



8MW BIOMASS BASED POWER PLANT AT PHAGWARA



Document Prepared By: LGAI Technological Center, S.A. (Applus+ Certification)

Project Title	8MW biomass based power plant at Phagwara
Version	02
Report ID	TQC 1022

Report Title	8MW biomass based power plant at Phagwara
Client	JCT Limited
Pages	40
Date of Issue	13/01/2023

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Summary:

Verification purpose: The project undertaken by “JCT Limited” was registered with UNFCCC on 17-February-2010¹. The project activity involves the installation of a high-pressure boiler 50 TPH (66 kg/cm² (co-fire coal and rice husk) and an 8 MW condensing cum extraction type turbine generator. The electricity is generated at 11kV and stepped down to 440V for the adjacent textile plant. The boiler is co-fired with coal and rice husk to generate steam, which in turn powers the turbine to generate power. The emission reductions claimed are for electricity generation from rice husk only.

Start date of the project activity is 21-August-2008 (Date of commissioning). An undertaking has been submitted by PP for double counting confirming that no GHG reduction will be claimed in any other GHG mechanism for current monitoring period.

This is the 2nd monitoring report under VCS covers activity from 01-December-2012 to 30-September-2018 (inclusive both days). During the Current Monitoring Period the project activity contributing to the GHG reductions of 227,187 tCO₂e.

VCS crediting period is of 10 years. The start date of crediting period is 01-October-2008 and 30-September-2018 is the end date of the crediting period.

A risk-based approach has been followed to perform this verification activity. In the course of

¹ <https://cdm.unfccc.int/Projects/DB/DNV-CUK1253797520.52/view>

verification, 06 Corrective Action requests (CAR), 01 Clarification Requests (CLs) and 00 Forward action requests (FARs) were raised and successfully closed. The review of the Monitoring report and additional documents related to baseline and monitoring methodology; the subsequent background investigation, follow-up interviews and PP have provided VVB with sufficient evidence to verify the fulfilment of the stated criteria of VCS.

LGAI Technological Center S.A. (Applus+ Certification) (Hereafter referred to as Applus+ Certification) has been appointed by "JCT Limited" to perform the verification of the "8MW biomass based power plant at Phagwara" under VCS standard 4.3 and VCS Program guide version 4.2. The objective of this verification activity is to have an independent third party for the assessment of the project design, monitoring report and Final Verification report and to ensure a thorough assessment of the proposed project activity against the applicable CDM and VCS requirements. In particular; the project's baseline is assessed against applied methodologies "AMC I.C: "Thermal Energy for the user with or without electricity" AMS I.C, "– Version 132. The project's compliance with the requirements of Article 12 of the Kyoto Protocol, the CDM Modalities and Procedures as agreed in the Marrakech Accords under decision 3/CMP.1, the annexes to this decision, subsequent decisions and guidance made by COP/MOP & CDM Executive Board and other relevant rules, including the Host Country legislation and sustainability criteria along with VCS program guide 4.2 and standard, version 4.3

- CDM Validation and Verification Standard for project activities, version 03.0
- CDM Project Standard for project activities, version 03.0
- VCS standard version 4.3
- VCS program guide version 4.2

Verification is a requirement for all VCS projects and is seen as necessary to provide assurance to stakeholders of the quality of the project and its intended generation of verified carbon units (VCUs).

The scope of the verification is the independent and objective review of the monitoring report (MR). The MR is reviewed against the relevant criteria (see above) and decisions by the CDM Executive Board and VCS executive board, including the approved baseline and monitoring methodology. The verification was based on the guidance given in the CDM Validation and Verification Standard for the project activities, version 03.0, review against registered VCS-PD and Final Validation report, CDM Project Standard for project activities, version 03.0; and VCS program guide, version 4.2 and standard version 4.3.

The assessment team has employed a risk-based approach to assess the completeness and accuracy of the claims and conservativeness of the assumptions in the MR. The main focus of the assessment team is to identify the significant risks for the project implementation and the generation of VERs. The verification is not meant to provide any consulting towards the project participants. However, stated requests for clarifications and/or corrective actions may have provided input for improvement of the monitoring report combined.

The only purpose of the verification is its usage during the issuance process as part of the VCS

² <https://cdm.unfccc.int/methodologies/DB/VJWCBOFBX89L3K73D4S1QPUP0UBXGC>

project cycle. Therefore, LGAI Technological Center S.A. (Applus+ Certification) can't be held liable by any party for decisions made or not made based on the verification opinion, which will go beyond that purpose.

The verification has been planned and organized to achieve a Reasonable Level of assurance as per the requirement of VCS. No sampling procedure applied for remote audit or document verifications. The entire documents checked/plant verification conducted to arrive at positive verification conclusions.

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1 INTRODUCTION

1.1 Objective

LGA Technological Center S.A. (Hereinafter referred as Applus+ Certification) has been appointed by “JCT Limited” to perform the 4th periodic verification of the project entitled “8MW biomass based power plant at Phagwara” under VCS standard version 4.3 and program guide version 4.2. The objective of this verification activity is to have an independent third party for the assessment of the project design, monitoring report and final verification report and to ensure a thorough assessment of the proposed project activity against the applicable CDM and VCS requirements. In particular;

The project's baseline plan is assessed against applied methodologies – “Thermal Energy for the user with or without electricity” AMS I.C, – Version 13.

The project’s compliance with the requirements of Article 12 of the Kyoto Protocol, the CDM Modalities and Procedures as agreed in the Marrakech Accords under decision 3/CMP.1, the annexes to this decision, subsequent decisions and guidance made by COP/MOP & CDM Executive Board and other relevant rules, including the Host Country legislation and sustainability criteria along with VCS program guide, version 4.2 and standard version 4.3.

CDM Validation and Verification Standard for project activities, version 03.0

CDM Project Standard for project activities, version 03.0

Verification is a requirement for all VCS projects and is seen as necessary to provide assurance to stakeholders of the quality of the project and its intended generation of estimated verified carbon units (VCUs).

