

24.45 MW BIOMASS BASED PROJECT IN PUNJAB



Document Prepared By Earthood Services Private Limited

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Summary:

Earthood Services Private Limited (hereafter referred to as ESPL) has been contracted by Infinite Solutions (Representative of Project proponent) to conduct the validation of the project - "24.45 MW Biomass based project in Punjab", with regard to the relevant requirements of VCS programme guidelines and standard (VCS standard version 3.7, & VCS program guide version 3.7). Relevant requirements of the UNFCCC for CDM project activities, as well as criteria for consistent project operations, monitoring and reporting has been applied for validation and verification.

The validation includes confirming the implementation of the project activity as described in the VCS PD (Project pipeline ID 1920) and the application of the monitoring methodology as per ACM0006: "Electricity and heat generation from biomass", Version 14.0. A site visit was conducted to verify the implementation of the project activity.

The project activity involves the installation of a 24.45 MW (10.45MW+ 14 MW) biomass (rice husk) based cogeneration system to meet the in-house process steam requirements and displace the electricity that would otherwise being procured from the Indian grid. The project activity is not intended to supply/export the power to the grid. The project activity thus reduces GHG emissions by displacing the fossil fuel dominated Indian grid by generating electricity using renewable sources.

Thus, project activity displaces the equivalent amount of electricity from the grid which is predominantly generated through fossil fuel based power plant. The project activity results in reductions of greenhouse gas (GHG) emissions that are real, measurable, and verifiable and also plays beneficial role in the mitigation of climate change.

The project proponent has applied the baseline and monitoring methodology ACM0006: "Electricity and heat generation from biomass", Version 14.0".

The project activity involves installation of new a cogeneration units consisting of a 125 TPH (50 TPH +75 TPH) boiler and a 24.45 MW (10.45+14) steam turbine in existing facility to generate both steam and power. Project activity to be commissioned in two phases, first phase (10.45MW) was commissioned on 15/09/2017. The same was verified against the commissioning certificates/07/. Second phase of the project activity (14MW) is yet to be commissioned.

The proposed project activity is a Expansion of the paper mill and shall result in an estimated GHG emission reduction of 208,613 tCO₂ annually and a total of 2,086,130 tCO₂e over 10 years of the crediting period. The power generated by the project will be replacing the equivalent amount of electricity from the Grid system of India, which is dominated by fossil fuel based grid connected power plants.

A risk based approach has been followed to perform this combined validation & verification. In the course of validation & verification, 02 Corrective Action request (CARs) and 02 Clarification request (CLs) were raised and successfully closed.

The review of the project design documentation, monitoring report and additional documents related to baseline and monitoring methodology; the subsequent background investigation, follow-up interviews and stakeholders have provided ESPL with sufficient evidence to validate the fulfillment of the stated criteria.

The calculation of the emission reductions is carried out in a transparent and conservative manner, so that the calculated emission reductions of 2,086,130 tCO₂e are most likely to be achieved within the 10 years crediting period.

Validation Conclusion:

The conclusions of this report show, that the project, as it was described in the project documentation, is in line with all criteria applicable for the validation. This validation is based on the information made available to ESPL and the engagement conditions are detailed in this report. No restrictions or uncertainties were identified related to the validation and verification.

ESPL confirms that the project is implemented in accordance with the validated VCS PD. The monitoring system is in place and the emission reductions are calculated without material misstatements. Our opinion relates to the projects GHG emissions and the resulting GHG emission reductions reported and related to the valid and registered project baseline and monitoring and its associated documents.

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1 INTRODUCTION

1.1 Objective

ESPL has been contracted by Infinite Solutions ((Representative of Project proponent, to undertake the validation of the renewable energy project titled “24.45 MW Biomass based project in Punjab”.

The purpose of this validation and verification is to have an independent third party assessment of whether the project activity conforms to the qualification criteria set out in the VCS Version 3.7 standard to attain real, measurable, additional and permanent emission reductions. The validation/verification statement/opinion is a written assurance that:

- The project complies with all the applicable VCS requirements and has the ability to generate the emission reductions stated over the project’s crediting period.
- The validation followed the requirements of the current version of the VCS Standard Version 3.7 and VCS program guide 3.7 to ensure the quality and consistency of the validation work and the report.
- The project has resulted in emission reductions as declared by the organisation or GHG project’s GHG assertion;
- The data reported is accurate, complete, consistent, transparent and free of material error or omission.

1.2 Scope and Criteria

The validation scope is given as an independent and objective review of the project design, the project’s baseline study and monitoring plan which is included in the VCS PD and other relevant supporting documents.

The scope of work covered in the validation is described below:

- To validate whether the project activity meets the requirements of VCS Standard Version 3.7, VCS Validation and VCS program guide 3.7 including additionality, proof of title and compliance with local laws.
- To evaluate whether the baseline and monitoring plan are in conformance with the applied methodology from the VCS approved GHG program
- To confirm that the information presented are completed, consistent, transparent and free of omission or material error
- Background investigation and follow up interviews
- Issuance of draft validation report with CARs, CRs & FARs, if any
- Final validation opinion

The information in the VCS PD is reviewed against the criteria of VCS Standard 3.7, the VCS program guide 3.7 and the approved baseline and monitoring CDM methodology ACM0006, version 14.0.

ESPL has performed validation based on a risk based approach focusing mainly on the significant risks to meet the qualification criteria and the ability to generate Verified Carbon Units (VCUs).

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

1.3 Level of Assurance

The validation has been planned and organized to achieve a

Reasonable level of assurance

Limited level of assurance.

1.4 Summary Description of the Project

The summary of project description is well defined in the VCS PD. The project activity is essentially a capacity expansion in order to meet the increased demand of heat and electricity due to enhanced production (of paper mill) from 300 TPD to 685 TPD. The project is a cogeneration unit with 125 TPH (50 TPH +75 TPH) biomass based boiler and a 24.45 MW (10.45 + 14) MW turbine generator (TG). The generated steam and electricity is used to meet the captive demand of increased capacity of paper plant. The electricity requirement of the project is expected to increase from 488 MWh/day to 1018 MWh/day, which was met by the captive power plants and grid in the pre project scenario. After the implementation of the project activity all electricity requirement will be met from the captive power plants, including the project power plant. There is also an increase in the process heat requirement from erstwhile 11.75 TJ/day by 8.01 TJ/day, which will also be met from the captive sources. The total process heat requirement shall be 19.76 TJ/day.

In the baseline, the increased electricity requirement would have been met through the import from the grid. The increased process heat requirement in the baseline would have been met from a new 95 TPH (30 TPH +60 TPH) coal based boiler which would generate only heat required for the project. Therefore, the emission reductions are accounted, as per applied methodology, for electricity component only. The project description is accurate and complete.

2 VALIDATION AND VERIFICATION PROCESS

2.1 Method and Criteria

For Validation:

The validation process is undertaken by validation team that involves the following:

- The desk review of documents and evidences submitted by the project proponent in context of the reference VCS rules and guidelines,
- Undertaking site visit, interview or interactions with the representative of the project proponent,
- Reporting audit findings with respect to clarifications and non-conformities and the closure of the findings, as appropriate and
- Preparing a draft validation report
- Resolution of outstanding issues and the issuance of final verification report and opinion

In order to ensure transparency, a validation protocol was prepared for the project according to the VVS for PAs version 02.0 verification requirements and VCS Standard version 3.7. The Clarification Requests (CR) were issued where additional information was needed to clarify issues, and Forward Action Requests (FAR) for issues relating to project implementation that required review during the first verification of the project activity.

2.2 Document Review

The validation team has conducted the validation using the VCS Standard and the ACM0006 version 14.0 methodology as the reference criteria. The validation team had done the completeness check of VCS PD submitted by the PP as per the VCS standard Version 3.7 requirements was reviewed. Furthermore, a desk review was also carried out to assess the following:

- Information of project details in compliance with VCS PD
- Appropriateness of methodology ACM0006 version 14.0 applied to the project activity
- Compliance with relevant laws and regulations
- Correctness of application of baseline and monitoring methodology
- Demonstration of additionality
- Monitoring plan described in the VCS PD
- Stakeholder consultation
- Proof of listing of project under pipeline
- Calculation of grid emission factor, etc. where applicable.

The VCS PD version 01 dated 05/06/2019 was initially reviewed and the PP requested to submit the revised documents along with the supporting information and documents. The revised documents and additional supporting documents were further assessed by the validation team. During the validation process, the revised VCS PD /1/ and the supporting documents were assessed to confirm the actions taken by the PP to the CARs and CLs issued.

The validation team has reviewed the final version of the VCS PD Version 02 dated 12/09/2019 to confirm that all changes agreed have been incorporated.

Further, prior to the onsite visit, it was verified by the validation team that the project was listed in the VCS pipeline in line with the requirements (Section 3, Registration and Issuance process, version 3.8) Ref: https://www.vcsprojectdatabase.org/#/pipeline_details/PL1920

2.3 Interviews

The assessment team has carried out interviews in order to verify the information included in the project documentation and to gain additional information regarding the compliance of the project with the VCS requirements. Before and during the on-site visit, the assessment team has interviewed the representatives of the PP to confirm selected information and to clarify issues identified during the document review. Representatives of the PP and O&M contractor were also interviewed. The names and designations of the personnel interviewed are mentioned in section 2.4 below.

