of gross electricity generation	Confirmed from Detailed Project Report. 71,280 MWh/year x 10% = 7,128 MWh/year

	Validated situation	Conclusion

Net electricity generation (to be supplied to grid)	64,152 MWh/year	Calculated: 71,280 MWh/year – 7,128 MWh/year

The validation team confirmed the Detailed Project Report prepared by third party 'ARK Engineering & Consultancy' mentioned the gross electricity generation and net electricity generation. Furthermore, the Detailed Project Report indicating the net electricity generation figure was submitted to the bank for debt financing. The validation team confirmed that the PP had submitted the DPR to the lenders - Bank of India on 22/02/2010 and United Bank of India on 16/11/2009. Also, the DPR dated October 2008 was acknowledged by United Bank of India. Hence, the validation team confirmed the electricity generation estimate is appropriate in accordance with paragraph 3 (a) and 3 (b) of Guidelines for the reporting and validation of plant load factors.

Hence, the annual average baseline emission is estimated to be **53,887 tCO_2e**.

The validation team also confirmed the remaining life of the pre-project biomass based steam generation boilers by reviewing the commissioning certificates of the boilers, boiler inspection certificates and independent evaluation by technical expert (Chartered Engineer) as below:

Serial No.	Manufacture	First DOC*	Rated Capacity	Rated Steam Pressure	Fuel	Remaining life as on 12/10/2012
MP/4370	Thermax	22/08/1997	3 TPH	10.54 kg/cm2	Rice husk	15 to 18 years
CG/459	Thermax	26/11/2008	4 TPH	10.54 kg/cm2	Rice husk	20-25 years

* Date of Commissioning

The technical expert (Chartered Engineer) had conducted the assessment for the remaining lifetime of existing boilers based on:

- Operational history of the boilers from the boiler records
- Operation and maintenance systems involved
- Physical inspections involving on-site ultrasonic examination
- Sectoral expertise

	Validated situation	Conclusion
	Validation team confirmed that the independent assessment on the boiler lifetime is in accordance with the "Tool to determine the remaining lifetime of equipment Version 01" and hence appropriate. As the existing boilers would have continued operation for at least 15 years since 12/10/2012 i.e. until September 2027, a fixed crediting period of 10 years is deemed to be appropriate for the project activity. Hence the team confirms that the requirements of paragraph 40 of AMS-I.C version 19 are met. Further, the PP shall not be claiming any emission reductions on account of the steam generation. The emission reductions shall only be claimed on the net electricity supplied to the grid. **Project Emissions :** The project emissions are calculated as per paragraph 45 of the approved small scale methodology AMS-I.C version 19. The project will include emissions due to on-site consumption of fossil fuel due to the project activity and shall be calculated using the latest version of "Tool to calculate project or leakage CO_2 emission from fossil fuel consumption". The project emissions arise due to: • Firing of coal fines in the boiler • Consumption of diesel in DG set for catering for emergency start-up requirements Project emissions shall be calculated using the below formula: Therefore, $PE_{FC,j,y} = \sum_i FC_{i,j,y} \times COEF_{i,y}$ where	

	Validated situation	Conclusion
	$PE_{FC,j,y}$ The CO_2 emissions from fossil fuel combustion in process j during the year y (tCO_2/MWh) $FC_{i,j,y}$ The quantity of fuel type i combusted in process j during the year y (mass or volume unit/yr) $COEF_{i,y}$ The CO_2 emission coefficient of fuel type I in year y (tCO_2/mass or volume unit) i The fuel types combusted in process j during the year y The CO_2 emission coefficient $COEF_{i,y}$ is calculated based on net calorific value and CO_2 emission factor of the fuel type i, as follows: $$COEF_{I,y} = NCV_{,i,y} \times EF_{CO2,i,y}$$ Where: $NCV_{,i,y}$ Is the weighted average net calorific value of the fuel type i in year y (GJ/mass or volume unit of the fuel); $EF_{CO2,i,y}$ Is the weighted average CO_2 emission factor of fuel type i in year y (tCO_2/GJ) <u>Ex-ante project emissions due to diesel consumption in DG set:</u> As the diesel quantity would be very low and only used in emergency situations, for ex-ante emission reduction calculations, $PE_{FC,j,y}$ on account of diesel consumption are considered as zero for simplification. <u>Ex-ante project emissions due to firing of coal fines:</u> The estimated consumption of coal fines in a year is 14,048 tonnes. Validation team validated the figure as below:	

Parameter	Value	Validation opinion
Steam required	50 TPH	Confirmed from Technical specifications of boiler
Boiler efficiency	80%	Confirmed from Technical specifications of boiler
Fuel Mix	15% energy from coal fines; 85% energy from rice husk	Confirmed from the DPR

	Validated situation			Conclusion
	Net enthalpy in the boiler	679 kcal/kg	Based on the input enthalpy (130 kcal/kg) and output enthalpy (809 kcal/kg) as confirmed from standard steam table	
	Operational hours	7128 hours	Considering 330 operational days and 90% PLF as confirmed from the DPR	
	Average GCV of fuel mix	3230 kcal/kg	Confirmed from DPR. GCV of rice husk is 3200 kcal/kg, while GCV of coal fines is 3400 kcal/kg or 0.0142358GJ/kg (1kcal = 0.000004187GJ)	
	Fuel mix required	13,139 kg/hour	Calculated: (50 TPH x 1000 x 679 kcal/kg) / (80% x 3230 kcal/kg)	
	Coal fines required	14,048 tonnes/year	Calculated: (13,139 x 7128 x 15%) / 1000	
	CO_2 emission factor for coal	0.09970 tCO_2e/GJ	Confirmed from IPCC default values at the upper limit of the uncertainty at a 95% confidence interval as provided in table 1.4 of Chapter1 of Vol. 2 (Energy) of the 2006 IPCC Guidelines on National GHG Inventories (99,700kg/TJ)	

Hence, the ex-ante project emission estimate on account of firing of coal fines is calculated as:

$$COEF_{I,y} = NCV_{,i,y} \times EF_{CO2,i,y}$$

= 0.0142358 GJ/kg x 0.09970 tCO_2e/GJ
= 0.001419305 tCO_2e/kg

Hence, $PE_{FC,j,y} = \sum_i FC_{i,j,y} \times COEF_{i,y}$

= (14,048 tonnes/year x 0.001419305 tCO_2e/year) / 1000
= **19,939 tCO_2e/year** (rounded up value for conservativeness)

	Validated situation	Conclusion
	Leakage Emissions : There is no transfer of equipment from outside the project boundary to the project activity and hence no leakage is considered and this in line with paragraph 47 of AMS-I.C Version 19 and hence acceptable. Paragraph 48 of AMS-I.C version 19 states 'In cases where the collection/processing/transportation of biomass residues is outside the project boundary CO_2 emissions from the collection/processing/transportation of biomass residues to the project site shall be taken into account as leakage.' Further, it states that 'If biomass residues are transported over a distance of more than 200 kilometres due to the implementation of the project activity then this leakage source attributed to transportation shall be considered, otherwise it can be neglected.' Furthermore, the validation team confirmed the leakage emission in applying the "General guidance on leakage in biomass project activities" Version 3 which categorises three leakage emission sources as below: (A) Shifts of pre-project activities – Not applicable as the project activity shall use surplus biomass residues and hence not lead to any decrease in carbon stocks as a result of deforestation, outside the land area where the biomass is grown, due to shifts of pre-project activities. (B) Emissions related to the production of the biomass – Not applicable as the project activity does not lead to any production of biomass for catering the biomass requirement for project. Rather the project shall use the surplus biomass available in the region. (C) Competing uses for the biomass – Applicable for the project activity. As per Para 04 & 05 of the General guidance on leakage in biomass project activities version 3, the 'competing use of biomass' is a relevant source for leakage as the project activity utilises the biomass residues in the project activity. PP conducted a biomass assessment study in the study area of 75 kilometres around the project site. Validation team confirmed that the biomass assessment	

	Validated situation	Conclusion

study was performed by an independent party and was approved by the nodal agency 'Chhattisgarh State Renewable Energy Development Agency' (CREDA).

Also, validation team confirmed the surplus availability of biomass in the study area as below:

Parameter	Value	Validation opinion
Total rice husk generation in the study area	577,080 Tonnes/year	Confirmed from approved biomass assessment report
Rice husk consumed in industries in study area	6,240 Tonnes/year	Confirmed from approved biomass assessment report.
Estimated rice husk consumption in the project activity	79,604 Tonnes/year	Confirmed from the DPR
Total rice husk consumption	85,844 Tonnes/year	Calculated: 6240 Tonnes/year + 79,604 Tonnes/year
Surplus biomass	572%	Calculated: (577,080/85,844) - 1

As all the biomass fuel will be available from within 75 kilometer radius of project site and is in surplus of more than 25%, there are no leakage emissions to be considered.

Emission reductions

The annual emission reductions from the project activity can be estimated as the difference between the baseline emissions and the project emissions as follows:

$ER_y = BE_y . PE_y - LE_y$

$ER_y = 53,887 – 19,939 - 0$

$= 33,948\ tCO_2e$

The average annual emission reduction is 33,948 tCO_2e over 10 year crediting period.

<table>
<tr><th></th><th>Validated situation</th><th>Conclusion</th></tr>
<tr><td>2. Verify the justification given in the PDD for the choice of data and parameters used in the equations to determine estimated emission reductions.
If data and parameters will not be monitored throughout the crediting period and will remain fixed, assess that all data sources and assumptions are appropriate and calculations are correct, applicable to the proposed CDM project activity and will result in a conservative estimate of the emission reductions.
If data and parameters will be monitored on implementation and hence become available only after validation of the project activity, confirm that the estimates provided in the PDD for these data and parameters are reasonable.
List all data and parameters provided in the PDD in the tables in next column.</td><td>
<table>
<tr><td>Data/Parameter title:</td><td>$EF_{CO2,grid,y}$</td></tr>
<tr><td>Title in line with methodology?</td><td>Yes</td></tr>
<tr><td>Fixed throughout the crediting period?</td><td>Yes</td></tr>
<tr><td>Data unit correctly expressed?</td><td>Yes
tCO_2/MWh</td></tr>
<tr><td>Appropriate description of parameter?</td><td>Yes
Combined Margin Emission Factor of the NEWNE Grid</td></tr>
<tr><td>Source clearly referenced?</td><td>Yes
CEA CO2 Baseline Database (Version- 5.0)</td></tr>
<tr><td>Value provided is considered reasonable?</td><td>Yes
0.8400</td></tr>
<tr><td>Has this value been verified?</td><td>Yes</td></tr>
<tr><td>Choice of data correctly justified?</td><td>Yes
Fixed ex-ante</td></tr>
<tr><td>Measurement method correctly described?</td><td>NA</td></tr>
</table>

<table>
<tr><td>Data/Parameter title:</td><td>$EF_{grid,OM,y}$</td></tr>
<tr><td>Title in line with methodology?</td><td>Yes</td></tr>
<tr><td>Fixed throughout the crediting period?</td><td>Yes</td></tr>
<tr><td>Data unit correctly expressed?</td><td>Yes
tCO_2/MWh</td></tr>
<tr><td>Appropriate description of parameter?</td><td>Yes
Operating Margin Emission Factor of the NEWNE Grid</td></tr>
<tr><td>Source clearly referenced?</td><td>Yes
CEA CO2 Baseline Database (Version- 5.0)</td></tr>
<tr><td>Value provided is considered reasonable?</td><td>Yes
1.0049</td></tr>
<tr><td>Has this value been verified?</td><td>Yes</td></tr>
<tr><td>Choice of data correctly justified?</td><td>Yes
Fixed ex-ante</td></tr>
<tr><td>Measurement method correctly described?</td><td>NA</td></tr>
</table>
</td><td>OK</td></tr>
</table>

	Validated situation		Conclusion
	Data/Parameter title:	**$EF_{grid,BM,y}$**	
	Title in line with methodology?	Yes	
	Fixed throughout the crediting period?	Yes	
	Data unit correctly expressed?	Yes tCO_2/MWh	
	Appropriate description of parameter?	Yes Build Margin Emission Factor of the NEWNE Grid	
	Source clearly referenced?	Yes CEA CO2 Baseline Database (Version- 5.0)	
	Value provided is considered reasonable?	Yes 0.6751	
	Has this value been verified?	Yes	
	Choice of data correctly justified?	Yes Fixed ex-ante	
	Measurement method correctly described?	NA	
	Data/Parameter title: **$EG_{BL,y}$**	Comments	
	Title in line with methodology?	Yes	
	Fixed throughout the crediting period?	No, shall be monitored	
	Data unit correctly expressed?	Yes, MWh/y	
	Appropriate description of parameter?	Yes Quantity of net electricity supplied to the grid in year y	
	Source clearly referenced?	Yes Joint meter reading reports	
	Value provided is considered reasonable?	Yes 64,152	
	Has this value been verified?	Yes	
	Choice of data correctly justified?	Yes	
	Measurement method correctly described?	Yes $EG_{BL,y}$ shall be calculated based on the $EG_{Export,y}$ and $EG_{Import,y}$ as below:	

	Validated situation		Conclusion
		$EG_{BL,y} = EG_{Export,y} - EG_{Import,y}$ The metering for $EG_{Export,y}$ and $EG_{Import,y}$ shall be carried out using energy meter located at common metering point/interconnection point. Joint meter readings will be taken at the interconnection point monthly by representatives from the project activity and Electricity Board officials.	