1.2 Scope and Criteria

The scope is defined as an independent and objective review of the Monitoring report (MR) prepared as per the registered VCS-PD and registered approved methodologies Thermal Energy for the user with or without electricity” AMS I.C, – Version 13. The MR is reviewed against the criteria stated in Article 12 of the Kyoto Protocol, the CDM modalities and procedures as agreed in the Marrakech Accords and the relevant decisions by the CDM Executive Board and VCS standard, version 4.3 and VCS Program guide version 4.2, including the approved baseline and monitoring methodologies applied. The verification was based on the requirements in the CDM validation and verification standard for project activities, Version 03.0, CDM Project Standard for project activities, version 03.0, and VCS program guide, version 4.2 and standard version 4.3.

The verification is not meant to provide any consulting towards the project participants. However, stated requests for clarifications and/or corrective actions may have provided input for improvement of the Monitoring report. In line with Guidelines for Application of materiality in verifications, the verification team has conducted a complete verification of all the information presented in the monitoring report and data monitored as presented in the emission reduction calculation spread sheet. There are no material errors, overestimation of ER, omission or misstatement. The verification team has reviewed all the documents like commissioning certificate, Energy generation records, fuel records etc.

1.3 Level of Assurance

The verification has been planned and organized to achieve a Reasonable Level of assurance as per the requirement of VCS. The entire documents checked/Power plant verification conducted to arrive at positive verification conclusions.

1.4 Summary Description of the Project

The project activity located at the JCT textile mills in the state of Punjab, India, involves the installation of a rice husk-based cogeneration plant for captive power generation.

The project activity involves the installation of a high-pressure boiler 50 TPH (66 kg/cm² (co-fire coal and rice husk) and an 8 MW condensing cum extraction type turbine generator. The electricity is generated at 11kV and stepped down to 440V for the adjacent textile plant.

The project involves the installation of a new 8MW condensing cum extraction type turbine generator, along with a 50 TPH (66 kg/cm²) capacity boiler. The boiler is co-fired with coal and rice husk to generate steam, which in turn powers the turbine to generate power. The emission reductions claimed are for electricity generation from rice husk only.

The total emission reductions achieved in this monitoring period i.e. from 01-December-2012 to 30-September-2018 (first and last days included) is 227,187 tCO₂ e.

2 VERIFICATION PROCESS

2.1 Method and Criteria

Verification Process: The project assessment is based on the Clean Development Mechanism Validation and Verification Standard for project activities, version 03.0 and VCS standard 4.3 and VCS program guide, version 4.2 and is conducted using standard auditing techniques to assess the correctness of the information provided by the project participants. Before the

assessment begins, members of the team covering the technical scope(s), sectoral scope(s), and relevant host country experience for evaluating the VCS project activity are appointed.

Once the project is received by the assessment team, the members of the assessment team carried out:

1. A desk review of the monitoring Report against the registered PD;
2. Follow-up interviews with project participant;
3. The resolution of outstanding issues and the issuance of the final verification report and opinion.

The prepared verification report and other supporting documents then undergo an internal quality control at the HQ (Accredited office) before being submitted to the VCS executive board.

In order to ensure transparency, assumptions must be clear and stated explicitly and background material must also be referenced. LGAI Technological Center, S.A. (Applus+ Certification) has developed a specific checklist customized for the project. The checklist demonstrates, in a transparent manner, the project criteria (requirements), discussion on each criterion by the assessment team, and the results from verifying the identified criteria.

Appointment of the assessment team

According to the sectoral scope / technical area and experience in the sectoral or national business environment, LGAI Technological Center S.A. (Applus+ Certification) has composed a project assessment team in accordance with the appointment rules in the internal Quality Management System of LGAI Technological Center S.A. (Applus+ Certification).

The composition of audit team shall be approved by the LGAI Technological Center S.A. (Applus+ Certification) ensuring that the required skills are covered by the team.

The four qualification levels for team members that are assigned by formal appointment rules are as presented below:

- Lead Auditor (LA).
- Auditor (A) / Auditor in Training (AiT)
- Technical Expert (TE)
- Technical Reviewer (TR)

The sectoral scope / technical area knowledge linked to the applied methodology/ies shall be covered by the assessment team.

Name	Role	SS Coverage	TA Coverage	Financial Aspect	Host Country Experience
Pankaj Kumar	LA/TE	YES	YES	NA	YES

Simon Shen	TR	YES	YES	NA	NA
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The complete list of CVs is included as Appendix 3 of this report.

Document review

The Monitoring Report version 1 submitted by the PP was reviewed against the approved methodology, registered CDM PDD, final validation report and other relevant criteria to verify the correctness, credibility, and interpretation of the presented information. Furthermore, a cross-check between information provided and information from other sources has been done. A complete list of all documents and evidence material reviewed is included in this report below in appendix 1.

Follow-up interviews

A remote audit was conducted by LGAI Technological Center S.A. (Applus+ Certification) who performed interviews, telephone conferences with project stakeholders to confirm selected information and to resolve issues identified in the document review. The detail is provided in this report in the below sections.

Resolution of Clarification and Corrective Action Request

The objective of this phase of the Verification was to resolve the requests for corrective actions and clarification and any other outstanding issues which need to be clarified for Applus+ Certification positive conclusion on the Monitoring report. The Corrective Action Requests and Clarification Requests raised by Applus+ Certification were resolved during communications between the Client and Applus+ Certification to guarantee the transparency of the verification process, the concerns raised and responses given are summarized below in the Appendix 2.

The final MR Version 02 submitted by PP on 19-August-2022 serves as the basis for the final assessment presented. Additional changes to the project during the verification process are not considered to be significant with respect to the main CDM/VCS objectives. The two CDM/VCS main objectives are the reduction of anthropogenic GHG emissions and the contribution of sustainable development to the host country.