The main topics covered during the interview are as follows:

- General Aspects of the project
- Project Implementation

- Equipment and operation
- Staff Training procedures
- Calibration procedures
- Monitoring & Measuring System
- Data collection, recording and archiving procedure
- QA/QC procedures
- VCS documentation
- Emission reduction calculations

2.4 Site Inspections

As part of the validation & verification, an on-site inspection has been performed by the assessment team. The site visit was carried out on 23/08/2019. During the site visit representatives of the PP and O&M contractors were interviewed; i.e. personnel responsible for monitoring of the project activity, data collection and management, and QA/QC procedure. The details of the people interviewed and the topics discussed are mentioned in the table below:

Location: District - Muktsar, State – Punjab	Date: 23/08/2019
Coverage	Source of Information / Persons Interviewed
<p>Project implementation, start date as per the VCS requirements.</p> <p>Electricity Generation Records (monthly energy statements, Invoices)</p> <p>Reliability & accuracy of readings considered for emission reduction calculations, Calibration procedure</p>	<p>Mr. Ajay Jindal (SIL)</p> <p>Mr. Jimmy Sah (Infinite Solutions)</p>
<p>Monitoring and measuring system</p> <ul style="list-style-type: none"> • Collection of measurements • Observations of established practices • Data Verification of monitoring parameters 	<p>Mr. Deepak Sharma (SIL)</p>
<p>QA/QC procedures, data management, internal audits to maintain data quality & reliability, maintenance Practices</p> <p>Consideration of monitoring period, monitoring methodology, project documentation and</p>	<p>Mr. Ajay Jindal (SIL)</p>

emission reduction calculations	
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2.5 Resolution of Findings

As an outcome of the validation process, the team can raise different types of findings:

A Clarification Request (CL) is raised if information is insufficient or not clear enough to determine whether the applicable VCS requirements have been met

Where a non-conformance arises the team leader shall raise a Corrective Action Request (CAR). A CAR is issued, where:

- The project participants have made mistakes that will influence the ability of the project activity to achieve real, measurable additional emission reductions;
- The VCS requirements have not been met;
- There is a risk that emission reductions cannot be monitored or calculated.
- The validation process may be halted until this information has been made available to the team leader's satisfaction. Failure to address a CL may result in a CAR. Information or clarifications provided as a result of a CL may also lead to a CAR. No CL has been raised during the validation of the project activity.

During the validation and verification process, total 02 CARs and 02 CL were raised and resolved satisfactorily. The list of CARs/CLs/FARs raised and the response provided, the mean of validation, reasons for their closure and references to correction in the relevant documents are provided in Appendix 2 of this report

2.5.1 Forward Action Requests

A Forward Action Request (FAR) is raised during validation to highlight issues related to project implementation that require review during the first verification of the project activity. FARs shall not relate to the VCS requirements for registration.

No FAR has been raised during the validation and verification of the project activity.

3 VALIDATION FINDINGS

3.1 Project Details

As per the project type defined by the UNFCCC and VCS standard version 3.7 Guidelines, the project activity is falls under type-I (Renewable energy projects) and the list of Sectoral the sectoral scope 1 - Energy Industries (renewable/ non-renewable sources).

The project activity involves the installation of 24.45 MW turbo - generator along with 125 TPH (50 TPH +75 TPH) biomass-based boilers as new power plant in order to meet increased electricity and process heat demand for the paper mill. The capacity of paper mill has expanded from erstwhile 300 TPD to 685 TPD /36/. The paper mill was meeting the power and process heat requirement from existing boilers and turbines. There were 4 boilers of 45 TPH, 20 TPH, 50 TPH and 75 TPH each. The boiler for 20 TPH and 50 TPH are Chemical Recovery Boilers (CRP). . There were 3 turbines one of 5 MW Condensing another 5 MW based on CRP while a 12.5 MW that were connected to the steam system. The paper mill adequately met entire process steam requirement whereas it relied on import from grid to meet additional power to meet the plant requirements in the past. The name place data and annual reports /51/ of previous years were reviewed and were found consistent with the information given under section 1.8 of VCS PD. Thus, the project activity generates the emission reductions on account of displacing the grid electricity and not on account of meeting process steam. The VCS PD contains clear and information for electricity and heat requirement in the pre project scenario as well in the project case.

Project proponent and other entities involved in the project-

The project activity is developed by Satia Industries Limited (SIL).

Satia Industries Limited is the project proponent and Infinite Solutions is other entity involved in the project activity.

Project start date-

The project start date is 15/09/2017/07/. This was commissioning date first turbine of project activity.

Project crediting period-

The crediting period of the project activity is for 10 years (renewable). The first crediting period is from 15/09/2017 to 14/09/2027.

Project scale and estimated GHG emission reductions or removals-

The estimated annual emission reductions for the project activity are 2,086,130 tCO₂e which is more than 300,000 tCO₂e. Hence the category is applicable under "Large project".

Project location-

The Biomass power project is located in District Muktsar of Punjab state, India.

Geo-coordinates of the project location are verified as: Latitude: 30° 25'43" N and longitude as 74° 31' 22" E

Conditions prior to project initiation-

In the pre-project scenario, the SIL had paper production installed capacity of the plant would be 300 MT per day and total process steam and electricity requirement would be around 11.75 TJ/day and 488 MWh/day, to meet the increased demand for both electricity and process steam due to increase in production capacity, additional power would have been drawn from the connected grid. Thus, the project activity generates the emission reductions on account of displacing the grid electricity and not on account of meeting process steam. The VCS PD contains clear and information for electricity and heat requirement in the pre project scenario as well in the project case.

Project compliance with applicable laws, statutes and other regulatory frameworks:

The project is a voluntary initiative by the project proponent and has not been implemented to meet any local / national laws or regulatory compliances. The project activity is in compliance with current laws and regulations and there are no legal and/or regulatory requirements that prevent the project implementation. Also the validation team has confirmed that there is no such compliance requirement with an emission trading program or any binding limits on GHG emissions for the project activity in India (host country) as it is a non-annex 1 country. The project has obtained valid consents/35/, for the installation and operation from the state nodal agencies and is in compliance with local laws and regulations.

Ownership and other programs-**Right of use**

The project activity is owned by Satia Industries Limited. The ownership of the project activity is verified through the following documents:

- Commissioning certificate /07/
- Purchase order issued by the PP to technology supplier /13 to 16/

Emissions trading programs and other binding limits

The project is not participating in other emission trading programs. The letter of undertaking/28/ has been furnished by project participant confirming that net GHG emission reductions or removals generated by the project will not be used for compliance with an emissions trading program or to meet binding limits on GHG emissions.

Other forms of environmental credit sought or received and eligible to be sought or received:

The project seeking registration under the VCS (Pipeline ID-1920) and not listed under Domestic REC mechanism/26/ as verified from <https://recregistryindia.nic.in/index.php/publics/index>

However, the project is registered under International REC Mechanism (I-REC) and claiming credits since July 2018. The project proponent has submitted a declaration that they would not be claiming credits for any specific monitoring period under any one of the mechanism depending on the market conditions.

Participation under other GHG programs:

Project is seeking registration under VCS only (Pipeline ID-1920). The PP has submitted the declaration/28/ which states that the net GHG emission reductions generated by the project activity will not be used for compliance with any other emissions trading program or to meet binding limits on GHG emissions for the same monitoring period.

Rejection by other GHG programs:

The project has not been rejected by other GHG programs.

Additional information relevant to the project, including:

- Eligibility criteria for grouped projects

The project activity is not a grouped project, hence not applicable to the project activity.

- **Leakage management for AFOLU projects**

Not applicable to the project activity.

- **Commercially sensitive information**

No commercially sensitive information has been excluded from the public version of the project description.

Conclusion:

In view of the assessment of VCS PD and supporting documents as listed in Appendix 1 of this report, the validation team is able to confirm that the description contained in the VCS PD of the project activity provides the reader with a clear understanding of the precise nature of the project activity and the technical aspects of its implementation. Consequently, **ESPL** confirms that the project description of the project contained in the VCS PD/01/ to be complete and accurate. The VCS PD complies with the relevant forms and guidance for completing the VCS PD.

3.2 Participation under Other GHG Programs

The project activity is seeking registration under VCS programme only. The start date of the proposed project activity is 15/09/2017 which is commissioning date of first turbine of the project activity. Hence it can be confirmed that the project is complying with all the applicable VCS rules, including project start date and project crediting period requirements.

During the validation process, the team has reviewed the declaration submitted by the project proponent confirming that GHG emission reduction credits from the Project have not been registered under another GHG program. It can be concluded that the project is eligible to participate under the VCS Program.

3.3 Application of Methodology

3.3.1 Title and Reference

The project, as given in the VCS PD, has applied ACM0006 Version 14.0 and relevant tools prescribed therein. The reference to the versions of the tools and methodology were found to be valid for use. The project is applying tools as referenced in the VCS PD. The steps taken to assess compliance of the project with each applicability condition of the applied methodology applicability conditions are described in this section along with conclusion towards each applicability condition.

3.3.2 Applicability

Criteria-1

This methodology is applicable to project activities that operate biomass (co-)fired power and-heat plants.

The CDM project activity may include the following activities or, where applicable, combinations of these activities:

(a) The installation of new plants at a site where currently no power or heat generation occurs (Greenfield projects);

(b) The installation of new plants at a site where currently power or heat generation occurs. The new plant replaces or is operated next to existing plants (capacity expansion projects);

(c) The improvement of energy efficiency of existing plants (energy efficiency improvement projects), which can also lead to a capacity expansion, e.g. by retrofitting the existing plant;

(d) The total or partial replacement of fossil fuels by biomass in existing plants or in new plants that would have been built in the absence of the project (fuel switch projects), e.g. by increasing the share of biomass use as compared to the baseline, by retrofitting an existing plant to use biomass

The project involves the installation of the 24.45 (10.45 + 14) MW power plants at the project site where currently power and heat generation occurs. The project intends to operate next to existing plant in order to meet the enhance heat and power requirement of the paper mill, where it is situated. Based on the description given in the VCS PD, observations during site visit, reviewed HMBD diagram /13/, it has found to be capacity expansion project and therefore meeting the applicability criteria (b).