Data/Parameter title: $B_{Biomass,y}$	Comments
Title in line with methodology?	Yes
Fixed throughout the crediting period?	No, shall be monitored
Data unit correctly expressed?	Yes Tonnes
Appropriate description of parameter?	Yes Net quantity of biomass consumed in year y
Source clearly referenced?	Yes Plant records
Value provided is considered reasonable?	Yes 79,604
Has this value been verified?	Yes
Choice of data correctly justified?	Yes
Measurement method correctly described?	Yes The quantity of rice husk consumed is measured and recorded in log book. The total quantity of rice husk consumed in the boiler shall be cross-checked with annual energy balance.

	Validated situation	Conclusion

Data/Parameter title: $B_{moisture}$	Comments
Title in line with methodology?	Yes
Fixed throughout the crediting period?	No, shall be monitored
Data unit correctly expressed?	Yes %
Appropriate description of parameter?	Yes, Moisture content of the biomass
Source clearly referenced?	Yes Plant records
Value provided is considered reasonable?	Yes 8.92
Has this value been verified?	Shall be monitored ex-post.
Choice of data correctly justified?	Shall be monitored ex-post.
Measurement method correctly described?	Yes The moisture content of rice husk will be monitored for every batch and average value of all three batches for a day recorded in log book signed off by Controller, Laboratory. The instruments used for measuring moisture content of biomass shall be calibrated as per manufacturers' specifications. Daily data aggregated into monthly data. The moisture content (% of water) will be obtained from the laboratory records The weighted average of monthly data will be calculated for each monitoring period

Data/Parameter title: NCV_k	Comments
Title in line with methodology?	Yes
Fixed throughout the	No, shall be monitored

	Validated situation		Conclusion
	crediting period?		
	Data unit correctly expressed?	Yes GJ/mass or volume unit	
	Appropriate description of parameter?	Yes Net calorific value of biomass residue	
	Source clearly referenced?	Yes Plant records	
	Value provided is considered reasonable?	Yes 0.013398 Calculated based on the standard formula as per 2006 IPCC Guidelines for National Greenhouse Gas Inventories to convert GCV to NCV as below: Gross CV of rice husk (kcal/kg) 3200 DPR H (percentage of hydrogen) 4.70% DPR M (percentage of moisture) 8.92% DPR O (percentage of oxygen) 29.34% DPR Net CV of rice husk (kcal/kg) 3200 Calculated Net CV of rice husk (GJ/kg) 0.013398 Calculated (conversion from kcal/kg to GJ/kg	
	Has this value been verified?	Shall be monitored ex-post.	
	Choice of data correctly justified?	Shall be monitored ex-post.	
	Measurement method correctly described?	Yes The fuels will be tested using the bomb calorimeter at the laboratory on site. The instruments used for monitoring NCV of biomass shall be calibrated as per manufacturers' specifications. NCV of rice husk will be measured quarterly, taking at least three samples of each	

	Validated situation	Conclusion
	measurement and the average value shall be used for the rest of the crediting period	

Data/Parameter title: $FC_{Coal,i,y}$	Comments
Title in line with methodology?	Yes
Fixed throughout the crediting period?	No, shall be monitored
Data unit correctly expressed?	Yes Tonnes/yr
Appropriate description of parameter?	Yes Quantity of coal fines used in the project activity in the year y
Source clearly referenced?	Yes On site measurement
Value provided is considered reasonable?	Yes 14,048
Has this value been verified?	Shall be monitored ex-post.
Choice of data correctly justified?	Shall be monitored ex-post.
Measurement method correctly described?	Yes The amount of coal used in the project activity will be measured via a calibrated weighbridge system. The total quantity of coal procured for the project activity is completely combusted in the boiler. Hence, the total quantity of coal procured and quantity of coal combusted is considered as same for the project activity.

Data/Parameter title: $EF_{CO2,coal,y}$	Comments
Title in line with methodology?	Yes
Fixed throughout the crediting period?	No, shall be monitored
Data unit correctly expressed?	Yes tCO_2 /GJ
Appropriate description of parameter?	Yes CO_2 emission factor for coal
Source clearly referenced?	Yes, in accordance with the “Tool to

	Validated situation		Conclusion
		calculate project or leakage CO2 emissions from fossil fuel combustion"	
	Value provided is considered reasonable?	Yes 99700 x 10^{-6}	
	Has this value been verified?	Shall be monitored ex-post.	
	Choice of data correctly justified?	Shall be monitored ex-post.	
	Measurement method correctly described?	Yes, in accordance with the "Tool to calculate project or leakage CO2 emissions from fossil fuel combustion"	

Data/Parameter title: **$NCV_{i,y}$**	Comments
Title in line with methodology?	Yes
Fixed throughout the crediting period?	No, shall be monitored
Data unit correctly expressed?	Yes GJ/kg
Appropriate description of parameter?	Yes Net calorific value of coal
Source clearly referenced?	Yes Plant records
Value provided is considered reasonable?	Yes 3400
Has this value been verified?	Shall be monitored ex-post.
Choice of data correctly justified?	Shall be monitored ex-post.
Measurement method correctly described?	Yes, in accordance with the "Tool to calculate project or leakage CO2 emissions from fossil fuel combustion"

Data/Parameter title: **$FC_{i,j,y}$**	Comments
Title in line with methodology?	Yes
Fixed throughout the crediting period?	Yes
Data unit correctly expressed?	Yes Litres

	Validated situation		Conclusion
	Appropriate description of parameter?	Yes Quantity of diesel consumed on site every year	
	Source clearly referenced?	Yes Plant records	
	Value provided is considered reasonable?	Yes 0 (for ex-ante estimations)	
	Has this value been verified?	Assumed to be zero for ex-ante estimation. Shall be monitored ex-post.	
	Choice of data correctly justified?	Assumed to be zero for ex-ante estimation. Shall be monitored ex-post.	
	Measurement method correctly described?	Yes A level indicator gauge at fuel tank of the DG set shall be used to monitor the diesel consumption every month. Log book shall also maintain for the same purpose. Diesel consumption records will be cross-checked with diesel inventory records maintained by the stores.	

Data/Parameter title: $EF_{CO2,i,y} = EF_{diesel}$	Comments
Title in line with methodology?	Yes
Fixed throughout the crediting period?	Yes
Data unit correctly expressed?	Yes tCO_2e/ TJ
Appropriate description of parameter?	Yes CO_2 emission factor for Diesel Oil
Source clearly referenced?	Yes, in accordance with the “Tool to calculate project or leakage CO2 emissions from fossil fuel combustion”
Value provided is considered reasonable?	Yes

	Validated situation		Conclusion
		74.8	
	Has this value been verified?	Default Net calorific value (for diesel oil) provided in the 2006 IPCC Guidelines for National Greenhouse Gas Inventories has been used for calculating project activity emissions.	
	Choice of data correctly justified?	Yes.	
	Measurement method correctly described?	Yes, in accordance with the "Tool to calculate project or leakage CO2 emissions from fossil fuel combustion"	

Data/Parameter title: **$NCV_{i,y} = NCV_{Diesel}$**	Comments
Title in line with methodology?	Yes
Fixed throughout the crediting period?	Yes
Data unit correctly expressed?	Yes GJ/t
Appropriate description of parameter?	Yes Net calorific value of Diesel Oil
Source clearly referenced?	Yes, in accordance with the "Tool to calculate project or leakage CO2 emissions from fossil fuel combustion"
Value provided is considered reasonable?	Yes 43.3
Has this value been verified?	Default Net calorific value (for diesel oil) provided in the 2006 IPCC Guidelines for National Greenhouse Gas Inventories has been used for calculating project activity emissions.
Choice of data correctly justified?	Yes.
Measurement method correctly described?	Yes, in accordance with the "Tool to calculate project or leakage CO2 emissions from fossil fuel combustion"

	Validated situation	Conclusion
3. Confirm that all assumptions and data used by PPs are listed in the PDD including their references and sources, and that the documentation used as the basis for these assumptions and source of data is correctly quoted and interpreted in the PDD.	All assumptions and data used by the PP have been listed in the PDD including their references and sources. The grid emission factor is calculated based on the CO_2 Baseline Database for the Indian Power Sector published by the Central Electricity Authority (CEA), Ministry of Power, Government of India (http://cea.nic.in/reports/planning/cdm_co2/cdm_co2.htm)	OK
4. Confirm that all estimates of the baseline emissions can be replicated using the data and parameter values provided in the PDD.	The validation team confirms that the estimate of baseline emissions can be replicated using the data and parameter values provided in the PDD.	OK

	Validated situation	Conclusion
SECTION 6. Additionality of a project activity		
1. Does the PDD clearly describe how the proposed CDM project activity is additional?	Yes ☒ No ☐	OK
2. List the documents and tools provided by the CDM Executive Board used to demonstrate the additionality	Attachment A of Appendix B of the Simplified modalities and procedures for small-scale CDM project activities, Version 08, EB 63 Annex 24	OK

	Validated situation	Conclusion
SECTION 6a. Prior consideration of the clean development mechanism		
1. Does the PDD clearly indicate the start date of the project activity in format: dd/mm/yyyy and it is in accordance to the Glossary of CDM Terms?	Yes ☒ No ☐ The start date for the project activity is 29/01/2010, the earliest date on which the purchase order for the boiler was issued by Shri Shyam Warehousing and Power Pvt. Ltd. and thereby the PP has committed to expenditures related to implementation of the project. LRQA has validated the start date in accordance with Glossary of CDM terms Version 06, through the review of purchase orders for project equipment and power purchase agreements.	OK
If the PDD was published for Global Stakeholder Consultation process after the start date, check that the CDM benefits were considered necessary in the decision to undertake the project activity as a CDM project, following the below queries.		

	Validated situation	Conclusion
2. For a project activity with a start date on or after the 2nd August 2008, confirm that the PPs have informed the host party DNA and the UNFCCC secretariat in writing of their intention to seek CDM Status If such a notification has not been provided by the PPs within six months of the project activity start date, determine that the CDM was not seriously considered in the decision to implement the project activity	As the start date was after 02/08/2008, in accordance with the "Guidelines on the demonstration and assessment of prior consideration of the CDM" the PP informed the Host Party DNA and the UNFCCC secretariat on 29/05/2010, of their intention to seek CDM status. The validation team has reviewed the copy of the prior consideration form that has been sent to the UNFCCC and DNA and the list of notifications received by the UNFCCC from the UNFCCC website. The validation team has confirmed the name of the project activity in the list of notifications received by the UNFCCC available from the UNFCCC website. The notification to the host country DNA was confirmed from an email dated 29/05/2010 sent by PP to DNA with the F-CDM-prior consideration form dated 28/04/2010. Thus, LRQA confirms that the CDM was seriously considered in the decision to implement the project.	OK
3. For a project activity with a start date before the 2nd August 2008, check the following requirements through document reviews to assess the PPs prior consideration of the CDM: (a) Evidence that must indicate that awareness of the CDM prior to the project activity start date, and that the benefits of the CDM were a decisive factor in the decision to proceed with the project. (b) Reliable evidence from project participants that must indicate that continuing and real actions were taken to secure CDM status for the project in parallel with its implementation. The time gap between the documented evidence of prior CDM consideration and continuing and real actions shall be within the period required by the Guidance on prior consideration of the CDM If evidence to support the serious prior consideration of the CDM as indicated above that is authentic is not available, determine that the CDM was not considered in the decision to implement the project activity.	Not applicable	NA

	Validated situation	Conclusion
SECTION 6b. Identification of alternatives		
1. Does the PDD identify credible alternatives to the project activity, in order to determine the most realistic baseline scenario? Assess this list of alternatives and ensure that: (a) The list of alternatives includes as one of the options that the project activity is undertaken without being registered as a proposed CDM project activity; (b) The list contains all plausible alternatives considered to be viable means of supplying the outputs or services that are to be supplied by the proposed CDM project activity; (c) The alternatives comply with all applicable and enforced legislation.	LIST OF ALTERNATIVES No Description in the PDD Describe why it is credible and complete Not applicable. The project is categorised as small scale project activity and applies Attachment A of Appendix B of the Simplified modalities and procedures for small-scale CDM project activities, Version 08, EB 63 Annex 24 for demonstrating additionality. This is acceptable since the project activity is a small-scale project activity. The PP has demonstrated the financial unattractiveness of the project activity through investment barrier by applying the benchmark analysis. Since the baseline for the project activity is electricity supplied by the grid which is outside the direct control of the project developer, the choice of benchmark approach for demonstration of additionality is relevant.	OK

	Validated situation	Conclusion
SECTION 6c. Investment analysis		
1. Verify the accuracy of financial calculations carried out for the investment analysis: (a) Conduct a thorough assessment of all parameters and assumptions used in calculating the relevant financial indicator, and determine the accuracy and suitability of these parameters; (b) Cross-check the parameters against third-party or publicly available sources, such as invoices or price indices; (c) Review feasibility reports, public announcements and annual financial reports related to the proposed CDM project activity and the project participants;	The PP has demonstrated additionality by applying the investment barrier in accordance with the Attachment A of Appendix B. As per the simplified modalities and procedures for small-scale CDM project activities, a simplified baseline and monitoring methodology listed in Appendix B may be used for a small-scale CDM project activity if project participants are able to demonstrate to a designated operational entity that the project activity would otherwise not be implemented due to the existence of one or more barrier(s) listed in Attachment A of Appendix. B. These barriers are: • Investment barrier • Technological barrier • Barrier due to prevailing practice • Other barriers The PP has chosen investment barrier to prove the additionality of the proposed project activity. A thorough assessment of all parameters and assumptions used in the financial analysis was conducted by the validation team. The parameters were cross-checked with relevant sources. The details on the validation of input parameters and assumptions are presented in the below table. It was noted that investment decision was taken on 10/10/2009 as recorded in the company's Board minutes. It was further confirmed from the interview of the PP that the Detailed Project Report prepared by third party engineering firm was presented to the Board. The actual investment in the project was taken from Purchase Orders placed to the boiler supplier on 29/01/2010. Due to very small time gap in proposal and real action for the project activity, the validation team is of the opinion that input values would not have materially changed.	OK
2. Assess the correctness of computations carried out and documented by the project participants	The validation team has assessed the correctness of the calculations that were carried out by the PP. The IRR was calculated for a period of 20 years, which reflects the period of expected	OK ~~CL04~~

[4] Section 80 IA – Reduction in respect of profits and gains from industrial undertaking or enterprises engaged in infrastructure development etc. under which a deduction of an amount equal to 100% of the profit and gain derived from such business is allowed for any ten consecutive years out of fifteen years beginning from the year in which the undertaking or enterprise generates power or commences transmission or distribution of power.