Internal quality control

As final step of a verification of the final documentation including the final verification report and the checklist have to undergo an internal quality control by the technical review committee, i.e., each report has to be finally approved either by the head of the technical review committee or the deputy. In case one of these two persons is part of the assessment team approval can only be given by the other one to avoid any conflict of Interest.

After confirmation of the project owners, the positive verification opinion and relevant documents are submitted to the VCS secretariat through the VCS web-platform.

2.2 Document Review

The details of the document observed during the verification process are listed below in appendix 1 of this report.

2.3 Interviews

A remote audit (video conferencing) was conducted for the project activity on 11-February-2022. Remote audit was conducted due to ongoing COVID-19 pandemic situation in the entire country of India. Taking into account the rules of relevant national and local authorities (local to the VVB offices as well as to locality of the remote audits), World Health Organization (WHO) recommendations, policies of the VVB and other relevant travel restrictions and guidance (for example, a requirement to self-isolate upon return). Moreover, The VCS Program does not explicitly mandate remote audits as part of the validation and verification process, only that VVBs must achieve a reasonable level of assurance on all validations and verifications (per Section 4.1.2 of the VCS Standard, version 4.3

The VVB has taken alternative measures to reach reasonable level of assurance and conducted remote audit through video conferencing with site personal & consultant (refer section 2.3) with the PP representative. This is also in line with the COVID-19 travel guidance for projects of VERRA.

Verification team has used the following alternative means for its assessment and to justify that they are sufficient for the purpose of verification. Along with desk review, audit team has conducted remote audit interview through video conferencing as follows:

- A complete desk review of the MR, previously registered MR and verification reports, as well as all applicable country legal requirement and supportive evidences have been checked by the verification team.
- Verification team has performed video conferencing interview with PP in order to check implementation, project boundary, current situation, monitoring and metering equipment, monitoring procedures, calibration etc.
- Cross-check evaluation, for information received from interviews, under the scope of all information and references provided in MR and supporting documents.
- A check of the monitoring equipment including performance and observations of monitoring practices against the requirements of the registered PDD and the selected methodology.
- Assessment of data and calculation of emission reductions or net removals (conservativeness, use of calculation methods and assumptions).

All the documents were cross checked to ensure conservative estimation of emission reduction.

During the remote audit through video conferencing, the PP representatives were questioned about the implementation of the project activity. Several topics like the verification of

commissioning date of equipment, generation records, and monitoring of the data and the error accountability were discussed. To cross check the information provided by PP, various documents like technical specifications, commissioning certificates, PPA, Plant records, Energy Generation Record sheets, invoice, calibration certificates etc. were also verified. The names of the persons interviewed during remote audit through video conferencing is given below;

Organization	Name of Persons/Designation	Topics discussed	Team Member
EKI Energy Services Limited	Mr. Manish Dabkara	Project activity implementation Operation, Calibration, O&M practices, ENERGY GENERATION RECORDS etc. LSC mechanism Mechanical maintenance Electrical maintenance Project description Invoicing practices Project activity implementation Operation, Calibration, O&M practices, ENERGY GENERATION RECORDS etc. LSC mechanism Mechanical maintenance Electrical maintenance Project description Invoicing practices MR, ER calculations etc.	Pankaj Kumar
Local Stakeholder	Karmbir		
EKI Energy Services Limited	Mr. Sachin Nagarkar		
Local Stakeholder	Chander Shekhar		
Local Stakeholder	Lalbihari		
JCT Ltd	MR. Ashwani Thapar		

During the remote audit, the PP representatives were questioned about the implementation of the project activity. Several topics like the verification of commissioning date of equipment, the generation, recording, and monitoring of the data and the error accountability were discussed.

Various documents like the energy generation records sheets, plant records, invoices, on-site Photographs includes boiler nameplates, meter specifications, key technical specifications of the major equipment provided to assessment team were verified on video conference call to establish the current status and the implementation of the Project Activity.

2.4 Site Inspections

Remote Audit (Video Conferencing): 11-February-2022				
No.	Activity performed on-site	Site location	Date	Team member
1.	Assessment team checked the implementation of the project, Baseline emission, Emission reduction calculation, technical description of the project and Monitoring. Assessment team also checked that whether the monitoring plan as described in the CDM PDD is actually practised onsite. Also, assessment team checked any change in host country criteria which may affect the baseline of the project activity.	Host Party (ies): India Region/ State/ Province, etc.: Punjab City/ Town/ Community, etc.: Tehsil Phagwara of Kapurthala district,	11-February-2022	Pankaj Kumar

2.5 Resolution of Findings

The objective of this phase of the verification was to resolve the requests for corrective actions and clarification and any other outstanding issues which need to be clarified for LGAI Technological Center S.A. (Applus+ Certification)'s positive conclusion on the project design and Monitoring report. The Corrective Action Requests and Clarification Requests raised by LGAI Technological Center S.A. (Applus+ Certification) were resolved during communications between the Client and LGAI Technological Center S.A. (Applus+ Certification) to guarantee the transparency of the validation process, the concerns raised and responses given are summarized below in the appendix 2.

The final MR Version 02 submitted by project owners on 19-August-2022 serves as the basis for the final assessment presented. Additional changes to the project during the verification process are not considered to be significant with respect to the main CDM/VCS objectives. The CDM/VCS main objectives are the reduction of anthropogenic GHG emissions and the contribution of sustainable development to the host country.

Areas of verification findings	No. of CL	No. of CAR	No. of FAR
Project design document and Monitoring report	01	01	00
Description of project activity	00	00	00
Application of selected baseline and monitoring methodology and selected standardized baseline			
- Applicability of methodology and standardized baseline	00	00	00
- Deviation from methodology	00	00	00
- Clarification on applicability of methodology, tool and/or standardized baseline	00	00	00
Project boundary	00	00	00
Establishment and description of baseline scenario	00	00	00
Demonstration of additionality	00	00	00
Emission reductions	00	00	00
Calibration details	00	00	00
Monitoring plan	00	00	00
No Net harm assessment	00	00	00
Local stakeholder consultation	00	01	00
Others (please specify)-	00	04	00
- Regarding double counting Declaration			
- ER Sheet			
- Supporting documents			
Total	01	06	00

The list of findings and their resolution is presented in appendix 2 of this report.