Criteria-2

The methodology is applicable under the following conditions:

(a) Biomass used by the project facility is limited to biomass residues, biogas, RDF2 and/or biomass from dedicated plantations;

(b) Fossil fuels may be co-fired in the project plant. However, the amount of fossil fuels co-fired does not exceed 80% of the total fuel fired on energy basis;

(c) For projects that use biomass residues from a production process (e.g. production of sugar or wood panel boards), the implementation of the project does not result in an increase of the processing capacity of raw input (e.g. sugar, rice, logs, etc.) or in other substantial changes (e.g. product change) in this process;

(d) The biomass used by the project facility is not stored for more than one year; (e) The biomass used by the project facility is not processed chemically or biologically (e.g. through esterification, fermentation, hydrolysis, pyrolysis, bio- or chemical degradation, etc.) prior to combustion. Thermal degradation, drying and mechanical processing, such as shredding and palletisation, are allowed

Validation assessment:

(1) The technical specification /09 to 12/ of the project boiler indicate that only rice husk will be used in the power plant. It was also confirmed during the site visit. This criteria is applicable in the context of the project

(2) Though, the project boiler is capable of firing coal but no co-firing is envisaged. The project may use small quantity of diesel or wood chips during the cold boot/start up. The practice was found consistent with other boilers that are already existing and operating at the project site. This criteria is not applicable in the context of the project

(3) The project uses the biomass that is agricultural residue from nearby areas and is not produced from the production system. These technical specifications of the boiler do not allow the usage of other biomass either. This criterion is not applicable in the context of the project.

(4) The actual physical storage area for biomass was witnessed during the site visit and owing to bulky nature (less density) and easy availability in the nearby regions it is not expected that rice husk would be stored for more than a week or two. The industry has maximum possible storage capacity up to 15 days or so for rice husk (biomass) that can be used by all boilers. Therefore, this criterion is applicable and clearly met.

Criteria-3

In the case of fuel switch project activities, the use of biomass or the increase in the use of biomass as compared to the baseline scenario is technically not possible at the project site without a capital investment in: (a) The retrofit or replacement of existing heat generators/boilers; or (b) The installation of new heat generators/boilers; or (c) A new dedicated biomass supply chain established for the purpose of the project (e.g. collecting and cleaning contaminated new sources of biomass residues that could otherwise not be used for energy purposes); or (d) Equipment for preparation and feeding of biomass.

Validation assessment:

As described above, the project is capacity expansion and not a fuel switch project. This criteria, therefore, is not applicable, and suitably indicated in the VCS PD.

Criteria-4

If biogas is used for power and/or heat generation, the biogas must be generated by anaerobic digestion of wastewater, and: (a) If the wastewater generation source is registered as a CDM project activity, the details of the wastewater project shall be included in the PDD, and emission reductions from biogas energy generation are claimed using this methodology;

(b) If the wastewater source is not a CDM project, the amount of biogas does not exceed 50% of the total fuel fired on energy basis.

Validation assessment:

As validated under project description that the project is only using rice husk and no other biomass, therefore, this criterion is not applicable in the context of the project.

Criteria-5

In the case biomass from dedicated plantations are used, the applicability conditions of the methodological tool "Project and leakage emissions from biomass" apply.

Validation assessment:

The rice husk is not coming from dedication plantations but is an agricultural refuse from the crop paddy. This criteria, therefore, is not applicable.

Criteria-6

Finally, the methodology is only applicable if the baseline scenario, as identified per the "Selection of the baseline scenario and demonstration of additionality" section hereunder, is:

(a) For power generation: scenarios P2 to P7, or a combination of any of those scenarios;

(b) For heat generation: scenarios H2 to H7, or a combination of any of those scenarios;

(c) If some of the heat generated by the CDM project activity is converted to mechanical power through steam turbines, for mechanical power generation: scenarios M2 to M5:

(i) In the case of M2 and M3, if the steam turbine(s) are used for mechanical power in the project, the turbine(s) used in the baseline shall be at least as efficient as the steam turbine(s) used for mechanical power in the project;

(ii) In the case of M4 and M5, steam turbine(s) for mechanical power are not allowed for the same purpose in the project;

Validation assessment:

As validated under project description that ,the baseline scenario identified for the project is:

a. Power: P7

b. Heat: H5

c. Mechanical Power - The heat generated by the project activity is not converted into mechanical power. Hence not applicable.

Biomass: B1 and B4.

The project does not involve biomass sourced from dedicated plantation hence not applicable.

Biomass is not used from dedicated plantation area. Hence L1 is not required

As the identified baseline scenarios for Power, Heat and Biomass is permitted, the application of the methodology is justified.

3.3.3 Project Boundary

The project boundary and identified GHG sources, sinks and reservoirs for the project and baseline scenarios (including leakage if applicable) are appropriately defined in the VCS PD. The selection and justification for inclusion or exclusion is appropriate and duly supported by the onsite observation during the physical site visit. In addition to the table, a diagram or map of the project boundary, showing clearly the physical locations of the various installations or management activities taking place as part of the project activity based on the description provided in Section 1.8 is included in the VCS PD. This was confirmed from the HMBD /13,16/ and onsite observations, and name plate data of the key equipment during the site visit.

The project boundary given in the VCS PD was checked from the HMBD /18/, name plate data of the project activity system /09,10/ and were physically verified during the site visit through a walk through inspection. The choices of GHGs are also appropriate to the context of the project description. There is no GHG source that is omitted. The information in the VCS PD under the table 'For each plant generating power and/or heat that would be installed in the absence of the project activity' is clear/substantiated.

3.3.4 Baseline Scenario

The baseline scenarios have been identified using the application of Tool for demonstration and assessment of additionality" (version 7.0) which is as prescribed in the applied methodology. These are discussed under Step 1 (1a and 1b) wherein all the possible alternatives were identified and justification given against that. The list considers all the alternatives that are defined in the applied methodology and therefore confirms the minimum criteria. In the opinion of technical expert, there are no other credible alternatives that can supply electricity and heat than described in the VCS PD. The project is also listed as one of the alternative.

The alternatives to provide electricity, heat and fate of biomass were eliminated in accordance with the methodology one by one. In the opinion of the technical expert the elimination of these alternatives is reasonable and justified when compared to the requirement at paper mill and the location of the project activity.

The potential and realistic alternatives to the project have been identified as

- 1) Project activity itself (i.e. biomass based cogeneration system as defined in the project description)
- 2) Coal based cogeneration system similar to project system
- 3) Biomass based boiler (low pressure) and electricity from the grid and
- 4) Coal based boiler (low pressure) and electricity from grid. These are further discussed under additionality in terms of economical attractiveness.

The procedures for identifying the baseline scenario have been correctly followed and the identified scenario reasonably represents what would have occurred in the absence of the project. The conservativeness principle has been taken into account while determining the baseline scenario e.g. coal based cogeneration system has been ruled out considering the historical practices of the industry. The VCS PD lists Electricity Act 2003, National Electricity Policy 2005 and Tariff Policy 2006 and it has been confirmed that none of these prevent any of the baseline scenario prescribed therein.

The baseline scenario is based on the plant historical record and quotations..

The validation team confirms that the documentary evidences are correctly quoted and interpreted. The assumption and data can be deemed reasonable. The VCS PD considers the national and sectoral policies in effect.

The selected methodology has been correctly applied to identify the baseline scenario as what would happen in the absence of the project and in compliance with the prescription given therein.

3.3.5 **Additionality**

The investment analysis method is used by the PP as prescribed by the applied methodology to demonstrate additionality. An optional Step (Step 2, i.e. Barrier Analysis) has been ruled out by the PP. The approach is in line to methodology and VCS requirements.

There is relevant description given in the VCS PD with regard to adherence to regulatory surplus requirements. In the opinion of the validation team, the project is voluntary initiative and is not forced upon PP by any external reason.

VCS PD has defined the additionality approach (project specific) as per VCS guidance/standard. As described above, the additionality is mainly based on investment analysis as prescribed in the Tool for the demonstration and assessment of additionality Version 7.

Investment Analysis

Investment Comparison Analysis

The project is generating electricity and steam for process, which can be monetized and suitably included in the VCS PD. It has been confirmed that all the plausible options/alternatives require an investment to be made in order to meet the plant requirements for electricity and steam. This is appropriately reflected in the VCS PD.

As discussed above, the project generates the electricity and process steam therefore simple cost analysis is ruled out in the VCS PD, which is in accordance with the applied tool in this regard. Further, considering all the alternatives do require some kind of investment to be made by the PP, therefore investment comparison analysis is considered appropriate in the context of the project. The project, therefore, applied investment comparison analysis, which is appropriate and accepted. The VCS PD includes sufficient justification in this regard.

Benchmark/Discount Rate

The investment decision for the proposed project was taken on 11/11/2015 (10.45 MW) and 02/03/2017 (14 MW) as confirmed from the Board Meeting extracts /36/. The discount rate applied i.e., 9.82% (Phase 1) and 9.75% (Phase 2) in the project, also discussed separately in the table in later in this section, is latest and valid at the time of investment decision and has been taken from the central bank i.e. Reserve Bank of India. The discount rate is publicly available and conservative in particular considering the actual loan disbursement was at 10%.

Financial Indicator

The financial indicator for the project is considered to be Levelized Cost of Energy (referred as LCOE) considering (by converting them into Mega Joules) the electrical output and heat output from all the alternatives during Board Meeting held on 11/11/2015 (10.45 MW) and 02/03/2017 (14 MW) with carbon benefits. Thereafter, the purchase order /11/ for the boiler was placed on 17/12/2015 and 05/04/2017 respectively for Biomass Boilers. The financial indicator selected by the PP is appropriate and the benchmark is identical in all alternatives on which the investment comparison analysis is conducted. The levelized cost has been determined on pre-tax basis. The levelized cost of energy (i.e. financial indicator) for all the alternatives is presented below.