	Validated situation	Conclusion
	operation of the underlying project activity (technical lifetime) and hence was found to be appropriate. LRQA confirms that the salvage value (fair value of any project activity assets at the end of the assessment period) is added back as cash inflows in accordance with guidance 4 of 'Guidelines on the Assessment of Investment Analysis'. Further, LRQA confirms that the tax calculation considers benefit under section 80 IA[4] of the Income Tax Act under which such projects are entitled for tax holiday for 10 consecutive years out of the first 15 years. In accordance with guidance 5 of 'Guidelines on the assessment of investment analysis', LRQA confirms that the depreciation and interest payment have been added back to net profits for the purpose of calculating the IRR. The PP presented the unprotected spreadsheet versions of all investment analysis, having readable formulae. LRQA could confirm that the investment analysis is presented in a transparent manner, to the extent that the reader can reproduce the results. It was confirmed by the validation team from the available evidence and relevant accounting practices that in the estimation of the post tax Project IRR, the PP had applied the accepted local accounting and taxation principles. Also, LRQA confirms that all the input values considered for the investment analysis were applicable at the time of investment decision taken by the project participant and it is in compliance with the guidance 6 of the Guidelines on the assessment of the investment analysis Version 5. Also, the assessment of input parameters has been confirmed in accordance to paragraph 110 & 111 of VVM Version 01.2 The project IRR calculated with the input parameters as provided below work out to 11.08% for the project activity without considering the benefits from the CDM revenue which is less than the benchmark of 13.02%. CL04 was raised to clarify some aspects of the investment analysis relating to considering opportunity cost for steam consumption, benchmark calculation, input values for investment analysis, depreciation and sensitivity. In response, the PP provided a revised PDD and financial sheet addressing the issues raised. Please refer the findings log at the end of the report for further details.	

<table>
<tr><th></th><th>Validated situation</th><th>Conclusion</th></tr>
<tr><td>3. Assess the sensitivity analysis by the project participants to determine under what conditions variations in the result would occur, and the likelihood of these conditions</td><td>Parameters (i) Electricity tariff rate, (ii) Plant Load factor, (iii) Fuel cost, and (iv) Investment cost were selected for sensitivity analysis. The validation team confirms the sensitivity analysis as below:

<table>
<tr><th>Parameter</th><th>+10%</th><th>Base IRR</th><th>-10%</th><th>Cross over point</th></tr>
<tr><td>Electricity tariff</td><td>15.61%</td><td rowspan="5">11.08%</td><td>0.0%</td><td>3.92%</td></tr>
<tr><td>Plant Load Factor</td><td>15.43%</td><td>6.14%</td><td>4.35%</td></tr>
<tr><td>Fuel cost</td><td>8.06%</td><td>13.79%</td><td>-7.05%</td></tr>
<tr><td>Investment cost</td><td>9.16%</td><td>13.35%</td><td>-8.64%</td></tr>
<tr><td>O&M cost</td><td>10.72%</td><td>11.43%</td><td>-57.30%</td></tr>
</table>

<u>Electricity tariff rate:</u>
The CSERC order dated 15/01/2008 specifies a tariff rate for a period of ten years. The PP has entered into a Power Purchase Agreement with the Chhattisgarh State Electricity Board on 19/12/2007, as per which the tariff rate shall be as per the prevailing tariff order of CSERC. Tariff rate in India has been under government control; though the government varies tariff rates in accordance with the market conditions or other incentives as per national priorities, an increase of 3.92% in the rate is considered unlikely. Further, the tariff order considers repayment of the debt in 10 years from the date of commissioning and hence, the tariff is not expected to be increased after 10 years. However, the PP has considered an annual escalation of 0.93% from 11th year onwards, which is calculated based on the CAGR considering the tariff rate in the 1st year and 10th year. Hence, a further increase in tariff rate by 3.92% from the first year of the project activity is very unlikely.

<u>Plant Load Factor:</u>
The IRR reaches the benchmark on increasing the PLF by 4.35%. The validation team confirmed the net electricity generation estimate from Detailed Project Report dated October 2008 prepared by third party engineering firm. Further, the DPR was submitted to the banks based on which the project received debt financing. Hence, the net electricity generation estimate is validated as appropriate in accordance with paragraph 3 (a) and 3 (b) of ‘Guideline for the reporting and validation of plant load factors’ version 01.
The CSERC tariff order dated 15/01/2008 considers a PLF of 80%, which is lower than that considered in the project activity. PP has already considered a PLF of 90%.
Hence, the validation team is of the opinion that an increase in the PLF by 4.35%</td><td>OK
~~CL03 (v) and (vi)~~</td></tr>
</table>

	Validated situation	Conclusion
	(equivalent to 93.92%) for the biomass base projects is highly unlikely based on local and sectoral expertise. Fuel cost: The IRR reaches the benchmark for a variation of -7.05% of the fuel cost. The validation team confirmed the quotations for sale of rice husk and coal dated 16/08/2008 and 18/09/2008 mentioned a cost of INR 1200/tonne and INR 1300/tonne respectively. Hence, the cost considered for investment analysis is conservative. Furthermore, the validation team confirmed the cost of rice husk and coal from farmers and biomass/coal suppliers and confirmed the cost to be in the range of INR 2,000 to 2,500/tonne for rice husk and INR 1,500 to 1800/tonne for coal. Considering the increasing inflation rate of the country and general increasing trend of fuel cost, a decrease in the rice husk cost by -7.05% is highly unlikely. Project investment cost: As the project activity is operational and the costs have already been incurred by the project participant, LRQA confirmed the actual project cost as INR 524.298 million, which is higher than the project cost considered at the time of investment decision. The project IRR reaches the benchmark at a variation by -8.64%, which is not possible since the project is already in operation. Furthermore, the PP have conducted a sensitivity analysis based on financials considering the impact of the recent tariff order for the purchase of electricity generated by biomass based power plants in Chhattisgarh as issued by Chhattisgarh State Electricity Regulatory Commission on 28/12/2011 (http://cserc.gov.in/pdf/Order%202011/Biomass%20order_Dec%2028_2011%20in%20P%20No%2022%20of%202011(T).pdf). The applicable tariff rate is INR 4.41/kWh. The PP has considered an annual escalation of 0.93% calculated as CAGR of the 1st year tariff rate and 10th year tariff rate specified in the CSERC order dated 15/01/2008 applicable at the time of investment decision making. The tariff order issued by CSERC dated 28/12/2011 mentions an indicative cost of biomass as INR 2017/tonne. As the cost of coal fine is not mentioned in the recent tariff order, PP has applied the coal fine cost of INR 2310/tonne based on the actual coal procurement in the month of June 2012. The validation team confirmed the tariff rate and cost of fuel by reviewing the tariff order dated 28/12/2011 and the certificate from Chartered Accountant confirming the coal cost for June 2012. Also, the actual tariff rate	

	Validated situation	Conclusion
	was confirmed from the payment of power purchase for the month of May 2012 by Chhattisgarh State Power Distribution Co. Ltd. which was INR 4.363/kWh. The PP provided an additional scenario considering the fuel cost and tariff rate as per tariff order 28/12/2011. The validation team confirmed the IRR of 10.96%, which is well below the benchmark. LRQA confirmed that the result of the sensitivity analysis consistently supports the conclusion that the project activity is not financially attractive. Based on the validation of the investment analysis that included an assessment of all parameters and assumptions used in calculating the relevant financial indicator, cross-checks against third party or publicly available sources and correctness of calculations carried out, the financial returns of the proposed CDM project activity would be insufficient to justify the required investment. However, CL04 (v) and (vi) were raised as borrowing costs were manually entered and not impacted due to sensitivity variations. Also, depreciation and working capital were not linked to project cost. Please refer the detailed findings log at the end of the report for details on the closure.	

Use the table below to list all the inputs to the investment analysis and to describe how each parameter has been validated:

Parameter/input	Symbol/Unit	Value	Source	Means of validation	Conclusion
Project installed capacity	MW	10	Detailed Project Report dated October 2008 considered during investment decision making	• Minutes of meeting of the Board of Directors of Shri Shyam Warehousing and Power Pvt. Ltd. dated 10/10/2009 confirmed the PP had decided to install 10 MW biomass power project. • Offer letter for supply of turbine generator dated 16/02/2009 confirmed requirement of 10 MW bleed cum extraction cum condensing TG set. • Purchase order for turbine generator issued by Shri Shyam Warehousing and Power Pvt. Ltd. dated 29/01/2010 for supply of 10 MW TG set.	OK
Availability	days	330	Detailed Project Report dated October 2008 considered during investment decision making	• The operational days of the similar registered projects based on agricultural residues including rice husk (Project ref. no. 4239, 4213, 4025, 3926, 3188 and 3182) are also in the same range. • The operational days of 330 were confirmed to be appropriate based on sectoral expertise.	OK
Plant Load Factor	%	90	Detailed Project Report dated October 2008 considered during investment decision making	• The Chhattisgarh State Electricity Regulatory Commission tariff order dated 15/01/2008 specifies a PLF of 80% for biomass based generation plants. • Validation team confirmed the PLF of 90% to be appropriate based on sectoral expertise.	OK
Annual gross electricity generation	MWh/year	71,280	Detailed Project Report dated October 2008 considered during investment decision making	Gross electricity generation is calculated based on the PLF, availability and installed capacity as below: 10 MW (installed capacity) x 330 days x 90% PLF = 71,280 MWh/year The validation team confirmed the electricity generation from the Detailed Project Report dated October 2008 considered during the investment decision making. The DPR dated October 2008 was prepared by third party engineering firm 'ARK Engineering & Consultancy' contracted by the PP. Further the DPR	OK

Parameter/input	Symbol/Unit	Value	Source	Means of validation	Conclusion
				was submitted to the banks based on which the project received debt financing. Hence, the electricity generation estimate is validated as appropriate in accordance with paragraph 3 (a) and 3 (b) of 'Guideline for the reporting and validation of plant load factors' version 01.	
Auxiliary electricity consumption	%	10	Detailed Project Report dated October 2008 considered during investment decision making	• The Chhattisgarh State Electricity Regulatory Commission tariff order dated 15/01/2008 specifies an auxiliary consumption of 10% for biomass based generation plants. • Validation team confirmed the auxiliary consumption of 10% to be appropriate based on sectoral expertise.	OK
Annual net electricity supplied to the grid	MWh/year	64,152	Detailed Project Report dated October 2008 considered during investment decision making	Net electricity generation is calculated based on the gross electricity generation and auxiliary consumption as below: 71,280 MWh/year of gross electricity generation x (1-10% auxiliary consumption) = 64,152 MWh/year of net electricity generation to be supplied to the grid. The validation team confirmed the net electricity generation from the Detailed Project Report dated October 2008 considered during the investment decision making. The DPR dated October 2008 was prepared by third party engineering firm 'ARK Engineering & Consultancy' contracted by the PP. Further the DPR was submitted to the banks based on which the project received debt financing. Hence, the net electricity generation estimate is validated as appropriate in accordance with paragraph 3 (a) and 3 (b) of 'Guideline for the reporting and validation of plant load factors' version 01.	OK

<table>
<tr><th>Parameter/input</th><th>Symbol/Unit</th><th>Value</th><th>Source</th><th>Means of validation</th><th>Conclusion</th></tr>
<tr><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>Total investment cost</td><td>INR million</td><td>519.617</td><td>Detailed Project Report dated October 2008 considered during investment decision making</td><td>Total investment cost was estimated to be INR 526.167 million as confirmed from the DPR dated October 2008 considered during investment decision making.