2.5.1 Forward Action Requests

This is 2nd periodic verification of the project activity and no FAR was raised from previous verification or validation /and during this verification process.

2.6 Eligibility for Validation Activities

This section is not applicable for present verification, as Applus+ Certification holds the accreditation for Validation of projects under this Sectoral Scope.

3 VALIDATION FINDINGS

3.1 Participation under Other GHG Programs

The project activity is first registered under CDM (<https://cdm.unfccc.int/Projects/DB/DNV-CUK1253797520.52/view>) with fixed crediting period as 17-February-2010 to 16-February-2020. The project proponent has not claimed any GHG credits under CDM mechanism during current monitoring period.

The undertaking is provided to confirm that there is no any double accounting for current monitoring period.

Other forms of Credit:

Emission Trading Programs and Other Binding Limits: The PP has not applied this project in any Emission Trading Programs and other Binding Limit.

Other Forms of Environmental Credit: The PP has not applied this project in any other form of environmental credits.

3.2 Methodology Deviations

The project activity has not applied for request for methodology deviation during this monitoring period and the earlier monitoring periods.

3.3 Project Description Deviations

There is no project description deviations applied during current monitoring period. However, as a part of CDM Post Registration Changes, PP had applied for changes to the project design of a registered project and project implementation which were approved by CDM EB through PRC-2998-001³.

3.4 Grouped Project

The project does not involve any addition of new project activity and thus the project do not fall under grouped project.

4 VERIFICATION FINDINGS

4.1 Project Implementation Status

During the remote audit, it was concluded that the project was requested design change and it was approved on 09-October-2012. The design change was effective from 01-October-2010 onwards. The design change is given below,

In the registered project activity, it was estimated that the project activity will be implemented as mentioned in the registered PDD. At the time of registration, it was envisaged that the

³ CDM: 8MW biomass based power plant at Phagwara (unfccc.int)

project will utilize rice husk for 7 months and coal for 4 months in a year. During the first verification period which was of around 7.5 months, the PP had utilized rice husk as the only fuel source for the co-generation facility. The project is running fully on rice husk (without any coal) due to the availability of the same. Hence this project design change is requested because it is envisaged then that the project may run fully on rice husk even upto 11 months without usage of any coal depending on the availability of the rice husk.

During the current monitoring period it was observed that no unforeseen situation evolved which can impact the operation of the project activity. The same was verified through the shutdown summary sheet of the project activity submitted. Scheduled maintenance was carried out as per the instruction of the manufacturer and the same is acceptable to the assessment team. No major equipment has been replaced or exchanged during this period. There was no such event occurred that may impact the GHG emission reductions or removals and monitoring.

Project location is confirmed by the assessment team through interview with PP during remote audit and assessment of monitoring report. Assessment team also checked the technical details of the project site containing latitude and longitude of the project site and confirmed that the details as mentioned in the registered CDM PDD are correct.

Geographical & Physical information of the Project activity

1. Host Party (ies): India
2. Region/ State/ Province, etc.: Punjab
3. City/ Town/ Community, etc.: Tehsil Phagwara of Kapurthala district,
4. Physical/ Geographical location: GPS coordinates 31.2055°N (31°13'11" N) and 75.7752°E (75°45'36"E)

The start date of the project is 21-August-2008 (Date of commissioning).

Ownership and Other Programs

The PP has participated under CDM mechanism of UNFCCC. The UN reference id 2998⁴ of program with this project activity and had claimed CDM benefits for the period of 17-February-2010 to 30-November-2012. The PP would not consider the credit from any other mechanism for the current monitoring period. The undertaking is provided to confirm that there is no any double accounting for current monitoring period.

Emission Trading Programs and Other Binding Limits: The PP has not applied this project in any Emission Trading Programs and other Binding Limit.

⁴ <https://cdm.unfccc.int/Projects/DB/DNV-CUK1253797520.52/view>

Other Forms of Environmental Credit: The PP has not applied this project in any other form of environmental credits.

Verification team was able to verify that authorities and responsibilities for monitoring and reporting of all data related to the emission reductions were clearly defined for the monitoring period from 01-December-2012 to 30-September-2018.

The allocation of the responsibilities is documented in a written form and is followed as described in the registered PDD. Routines for the archiving of data are defined and documented. The electricity generation records were verified and found that the data is consistent with the provided in the final MR/1.2/ and Final ER Sheet. The monitoring plan described in section 4.3 of the MR is confirmed to be correct. All the parameters of the monitoring plan are monitored using appropriate metering system. The verification team has remotely interviewed the plant personnel involved in the monitoring of the parameters that are used to determine the emission reductions of the CER project. It is confirmed based on the interviews and training records that the plant's team is competent enough to monitor the parameters as described in the 'registered' monitoring plan.

As discussed above, the verification team concludes that management and operational system of the project is implemented and operated well. Thus, it ensures the quality of data which is required in calculating the emission reductions.

The Project participant contribution from the project activity towards sustainable development are as explained below:

Social well-being: The project helps in generating employment opportunities during the construction and operation phases. The project activity leads to development in infrastructure in the region like development of roads, telecommunication and also may promote business with improved power generation.

Economic well-being: The project is a clean technology investment in the region, which would not have been taken place in the absence of the VCS benefits the project activity also helps to reduce the demand supply gap in the state. The project activity generates power using biomass based power generation which helps to reduce GHG emissions and specific pollutants like SO_x, NO_x, and SPM associated with the conventional thermal power generation facilities.