Alternatives	Financial Indicator	Remarks
(Project, Alternative 1)		This alternative is project activity as included in the VCS PD.
Biomass based 14 MW power plant	1.365	
Biomass based 10.45 MW power plant	1.331	
(Alternative 2)		This alternative, though, is the most attractive option for PP. However, it has been excluded to make it consistent with the baseline scenario of chosen with least emissions among alternatives. This is conservative.
Coal based 14 MW power plant	0.657 INR/MJ	
Coal based 10.45 MW power plant	0.660 INR/MJ	
(Alternative 3)		This alternative has been considered as baseline scenario.
Biomass based 60 TPH low pressure boiler and Electricity from Grid	1.320 INR/MJ	
Biomass based 35 TPH low pressure boiler and Electricity from Grid	1.261 INR/MJ	
(Alternative 4)		This alternative, though, is the second

Coal based 60 TPH low pressure boiler and Electricity from Grid	0.818 INR/MJ	most attractive option for PP. However, it has been excluded to make it consistent with the baseline scenario of chosen with least emissions among alternatives. This is conservative.
Coal based 35 TPH low pressure boiler and Electricity from Grid	0.844 INR/MJ	

It has been indicated in the VCS PD that several parameters for example electricity tariff, biomass cost were based on historical records of the plant. The actual historical records and quoted sources were reviewed by the validation team and found to be inconsistent in the draft VCS PD. However, these were later corrected to the values as indicated in the relevant source and therefore were accepted by the validation team. The validation team also reviewed the data that was available after the investment decision date for various parameters in order to ensure the robustness of input values and found them acceptable/satisfactory. The validation of key input parameters for alternative 1 (project) and alternative 3 (baseline) is described below.

Parameter (1)	Unit
Boiler Cost (Biomass based)	million INR
Boiler(75 TPH)	183.30
Boiler(50 TPH)	138.80
The Boiler Cost (75 TPH and 50 TPH) in the VCS PD and corresponding Investment spread sheet was 183.30 million INR and 138.80 million INR respectively. The reported value was validated from Quotation from supplier /23/ and it was found to be consistent. Therefore, the reported value in the revised VCS PD was accepted.	
Parameter (2)	Unit
Turbine Cost	million INR
Turbine (10.45 MW)	195.05
Boiler (14 MW)	234.06
The Turbine Cost for respective capacity in the VCS PD and corresponding Investment spread sheet was validated from Quotation from supplier /09 & 11/. It is confirmed that the reported value (for this parameter) in the most recent version of VCS PD and Investment spread sheet (as mentioned above) is mutually consistent in between and found to be consistent with the referenced source above. Therefore, the reported value in the VCS PD was accepted.	
Parameter (3)	Unit
Boiler Cost (Coal based)	million INR
Boiler (35 TPH)	97.16

Boiler (60 TPH)	146.64
<p>The Boiler Cost (35 TPH and 60 TPH) in the VCS PD and corresponding Investment spread sheet was 97.16 million INR and 146.64 million INR respectively. . The reported value was validated from Quotation by Cheema Boilers Ltd. /10/ and it was found to be consistent. Therefore, the reported value in VCS PD was accepted.</p>	
Parameter (4)	Unit
Fuel cost	INR/tonne
Biomass cost (First phase 10.45 MW)	4522.81
Biomass cost (Second phase 14 MW)	4973.49
<p>The Biomass cost for the respective capacity (10.45 MW commissioned) & 14 MW (to be commissioned) in the VCS PD and corresponding Investment spread sheet was validated from Biomass Prices /06/ and it was found to be consistent. Therefore, the reported value in VCS PD was accepted.</p>	
Parameter (5)	Unit
	kCal/kg
NCV of Biomass cost	3537
<p>The NCV of biomass reported in the VCS PD and corresponding Investment spread sheet was validated from Lab Reports /25/ and it was found to be inconsistent. Therefore, the reported value in VCS PD was accepted.</p>	
Parameter (6)	Unit
Fuel cost	INR/tonne
Coal cost (10.45 MW)	4000
Coal Cost (14 MW)	4320
<p>The Coal cost in the VCS PD and corresponding Investment spread sheet was validated from Coal Quotation /30/ and it was found to be consistent. Therefore, the reported value in VCS PD was accepted.</p>	
Parameter (7)	Unit
	kCal/kg
NCV of coal	5060
<p>The NCV of coal in the VCS PD and corresponding Investment spread sheet was validated from Coal Quotation /30/ and it was found to be inconsistent. Therefore, the reported value in draft VCS PD was not accepted.</p>	
Parameter (8)	Unit
	Percentage
Interest rate	10%

The Interest rate in the VCS PD and corresponding Investment spread sheet was validated from previous loan sanction letter from Bank /19/ and it was found to be consistent. Therefore, the reported value in VCS PD was accepted.	
Parameter (9)	Unit
	%
Salvage value	10
Salvage value is considered as 10% of the total project cost (excluding cost of land lease, erection and commissioning charges as well as transportation charges) as per the As per CERC (Terms and Conditions of Tariff) Regulations 2004, Page 42. These have been added back to the cash flow. This is further validated as per the accounting practises and same has been also cross checked from Section 205 (2b and c) of Companies Act 1956 on the publically available web-link(http://www.indiankanoon.org/doc/1422372/) which allows a depreciable cost of ninety five per cent which implies a consideration of 5% of salvage value as a standard accounting practice. Thus, the consideration by the PP of 10% salvage value is conservative and hence appropriate for the purpose. The appropriateness of this is confirmed by the financial expert involved in the project activity; thus it is accepted.	
Parameter (10)	Unit
	%
Escalation Biomass cost	9.96
The Escalation Biomass cost in the VCS PD and corresponding Investment spread sheet was validated from Annual Reports /24/ and it was found to be consistent. Therefore, the reported value in VCS PD was accepted.	
Parameter (11)	Unit
	INR/kWh
Electricity tariff	6.14 (10.45 MW) 6.03 (14 MW)
Electricity tariff rate in the draft VCS PD and corresponding Investment spread sheet was validated from Annual Reports /51/ and it was found to be consistent. Therefore, the reported value in VCS PD was accepted.	
Parameter (12)	Unit
	%
Plant Load Factor	80
The Plant Load Factor in the VCS PD and corresponding Investment spread sheet was found to be mutually inconsistent. The reported value was validated from theoretical maximum (100%) and it was found that the considered value is conservative. Therefore, the reported value in VCS PD was accepted.	
Parameter (13)	Unit

	%
Efficiency of Biomass boiler	80
The Efficiency of Biomass boiler in the VCS PD and corresponding Investment spread sheet was found to be mutually consistent. The reported value was validated from Boiler system /10/ and it was found to be consistent. Therefore, the reported value in VCS PD was accepted.	
Parameter (14)	Unit
	%
Efficiency of coal based boiler	80
The Efficiency of coal based boiler in the VCS PD and corresponding Investment spread sheet was found to be mutually consistent. The reported value was validated from Boiler system /10/ and it was found to be consistent. Being conservative the efficiency of coal based boiler is kept same as biomass boiler .Therefore, the reported value in VCS PD was accepted.	
Parameter (15)	Unit
	%
Escalation in Coal Cost	6.62
The Escalation in Coal Cost in the draft VCS PD and corresponding Investment spread sheet was validated from Web link /32/ and it was found to be inconsistent. Therefore, the reported value in VCS PD was accepted.	
Parameter (16)	Unit
	MWh/year
Electricity Generation (Project)	193,644
The Electricity Generation (Project) in the VCS PD and corresponding ER spread sheet was found to be mutually consistent. The reported value was validated from calculated /05/ and it was found to be consistent. Therefore, the reported value in VCS PD was accepted.	
Parameter (17)	Unit
Net Quantity of Thermal Energy Generation (Project)	TJ/year
10.45 MW	1126
14 MW	1690
The Net Quantity of Thermal Energy Generation (Project) in the VCS PD and corresponding Investment spread sheet was found to be mutually consistent. The reported value was validated from calculated /04,05/ and it was found to be consistent. Therefore, the reported value in VCS PD are accepted.	
Parameter (18)	Unit
Quantity of Rice Husk required	Tonnes/year

10.45 MW	95,147
14 MW	142,720
The Quantity of Rice Husk required in the VCS PD and corresponding Investment spread sheet was found to be mutually consistent. The reported value was validated from calculated /04,05/ and it was found to be consistent. Therefore, the reported value in VCS PD is accepted.	
Parameter (19)	Unit
Quantity of Rice Husk required in baseline Boiler	Tonnes/year
10.45 MW	60,972
14 MW	104,524
The Quantity of Rice Husk required in the VCS PD and corresponding Investment spread sheet was found to be mutually consistent. The reported value was validated from calculated /04/ and it was found to be consistent. Therefore, the reported value in VCS PD is accepted.	
Parameter (20)	Unit
	%
Escalation in Electricity Tariff	0
There is no escalation in Electricity Tariff is considered in the VCS PD and corresponding Investment spread sheet. This approach is found to be conservative hence accepted.	
Parameter (21)	Unit
Net Quantity of Thermal Energy Generation (Baseline Boiler)	%
35 TPH	722
60 TPH	1237
The Net Quantity of Thermal Energy Generation (Baseline Boiler) in the VCS PD and corresponding Investment spread sheet was found to be mutually consistent. The reported value was validated from calculated and it was found to be consistent. Therefore, the reported value in VCS PD was accepted.	

Sensitivity Analysis

The sensitivity analysis has been conducted on several items, viz., biomass prices, electricity tariff, project cost; O&M cost, biomass NCV, escalation in electricity tariff and biomass prices.. In the opinion of the validation team, the components considered as subject for sensitivity analysis are complete and comply with para 20 of the Guidance on assessment of investment analysis /51/.