The break-up of project cost was confirmed as below:
<table><tr><td>Component</td><td>INR million</td></tr><tr><td>Land & site development</td><td>8.0</td></tr><tr><td>Building & civil work</td><td>93.7</td></tr><tr><td>Plant & Machinery</td><td>349.0</td></tr><tr><td>other fixed cost</td><td>1.25</td></tr><tr><td>Preliminary and pre-operative cost[5]</td><td>36.539</td></tr><tr><td>Working capital</td><td>31.128</td></tr><tr><td>Total investment</td><td>519.617</td></tr></table>
The validation team cross-checked the total investment cost from the following:
• Application to the United Bank of India for debt funding on 16/11/2009 which confirmed the estimated project cost as INR 504.4 million.
• Application to Bank of India for debt funding on 20/02/2010 which confirmed the estimated project cost as INR 504.4 million.
• Actual project cost for the project is confirmed to be INR 524.298 million. The validation team reviewed the independent certificate from Chartered Accountant dated 17/03/2012, certifying the actual project cost. The certificate dated 17/03/2012 was also submitted to United Bank of India which has debt funding for the project activity.

The validation team confirms the estimated project cost</td><td>OK
~~CL04 (ii), CL04 (viii)~~</td></tr>
</table>

[5] Cost related to technical consulting i.e. for preparation of DPR (INR 4 million) was removed as it is considered to be sunk costs. This is appropriate and conservative.

Parameter/input	Symbol/Unit	Value	Source	Means of validation	Conclusion
				of INR 519.617 million to be appropriate based on local and sectoral expertise. CL04 (ii) and (viii) were raised clarifying the inclusion of deposits and expense related to technical consulting fee as part of project cost. PP submitted revised financial calculation sheet/PDD wherein the costs included as deposits and technical consulting fee was removed. Refer findings log at the end of the report for details on the closure.	
Interest rate for Term Loan	%	12.00	Detailed Project Report dated October 2008 considered during investment decision making	Interest rate for term loan from bank (12.00%) was confirmed from the DPR dated October 2008 considered during investment decision making. The validation team cross-checked with the loan sanction letter dated 18/01/2010 (United Bank of India) which confirmed the actual interest rate to be 12.5%. Furthermore, the Chhattisgarh State Electricity Regulatory Commission tariff order dated 15/01/2008, applicable at the time of decision making mentions an interest rate of term loan of 11.75%. The validation team confirms the interest rate for term loan from the bank (12.00%) to be appropriate based on local and sectoral expertise. CL04 (iii) was raised to clarify the appropriateness for considering actual loan sanction letter for justifying the debt-equity ratio, interest rate, repayment period. Please refer the detailed findings log at the end of the report for details on the closure.	OK ~~CL04 (iii)~~
Repayment for Term Loan	Years	9	Detailed Project Report dated October 2008	Repayment period for loan from the bank was confirmed as 9 years from the DPR dated October	OK

Parameter/input	Symbol/Unit	Value	Source	Means of validation	Conclusion
			considered during investment decision making	2008 considered during investment decision making. The validation team cross-checked the Chhattisgarh State Electricity Regulatory Commission tariff order dated 15/01/2008, applicable at the time of decision making, and confirmed mention of a repayment period of 10 years. The validation team confirms the repayment period of 9 years to be appropriate based on local and sectoral expertise.	
Moratorium for Term Loan	Year	1	Detailed Project Report dated October 2008 considered during investment decision making	Moratorium period for loan from bank was confirmed as 1 year from the DPR dated October 2008 considered during investment decision making. Validation team cross-checked the Chhattisgarh State Electricity Regulatory Commission tariff order dated 15/01/2008, applicable at the time of decision making, which mentions a moratorium of 1 year. The validation team confirms the moratorium of 1 year to be appropriate based on local and sectoral expertise.	OK
O&M expense Escalation in O&M expense	% of project cost %	2.50 5	Detailed Project Report dated October 2008 considered during investment decision making	O&M expenses was estimated to be 2.50% of project cost as confirmed from the DPR dated October 2008 considered during investment decision making. The DPR mentions the O&M expense to be 2.5% of the project cost. Hence, the O&M cost for first year is calculated as below: INR 492.489 million (Project cost excluding working capital) x 2.5% = INR 12.312 million/year Validation team raised CL04 (iv) seeking clarification as to how the opportunity cost due to avoidance of steam generation from the existing boilers of 3 TPH and 4	~~CL04 (iv)~~ OK

Parameter/input	Symbol/Unit	Value	Source	Means of validation	Conclusion
				TPH was accounted in the financials. In response, PP provided revised PDD/financials wherein the O&M cost for the existing boilers is deducted from the project O&M cost. The validation team confirmed the O&M cost for the existing boilers from independent Chartered Accountants certificate. The revised financials duly account for the opportunity cost as a result of avoided steam generation in the pre-project scenario. Please refer the findings log at the end of the report for details. The validation team confirmed the avoided O&M cost due to non operation of the existing boilers to be INR 0.775 million from Chartered Accounts certificate dated 26/08/2011. The PP has correctly accounted the opportunity cost relating to the O&M cost and hence the resultant O&M related expense is reduced, leading to increase in the IRR and is hence conservative. The validation team cross-checked the CSERC tariff order 15/01/2008, applicable at the time of decision making which specifies an O&M cost equivalent to 7% of the project cost with 5% annual escalation. As per the CSERC tariff order, the O&M cost would be INR 33.699 million (after accounting the opportunity cost), which results in IRR of 3.04%. The validation team confirms the estimated O&M expense of 2.50% of project cost to be conservative and appropriate based on local and sectoral expertise.	
Expense on account of salaries Escalation in salaries	INR million %	6.0 5	Detailed Project Report dated October 2008 considered during investment decision making	Expense on account of salaries was estimated to be INR 6.0 million/year and annual escalation of 5% as confirmed from the DPR dated October 2008 considered during investment decision making.	OK

<table>
<tr><th>Parameter/input</th><th>Symbol/Unit</th><th>Value</th><th>Source</th><th>Means of validation</th><th>Conclusion</th></tr>
<tr><td></td><td></td><td></td><td></td><td>The validation team confirms the estimated expense on salaries and annual escalation to be appropriate based on local and sectoral expertise.</td><td></td></tr>
<tr><td>Residual value</td><td>%</td><td>10.0</td><td>CERC tariff order, 2009</td><td>Residual value of 10% was confirmed from CERC order dated 03/12/2009.

The validation team confirms residual value of 10% is appropriate for biomass power projects based on local and sectoral expertise.</td><td>OK</td></tr>
<tr><td>Rice husk requirement</td><td>Tonnes / year</td><td>79,604</td><td>Calculated based on the Detailed Project Report dated October 2008 considered during investment decision making</td><td>The validation team confirmed the rice husk consumption from the Detailed Project Report dated October 2008 which confirms the rice husk requirement as 79,604 tonnes/year as below:
<table>
<tr><th>Parameter</th><th>Value</th><th>Validation opinion</th></tr>
<tr><td>Steam required</td><td>50 TPH</td><td>Confirmed from Technical specifications of boiler</td></tr>
<tr><td>Boiler efficiency</td><td>80%</td><td>Confirmed from Technical specifications of boiler</td></tr>
<tr><td>Fuel Mix</td><td>15% energy from coal fines; 85% energy from rice husk</td><td>Confirmed from the DPR</td></tr>
<tr><td>Net enthalpy in the boiler</td><td>679 kcal/kg</td><td>Based on the input enthalpy (130 kcal/kg) and output enthalpy (809 kcal/kg) as confirmed from</td></tr>
</table></td><td>OK
~~CL04 (i)~~</td></tr>
</table>

<table>
<tr><th>Parameter/input</th><th>Symbol/Unit</th><th>Value</th><th>Source</th><th>Means of validation</th><th>Conclusion</th></tr>
<tr><td></td><td></td><td></td><td></td><td>
<table>
<tr><td></td><td></td><td>standard steam table</td></tr>
<tr><td>Operational hours</td><td>7128 hours</td><td>Considering 330 operational days and 90% PLF as confirmed from the DPR</td></tr>
<tr><td>Average GCV of fuel mix</td><td>3230 kcal/kg</td><td>Confirmed from DPR. GCV of rice husk is 3200 kcal/kg, while GCV of coal fines is 3400 kcal/kg</td></tr>
<tr><td>Fuel mix required</td><td>13,139 kg/hour</td><td>Calculated: (50 TPH x 1000 x 679 kcal/kg) / (80% x 3230 kcal/kg)</td></tr>
<tr><td>Rice husk required</td><td>79,604 tonnes/year</td><td>Calculated: (13,139 x 7128 x 85%) / 1000</td></tr>
</table>

The validation team confirmed the rice husk requirement to be appropriate based on sectoral expertise.

<u>Savings in fuel cost as a result of non operation of pre-project boilers:</u>
In addition, the validation team confirmed that the existing boilers were operated using part of the rice husk generated in the rice mill and there was no additional purchase of rice husk to operate the boilers of 3 TPH and 4 TPH.

The validation team confirmed the total rice husk generation from the rice mill from the ‘Certificate issued by ARK Engineering and Consultancy’ dated
</td><td></td></tr>
</table>

Parameter/input	Symbol/Unit	Value	Source	Means of validation	Conclusion
				15/09/2011 which confirmed the total rice husk generation from the rice mill as 17,010 tonnes/year and was able to cater the rice husk needs for operating the existing 3 TPH and 4 TPH boilers. To confirm this, validation team cross checked the rice husk consumption in the existing boilers for the below three calendar years as below: 3 TPH Boiler: Year Tonnes of rice husk consumed (tonnes) 2011 900 2010 520 2009 950 4 TPH Boiler: Year Tonnes of rice husk consumed (tonnes) 2011 4419 2010 4714 2009 3907 Out of the total rice husk requirement in the project activity as confirmed from the Detailed Project Report dated October 2008 i.e. 79,604 tonnes/year, PP has discounted the rice husk generation from the rice mills i.e. 17,010 tonnes/year and only considered the difference i.e. 62,594 tonnes/year for fuel cost. Hence, the PP has already considered the fuel savings not only for the fuel saved as a result of non operation of existing boilers of 3 TPH and 4 TPH, but for the whole of rice husk generated in the existing rice mill, which is conservative. CL04 (i) was raised as the NCV for biomass and coal considered in the financials does not match with DPR figures. Please refer the detailed findings log section at	

Parameter/input	Symbol/Unit	Value	Source	Means of validation	Conclusion
				the end of the report for details on the closure.	
Cost of rice husk	INR/tonne	1,200	Detailed Project Report dated October 2008 considered during investment decision making	Rice husk cost of INR 1,200/tonne was confirmed from the Detailed Project Report dated October 2008 considered during investment decision making. The validation team cross-checked the cost of rice husk with the following: • Tariff order for biomass co-generation plants issued by Chhattisgarh State Electricity Regulatory Commission on 15/01/2008, applicable at the time of decision making mentions a rice husk cost of INR 937/tonne for the year 2007-08 with an annual escalation of 5% per annum. Hence, as per the tariff order, the cost of rice husk is INR 1,033/tonne for the year 2009-10[6]. Even if a price of rice husk is considered as INR 1,033/tonne, the IRR does not cross the benchmark. • Quotation for sale of rice husk dated 16/08/2008 mentioning a cost of INR 1200/tonne. Hence, the cost considered for investment analysis is conservative. • In addition, LRQA interviewed biomass suppliers and farmers in the project region and confirmed rice husk cost to be in the range of INR 2,000 to 2,500/tonne. The validation team confirms the rice husk cost considered to be appropriate based on local and sectoral expertise.	OK
Cost of coal fines	INR/tonne	1,300	Detailed Project Report dated October 2008 considered during	Coal fines cost of INR 1,300/tonne was confirmed from the financial proposal dated October 2008 considered during investment decision making.	OK

[6] Year in which the project was to be commissioned, decided at time of investment decision making.

Parameter/input	Symbol/Unit	Value	Source	Means of validation	Conclusion
			investment decision making	The validation team cross-checked the cost of coal fines with the following: • Tariff order for biomass co-generation plants issued by Chhattisgarh State Electricity Regulatory Commission on 15/01/2008, applicable at the time of decision making mentions a coal fine cost of INR 1323/tonne for the year 2007-08 with an annual escalation of 5% per annum. Hence, as per the tariff order the cost of coal fines is INR 1,458/tonne for the year 2009-10[7]. Even if a price of coal fines is considered as INR 1,458/tonne, the IRR reduces further. • Quotation for sale of coal fines dated 16/08/2008 mentioning a cost of INR 1300/tonne. Hence, the cost considered for investment analysis is appropriate. • In addition, LRQA interviewed coal suppliers in the project region and confirmed cost of coal fine to be in the range of INR 1,500 to 1800/tonne. The validation team confirms the cost of coal fines considered to be appropriate based on local and sectoral expertise.	
Escalation in fuel cost (rice husk and coal fines)	%	5.0	Detailed Project Report dated October 2008 considered during investment decision making	Annual escalation in rice husk cost was confirmed as 5% from the financial proposal dated October 2008 considered during investment decision making. The validation team cross-checked the escalation in rice husk cost with the following: • Tariff order for biomass co-generation plants issued by Chhattisgarh State Electricity Regulatory	OK

[7] Year in which the project was to be commissioned, decided at time of investment decision making.