Technological well-being: The successful operation of project activity would lead to promotion of biomass based power generation and would encourage other entrepreneurs to participate in similar projects

Environmental well-being: The project activity being a renewable source of energy, it reduces the dependence on fossil fuels and conserves natural resources which are on the verge of depletion. Project activity also helps in avoiding significant amount of GHG emissions.

Thus, the project activity contributes to the sustainable development of the country.

The assessment team observed that the project is in line with the registered CDM PDD and applied methodologies and thus no clarification/deviation is sought. 06 CAR and 01 CL was raised during the verification process. Please refer below Appendix 2 for the detail closure of the CARs.

Assessment team confirms following during the verification remote audit:

1. Start date of the project is 21-August-2008.
2. An undertaking letter has been submitted by PP for no double counting with any other GHG program. PP also has given a written declaration that project will not claim other form of GHG credit for the concerned monitoring period.
3. Assessment team confirms that this is the 2nd monitoring under VCS and covers the activity from 01-December-2012 to 30-September-2018 (first and last days included). VCS crediting period is of 10 years with 01-October-2008 as the start date of crediting period and end date as 30-September-2018.
4. Assessment team checked and found that the Project proponent of the project activity is as below for the current monitoring period:

Organization name	<i>JCT Limited</i>
Contact person	<i>Ashwani Thapar</i>
Title	<i>General Manager</i>
Address	<i>G T Road, Phagwara, Punjab, India - 144401</i>
Telephone	<i>+ (91) 1824 521404</i>
Email	<i>athapar@jctltd.com</i>

Finding: CAR 01, 02, 03, 04, 05 and 06 and CL 00 were raised and successfully closed. Please refer appendix 3 for more information.

4.2 Safeguards

4.2.1 No Net Harm

During remote audit, it was observed and validated by the assessment team that an Environmental Impact Assessment was carried out to investigate, analyze and mitigate the effects caused by the project activity on the surrounding environment. In view of running the project activity as a sustainable one, the project proponent has taken care to follow the rules

and regulations for conservation of environment. In relation to the baseline scenario no negative environmental impacts would arise as a result of the project activity. The positive environmental impacts arising from the project activity are:

1. A reduction in carbon dioxide emissions from the replacement of fossil fuels which would be generated under the baseline scenario
2. A reduction in the emissions of other harmful gases (NO_x and SO_x) that arise from the combustion of coal in power generation
3. A reduction in ash in comparison to the baseline scenario due to the lower ash content of rice husk relative to coal (10-12% versus 30-40% respectively).

The factory meets all environmental legislations as set out by the Punjab Pollution Control Board (PPCB) and there is on-going monitoring of the plant by this state body. A “Consent to Establish” the project activity has been issued and a “Consent to Operate” is obtained prior to commissioning of the plant and renewed every year. The plant has installed ESP at the exit of the boiler to limit suspended particulate matter in the flue gases to less than 150 mg/Nm³. There is also be investment in wastewater systems to treat the water demineralization plant effluent and also the blow down water from the cooling tower and steam generator. Monitoring of air and water quality is undertaken on a regular basis as per Punjab Pollution Control Board guidelines since the plant commissioning. The testing of the environmental parameters is undertaken by an independent third party.

Hence, it was concluded that there is no significant environmental and socio-economic impacts are likely to occur due to the implemented project activity.

4.2.2 Local Stakeholder Consultation

The stakeholder meeting was conducted during registration of the project activity. PP took due care of the comments received during LSC.

The process of local stakeholder consultation is continuous. During the current monitoring period, the project proponent has kept grievance register in plant site office and sought comments/grievances/suggestions from local stakeholders including local community, government agencies and NGOs. However, no major comments/grievances/suggestions have been received from the aforementioned stakeholders during the current monitoring period thus, no any mitigations have been applied

4.3 AFOLU-Specific Safeguards

The project activity deals with generation of electricity using biomass and not from AFOLU projects. Hence not applicable.

4.4 Accuracy of GHG Emission Reduction and Removal Calculations

Means of verification	The verification team assessed whether the data and calculations of GHG emission reductions achieved resulting from the MR. The verification team has checked whether calculations of baseline GHG emissions, project GHG emissions and leakage GHG emissions have been carried out in accordance with the formulae and methods described in the monitoring plan of the CDM PDD and MR.
Findings	CAR#04 and CAR#05 have been raised and resolved successfully.
Conclusion	The verification team has reviewed the emission reduction (ER) spread sheet and checked all the formulae and verified them to be correct and in line with the monitoring plan of the registered PDD and the applied monitoring methodology. All the monitored parameters are described above in section 4.2 of MR. All the ex-ante parameters which are used in the calculation of emission reduction are presented in section 4.1 of the MR transparently. It is confirmed that all the ex-ante parameters have been correctly used in the emission reduction calculation. Baseline Emission The formulae used to calculate the baseline emissions are: $BE_{elec,y} = EG_y * EF_{grid,y}$ BE_{elec,y} Baseline emissions from electricity displaced by project during year y, tCO₂e EG_y Net electricity produced with biomass during the year y, MWh EF_{grid,y} CO₂ emission factor of the grid, tCO₂e/MWh Where: $EG_y = MIN \left[\left(\frac{M_{biomass,y}}{SC_{biomass}} \right) and \left(EG_{total,y} - \left(\frac{M_{coal,y}}{SC_{coal}} \right) \right) \right]$ M_{biomass,y} = Amount of biomass used, tonnes/ year SC_{biomass} = Specific fuel consumption for biomass, tonnes/MWh EG_{total,y} = Net electricity generated from all the fuels in the project activity, MWh M_{coal,y} = Amount of coal used, tonnes/ year SC_{coal} = Specific fuel consumption for coal, tonnes/MWh = MIN [(474,280/1.27) and (289,217.36– (10186/0.77))] = MIN [(373,448.81) and (280,482.48)] = 280,482.48 MWh BE_{elec,y} = 280,482.48*0.81 = 2,27,187 tCO₂e (round down value)

It is noted that the formula and calculation used for baseline emission calculation in the monitoring report and ER sheet is in compliance with the registered PDD. The default values and data used in the monitoring report is in-line with the registered PDD. Hence, acceptable to the verification team.