A typical range of 10% has been considered for all parameters included for sensitivity. The range is reasonable and complies with the para 21 of the Guidance on assessment of investment analysis /51/. The financial spread sheet in this regard was checked and it is confirmed that the

project activity remains additional (i.e., the baseline scenario remains the most attractive under all realistic and potential variations) if any of the parameter is varied to 10% on either side. Therefore, the robustness of the financial indicator was confirmed. The result of sensitivity analysis between project and identified baseline are suitably included in the VCS PD and corresponding financial spread sheet

For 10.45 MW: Phase 1

Input Parameter	±%	Project (INR/MJ)	Baseline (INR/MJ)
At Base Value of Input parameters	0%	1.331	1.261
Change in Biomass rate	10%	1.457	1.339
	-10%	1.205	1.182
Change in Coal rate	10%	1.331	1.261
	-10%	1.331	1.261
Change in Electricity rate	10%	1.331	1.306
	-10%	1.331	1.215
Change in NCV of Biomass	10%	1.216	1.189
	-10%	1.471	1.347
Change in NCV of Coal	10%	1.331	1.261
	-10%	1.331	1.261
Change in Project cost	10%	1.338	1.262
	-10%	1.324	1.259
Change in O&M cost	10%	1.333	1.261
	-10%	1.329	1.260

For 14 MW: Phase 2

Input Parameter	±%	Project (INR/MJ)	Baseline (INR/MJ)
At Base Value of Input parameters	0%	1.365	1.320
Change in Biomass rate	10%	1.495	1.412
	-10%	1.234	1.227
Change in Coal rate	10%	1.365	1.320
	-10%	1.365	1.320
Change in Electricity rate	10%	1.365	1.357
	-10%	1.365	1.282
Change in NCV of Biomass	10%	1.246	1.235
	-10%	1.510	1.422
Change in NCV of Coal	10%	1.365	1.320
	-10%	1.365	1.320
Change in Project cost	10%	1.370	1.321
	-10%	1.359	1.318
Change in O&M cost	10%	1.366	1.320
	-10%	1.363	1.319

It is unlikely that the variation in the input parameters would surpass the typical range selected and therefore these were accepted. The project remains additional under the sensitivity range considered.

Barrier Analysis, if applicable

Not applicable

Common Practice Analysis

PP has demonstrated common practice analysis as per “Common practice tool” version 03.1. The stepwise approach to validate common practice analysis for the project activity is discussed as below;

As per paragraph 13 of “Tool for the demonstration and assessment of additionality” – Version 7.0.0, project activity belong to measure “Switch of technology with or without change of energy source including energy efficiency improvement as well as use of renewable energies”; hence sub-step 4a) of the tool is applicable for the project activity.

Sub-step 4a): The proposed CDM project activity (ies) applies measure(s) that are listed in the definitions section above

As per sub-step 4a), paragraph 58 of the “Tool for the demonstration and assessment of additionality” – Version 7.0.0, latest version of the “Guidelines on common practice” available on the UNFCCC website shall be applied.

The PP applied latest version 03.1 of “common practice tool” and same has been as below;

Applicable Geographical Area: As per section 4 clause 9 of common practice tool version 03.1

“Applicable geographical area should be the entire host country. If the project participants opt to limit the applicable geographical area to a specific geographical area (such as province, region, etc.) within the host country, then they shall provide justification on the essential distinction between the identified specific geographical area and rest of the host country.”

Applicable Geographical Area: As per section 4 clause 9 of common practice tool version 03.1

“Applicable geographical area should be the entire host country. If the project participants opt to limit the applicable geographical area to a specific geographical area (such as province, region, etc.) within the host country, then they shall provide justification on the essential distinction between the identified specific geographical area and rest of the host country.”

The applicable geographical area has been considered as Punjab state, since applicable power tariff structure for renewable energy projects is unique for all the states across national boundary of India; which is based on Electricity Act 2003 (EA 2003), section 82 which clearly mentions “Every State Government shall, within six months from the appointed date, by notification, constitute for the purposes of this Act, a Commission for the State to be known as the (name of the State) Electricity Regulatory Commission” Appropriateness of the same has been checked and confirmed from EA 2003 (<http://www.cercind.gov.in/08022007/Act-with-amendment.pdf>).

Therefore based on the above discussed objective information validated, it has been concluded that the investment climate for the renewable energy projects varies from State to State within India due to state specific local policy & regulatory framework as outlined by the State Electricity Regulatory Commissions of the respective state. This difference in investment condition leads to essential distinction among solar energy projects between different States of the host country India.

Thus, consideration of the specific geographical area i.e. State Punjab for the common practice analysis of the proposed project activity found to be reasonable and justified.

The PP has submitted the excel spread sheet of common practise analysis/03/ as per steps below for projects identification for similar and different projects and found to be appropriate.

Step 1: calculate applicable capacity or output range as +/-50% of the total design capacity or output of the proposed project activity.

The capacity of the project activity is 24.45 MW; hence applicable output range is 12.225 MW to 36.675 MW.

Step 2: identify similar projects (both CDM and non-CDM) which fulfill all of the following conditions:

- (a) The projects are located in the applicable geographical area;
- (b) The projects apply the same measure as the proposed project activity;
- (c) The projects use the same energy source/fuel and feedstock as the proposed project activity, if a technology switch measure is implemented by the proposed project activity;
- (d) The plants in which the projects are implemented produce goods or services with comparable quality, properties and applications areas (e.g. clinker) as the proposed project plant;
- (e) The capacity or output of the projects is within the applicable capacity or output range calculated in Step 1;
- (f) The projects started commercial operation before the project design document (CDM-PDD) is published for global stakeholder consultation or before the start date of proposed project activity, whichever is earlier for the proposed project activity.

PP had considered 9 projects in applicable geo-graphical area in applicable output range of +/-50% of the total design capacity of 24.45 MW i.e. output range of 12.225 MW to 36.675 MW. The assessment team has checked and confirmed that all these 6 projects have started their commercial operation before start date of the project activity, 15/09/2017.

This data has been sourced from Punjab Energy Development Agency (PEDA) <http://www.peda.gov.in/main/cogeneration.html>. This is cross checked and found to be appropriate, thus it is accepted.

Step 3: within the projects identified in Step 2, identify those that are neither registered CDM project activities, project activities submitted for registration, nor project activities undergoing validation. Note their number N_{all}

Out of the projects identified under step 2, 6 projects are either registered or submitted for registration or undergoing validations. It is checked and confirmed from UNFCCC project database and CDM Pipeline. Hence, $N_{all} = 6$.

Step 4: within similar projects identified in Step 3, identify those that apply technologies that are different to the technology applied in the proposed project activity. Note their number N_{diff}

The PP has considered the projects implemented in different investment climate as different technology. $N_{diff} = 6$

Step 5: calculate factor $F=1-N_{diff}/N_{all}$ representing the share of similar projects (penetration rate of the measure/technology) using a measure/technology similar to the measure/technology used in the proposed project activity that deliver the same output or capacity as the proposed project activity.

Factor $F=1-N_{diff}/N_{all}$

Hence, $F = 1 - 6/6 = 0$

Also $N_{all}-N_{diff} = 0$

As per paragraph 18 of the “Common practice tool” v.03.1 “*The proposed project activity is a “common practice” within a sector in the applicable geographical area if the factor F is greater than 0.2 and $N_{all}-N_{diff}$ is greater than 3*”.

Conclusion:

Thus assessment team had concluded that the project activity is not a common practice in the host country India, as F is less than 0.2 and $N_{all} - N_{diff}$ is lesser than 3. This is found to be appropriate and it is accepted.

3.3.6 Quantification of GHG Emission Reductions and Removals

The quantification methods for GHG emission reductions and removals generated by the project are identified as per the steps prescribed in the applied methodology and tools, wherever relevant. The calculations are included in separate worksheet /4/. These are also included in the VCS PD along with the relevant sources. All the input values used in ex ante emission reductions have been validated from the relevant source and described under relevant parameter, wherever appropriate. The steps included in the ER sheet /4/ were reproducible and found complying the prescription of applied methodology and tool.

Baseline Emissions

The calculation of baseline emissions are conducted a separate sheet /4/ in clear manner that includes all relevant steps as specified in the applied methodology. The project activity has the baseline emissions on account of electricity generation only and no baseline emissions have been estimated by the PP on account on thermal generation or fate of biomass. This was found conservative and complying with the applied methodology.

Project Emissions

The project emissions are calculated in accordance with the methodology. The estimate project emissions for PE_{TRY} , as per relevant tool were found to be **6,046 tCO₂/year**. The project emissions on account of import of electricity $PE_{GR1,y}$ would be monitored and accounted. However, these are estimated to zero as no electricity import is expected for any power plants. Further, the project emissions (PE_{FFy}) on account of fossil fuels consumption e.g., diesel in cold boot or cold start-up are monitored as prescribed (as per Option B) in the 'Tool to calculate project or leakage CO₂ emissions from fossil fuel combustion 'Therefore, in the opinion of validation team, the project emission calculations are justified.

Leakage

The leakages are not applicable in the context of project and validated baseline scenario.

Parameters available at validation	Assessment
Biomass Type & Quantity, Tonnes (dry)	The parameter has been validated based on onsite measurements at plant site. The quantity of rice husk that would have been dumped is estimated to be 246,767 Tonnes, which is derived based on the difference of consumption in project and identified baseline scenario. On the other hand, the quantity of biomass that would have been consumed at the project site in the baseline is 118,448 Tonnes (14 MW) and 69,095 tonnes (10.45 MW). These were found consistent with the designed specifications of project and baseline.