Parameter/input	Symbol/Unit	Value	Source	Means of validation	Conclusion
				Commission on 15/01/2008, applicable at the time of decision making mentions a 5% annual escalation in fuel cost. • In addition, LRQA interviewed rice husk/coal suppliers and farmers in the project region and confirmed fuel cost at the time of site visit as below: o Rice husk: INR 2,000 to 2,500 /tonne o Coal fines: INR 1,500 to 1800/tonne • In addition to the above, LRQA has confirmed the inflation trend in the host country and confirmed that there is no decreasing trend in the inflation rates, which will result in the increase of the biomass cost. The validation team confirms the escalation in rice husk cost considered to be appropriate based on local and sectoral expertise.	
Tariff rate for electricity supplied to grid	INR/kWh	3.18 (1st year) increasing to 3.49 (10th year) with 0.93% annual escalation from 11th year.	Detailed Project Report dated October 2008 considered during investment decision making	Tariff rate for sale of electricity was confirmed from the DPR dated October 2008 considered during investment decision making. The validation team cross-checked the tariff rate with the following: • Tariff order for biomass co-generation plants issued by Chhattisgarh State Electricity Regulatory Commission on 15/01/2008, applicable at the time of decision making confirmed the tariff rate of INR 3.18/kWh (1st year) increasing to INR 3.49/kWh (10th year). • Loan application letter dated 16/11/2009 and 22/02/2010 which referred to the DPR. • Power Purchase Agreement dated 13/12/2007 between Chhattisgarh State Electricity Board and PP which mentions that the tariff rate will be as per the applicable tariff during the project operation. As	OK ~~CL04 (ix)~~

Parameter/input	Symbol/Unit	Value	Source	Means of validation	Conclusion
				the tariff order was the only source available at the time of investment decision making, it is considered to be appropriate for investment analysis. • Annual escalation of 0.93% from 11th year is calculated based on CAGR of 1st year tariff rate of INR 3.18/kWh and 10th year tariff rate of INR 3.49/kWh and is deemed appropriate. The validation team confirms the tariff rate and annual escalation considered to be appropriate based on local and sectoral expertise. CL04 (ix) was raised to clarify why the tariff rate would not be escalated from 11th year onwards. Please refer the detailed findings log section at the end of the report for details on the closure.	
Depreciation on buildings	%	3.34	Indian Companies Act, 1956	The validation team confirms that the rate of depreciation as per the Companies Act 1956 has been applied for calculation of Profit Before Tax. The validation team confirms that depreciation, being a non-cash item, has been added back to the Profit after Tax for calculating IRR, which is in accordance with guidance 5 of 'Guidelines on the Assessment of Investment Analysis'	OK
Depreciation on plant & machinery	%	5.28	Indian Companies Act, 1956	The validation team confirms that the rate of depreciation as per the Companies Act 1956 has been applied for calculation of Profit Before Tax. The validation team confirms that depreciation, being a non-cash item, has been added back to the Profit after Tax for calculating IRR, which is in accordance with guidance 5 of 'Guidelines on the Assessment of Investment Analysis'	OK

Parameter/input	Symbol/Unit	Value	Source	Means of validation	Conclusion
Accelerated depreciation as per IT Act	%	80	Section 32 of Income Tax Act 1961	The validation team confirms that the rate of depreciation is in accordance with the host country regulations and confirmed from the Section 32 of Income Tax Act 1961	OK
Corporate tax rate	%	33.99	Host country rates (Financial year 2009-10)	LRQA confirmed the host country taxation laws applicable during the investment decision from publicly available information[8] and confirmed the corporate tax rate. The PP has applied the corporate tax rate applicable appropriately.	OK
Minimum Alternative Tax rate	%	11.33	Host country rates (Financial year 2009-10)	LRQA confirmed the MAT rate to be applicable for the financial year 2009-10 in which the PP decided to invest in the project activity from publicly available information[9].	~~CL04 (x)~~ OK

[8] http://www.incometaxindiapr.gov.in/incometaxindiacr/contents/taxrates/taxrates_2009_10_cos.htm

[9] http://www.incometaxindiapr.gov.in/incometaxindiacr/contents/taxrates/taxrates_2009_10_cos.htm

	Validated situation	Conclusion
4. Confirm the suitability of any benchmark applied in the investment analysis: (a) Determine whether the type of benchmark applied is suitable for the type of financial indicator presented; (b) Ensure that any risk premiums applied in determining the benchmark reflect the risks associated with the project type or activity; (c) Determine whether it is reasonable to assume that no investment would be made at a rate of return lower than the benchmark by, for example, assessing previous investment decisions by the project participants involved and determining whether the same benchmark has been applied or if there are verifiable circumstances that have led to a change in the benchmark.	As per the 'Guidelines on the assessment of investment analysis' Version 05, in cases where a benchmark approach is used the applied benchmark shall be appropriate to the type of IRR calculated. Local commercial lending rates or weighted average costs of capital (WACC) are appropriate benchmarks for a project IRR. The PP has selected WACC as the benchmark to compare against the Project IRR, which is appropriate. **Choice of benchmark** The project IRR has been evaluated against the benchmark of WACC which is appropriate in accordance with guidance 12 of the Guidelines on the Assessment of Investment Analysis that states that the WACC is one of the appropriate benchmarks for a project IRR. In the project case where the project could have been implemented by any other entity, a WACC of 13.02% is chosen as the benchmark calculated using Capital Asset Pricing Model (CAPM), comprising of government bond rate with suitable risk premium to reflect the project type and local lending rates published by Reserve Bank of India (RBI) that are publicly available. LRQA confirms that the WACC has been calculated from publicly available data sources and is deemed appropriate. The WACC is calculated using the well-established Capital Asset Pricing Model and is calculated as follows: WACC = wd * cd + we * ce wd: Weight of debt cd: Cost of debt we: Weight of equity ce: Cost of equity Weight of debt and equity is considered in the ratio of 70:30 which is appropriate considering investment in biomass co-generation project and found to be in line with the Chhattisgarh State Electricity Regulatory Commission tariff order dated 15/01/2008. <u>Cost of debt (c_d):</u> The cost of debt is considered to be the average Prime Lending Rate (PLR) as	OK ~~CL04~~

	Validated situation	Conclusion
	published by the Reserve Bank of India (RBI) and is publicly available. For the post tax cost of debt, the income tax will be deductible at the rate prevailing at the time of conceptualisation of the project activity. Since the project is incurring Minimum Alternate Tax (MAT), MAT payable under section 80 IA of Income Tax act prevailing at the time of decision making as 11.33% has been considered. PLR published by RBI during the investment decision ranges from 11% to 12%. Accordingly, the PP had revised the interest rate to 11.50% which is an average of the range of PLR published by the RBI available at the time of investment decision. The cost of debt is calculated as follows: Cost of debt (c_d) = PLR * (1 – tax rate) Where the PLR is available for the individual project promoters during the investment decision. The cost of debt (post tax prime lending rate) thus calculated as 10.19%. Cost of equity (c_e): Cost of equity based on the CAPM method is calculated using the following formula: $c_e = Rf + ß (Rm-Rf)$ Where, Rf - Risk free rate of return Rm - Expected market returns ß - Beta (Rm - Rf) - Market risk premium LRQA further validated the following components of CAPM: Risk free rate of return (Rf): Investment in long term government securities is considered as an investment without any risk; accordingly, returns on Government of India dated Securities for a maturity period of more than 10 years available at the time of decision making. The validation team confirmed the risk free rate of return from the RBI website to be 7.60% at the time of investment decision making.	

	Validated situation	Conclusion
	Expected Rate of Market Return (Rm): The expected rate of return of market portfolio has been calculated based on the compounded annual growth rate (CAGR) of publicly available BSE-500 Index data for a period of 10.58 years from 01/02/1999 to 01/09/2009. The Bombay Stock Exchange Limited constructed an index, christened BSE-500, consisting of 500 scripts. The changing pattern of the economy and that of the market were kept in mind while constructing this index. BSE-500 Index is a broad-based Index consisting of 500 companies across 20 sectors listed at the Exchange, representing approximately 93% of the total market capitalisation on BSE and covers all 20 major industries of the economy. This is the most diversified index of the entire stock indices portfolio at the BSE. BSE-500 Index is scientifically calculated and the 500 companies are selected based on market capitalisation, liquidity and balanced industry representation. The BSE-500 index is the largest quantum of data (500 companies) available among all the other indices and provides the most comprehensive view of the Indian capital market. As the BSE-500 index represents a widely diversified portfolio in terms of quantum of companies, the selection of the same for the calculation of Rm used in CAPM was deemed to be appropriate. The average market return has been calculated with the help of the Compound Annual Growth Rate (CAGR). The CAGR is a metric that measures the average returns from the stock market investments over a period of time. It is a more accurate measure than simple average of returns and calculated as: CAGR = (index value at end/ index value at beginning) ^ (1 / no. of years) – 1 LRQA verified the values considered for calculating the CAGR from publicly available information and confirms the calculation for market rate of return from the data available during the investment decision as 19.26%. <u>Market risk premium (Rm - Rf):</u> The market risk premium is calculated as the difference between the expected market returns and the risk free returns based on the standard formula. The value is calculated as 11.66%. <u>Beta (ß):</u>	

	Validated situation	Conclusion
	Beta is the measure of risk of a specific sector/company. Beta for similar power sector companies can be applied as proxy risk profile for the project activity for determination of Cost of Equity. The Beta in the CAPM equation helps to account for the systematic risk by quantifying the sensitivity of the stock of a listed company representing a particular project type/sector with the market returns. The PP has arrived at the Beta value which is the average of the Beta values of ten companies in the power sector for a period of four years (September 2005 – September 2009) that were listed at the time of investment decision (except for companies Torrent Power, Indowind energy and GVK Power for which the data since inception is considered, as the stock indices for these companies was available for less than 4 years). LRQA confirms this is in line with paragraph 14 of the Guidance on the Assessment of Investment Analysis which stipulates that risk premiums applied in the determination of required returns on equity shall reflect the risk profile of the project activity being assessed. The equity Beta has been calculated from company stock price and BSE-500 data which are publicly available. In order to remove the effect of the financial gearing specific to the company, asset Beta has been calculated for the ten power generating companies by un-levering the equity beta values . The average value of the asset Beta (1.03) has been considered for calculation of benchmark and it is deemed reasonable and conservative. The validation team confirmed a four year period for beta calculation as appropriate based on financial expertise. Furthermore, the article “Estimating Risk Parameters, Aswath Damodaran Stern School of Business”. by Aswath Damodaran states the following: “Risk and return models are silent on how long a time period one needs to use to estimate betas. Services use periods ranging from two years to five years for beta estimates, with varying results”. Also, the article “Investment Management A modern guide to security analysis and stock selection” mentions “…an analyst has the liberty to choose the time period for beta estimation. Typically analysts use 2 year and 5 year data.” Moreover, the Indian power sector underwent major structural changes between the	

	Validated situation	Conclusion
	period 2003 and 2005 after the Government of India introduced the Electricity Act 2003 and subsequently, the National Electricity Policy and the National Tariff Policy in 2005. There was no uniform regulation for determination of tariff for generation and sale of power prior to the Electricity Act 2003. Under the Electricity Act 2003, generation of electricity was de-licensed and captive generation was freely permitted. Also, it facilitated voluntary inter-connections and co-ordination of facilities for the inter-State, regional and inter-regional generation and transmission of electricity. Hence, the changes impacted the risks that the power sector companies were earlier exposed to. Therefore, it is considered appropriate to use data available after the introduction of these policies for calculating the beta specific to power generation companies. Hence, the validation team is of the opinion that consideration of four year data (September 2005 – September 2009) for beta estimation by the PP is very well within the host country accounting practices and therefore appropriate. LRQA validated the calculations to arrive at the Beta values by cross-checking the BSE-500 Index for the companies, confirming the debt/equity structures and tax rates. Based on the above parameters, the cost of equity has been calculated as 19.62% based on CAPM approach. Therefore, based on the above parameters, LRQA confirmed the WACC as 13.02%. The PP had chosen the WACC of 13.02% as benchmark for the project. The benchmark chosen by the project participant is in accordance with the guidance 12 of Guidelines on the assessment of investment analysis. The evaluation of the benchmark has been done based on Para 112 of VVM 1.2 and the estimated benchmark is appropriate. CL04 was raised as the data used for benchmark calculation (market risk premium, risk free return, beta and PLR) consider the data available at the project start date. Please refer the detailed findings log section at the end of the report for details on the closure.	