Project emissions:

$$\begin{aligned}
 PET_y &= N_y \cdot AVD_y \cdot EF_{km,CO_2} \\
 &= 30191 \cdot 125.1 \cdot 0.0012065 \\
 &= 4573.0 \text{ tCO}_2\text{e (round up value)}
 \end{aligned}$$

Where:

PET_y	=	CO ₂ emissions during the year y due to transport of the rice husk to the project plant (tCO ₂ /yr)
N_y	=	Number of truck trips during the year y
AVD_y	=	Average round trip distance (from and to) between the rice husk supply sites and the site of the project plant during the year y (km),
$EF_{km, CO_2, y}$	=	Average CO ₂ emission factor for the trucks measured during the year y (tCO ₂ /km)

It can be seen that $PET_y < 10\%$ of $BE_{elec, y}$ and therefore we do not need to consider project emissions due to transportation as indicated in the para 12 of the "General guidance on leakage in biomass project activities, EB 47, Annex 28.

$$PE_y = 0 \text{ tCO}_2\text{e}$$

Leakage Emission

Energy generating equipment is not transferred from another activity therefore leakage is not considered.

$$L_y = 0 \text{ tCO}_2\text{e}$$

Further,

$$ER_y = BE_y - PE_y - LE_y$$

Where:

ER_y : Emission reductions in year y (tCO₂e/yr)

BE_y : Baseline emissions in year y (tCO₂e/yr)

PE_y : Project emissions in year y (tCO₂e/yr)

So, the emission reductions is equal to baseline emissions

ERy = BEy =2,27,187 tCO2e (round down value)

Hence, net GHG reduction and removals

Year	Baseline emissions or removals (tCO2e)	Project emissions or removals (tCO2e)	Leakage emissions (tCO2e)	Net emission reductions or removals (tCO2e)
01-December-2012 to 31-December-2012	3639.0	0.0	0.0	3639.0
01-January-2013 to 31-December-2013	39,736.0	0.0	0.0	39,736.0
01-January-2014 to 31-December-2014	41,951.0	0.0	0.0	41,951.0
01-January-2015 to 31-December-2015	29,147.0	0.0	0.0	29,147.0
01-January-2016 to 31-December-2016	40,147.0	0.0	0.0	40,147.0
01-January-2017 to 31-December-2017	38,271.0	0.0	0.0	38,271.0
01-January-2018 to 30-September-2018	34,296.0	0.0	0.0	34,296.0
Total	227,187	0.0	0.0	227,187

	During the current monitoring period, actual emission reductions achieved are 227,187 tCO₂e whereas estimated emission reductions was 269,541 tCO₂e. The project witnessed a decrease of 15.7% in emission reductions as compared to ex-ante estimation. Considering, there is no increase in ERs than the estimated amount; it was found acceptable to the assessment team. VVB confirmed that GHG reductions and removals have been quantified correctly and in line with monitoring procedure in CDM PDD and applied methodology.
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4.5 Quality of Evidence to Determine GHG Emission Reductions and Removals

The below tables describe how the parameter, that is to be measured according to the monitoring plan, has been verified to confirm that the actual monitoring complies with the monitoring plan, monitoring data has been thoroughly assessed and that the calibration requirements are met

Parameter	EG _{total} (MWh)
Means of verification	The verification team checked the shutdown/break down log for the monitoring period. During the verification of remote audit, the Calibration details of the monitoring meters are checked with calibration certificates. The reporting frequency is in line with the monitoring plan as outline in the registered PDD and monitoring methodology. Net electricity generation is calculated and the figure i.e., 289,217.36 MWh is arrived by subtracting the auxiliary consumption from the generation of electricity. The generation meter is calibrated once in 3 years and the auxiliary meter is calibrated annually.
Findings	No finding was raised
Conclusion	The parameter has been monitored appropriately, in accordance with the registered monitoring plan (as per measurement methods and procedures to be applied) and applied methodologies. The monitoring results were recorded consistently as per the approved frequency in the monitoring plan.

Parameter	EG _{gen} (MWh)
Means of verification	The reporting frequency is in line with the monitoring plan as outline in the registered PDD and monitoring methodology. The generation meter is calibrated once in 3 years. Gross electricity generation from all the fuels i.e., 331179.18MWh is arrived by subtracting the auxiliary consumption from the generation of electricity. The data is measured continuously and recorded daily.

Findings	No finding was raised
Conclusion	The parameter has been monitored appropriately, in accordance with the registered monitoring plan (as per measurement methods and procedures to be applied) and applied methodologies. The monitoring results were recorded consistently as per the approved frequency in the monitoring plan.

Parameter	EG_{aux} (MWh)
Means of verification	The reporting frequency is in line with the monitoring plan as outline in the registered PDD and monitoring methodology. The auxiliary meter is calibrated annually. Auxiliary consumption i.e., 41961.82 MWh is arrived by subtracting the auxiliary consumption from the generation of electricity. The data is measured continuously and recorded daily.
Findings	No finding was raised
Conclusion	The parameter has been monitored appropriately, in accordance with the registered monitoring plan (as per measurement methods and procedures to be applied) and applied methodologies. The monitoring results were recorded consistently as per the approved frequency in the monitoring plan.

Parameter	M_{biomass,y} (Tonnes)
Means of verification	The reporting frequency is in line with the monitoring plan as outline in the registered PDD and monitoring methodology. Assessment team has cross checked the stores and purchase receipts of rice husk and plant log books during remote site verification for belt weigher and weigh bridge readings which are as per monitoring plan and hence, acceptable. Belt weigher is used to monitor the amount of biomass combusted in the project activity boiler (M_{biomass,y}) as mentioned in the monitoring plan of the registered PDD and monitored value is 474280.0 tonnes. The weighbridge gives reading on the higher side hence PP considers this value. The data is measured continuously and recorded daily.
Findings	CAR#06 has been raised and resolved successfully
Conclusion	The parameter has been monitored appropriately, in accordance with the registered monitoring plan (as per measurement methods and procedures to be applied) and applied methodologies. The monitoring results were recorded consistently as per the approved frequency in the monitoring plan.