$HG_{BL,BR,CG,y,i}$ GJ	<p>This parameter has been determined as the difference of the enthalpy of the process heat (steam or hot water) generated by the heat generators(s) minus the enthalpy of the feed-water, the boiler blow-down and any condensate return. The validated value is 2,745,503.64 GJ based on the designed conditions.</p>
$HC_{BL,BR,CG,y}$ GJ	<p>Baseline biomass-based process heat cogenerated in year y is calculated as 2,506,673.96 GJ in line with the step 3.2 of the applied methodology.</p>
$EL_{BL,BR,CG,y}$ MWh	<p>This parameter is calculated according to Case 1 of the Step 1.5 for the calculation of baseline emissions of the methodology ACM0006 Version 14: For heat engines with a minimum three-year operational period (2013, 2014, 2015). The validated values are indicated in the VCS PD.</p>
$CAP_{HG,h}$, GJ/h	<p>This parameter reflects the design maximum heat generation capacity (in GJ/h) of the baseline heat generation. The validated values are 821.96 GJ/h in the VCS PD and corresponding ER spread sheet.</p>
$CAP_{EG,CG,i}$, MW	<p>This parameter is the design maximum electricity generation capacity (in MW) of the baseline heat engines (Turbine 1, 2, 3). These are based on the installed capacity of the heat engines as 5 MW, 5 MW and 12.5 MW (Three units). These were validated from the name plate data. These were validated during the site visit.</p>
$LFC_{HG,h}$, Ratio	<p>As per methodology, this parameter should reflect the maximum load factor. PP has chosen the maximum value possible i.e. 1. The selection made by PP is justified.</p>
$HPR_{BL,i}$, Ratio	<p>The values have been calculated according to Step 1.5 of baseline emission calculation of the methodology ACM0006. The validated values are indicated in the VCS PD.</p>
$LFC_{EG,CG,i}$, Ratio	<p>This parameter reflects the maximum load factor (i.e. the ratio between the 'actual electricity generation' of the heat engine and its 'design maximum electricity generation') of the baseline heat engine 1, 2 and 4. The PP has used the last 3 years data (2013, 2014 and 2015 data). The values are the maximum observed values. The detailed calculations as under Step 1.3 were reviewed and found satisfactory.</p>
$NCV_{BR,n,x}$, GJ/Tonne	<p>The validated value of the parameter is 14.80 GJ/Tonne that is based on Lab Results /25/ conducted. The value is an average value and</p>

(dry basis)	therefore justified and accepted.
$EF_{EG,GR,y}$, tCO ₂ /MWh	The emission factors in the CO ₂ database of CEA are compiled specifically for application by grid-connected projects. The emission factors are consistent with Tool to calculate emission factor for an electricity system (Version 7.0). The validated value is 0.91270 tCO ₂ /MWh as per CO ₂ Baseline Database Version 14.
EF_{CO2f} , gCO ₂ /t km	The validated value of the parameter is 245 that are taken from the Tool: Project and leakage emissions from road transportation of freight/29/ and is a default value.
$EF_{FF,y,f}$, tCO ₂ /GJ	The validated value of the parameter is as per IPCC default for Diesel. The upper value has been considered. The applied value is therefore justified.
$HC_{BL,y}$, GJ	The validated value of the parameter is included in the VCS PD and is based on designed specifications of difference in the enthalpy of heat/steam generated and enthalpy of feed water, blow-down and any condensate recovery. The standard values from steam table have been applied and the result is accepted by the validation team.

The VCS PD includes all the parameters that are applied in the estimation of emission reductions.

There are no uncertainties associated with the calculation of emissions.

All estimates of the emission reductions can be replicated using the data and parameter values provided in the project description and complying with the provisions of the applied methodology.

The methodology and any referenced tools have been applied correctly to calculate baseline emissions, project emissions, leakage and net GHG emission reductions and removals. The entire emission reduction calculations have been done in separate worksheet that was reviewed by the validation team and found meeting the requirements.

3.3.7 Methodology Deviations

No methodology deviations identified.

3.3.8 Monitoring Plan

The parameters to be monitored are complete with respect to applied methodology and applied tools in the context of project design. These were found adequate, appropriate and consistent with methodology applied.

<i>Parameters to be monitored</i>	<i>Assessment</i>
$BR_{PJ,n,y}$, Tonnes (<i>dry</i>)	The total quantity of biomass that is expected to utilize in the

	project activity is 246,767 Tonnes/year (in the project activity power plant. The monitoring frequency, methods QA/QC are as prescribed in the applied methodology. The values will be reported on dry basis after accounting the % moisture in the rice husk.
EL _{PJ,gross,y} = Gross quantity of electricity generated in all power plants which are located at the project site and included in the project boundary in year y (MWh)	The value applied is 371,844 MWh/year that is based on maximum designed electricity generation from all the power plants at project site, including project activity. The value is calculated based on designed specifications and therefore accepted. The monitoring frequency, methods QA/QC are as prescribed in the applied methodology and would be separately monitored for each power plant.
Total quantity of electricity consumed by the project during the year y, EL _{PJ,aux,y} , MWh	The value applied is 37,184 MWh/year that is based standard assumption of 10% of maximum designed electricity generation (gross) from all the power plants at project site, including project activity. The value is calculated based on designed specifications and therefore accepted. The monitoring frequency, methods QA/QC are as prescribed in the applied methodology.
EL _{PJ,imp,y} = Project electricity imports from the grid in year y (MWh)	The value applied is 0 MWh/year that is based on consideration that all captive power plants will be able to meet the total electricity requirement. However, these will be monitored in case any electricity is imported as it will be used in project emissions as well as baseline emissions. The monitoring frequency, methods QA/QC are as prescribed in the applied methodology.
NCV _{BR,n,y} = Net calorific value of biomass residue of category n in year y (GJ/tonne on dry-basis)	The validated value of the parameter is 14.80 GJ/Tonne that is based on Lab Results /25/. The value is an average value and therefore justified and accepted. The monitoring frequency once in a year, methods QA/QC are as prescribed in the applied methodology.
Moisture content of each biomass residues type k	The moisture content will be monitored for each batch of biomass of homogeneous quality. The weighted average will be calculated for each monitoring period and used in the calculations. The monitoring frequency, methods QA/QC are as prescribed in the applied methodology.
LOC _y = Length of the operational campaign in year y (hour)	The value applied is 7,920 hours (based on 330 days and 24 hours) of operation. The monitoring frequency, methods QA/QC are as prescribed in the applied methodology.
Return trip distance between the origin and destination of freight transportation activity f in monitoring period	The value applied is 100 km that is based on Biomass Assessment Survey and historical records. The monitoring procedures are as prescribed in the Tool Project and leakage emissions from transportation of freight.

$m, D_{f,m}$	
Total mass of freight transported in freight transportation activity f in monitoring period m , $FR_{f,m}$	The monitoring procedures are as prescribed in the Tool Project and leakage emissions from transportation of freight. The value applied is same as the quantity of biomass used. This will be measured on as received basis.
Quantity of fuel type i combusted in process j during the year y , $FC_{i,j,y}$, (Tonnes)	The monitoring procedures are as prescribed in the 'Tool to calculate project or leakage CO2 emissions from fossil fuel combustion'. There is no value applied in ex ante. However, it will measure in case of complete shutdown, cold boot of power plants.
Weighted average net calorific value of fuel type i in year y , $NCV_{i,y}$, GJ/Ton	The value is taken as IPCC default at the upper limit of uncertainty at 95% confidence interval in accordance with the applied tool for the fuel type 'diesel'. If there are any revisions in IPCC default values, the revised values will be applied.

The monitoring plan as included in the VCS PD covers all the relevant monitoring parameter as required in the context of the project activity and as prescribed in the applied methodology and tools. The monitoring systems and responsibilities are clearly defined in the VCS PD and it gives impression to the validation team that the monitoring plan is feasible and implementable in the context of the project design. The monitoring parameters meet the minimum requirement of the applied methodology/tools in terms of measurement method, frequency and associated quality checks/ cross checks. The procedures for internal auditing and QA/QC are separately defined for each parameter, wherever applicable.

The monitoring plan has not applied sampling on any parameter and all of these are directly monitored or estimated based on monitoring methodology prescribed in applied methodology and tools, as appropriate. The organizational structure, responsibilities and competencies of the personnel that will be carrying out monitoring activities are adequately defined in the VCS PD including the policies for oversight and accountability of monitoring activities. Relevant internal procedures identified for day-to-day records handling (including what records to keep, storage area of records and how to process performance documentation).

It has been included in the VCS PD that all monitored data required for verification and issuance will be kept for two years after the end of the crediting period or the last issuance of VCU, for this project activity, whichever occurs later.

3.4 Non-Permanence Risk Analysis

This is not applicable for the proposed VCS project as it is Non AFOLU project.

4 SAFEGUARDS

4.1 No Net Harm

There is no negative impact to any socio economic conditions of the region due to the project activity. No adverse environmental impact has been envisaged in the project activity, still all the necessary clearances from the state pollution control board, state forest department as well the ministry of environment and forests has been obtained..

4.2 Environmental Impact

The project proponent has mentioned in the PD/01/ that the present project activity does not require EIA to be carried out because as per the schedule 1 of Ministry of Environment and Forest notification dated 14/09/2006 <http://envfor.nic.in/legis/eia/so1533.pdf> and further notification number 3067 from MoEF dated 01/12/2009/52/ <http://moef.nic.in/downloads/rules-and-regulations/3067.pdf> , activities are required to undertake environmental impact assessment studies. The proposed project activity does not fall under the listed categories and hence not required an EIA to be done. The project participant has nevertheless submitted a No Objection Certificates from state nodal agency/35/. Thus the adequacy of the analysis carried out by the project participant for the impact of the implementation of the project activity on the environment has been validated as per paragraphs 126 and 129 of VVS for PAs version 02.0.

The validation team is of the opinion that the project complies with environmental regulations in India.