	Validated situation	Conclusion
5. In case the project participants rely on values from a Feasibility Study Report (FSR) approved by any national authority, the team is required to ensure that: (a) The FSR has been the basis of the decision to proceed with the investment in the project, i.e. that the period of time between the finalization of the FSR and the investment decision is sufficiently short for the DOE to confirm that it is unlikely in the context of the underlying project activity that the input values would have materially changed; (b) The values used in the PDD and associated annexes are fully consistent with the FSR, and where inconsistencies occur the DOE should validate the appropriateness of the values; (c) On the basis of its specific local and sectoral expertise, confirmation is provided, by cross-checking or other appropriate manner, that the input values from the FSR are valid and applicable at the time of the investment decision. Use the table below to cross-check input values and describe here the results of the comparison.	Not Applicable	NA

Comparison to similar registered project in the region:

Not applicable since the project participants have not relied on values from a Feasibility Study Report (FSR) approved by any national authority for investment analysis.

	Validated situation	Conclusion
SECTION 6d. Barrier analysis		
1. Does the PDD demonstrate that the proposed project activity faces barriers that prevent its implementation and do not prevent at least the implementation of one of the alternatives? Provide here an overall determination of the credibility of the barrier analysis. Use the below table to list each barrier considered in the PDD and to describe how the team undertake their validation.	Not applicable. The PP has not applied barrier analysis.	NA

Barriers are issues in project implementation that could prevent a potential investor from pursuing the implementation of the proposed project activity. The identified barriers are only sufficient grounds for demonstration of additionality if they would prevent potential project proponents from carrying out the proposed project activity undertaken without being registered as a CDM project activity.

Type of Barrier	Description in the PDD	Determination			Conclusion
		Barriers are real	Prevent implementation of PA	Do not prevent implementation of BL	
Access to finance					NA
Risks related barriers					NA
Technological					NA
Due to prevailing practice					NA
Other					NA
First of its kind					NA

	Validated situation	Conclusion
SECTION 6e. Common practice analysis		
1. Describe how the geographical scope of the common practice analysis has been validated. Assess whether the geographical scope (e.g. the defined region) of the common practice analysis is appropriate for the assessment of common practice related to the project activity's technology or industry type.	Not applicable. The project is categorised as small scale project activity and hence, common practice analysis is not required.	NA
2. Determine to what extent similar and operational projects (e.g. using similar technology or practice), other than CDM project activities, have been undertaken in the defined region	NA	NA
3. If similar and operational projects, other than CDM project activities, are already widely observed and commonly carried out in the defined region, assess whether there are essential distinctions between the proposed CDM project activity and the other similar activities	NA	NA

	Validated situation	Conclusion

SECTION 7. Monitoring plan
1. *Compliance of the monitoring plan with the approved methodology.* Confirm that the MP contains all the necessary parameters and that they are monitored in accordance to the approve Methodology using the following table:

Parameter	Monitoring Meth description	PDD description	Validated situation	Conclusion
$EG_{BL,y}$	**Description:** Quantity of electricity generated/ supplied **Unit:** MWh/y **Monitoring/recording Frequency:** Continuous monitoring, integrated hourly and at least monthly recording **Measurement methods and procedures:** Measured using calibrated meters. Calibration shall be as per the relevant paragraphs of General guidelines to SSC CDM methodologies. In case the project activity is exporting electricity to other facilities, the metering shall be carried out at the recipients end and measurement results shall be cross checked with records for sold/purchased electricity (e.g. invoices/receipts). Metering the energy produced by a sample of the systems where the simplified baseline is based on the energy produced multiplied by an emission coefficient	**Description:** Quantity of net electricity supplied to the grid as a result of the implementation of the CDM project activity in year *y* **Unit:** MWh/y **Monitoring/recording Frequency:** The metering for $EG_{Export,y}$ and $EG_{Import,y}$ shall be carried out using the two way energy meter located at common metering point/interconnection point. The meter shall be capable Continuous monitoring. The monthly recording will be done manually and the records will be maintained electronically. **Measurement methods and procedures:** $EG_{BL,y}$ shall be calculated based on the $EG_{Export,y}$ and $EG_{Import,y}$ as below: $EG_{BL,y} = EG_{Export,y} - EG_{Import,y}$ The metering for $EG_{Export,y}$ and $EG_{Import,y}$ shall be carried out using energy meter located at common metering point/interconnection point.	Electricity supplied to the grid shall be monitored using energy meter. The meter shall be of 0.2 accuracy class and the meter readings shall be recorded once a month in presence of PP and Electricity Board officials. The meter shall be calibrated at least once in three years which is as per the general guidelines for small scale project activities and also in accordance with the host country regulation. The meter shall be capable of continuous monitoring and the PP shall carry out at least monthly recording. The invoices shall be used as a cross-check mechanism to verify the net electricity supplied to the grid.	OK

Parameter	Monitoring Meth description	PDD description	Validated situation	Conclusion
		Recording of reading will be done once a month in the presence of an official from state electricity board and project owner. Calibration frequency – The meters shall be calibrated once every three years. Net electricity export can be cross checked with invoice. Net electricity export can be cross checked with invoice.		
$B_{biomass,y}$	**Description:** Net quantity of biomass consumed in year *y* **Unit:** Mass or volume **Monitoring/recording Frequency:** Continuously or estimate using annual mass/ energy balance **Measurement methods and procedures:** Use mass or volume based measurements. Adjust for the moisture content in order to determine the quantity of dry biomass. The quantity of biomass shall be measured continuously or in batches. If more than one type of biomass fuel is consumed, each shall be monitored separately. For the case of processed renewable biomass (e.g. briquettes) data shall be collected for mass, moisture content, NCV of the processed biomass that is supplied to users with an appropriate sampling frequency.	**Description:** Net quantity of biomass consumed in year y **Unit:** Tonne **Monitoring/recording Frequency:** Annual mass balance **Measurement methods and procedures:** Each truck that enters the site will be recorded at the weighbridge installed at the factory. The biomass shall be calculated on dry basis based on the moisture content of biomass. The weighbridge records will be tallied against transporters receipts or against the computer generated payment invoices.	Net quantity of biomass consumed in year shall be monitored on wet basis by weighbridge installed at the factory and adjusted for moisture content. The weighing system shall be subjected to calibration by external agency, at least annually. Also, the total quantity of rice husk consumed shall be cross-checked with annual energy balance.	OK
$B_{moisture}$	**Description:** Moisture content of the biomass (wet basis)	**Description:** Moisture content of the biomass residue	The moisture content (% of water) of the biomass residue has been	OK

Parameter	Monitoring Meth description	PDD description	Validated situation	Conclusion
	Unit: % water **Monitoring/recording Frequency:** The moisture content of biomass of homogeneous quality shall be monitored for each batch of biomass. The weighted average should be calculated for each monitoring period and used in the calculations. **Measurement methods and procedures:** On-site measurements. This applies in the case where emission reductions are calculated based on biomass energy input. For all cases, *ex ante* estimates should be provided in the PDD and used during the crediting period In case of dry biomass, monitoring of this parameter is not necessary	**Unit:** % **Monitoring/recording Frequency:** This parameter will be monitored for every batch. Daily data would be aggregated into monthly data. The weighted average of monthly data will be calculated for each monitoring period. **Measurement methods and procedures:** The moisture content of rice husk will be monitored for every batch and average value of all three batches for a day recorded in log book signed off by Controller, Laboratory. The moisture content (% of water) will be obtained from the laboratory records The weighted average of monthly data will be calculated for each monitoring period. Alternatively, moisture content can be measured by any accredited laboratory to cross-check the consistency of moisture content estimated in plant's laboratory.	monitored by measurement data of the laboratory of the power plant and also the moisture content of biomass residue has been monitored based on the measurement data of the qualified laboratory using a standard test method. The validation team confirms that the monitoring plan and procedure is based on good industrial practice and it is in accordance with the Monitoring/recording Frequency mentioned in the monitoring methodology. In addition, the validation team has confirmed the measurement procedures of the moisture content based on the interview with the plant personnel.	
NCV_k	**Description:** Net calorific value of biomass residue type *k* **Unit:** GJ/mass or volume unit **Monitoring/recording Frequency:** Determine once in the first year of the crediting period **Measurement methods and procedures:** Measurement in	**Description:** Net calorific value of biomass residue **Unit:** GJ/mass **Monitoring/recording Frequency:** Annually **Measurement methods and procedures:** Measurement in laboratories according to relevant national/international standards. Measure quarterly, taking at least three samples for each measurement. The average	The net calorific value of the biomass residue shall be monitored in the laboratory of the power plant using a standard test method. The validation team confirms that the monitoring plan and QA/QC procedure is based on good industrial practice and it is in accordance with the Monitoring/recording Frequency mentioned in the monitoring methodology.	OK

Parameter	Monitoring Meth description	PDD description	Validated situation	Conclusion
	laboratories according to relevant national/international standards. Measure quarterly, taking at least three samples for each measurement. The average value can be used for the rest of the crediting period. Measure the NCV based on dry biomass. Check the consistency of the measurements by comparing the measurement results with relevant data sources (e.g. values in the literature, values used in the national GHG inventory) and default values by the IPCC. (If the measurement results differ significantly from previous measurements or other relevant data sources, conduct additional measurements)	value can be used for the rest of the crediting period. Measure the NCV based on dry biomass. Check the consistency of the measurements by comparing the measurement results with, relevant data sources (e.g. values in the literature, values used in the national GHG inventory) and default values by the IPCC.		
$FC_{coal,j,y}$	**Description**: Quantity of fossil fuel type j combusted in year y **Unit:** Mass or volume unit **Monitoring/recording Frequency:** As per the Tool to calculate project or leakage CO_2 emissions from fossil fuel Combustion". **Measurement methods and procedures:** As per the "Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion".	**Description:** Quantity of coal fines used in the project activity in the year y **Unit:** Tonnes/yr **Monitoring/recording Frequency:** As and when consumed on continuous basis. **Measurement methods and procedures:** The amount of coal used in the project activity will be measured via a calibrated weighbridge system. The total quantity of coal procured for the project activity is completely combusted in the boiler. Hence, the total quantity of coal procured and quantity of coal combusted is considered as same for the project activity. Weigh bridge undergoes maintenance /	The quantity of coal fines consumed in year shall be monitored using weighbridge on continuous basis. The weighing system shall be subjected to calibration by external agency, at least annually. The validation team confirms the monitoring arrangement is in accordance with the "Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion"	OK

Parameter	Monitoring Meth description	PDD description	Validated situation	Conclusion
		calibration subject to appropriate industrial standards, at least annually. The data recorded can be cross checked against purchase receipt. Cross check the measurements with an annual energy balance that is based on purchased quantities and stock changes, and the calibration frequency will not be less than once in three years.		
Diesel consumption ($FC_{i,j,y}$)	**Description**: Quantity of fossil fuel type j combusted in year y **Unit:** Mass or volume unit **Monitoring/recording Frequency:** As per the "Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion". **Measurement methods and procedures:** As per the "Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion".	**Description:** Quantity of diesel consumed on site every year **Unit:** Litre **Monitoring/recording Frequency:** Monthly **Measurement methods and procedures:** A monitoring cell fitted with a level indicator gauge above the fuel tank of the D.G Set shall be used to monitor the diesel consumption every month. Log book shall also maintain for the same purpose. The fuel tank of the D.G. Set is filled every five to eight months (As the consumption is very low) and with the help of level indicator gauge reduction in diesel level (on consumption) will be monitored every month. The level indicator gauge will be calibrated by Government accredited/ ISO certified agency every two years. The diesel consumption quantities can be cross-checked with the record of the quantity of diesel issued by the stores manager and maintained in a log book in the store room.	Diesel consumption shall be monitored using a level indicator gauge in the fuel tank. The level gauge indicator will be calibrated by an independent agency once every two years. The validation team confirms the monitoring arrangement is in accordance with the "Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion"	OK
$EF_{CO2,coal,y}$	**Description:** CO_2 emission factor of fossil fuel type *i*	**Description:** CO_2 emission factor for coal **Unit:** tCO_2e/ GJ	CO_2 emission factor for Coal shall be monitored annually in accordance with the "Tool to calculate project or	OK

<table>
<tr><th>Parameter</th><th>Monitoring Meth description</th><th>PDD description</th><th>Validated situation</th><th>Conclusion</th></tr>
<tr><td></td><td>Unit: tCO_2e/GJ

Monitoring/recording Frequency: As per the “Tool to calculate project or leakage CO_2 emissions from fossil fuel Combustion”.