Parameter	M_{coal,y} (Tonnes)
Means of verification	The reporting frequency is in line with the monitoring plan as outline in the

	registered PDD and monitoring methodology. Assessment team has cross checked the plant records and purchase receipts of coal which are as per monitoring plan and hence, acceptable. Weigh bridge is used to monitor the amount of coal combusted in the project activity as mentioned in the monitoring plan of the registered PDD and measured value is 10186.0 tonnes. The data is measured continuously and recorded daily.
Findings	No finding was raised
Conclusion	The parameter has been monitored appropriately, in accordance with the registered monitoring plan (as per measurement methods and procedures to be applied) and applied methodologies. The monitoring results were recorded consistently as per the approved frequency in the monitoring plan.

Parameter	N_y (Integer)
Means of verification	The reporting frequency is in line with the monitoring plan as outline in the registered PDD and monitoring methodology. Assessment team has cross checked the plant records which are as per monitoring plan and hence, acceptable. The rice husk usage is monitored through the parameter M_{biomass,y}. Each truck that enters the site is recorded at the weighbridge from which the truck capacity is established. The biomass usage is divided by the truck capacity to arrive at the number of trips i.e., 30191. The data is measured monthly.
Findings	No finding was raised
Conclusion	The parameter has been monitored appropriately, in accordance with the registered monitoring plan (as per measurement methods and procedures to be applied) and applied methodologies. The monitoring results were recorded consistently as per the approved frequency in the monitoring plan.

Parameter	AVD_y (km)
Means of verification	The reporting frequency is in line with the monitoring plan as outline in the registered PDD and monitoring methodology. Assessment team has cross checked the plant records which are as per monitoring plan and verified the value i.e. , 125.10Km and hence, acceptable. The weighbridge is calibrated at regular interval. The data is measured monthly.
Findings	No finding was raised
Conclusion	The parameter has been monitored appropriately, in accordance with the

	registered monitoring plan (as per measurement methods and procedures to be applied) and applied methodologies. The monitoring results were recorded consistently as per the approved frequency in the monitoring plan.
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Parameters Fixed Ex-ante

The following are the ex-ante parameters used in the ER calculation, which are in compliance with registered PDD.

Parameter	Description	Justification
$EF_{grid,y}$ (tCO ₂ /MWh)	CO ₂ emission factor of the grid	The ex-ante value (0.81 tCO ₂ e /MWh) has been determined in the registered PDD as per CEA database version 03 and the emission factor is found to be appropriate. Hence, it is confirmed that the ex-ante details presented on the ex-ante parameter, in the MR is found appropriate
$EF_{grid,BM,y}$ (tCO ₂ e/MWh)	Build margin CO ₂ emission factor for grid connected power	The ex-ante value (0.63 tCO ₂ e/MWh) has been determined in the registered PDD as per CEA database version 03 and the emission factor is found to be appropriate. Hence, it is confirmed that the ex-ante details presented on the ex-ante parameter, in the MR is found appropriate.
$EF_{grid,OM,y}$ (tCO ₂ e/MWh)	Operating margin CO ₂ emission factor for grid connected power generation in year y	The ex-ante value (1.0 tCO ₂ e/MWh) has been determined in the registered PDD as per CEA database version 03 and the emission factor is found to be appropriate. Hence, it is confirmed that the ex-ante details presented on the ex-ante parameter, in the MR is found appropriate.
EF_{km,CO_2} (tCO ₂ /km)	Emission factor for transport of biomass	The ex-ante value (0.0012065 tCO ₂ /km) has been determined in the registered PDD as per 1996 IPCC, Chapter 1 Ref 4, Mobile combustion (1.5.3). The data from the plausible options in Table 1-32 has been chosen most conservatively and the emission factor for transport of biomass is found to be appropriate. Hence, it is confirmed that the ex-ante details presented on the ex-ante parameter, in the MR is found appropriate
$SC_{biomass}$ (tonnes/MWh)	Specific fuel consumption of biomass	The ex-ante value (1.27 tonnes/MWh) has been determined in the registered PDD. The specific fuel consumption is calculated based on specifications of boiler and turbine which has been cross checked with plat records and specification from manufacturers and found appropriate to the assessment team. Hence, it is confirmed that the ex-ante details presented on the ex-ante parameter, in the MR is found appropriate.
SC_{coal}	Specific fuel consumption of	The ex-ante value (0.77 tonnes/MWh) has been

(tonnes/MWh)	coal	determined in the registered PDD. The specific fuel consumption is calculated based on specifications of boiler and turbine which has been cross checked with plat records and specification from manufacturers and found appropriate to the assessment team. Hence, it is confirmed that the ex-ante details presented on the ex-ante parameter, in the MR is found appropriate.
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Calibration of Meter

During the verification assessment of the project activity, accuracy of all the metering have been checked and found appropriate. The installation and working conditions of the meters were checked during the on-site inspection and were found to be satisfactory. Details of meters are provided in below table:

1. Gross Generation Meter - Calibration frequency: Once in three years

Serial No	Accuracy class	Calibration date	Valid till
07348782 L & T	0.5s	17-May-2011	16-May-2014
		06-May-2014	05-May-2017
		15-April-2017	14-April-2020

2. Auxiliary Meter: Calibration frequency: Annual

Serial No	Accuracy class	Calibration date	Valid till
701/0507/PO 5138	1.0	22-October-2012	21-October-2013
		15-October-2013	14-October-2014
		10-October-2014	09-October-2015
		08-October-2015	07-October-2016
		05-October-2016	04-October-2017
		02-October-2017	01-October-2018