4.3 Local Stakeholder Consultation

The local stakeholder consultation process has been described in detail, by the PP, in section 5.3 of the VCS PD the project participant identified the relevant stakeholders as Government Officials, Local villagers, Representatives of affected people residing in the project area and local village head.

The relevant stakeholders were invited for local stakeholders' meet that held on 06/09/2017. The meeting minutes /26/ were reviewed and it was noted that villagers did not raise any adverse comments. It was committed by the PP that 2% benefits would be shared with villages once realized.

The local regulations did not require any stakeholder consultation and it was done purely for the purpose of meeting GHG programme requirements. The attendance record /27/ for the event was reviewed and found that villagers and representatives from PP participated and therefore accepted.

Overall, there was agreement among the stakeholders that the proposed project activity would lead to the overall development of the area, mainly by generating employment opportunities and improving the infrastructure leading to an improved life for the villagers. The local stakeholders interviewed during the site visit endorsed this view.

The due account has been taken of the comments as reviewed in the meeting minutes report /26/ of the event. It is also confirmed that local stakeholders were invited by the project proponent to comment on the proposed project activity prior to the submission of the PD for validation.

4.4 Public Comments

In accordance with the requirement in clause 3.17.5 of the VCS standard version 3.7 “All VCS projects are subject to a 30-day public comment period. The date on which the project is listed on the project pipeline marks the beginning of the project’s 30-day public comment period”.

The PP listed their project activity in the VCS pipeline for 30 days from 25/07/2019 24/08/2019 (https://www.vcsprojectdatabase.org/#/pipeline_details/PL1920)/53/ for public comments. No comments received during the commenting period.

5 VALIDATION CONCLUSION

Infinite Solutions has commissioned Earthood Services Private Limited (VVB) for validation service for the VCS project 24.45 MW Biomass based project in Punjab, located in India against the requirement of VCS Program.

The project activity involves the installation of a 24.45 MW biomass (rice husk) based cogeneration system to meet the in-house process steam requirements and displace the electricity that would otherwise being procured from the Indian grid. The project activity is not intended to supply the power to the grid. The project activities thus reduce GHG emissions by displacing the fossil fuel dominated Indian grid by generating electricity using renewable sources.

As a result of validation 02 Corrective Action Requests (CARs), 02 Clarification Requests (CLs) were raised and satisfactorily resolved. There is no Forward Action Request (FAR) raised during the validation process.

The review of the VCS PD, corresponding annexures (ER and Financial Spreadsheet) and additional documents related to baseline and monitoring methodology and subsequent background investigation have provided Earthood Services Private Limited (VVB) with sufficient evidence to validate the fulfilment of the stated criteria.

The validation conclusions can be summarised as under:

- A reasonable level of assurance was applied;
- All data and information used for ex-ante calculation of emission reductions is primarily based on historical in nature and part of which is projected;
- The project is in line with all relevant host country legislation;

- The project additionality is adequately justified in the VCS-PD;
- The monitoring plan is feasible, transparent and adequate;
- No deviations from the selected methodology/tool were applicable/applied;

The calculation of the project's emission reductions was carried out in a transparent and conservative manner, so that the calculated emission reductions of 2,086,130 tCO₂e is most likely to be achieved within the 10 year crediting period with an average annual emission reduction of 208,613 tCO₂e.

The conclusions of this report demonstrate that the proposed VCS project, as described in the VCS PD, conforms to all applicable validation criteria.

Approved by



Dr. Kaviraj Singh
Managing Director
Earthood Services Privated Limited

Date: 14/09/2019
Place: Gurgaon, Haryana

APPENDIX 1: Document References

S. No.	Type of document/reference/evidence	Version	Date/No.
1	VCS PD (draft)	01	05/06/2019
2	VCS PD (final/revised)	02	12/09/2019
3	ACM0006	14.0	29/11/2018
4	ER Spread sheet (revised/final)	02	12/09/2019
5	Financial spread sheet (revised/final)	02	12/09/2019
6	Biomass Assessment Report	-	13/10/2015
7	Commissioning Letter for 10.45 MW TG	-	15/09/2017
8	Commissioning Letter of 50 TPH Boiler	-	29/09/2017
9	Quotation for 10.45 MW Turbine by Siemens	-	05/11/2015
10	Quotation for 50 TPH Boiler by Cheema Boilers	-	09/11/2015
11	Quotation for 14 MW Turbine by Siemens	-	20/02/2017
12	Quotation for 75 TPH Boiler by Cheema Boilers	-	02/02/2017
13	Purchase order for 50 TPH boiler to Cheema Boilers Ltd.	-	17/12/2015
14	Purchase order for 10.45 MW TG to Siemens India	-	05/05/2016
15	Purchase order for the project for 75 TPH boiler to Cheema Boilers Ltd.	-	05/04/2017
16	Purchase order for 14 MW TG to Siemens India	-	20/05/2019
17	% of O & M cost of the project Cost and Escalation in O&M cost, http://pserc.gov.in/pages/background_paper_nrse.html , Chapter 10	-	June 2007, Last accessed on 14/09/2019
18	HMBD (Proposed Project System)	-	Not Applicable
19	Loan Sanction Letter by Punjab National Bank	-	18/02/2017
20	Loan Sanction Letter by Central Bank of India	-	17/12/2016
21	Inflation forecast 10.45 MW Project: https://rbidocs.rbi.org.in/rdocs/Publications/PDFs/S/PF841CA35BE5B648789E690B14B10F47A6.PDF 14 MW Project: https://rbidocs.rbi.org.in/rdocs/Publications/PDFs/S/PF44E080220174E5A5BE8458B4157A19D50B66ED1	-	

	7951.PDF		
22	Salvage value (http://pserc.nic.in/pages/background_paper_nrse.html)	-	-
23	Tool for the demonstration and assessment of additionality	07	23/11/2012
24	http://peda.gov.in/eng/cogeneration.html	-	web link
25	Lab Reports - NCV Biomass	-	29/05/2015, 25/07/2015, 19/03/2016, 11/11/2016
26	Meeting Minutes - Local Stakeholder Consultation	-	06/09/2017
27	Attendance Record - Local Stakeholder Consultation	-	06/09/2017
28	Declaration by PP	-	10/09/2019
29	Tool: Project and leakage emissions from road transportation of freight	1.1.0	23/11/2012
30	Coal NCV Reports and Coal Quotation	-	01/10/2015 & 01/01/2017
31	Electricity Tariff Rate (http://www.pserc.nic.in)	-	2013-16
32	http://www.cercind.gov.in/11012008/Final-Annual-Report.pdf	-	web link
34	CEA Database: CO2 Baseline Database Version 14	-	12/2018
35	NOC for 75 TPH Boiler	-	29/12/2018
36	Board Meeting Extracts (50 TPH Boiler and 10.45 MW TG)	-	11/11/2015
37	Board Meeting Extracts (75 TPH Boiler and 14 MW TG)	-	02/03/2017
38	Plant Data (2013-14, 2014-15, 2015-16)	-	18/07/2019
39	Tool to calculate project or leakage CO2 emissions from fossil fuel combustion	03	22/09/2017
40	Tool to calculate the emission factor for an electricity system	07	-
41	IPCC Default Values	-	2006
42	http://emt-india.com/BEE-Exam/GuideBooks/2Ch1.pdf	-	web link
43	CDM PS for PAs	02.0	29/11/2018
44	CDM VVS for PAs	02.0	29/11/2018
45	VCS Standard	3.7	21/06/2017
46	VCS validation report template	3.4	latest

47	VCS Program Guide	3.7	21/06/2017
48	VCS Program Definitions	3.5	21/06/2017
49	VCS PD Template	3.3	latest
50	Guidelines on the assessment of investment analysis	05	15/07/2011
51	Audited Annual Reports of Paper Mill	-	2012-2015
52	Notification number 3067 from MoEF http://moef.nic.in/downloads/rules-and-regulations/3067.pdf	-	01/12/2009
53	Project VCS webpage https://www.vcsprojectdatabase.org/#/pipeline_details/PL1920	-	-

APPENDIX 02: Abbreviations

	Full text
ata	Atmospheric
BM	Build Margin
BSE	Bombay Stock Exchange
CAPM	Capital Asset Pricing Model
CAR	Corrective action request
CDM	Clean development mechanism
CE	Charter Engineer
CEA	Central Electricity Authority
CERC	Central Electricity Regulatory Commission
CH ₄	Carbon Tetrahydride (Methane)
CL	Clarification request
CM	Combined Margin
CMP	Conference of Parties serving as the Meeting of Parties
CO ₂	Carbone Dioxide
CO ₂ e	Carbone Dioxide equivalent
COP/MOP	Conference of Parties/Minutes of Parties
CP	Conference of Parties
DNA	Designated national authority
DOE	Designated operational entity
DPR	Detail Project Report
EB	Executive Board
EIA	Environmental Impact Assessment
ER	Emission Reduction
FAR	Forward action request
GHG	Greenhouse gas(es)
HCA	Host Country Approval
Hr	Hour
INR	Indian Rupees
IPCC	Intergovernmental Panel on Climate Change
IRR	Interest Rate of Return
ISHC	International Stake-Holder Consultation
KW	Kilo Watt
KWh	Kilo Watt Hour
LoA	Letter of Approval