Measurement methods and procedures: As per the .”Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion”.</td><td>Monitoring/recording Frequency: Annually

Measurement methods and procedures: The following data sources may be used if the relevant conditions apply:

<table><tr><th>Data source</th><th>Conditions for using the data source</th></tr><tr><td>a) Values provided by the fuel supplier in invoices</td><td>This is the preferred source</td></tr><tr><td>b) Measurements by the project participants</td><td>If a) is not available</td></tr><tr><td>c) Regional or national default values</td><td>If a) is not available

These sources can only be used for liquid fuels and should be based on well-documented, reliable sources (such as national energy balances)</td></tr><tr><td>d) IPCC default values at the upper limit of the uncertainty at a 95% confidence interval as provided in table 1.4 of Chapter1 of Vol. 2 (Energy) of the 2006 IPCC Guidelines on National GHG Inventories</td><td>If a) is not available</td></tr></table></td><td>leakage CO_2 emissions from fossil fuel combustion”</td><td></td></tr>
<tr><td>$NCV_{coal,i,y}$</td><td>Description: Net calorific value of fossil fuel type i

Unit: GJ/mass or volume unit

Measurement methods and procedures: As per the “Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion”.</td><td>Description: Net calorific value of coal

Unit: GJ/tonne

Measurement methods and procedures: The following data sources may be used if the relevant conditions apply:</td><td>Net calorific value of Coal shall be monitored annually in accordance with the “Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion”</td><td>OK</td></tr>
</table>

<table>
<tr><th>Parameter</th><th>Monitoring Meth description</th><th>PDD description</th><th>Validated situation</th><th>Conclusion</th></tr>
<tr><td></td><td></td><td>
<table>
<tr><th>Data source</th><th>Conditions for using the data source</th></tr>
<tr><td>a) Values provided by the fuel supplier in invoices</td><td>This is the preferred source if the carbon fraction of the fuel is not provided (Option A)</td></tr>
<tr><td>b) Measurements by the project participants</td><td>If a) is not available</td></tr>
<tr><td>c) Regional or national default values</td><td>If a) is not available

These sources can only be used for liquid fuels and should be based on well documented, reliable sources (such as national energy balances).</td></tr>
<tr><td>d) IPCC default values at the upper limit of the uncertainty at a 95% confidence interval as provided in Table 1.2 of Chapter 1 of Vol. 2 (Energy) of the 2006 IPCC Guidelines on National GHG Inventories</td><td>If a) is not available</td></tr>
</table>
</td><td></td><td></td></tr>
<tr><td>CO_2 emission factor ($EF_{CO2,i,y}$ = EF_{diesel})</td><td>Description: CO_2 emission factor of fossil fuel type i

Unit: tCO_2e/GJ

Monitoring/recording Frequency: As per the Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion”.

Measurement methods and procedures: As per the .”Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion”.</td><td>Description: CO_2 emission factor for Diesel Oil

Unit: tCO_2 e/ TJ
Monitoring/recording Frequency: Annually

Measurement methods and procedures: The following data sources may be used if the relevant conditions apply:
<table>
<tr><th>Data source</th><th>Conditions for using the data source</th></tr>
<tr><td>a) Values provided by the fuel supplier in invoices</td><td>This is the preferred source if the carbon fraction of the fuel is not provided (Option A)</td></tr>
<tr><td>b) Measurements by the project participants</td><td>If a) is not available</td></tr>
<tr><td>c) Regional or national default values</td><td>If a) is not available

These sources can only be used for liquid fuels and should be based on well documented, reliable sources (such as national energy balances).</td></tr>
<tr><td>d) IPCC default values at the upper limit of the uncertainty at a 95% confidence interval as provided in Table 1.2 of Chapter 1 of Vol. 2 (Energy) of the 2006 IPCC Guidelines on National GHG Inventories</td><td>If a) is not available</td></tr>
</table>
</td><td>CO_2 emission factor for Diesel Oil shall be monitored annually in accordance with the “Tool to calculate project or leakage CO2 emissions from fossil fuel combustion”</td><td>OK</td></tr>
</table>

<table>
<tr><th>Parameter</th><th>Monitoring Meth description</th><th>PDD description</th><th>Validated situation</th><th>Conclusion</th></tr>
<tr><td>NCV_{Diesel}</td><td>Description: Net calorific value of fossil fuel type i

Unit: GJ/mass or volume unit

Measurement methods and procedures: As per the Tool to calculate project or leakage CO2 emissions from fossil fuel combustion.</td><td>Description: Net calorific value of Diesel Oil

Unit: GJ/tonne

Measurement methods and procedures: The following data sources may be used if the relevant conditions apply:
<table>
<tr><th>Data source</th><th>Conditions for using the data source</th></tr>
<tr><td>a) Values provided by the fuel supplier in invoices</td><td>This is the preferred source if the carbon fraction of the fuel is not provided (Option A)</td></tr>
<tr><td>b) Measurements by the project participants</td><td>If a) is not available</td></tr>
<tr><td>c) Regional or national default values</td><td>If a) is not available

These sources can only be used for liquid fuels and should be based on well documented, reliable sources (such as national energy balances).</td></tr>
<tr><td>d) IPCC default values at the upper limit of the uncertainty at a 95% confidence interval as provided in Table 1.2 of Chapter 1 of Vol. 2 (Energy) of the 2006 IPCC Guidelines on National GHG Inventories</td><td>If a) is not available</td></tr>
</table></td><td>Net calorific value of Diesel Oil shall be monitored annually in accordance with the “Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion”</td><td>OK</td></tr>
</table>

	Validated situation	Conclusion
2. *Implementation of the plan.* confirm that the monitoring arrangements described in the monitoring plan are feasible within the project design Described the steps undertaken to assess this.	The monitoring plan describes the organisational structure, roles and responsibility, the monitoring instruments, data monitoring procedures, emergency preparedness and the management system. During the site visit, the validation team has confirmed that the monitoring is planned in a reasonable manner and considered feasible to be implemented by the PP. Site visit interviews confirmed the monitoring process. The monitoring mechanism in the revised PDD is appropriate as confirmed from the site visit.	OK
3. *Implementation of the Plan:* confirm that the means of implementation of the MP, including the data management and quality assurance and quality control procedures, are sufficient to ensure that the emission reductions achieved by/resulting from the proposed CDM project activity can be	The monitoring plan includes the internal quality control and assurance process, data control system and regular calibration of the monitoring instruments as appropriate that will ensure reliable monitoring and reporting of the ERs. CAR 05 was raised as the PDD did not specify the accuracy of measurement	OK ~~CAR 05~~

	Validated situation	Conclusion
reported ex post and verified	method, archiving and monitoring frequency as required by methodology. In response, the PP provided a revised PDD in accordance with the methodology and General guidelines to SSC CDM methodologies. Hence, the CAR was closed.	

	Validated situation	Conclusion
SECTION 8. Local stakeholder consultation		
6. Determine whether comments by local stakeholders that can reasonably be considered relevant for the proposed CDM project activity, have been invited	The validation team confirmed that the PP had invited the local stakeholders for providing comments by issuing a newspaper advertisement in the local newspaper on 03/09/2010. The local stakeholder meeting was conducted on 20/09/2010. The validation team confirmed the local stakeholder consultation process from review of the minutes of meeting, attendance sheet, newspaper advertisement and interviews with local stakeholders during the site visit. No negative comment was received through the local stakeholders' consultation processes.	OK
7. Confirm that the summary of the comments received as provided in the PDD is complete	The validation team confirmed that the summary of the comments received as provided in the PDD is complete. CAR 06 was raised as the section E.2 of PDD did not provide a summary of comments received during the local stakeholder consultation meeting. In response, the PP provided a revised PDD and included the comments received during the meeting. Hence, CAR was closed.	OK ~~CAR 06~~
8. Confirm that the project participants have taken due account of any comments received and have described this process in the PDD	No comment was received that requires further action to the PP.	OK

	Validated situation	Conclusion
SECTION 9. Environmental Impacts		
2. Is an EIA required by the environmental legislation of the host country? Describe the legislation applicable.	The Ministry of Environment & Forests (MoEF), Government of India, under Environment Impact Assessment (EIA) notification dated 1/12/2009 specified a list of projects/activities in Schedule I of the said notification, which for setting up new projects or modernisation or expansion, would require prior environmental clearance and which may call for an EIA as a part of obtaining environmental clearance. According to the notification dated 1/12/2009, "power plant up to 15MW, based on biomass and using auxiliary fuel such as coal/ lignite/ petroleum products up to 15% are exempt." (http://moef.nic.in/downloads/rules-and-regulations/3067.pdf). Hence, there is no need of applicability of the Environmental Impact Assessment (EIA) of the proposed project activity. As per the said notification, the proposed project activity does not require any EIA to be conducted.	OK
3. Confirm whether the project participants have undertaken an analysis of environmental impacts and, if required by the host Party, an environmental impact assessment	As above	OK
4. Confirm that environmental impacts considered significant by the PPs or the Host country are described in the PDD, including mitigation measures.	The rules of host country do not require EIA for the type of the project activity.	OK

Findings[10]

1. Grade / Ref:	CAR 01	**2. Date:**	15/07/2011	**3. Status:**	Closed
4. Requirement:		Para 44 of VVM Version 01.2			
5. Nature of the Issue Raised: Letter of Approval					
LoA by the DNA of the host country (India) and United Kingdom of Great Britain and Northern Ireland for the project has not been made available for validation.					
6. Nature of responses provided by the project participant:					
The Letter Of Approval (LOA) for this project activity from the host country and Annex-I country is being provided.					
7. Assessment of such responses:					
The LoA dated 18/04/2012 from Annex I party DNA and the LoA dated 19 April 2011 from host country DNA has been provided by the PP. The validation team reviewed and confirmed the LoAs are appropriate the validation of which included in the validation protocol above.					
8. References to resulting changes in the PDD or supporting annexes:					
-					

[10] Explanation of the Findings Log structure:
1. Grading and Sequential Number of the finding
2. Date of Original Finding
3. New, Open, Closed
4. Requirement (VVM, PDD-CDM, etc)
5. Reference to Protocol
6. Details of PP's response
7. Evaluation from the Validation team
8. List of changes made as a result of the finding

1. Grade / Ref:	CAR 02	2. Date:	15/07/2011	3. Status:	Closed
4. Requirement:		Guidelines for completing the CDM SSC PDD Version 05 AMS I.C version 19 Para 78 of VVM Version 1.2			

5. Nature of the Issue Raised: Project boundary

Please clarify the following with respect to the project boundary and emission sources:

1. During the site visit interview it was known that the PP will have a provision for a DG set for catering the emergency electricity requirements for auxiliaries in case of failure of grid. Also, it was noted that the DPR considers installation of a DG set of 500 kVA capacity for catering emergency start-up requirements. PP to clarify why emissions resulting from diesel consumption have not been considered.
2. The provision for import of grid electricity for start-up power is not depicted in the project boundary diagram.

6. Nature of responses provided by the project participant:

1. For CER estimation, consumption of diesel considered zero ex ante but all the parameters related to diesel (EF diesel, NCV diesel) will be monitored and included in the section B.7.1 of the PDD. PP has used "Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion" and option B has been used for calculation of CO2 emission co efficient and diesel related parameters are also monitored in compliance with the tool and upper limit of IPCC default value at 95% confidence interval considered for project emission calculation.
2. The electricity import from the grid for the start-up has been depicted in the project boundary diagram and the calculation of emission reduction has been shown in the section B.6.3 of the PDD. Net electricity generated is calculated after deducting auxiliary consumption. Consumption which also included import from grid from gross electricity generation. Necessary correction made in section B.7.1 of the revised PDD.

7. Assessment of such responses:

1. Project boundary in the revised PDD indicates the DG set and provision of electricity import as part of boundary.
2. Section B.7.1 of the revised PDD is updated wherein the monitoring parameters EFdiesel, NCVdiesel are in accordance to the 'Tool to calculate project or leakage CO2 emissions from fossil fuel combustion'

8. References to resulting changes in the PDD or supporting annexes:

PDD section B.3, B.6.1, B.6.3 and B.7.1

1. Grade / Ref:	CAR 03	2. Date:	15/07/2011	3. Status:	Closed
4. Requirement:		Guidelines for completing the CDM SSC PDD Version 05			

5. Nature of the Issue Raised: Baseline

"Tool to calculate the emission factor for an electricity system" specifies use a 3-year generation-weighted average, based on the most recent data available at the time of submission of the CDM-PDD to the DOE for validation.

Whilst the PDD (PDD Version 1, dated 15/10/2010) was initially submitted for validation on 31/01/2011 and published for global stakeholder consultation during 02 Feb 11 - 03 Mar 11, PP to clarify the use of CEA database version 6 which was only available during March 2011.

6. Nature of responses provided by the project participant:

PP had initially web hosted the project activity applying AMS I.D which was incorrect. The PDD version 1 dated 15/10/2010 was web hosted during 02/01/2011 to 03/03/2011. Hence, as the CEA data base version 05 was the most recent data available during the initial web-hosting, the PP has now revised the PDD according to the CEA version 05.

7. Assessment of such responses:

PP had initially web-hosted the project applying AMS-I.D during 02/01/2011 to 03/03/2011. However, during initial validation site visit, it was confirmed that the project is a co-generation project and cannot apply AMS-I.D. Hence, the PP later submitted revised PDD applying AMS-I.C and was web hosted during 12/05/2011 to 10/06/2011. However, as per the "Tool to calculate the emission factor for an electricity system" PP shall use a 3-year generation-weighted average, based on the most recent data available at the time of submission of the CDM-PDD to the DOE for validation. Hence, PP has now correctly referred CEA database version 05 which was the most recent data available at the time of initial web hosting (02/01/2011 to 03/03/2011).