LSC	Local Stakeholder Consultation
MAT	Minimum Alternate Tax
MNRE	Ministry of New and Renewable Energy
MoEF	The Ministry of Environment & Forests
MP	Monitoring Plan
MT	Metric Tonne
MW	Mega Watt
MWh	Mega Watt Hour
NCV	Net Calorific Value
N ₂ O	Nitrogen Di-oxide
NOC	No Objection Certificate
O &M	Operational and Maintenance
°C	Degree Celsius
OM	Operating Margin
Para	Paragraph
PD	Project Description
PEDA	Punjab Energy Development Agency
PLF	Plant Load Factor
PO	Purchase Order
PP	Project Proponent
PSERC	Punjab State Electricity Regulation Commission
QA/QC	Quality Assurance/Quality Control
RBI	Reserve Bank of India
Rs./KWh or INR/kWh	Indian Rupees per Kilo Watt Hour
SLM	Straight Line Method
t of CO ₂ e or tCO ₂ e	Tones of Carbone Dioxide equivalent
TA	Technical Area
TPA	Tonne Per Annum
TPH	Tonne Per Hour
UNFCCC	United Nations Framework Convention on Climate Change
WACC	Weighted Average Cost of Capital
VCS	Verified Carbon Standard
VCSA	Verified Carbon Standard Association
VCU	Verified Carbon Unit

APPENDIX 03: Competency Statement

Competence Statement	
Name	Ravi Kant Soni
Country	India
Education	B. Tech. (Mechanical Engineering) M. Tech. (Energy Management)
Experience	8 Years +
Field	Energy and Climate Change
Approved Roles	
Team Leader	YES
Validator	YES
Verifier	YES

Methodology Expert	AMS-I.D., AMS-I.C., ACM0002		
Local expert	YES (India)		
Financial Expert	NO		
Technical Reviewer	NO		
TA Expert	YES (TA 1.2)		
Reviewed by	Abhishek Mahawar	Date	01/03/2018
Approved by	Kaviraj Singh	Date	01/03/2018

Competence Statement			
Name	Shreya Garg		
Country	India		
Education	M.Sc. (Climate Science & Policy), TERI University		
Experience	6 Years +		
Field	Climate Change		
Approved Roles			
Team Leader	YES		
Validator	YES		
Verifier	YES		
Methodology Expert	AMS.I.A., AMS.I.C., AMS.I.D., AMS.I.F., AMS.II.D., AMS.II.G., AMS.II.J., AMS.III.AV., ACM0002, ACM0012		
Local expert	YES (India)		
Financial Expert	NO		
Technical Reviewer	YES		
TA Expert	YES (TA 1.2, TA 3.1)		
Reviewed by	Abhishek Mahawar	Date	01/03/2018
Approved by	Ashok Gautam	Date	01/03/2018

Competence Statement	
Name	Ashok Gautam
Country	India
Education	M. Sc. (Environmental Sciences) M. Tech. (Energy & Environmental Management)
Experience	16 Years +
Field	Energy, Climate Change & Environment
Approved Roles	
Team Leader	YES
Validator	YES

Verifier	YES		
Methodology Expert	AMS-I.D., AMS-I.A., AMS-I.C., AMS-I.E, AMS-II.D., AMS-II.G., AMS-III.E., AMS-III.H., AMS-III.Q, AMS-III.Z., AMS-III.AV., AM0029, AM0025, AM0056, ACM0001, ACM0002, ACM0004, ACM0012, ACM0006, AM0018, ACM0009		
Local expert	YES (India)		
Financial Expert	YES		
Technical Reviewer	YES		
TA Expert	YES (TA 1.1, TA 1.2, TA 3.1, TA 13.1)		
Reviewed by	Abhishek Mahawar	Date	01/03/2018
Approved by	Kaviraj Singh	Date	01/03/2018

APPENDIX 04: Findings Overview

Table 1. Remaining FAR from validation and/or previous verification

FAR ID		Section no.	NA	Date :DD/MM/YYYY
Description of FAR				
N/A				
Project participant response				Date :DD/MM/YYYY
Documentation provided by project participant				
DOE assessment				Date: DD/MM/YYYY

Table 2. CL from this verification

CL ID	01	Section no.	4.3	Date : 28/08/2019
Description of CL				
<ol style="list-style-type: none"> 1. Please submit the commissioning certificate and offer received from technology supplier. 2. Please submit the DPR and consent /approvals received from relevant authorities regarding implementation of project activity. 3. Please submit declaration confirming that the GHG Emission reductions or removals generated by the project activity will not be used for compliance with an emission trading program or to meet binding limits on GHG Emissions. 				
Project participant response				Date : 12/09/2019
<ol style="list-style-type: none"> 1. The commissioning certificate along with the offer and actual Purchase orders carried out till today are submitted herewith. 2. The DPR along with consent and approvals received are attached herewith. For phase 1 all the consents and approvals are received, however phase 2 is still under commissioning and the consents received till date are submitted. 3. Declaration is attached herewith. 				
Documentation provided by project participant				
<i>Commissioning Certificates Purchase order for the project Offer letter submitted by Technology supplier DPR for the project Declaration for no double counting.</i>				
DOE assessment				Date: 13/09/2019

The PP has provided the commissioning certificate, offer received from technology supplier and DPR along with the consent /approvals received from relevant authorities regarding implementation of project activity, found to be satisfactory, hence accepted.
 The PP has submitted declaration confirming that the GHG Emission reductions or removals generated by the project activity will not be used for compliance with an emission trading program or to meet binding limits on GHG Emissions.
 CL#1 is closed.

Table 3. CAR from this verification

CAR ID	02	Section no.	3.3.5	Date : 28/08/2019
Description of CAR				
Section 2.5 of VCS PD: Please submit the appropriate evidences for the input parameters used in the investment analysis as presented in. Date of decision making is mentioned as 29/01/2009. Please clarify. Please clarify why latest version of investment analysis guidelines is not referred. Project capacity mentioned under common practice analysis is not consistent with the same indicated at page 1. Please submit IRR and benchmark calculation sheet.				
Project participant response				Date : 12/09/2019
The replies are as follows; Section 2.5 of VCS PD <ul style="list-style-type: none"> • Appropriate evidences for the input parameters used in the investment analysis as presented in the revised VCS PD, the supporting documents for the same are attached herewith for reference. • The error has been corrected; date of decision making is 11th November 2015 for phase 1 while the date for phase 2 is 2nd March 2017. The VCS PD is revised accordingly. • The VCS PD is revised to refer the latest version of investment analysis guidelines. • The common practice analysis is revised to mention the capacity consistently. • The LCOE Sheet is attached herewith, since the project applies Levelised cost of Energy generation thus there is no separate Benchmark assessment for the project. 				
Documentation provided by project participant				
VCS PD Version 2 Decision making for both the phases LCOE sheet for both the phases Common Practice analysis sheet for the project				
DOE assessment				Date: 13/09/2019
Appropriate evidences for the input parameters used in the investment analysis are submitted and found to be acceptable. Date of decision making is corrected in the revised PD, found to be correct. Financial calculations are verified and it is confirmed that applicable investment analysis guidelines is followed. Project capacity mentioned under common practice analysis is corrected and made consistent with the same indicated at page 1. PP has submitted IRR and benchmark calculation sheet, found to be satisfactory, hence accepted. CL #2 is closed.				

CAR ID	03	Section no.	4.3	Date : 28/08/2019
Description of CAR				

Section 5.3 of VCS PD:	
<ol style="list-style-type: none"> 1. Please clarify why the procedures or methods used for engaging local stakeholders e.g dates of announcements or meetings, periods during which input was sought and location of stakeholder meeting not mentioned. 2. Please submit the attendance sheet and MoM of the local stakeholder meeting conducted for the project activity. 	
Project participant response	Date : 12/09/2019
Section 5.3 of VCS PD:	
<ol style="list-style-type: none"> 1. The details along with the procedures and methods used for engaging local stakeholders e.g dates of announcements or meetings, periods during which input was sought and location of stakeholder meeting have been detailed in the revised VCS PD. 2. The evidences for the same along with MOM and attendance sheet are attached herewith. 	
Documentation provided by project participant	
LSC MoM Attendance Sheet	
DOE assessment	Date: 13/09/2019
<p>The project proponent has described procedures used for engaging local stakeholders including dates of announcements or meetings, periods during which input was sought and location of stakeholder meeting in section 5.3 of VCS PD, found to be satisfactory, hence accepted.</p> <p>The project proponent has submitted attendance sheet, invitation letters and MoM of the local stakeholder meeting conducted for the project activity, found appropriate, and hence accepted.</p> <p>CAR #3 is closed.</p>	

CAR ID	04	Section no.	5.2	Date : 28/08/2019
Description of CAR				
<ol style="list-style-type: none"> 1. Please clarify why latest version of CEA baseline database available at the time of listing of project under VCS pipeline is not referred in emission factor calculation. 2. Please submit ER calculation sheet. 3. Actual emission reductions achieved in the current monitoring period are reasonably lower (66.16%) as compared to estimated ERs. Please clarify the reason for the same. 				
Project participant response				Date : 12/09/2019
<ol style="list-style-type: none"> 1. The ER sheet along with the VCS PD have been revised to use the latest version of CEA baseline database version 14. 2. The calibration details of equipment's have been described in the VCS PD. 3. The ER calculation sheet for estimated (validation) is submitted herewith while the actual ERs (verification) shall be submitted later. 4. The Verification for the project shall be carried out later, however the reason for lower emission reductions is that only phase 1 has been commissioned, phase 2 is still under commissioning. 				
Documentation provided by project participant				
CEA Version 14 VCS PD Version 2 ER Sheet				
DOE assessment				Date: 13/09/2019
<p>Latest version of CEA baseline database (V.14) available at the time of listing of project under VCS pipeline is referred in emission factor calculation and found to be acceptable.</p> <p>ER calculation sheet is submitted and found to be satisfactory.</p> <p>CAR #4 is closed.</p>				

Table 4. FAR from this verification

FAR ID	NA	Section No.	NA	Date :DD/MM/YYYY
Description of FAR				

No FAR rose during the verification.	
Project participant response	Date :DD/MM/YYYY
NA	
Documentation provided by project participant	
NA	
DOE assessment	Date: DD/MM/YYYY
NA	