8. References to resulting changes in the PDD or supporting annexes:

PDD Section B.6

1. Grade / Ref:	CAR 04	2. Date:	15/07/2011	3. Status:	Closed
4. Requirement:		Guidelines for completing the CDM SSC PDD Version 05			
5. Nature of the Issue Raised: Baseline					
National policies and circumstances relevant to the baseline of the proposed project activity are not summarised in section B.5 of the PDD.					
6. Nature of responses provided by the project participant:					
National Policies and circumstances relevant to the baseline of the proposed project activity have now been summarized in the section B.5 of the PDD.					
7. Assessment of such responses:					
Revised PDD includes justification for considering the national policies and circumstances relevant to the baseline of the project activity.					
8. References to resulting changes in the PDD or supporting annexes:					
PDD Section B.5					

1. Grade / Ref:	CAR 05	2. Date:	15/07/2011	3. Status:	Closed
4. Requirement:		Para 122 of CDM VVM Version 01.2 Guidelines for completing the CDM SSC PDD Version 05			

5. Nature of the Issue Raised: Monitoring plan

1. PDD section B.7.1 does not specify the accuracy of measurement method for monitoring EGgross, EGaux, Mbiomass,y and FCcoal,j,y.
2. PP to clarify why the parameter 'Moisture content of the biomass residues' is not being monitored
3. General guidelines to SSC CDM methodologies version 17 requires the monitored data to be electronically archived for a period of two years from the end of the crediting period
4. Whilst the project activity is a co-fired system capable for firing rice husk and coal, PP to clarify how the emission reductions are calculated in a conservative manner
5. Monitoring frequencies for parameters Mbiomass,y and FCcoal,j.y are not specified in accordance with the methodological requirements.

6. Nature of responses provided by the project participant:

1. The accuracy of the measurement method for the given monitoring parameters has now been specified in the section B.7.1 of the PDD.
2. The moisture content of the biomass residue will be monitored and it has now been included in the monitoring parameter in the section B.7.1 of the PDD.
3. The necessary changes has been made in section B.7.1 & B.7.2 of the PDD
4. The project activity is a co-fired system using 15% coal with 85% of rice husk. The project emission has been calculated due to the use of coal in the financial sheet and the same has been deducted in the baseline to get the emission reduction. The excel sheet is being provided.
5. Monitoring frequencies for parameters $M_{biomass,y}$ and $FC_{coal,j,y}$ have now been depicted according to the methodological requirement. The revised PDD is being provided.

7. Assessment of such responses:

1. Section B.7.1 of revised PDD specifies the accuracy of measurement method for the monitoring parameters.
2. The parameter 'Moisture content of the biomass residues' is being monitored as mentioned in the revised PDD.
3. Revised PDD confirms that the monitored data will be electronically archived for a period of two years from the end of the crediting period in accordance with the General guidelines to SSC CDM methodologies.
4. The emission reduction calculations are in accordance with the methodology AMS-I.C version 19.
5. Monitoring frequencies for parameters are specified in accordance with the methodological requirements as per AMS-I.C version 19.

8. References to resulting changes in the PDD or supporting annexes:
PDD Section B.7

1. Grade / Ref:	CAR 06	**2. Date:**	15/07/2011	**3. Status:**	Closed
4. Requirement:		Para 128 of CDM-VVM version 01.2 Guidelines for completing the CDM SSC PDD Version 05			
5. Nature of the Issue Raised: Local stakeholder consultation					
Section E.2 of the PDD does not provide a summary of comments received during the local stakeholder consultation meeting.					
6. Nature of responses provided by the project participant:					
The comments received from the local stakeholder consultation meeting have now been summarized in the section E.2.					
7. Assessment of such responses:					
Revised PDD provides summary of comments received during the local stakeholder consultation meeting in accordance with the guidelines for completing SSC-CDM-PDD.					
8. References to resulting changes in the PDD or supporting annexes:					
PDD section E.2					

1. Grade / Ref:	CL 01	**2. Date:**	05/09/2012	**3. Status:**	Closed
4. Requirement:		Guidelines for completing the CDM SSC PDD Version 05			
5. Nature of the Issue Raised: Project location					
The unique coordinates of the project activity mentioned under section A.4.1.4 i.e. 21^0 59' 40" N Latitude and 82^0 34'25"E Longitude represents agricultural fields on cross checking in Google Earth. PP to clarify.					
6. Nature of responses provided by the project participant:					
The latitude-longitude was corrected in the revised PDD and are 21^0 59' 51.83" N Latitude and 82^0 31'04.59"E Longitude.					
7. Assessment of such responses:					
Validation team confirmed the unique coordinates for the project activity as 21^0 59' 51.83" N Latitude and 82^0 31'04.59"E Longitude by cross checking with standard					

Google Earth website.
8. References to resulting changes in the PDD or supporting annexes:
PDD section A.4.1.4

1. Grade / Ref:	CL 02	**2. Date:**	15/07/2011	**3. Status:**	Closed
4. Requirement:		Para 122 of CDM VVM Version 01.2 Guidelines for completing the CDM SSC PDD Version 05			
5. Nature of the Issue Raised: Monitoring Plan					
Whilst the project activity is a co-generation power plant, the project description under section A.4.2 only details the electricity generation from the project activity. The steam generation / consumption related details are not mentioned.					
6. Nature of responses provided by the project participant:					
The detail of steam generation/consumption has now been summarized in the section A.4.2 of the PDD based on HMBD diagram of the project activity. HMBD diagram already provided to DoE.					
7. Assessment of such responses:					
The detail of steam generation/consumption has now been summarised in the section A.4.2 of the PDD. Validation team confirmed the technical specifications of the project activity from the Heat and Mass Balance Diagram (HMBD).					
8. References to resulting changes in the PDD or supporting annexes:					
PDD section A.4.2					

1. Grade / Ref:	CL 03	2. Date:	15/07/2011	3. Status:	Closed
4. Requirement:		Guidelines for completing the CDM SSC PDD Version 05			
5. Nature of the Issue Raised: Applicability condition					
Whilst the project activity proposes to co-fire biomass (rice husk) and coal, PP has mentioned 'the project activity is not a co-fired system' while justifying applicability condition 5 of AMS I.C version 18.					
6. Nature of responses provided by the project participant:					
The project activity is a co-fired system using both fossil and renewable fuel for the production of electricity with the total thermal installed capacity of 45MW_{th}.					
7. Assessment of such responses:					
The revised PDD clearly states that the project activity is a co-fired system using both fossil fuel and renewable fuel, which is appropriate. Also, the PDD now applies AMS-I.C version 19.					
8. References to resulting changes in the PDD or supporting annexes:					
PDD section B.2					

1. Grade / Ref:	CL 04	2. Date:	15/07/2011	3. Status:	Closed
4. Requirement:		Para 111 of CDM VVM Version 01.2 Guidelines for completing the CDM SSC PDD Version 05			

5. Nature of the Issue Raised: Investment analysis

PP to clarify the following related to benchmark:

Whilst guidance 6 of 'Guidelines on assessment of investment analysis' Version 5 requires input values used in all investment analysis should be valid and applicable at the time of the investment decision, data used for benchmark calculation (market risk premium, risk free return, beta and PLR) consider the data available at the project start date.

PP to clarify the following related to financial calculations:

i) The NCV for biomass and coal considered in the financials does not match with DPR figures

ii) Clarify the basis for considering 'deposits' of INR 2.55 million as part of project cost.

iii) Whilst the loan documents were available after the investment decision date, clarify the appropriateness for considering actual loan sanction letter for justifying the debt-equity ratio, interest rate, repayment period etc.

iv) Whilst the project activity shall supply steam to meet the captive requirement of the adjacent rice mills, PP to clarify how the same are accounted in the financial calculations

v) Borrowings costs are manually entered and not linked to investment cost, there is no impact on debt component and interest costs on sensitivity analysis for investment cost.

vi) Depreciation and working capital does not change with change in investment cost for sensitivity analysis

vii) PP to provide basis for considering boiler efficiency as 78%, salary of 1.159 million, boiler efficiency considered

viii) PP to clarify the appropriateness of pre and postoperative expense (INR 40.539 million) as part of project cost.

ix) PP to clarify why the tariff rate would not be escalated from 11th year onwards.

x) PP to clarify the appropriates of the MAT rate considered.

6. Nature of responses provided by the project participant:

The benchmark calculation has now been revised as per the investment decision for the project activity. The spread sheet is being provided.

i) The NCV of biomass and coal have been taken from the DPR. The NCV of both fuels have been cross checked with the laboratory report. The same is being provided.

ii) The amount of 2.5 million is only a provision in the budget for any deposits that may have to be made to the government agencies like water supply department, fuel supply department, electricity board etc. The same will be cross checked with the actual. However, PP has removed the cost from the project cost, which is conservative.

iii) Earlier the debt has been taken was 22 crore (INR 220million) instead of 32 crore (INR 320million) due to typographical error. Now the debt –equity ratio has been revised as 70:30 as per the CSERC tariff order dated 15.01.2008. The revised spread sheet is being provided. The interest rate on term loan has been revised and it has now been taken from CSERC tariff order. The repayment period has taken from DPR.

iv) The CA certificate for the calculation of the biomass quantity used in the pre-project scenario and the evidence for the cost of biomass (quotation from suppliers) has already been provided. The O & M costs incurred for the boilers 3TPH and 4TPH in the year 2009-2010 was INR 7,75,000. The Chartered Accountant (CA) certificate for the O & M expenses in the pre project scenario has now been provided and the same has accounted in the financial sheet. After deducting the O&M cost the IRR increases to 8.52%, thus the IRR still remains below the benchmark (13.02%). The revised financial sheet is being provided.

v) The borrowing cost has now been linked with the investment cost.

vi) The sensitivity formula has now been revised in the financial assumption sheet and it has linked up in the every cell including depreciation and working capital.

vii) The efficiency of the husk fired boiler is around 80 $\pm$ 2% given in the offer letter of boiler which has been already submitted. We have now revised the excel sheet and considered the average value of the boiler efficiency for rice husk which comes 80%. Break up for salary has been provided.

viii) The pre and post operative expense relating to technical consulting fee (INR 4 million) are now removed from the revised IRR calculation sheet. PDD is updated accordingly.

ix) PP has considered an annual escalation of 0.93% from 11th year onwards, which is calculated based on the CAGR considering the tariff rate in the 1st year and 10th year. The revised PDD and IRR calculation sheet are provided.

x) The MAT rate is now corrected to 11.33% which is applicable at the time of investment decision making.

7. Assessment of such responses:

PP submitted revised PDD and benchmark calculation sheet. Validation team confirmed that all the input data for benchmark calculation is at the time of investment decision making in accordance with 'Guidelines on assessment of investment analysis'

i) The NCV of biomass and coal have been taken from the DPR. Validation team confirmed the NCV of both fuels by cross-checking with independent laboratory reports.

ii)	PP has removed deposits from the project cost which is conservative.
iii)	Input values are now considered as available at investment decision making time.
iv)	PP mentioned that the biomass quantity being used in the existing boilers are not accounted while calculating the biomass requirement. Also, the O&M cost for the existing boilers is deducted from the project O&M cost. Validation team confirmed the quantity of rice husk requirement in the existing boilers from the detailed project report and site visit. The validation team further confirmed the O&M cost for the existing boilers from independent Chartered Accountants certificate. The revised financials duly account for the opportunity cost as a result of avoided steam generation in the pre-project scenario. Validation team confirmed the avoided O&M cost due to non operation of the existing boilers to be INR 0.775 million from Chartered Accounts certificate dated 26/08/2011. The PP has correctly accounted the opportunity cost relating to the O&M cost and hence the resultant O&M related expense is reduced leading to increase in the IRR and hence conservative.
v)	Borrowing cost (debt) has been linked correctly.
vi)	Depreciable cost and working capital is now linked to the sensitivity analysis for project cost.
vii)	The expense related to salary is now as per the DPR available at the time of investment decision making. PP has revised the boiler efficiency to 80% which is appropriate. Validation team confirmed the offer letter for boiler and the technical specifications which state the boiler efficiency as 80 +/- 2 %. Hence, it is appropriate to consider 80% as the boiler efficiency. Also, the change in boiler efficiency results in a higher IRR which is conservative.
viii)	PP has removed the pre and post operative expense contributed by the technical consulting fee for preparation of DPR (INR 4 million) from the project cost in the revised submission. This is deemed appropriate and conservative.
ix)	The PP has considered an annual escalation of 0.93% calculated as CAGR of the 1st year tariff rate and 10th year tariff rate specified in the CSERC order dated 15/01/2008 applicable at the time of investment decision making. This is deemed appropriate and conservative resulting in higher returns.
x)	Validation team confirmed the MAT rate of 11.33% to be applicable for the financial year 2009-10 in which the PP decided to invest in the project activity from publicly available information.

8. References to resulting changes in the PDD or supporting annexes:	
PDD section B.5, IRR calculation sheet and bench mark spread sheet.	