3. Belt weigher: Calibration frequency: Annual

Serial No	Accuracy class	Calibration date	Valid till
BCW55LO SI. no.425/08	± 5%	20-April-2012	19-April-2013
		15-April-2013	14-April-2014
		10-April-2014	09-April-2015
		08-April-2015	07-April-2016
		05-April-2016	04-April-2017
		03-April-2017	02-April-2018
		02-April-2018	01-April-2019

4. Weighbridge: Calibration frequency: Annual

Serial No	Accuracy class	Calibration date	Valid till
EB2KW301	± 5Kg	13-December-2011	12-December-2012
		10-December-2012	09-December-2011
		05-December-2013	04-December-2014
		30-November-2014	29-November-2015
		15-November-2015	14-November-2016
		25-October-2016	24-October-2017
		25-September-2017	24-September-2018
		03-August-2018	02-August-2019

The assessment team has verified the monthly invoices, plant log book and calibration certificates and confirmed that only the data recorded through all meters is used to calculate parameters belongs to particular developer and consequently for ER calculations. As verified through the calibration certificates, that meters were working satisfactorily during the current monitoring period. In view of the above discussion the assessment team is able to confirm that evidence used to determine the GHG reductions and removals are sufficient and appropriate with respect to quality and quantity.

4.6 Non-Permanence Risk Analysis

No.	Risk that could lead to material errors, omissions or misstatements	Assessment of the risk		Response to the risk in the verification plan and/or sampling plan
		Risk level	Justification	
1.	Not applicable	Not applicable	Not applicable	Not applicable

5 VERIFICATION CONCLUSION

Applus+ Certification has been engaged by “JCT Limited” to perform the verification of the “8MW biomass based power plant at Phagwara”.

The management of the project participant/owner is responsible for the preparation of the GHG emissions data and the reported/estimated GHG emissions reductions on the basis set out within the project’s Monitoring Plan in the CDM PDD and MR and the approved methodologies.

Our Verification approach was based on the requirements as defined under the Kyoto Protocol, Marrakesh accord, as well as those defined by the CDM Executive Board and VCS Standard version 4.3. Our approach is risk-based, drawing on an understanding of the risks associated with reporting GHG emissions data and the controls in place to mitigate these. The verification can confirm that:

- the project is operated as planned and described in the project document;
- the monitoring plan is as per the applied methodology;
- the monitoring process in Monitoring Report is as per the CDM PDD

- the development and maintenance of records and reporting procedures are in accordance with the monitoring plan
- the monitoring system is in place and generates GHG emission reductions data;
- the GHG emission reductions are calculated without material misstatements.
- A reasonable level of assurance was achieved during the verification.
- No limitation observed for the present verification

Verification period: From 01-December-2012 to 30-September-2018 (first and last date included).

Verified GHG emission reductions and removals in the above verification period:

Year	Baseline emissions or removals (tCO ₂ e)	Project emissions or removals (tCO ₂ e)	Leakage emissions (tCO ₂ e)	Net GHG emission reductions or removals (tCO ₂ e)
01-December-2012 to 31-December-2012	3639.0	0.0	0.0	3639.0
01-January-2013 to 31-December-2013	39,736.0	0.0	0.0	39,736.0
01-January-2014 to 31-December-2014	41,951.0	0.0	0.0	41,951.0
01-January-2015 to 31-December-2015	29,147.0	0.0	0.0	29,147.0
01-January-2016 to 31-December-2016	40,147.0	0.0	0.0	40,147.0
01-January-2017 to 31-December-2017	38,271.0	0.0	0.0	38,271.0
01-January-2018 to 30-September-2018	34,296.0	0.0	0.0	34,296.0
Total	227,187	0.0	0.0	227,187

APPENDIX 1: DOCUMENTS REVIEWED DURING VERIFICATION

No.	Title	References to the document	Provider
1.	Registered CDM PDD and validation report	https://cdm.unfccc.int/Projects/DB/DNV-CUK1253797520.52/view	UNFCCC
2.	Registered VCS PD and validation report	https://registry.terra.org/app/projectDetail/VCS/636	VERRA
3.	Commissioning Certificate	Commissioning of the TG	Project participant
4.	Technical specifications	Technical specifications of TG	Project participant
5.	Initial Monitoring report Final Monitoring report	Version 01, dated 31/01/2022 Version 02, dated 19/08/2022	Project participant
6.	Emission Calculation sheet	Version 01, dated 31/01/2022 Version 02, dated 19/08/2022	Project participant
7.	Tools/ guidelines used in the project activity • VCS Standard, version 4.3	VERRA website	VERRA
8.	Methodology AMS I.C, "Thermal Energy production with or without electricity", version 13	UNFCCC Website	UNFCCC
9.	Calibration details of the project activity undergoing verification	Calibration certificates	Project participant
10.	Plant records for electricity consumption	Plant log book	Project participant
11.	Biomass and Coal invoices	Invoices	Project Participant
12.	Training Records	Training	Project Participant
13.	Employment Records	Salary slip and attendance register	Project Participant
14.	VCS webpage for the project, VCS ID 636	https://registry.terra.org/app/projectDetail/VCS/636	VERRA
15.	No Double Counting Declaration	Declaration from PP	Project participant
16.	Grievance Register	Grievance Register	Project Participant

APPENDIX 2: CORRECTIVE ACTION REQUESTS, CLARIFICATION REQUESTS AND FORWARD ACTION REQUESTS (CAR/CL/FAR)

CL ID	01	Section no.	-	Date: 17-February-2022
Description of CAR				
During review of monitoring report with CDM PDD and previous issuance document. Assessment team observed version of PDD in CDM is gone through PRC. However, information as per the same is not reflected in the MR and parameters are not as per the revised PRC PDD. Thus, PP is requested to clarify the same till CL is raised.				
Project participant response				Date: 19 August 2022
The MR is revised with PRC details				
Documentation provided by project participant				
Revised MR				
VVB assessment				Date: 09-Sep-2022
PP has revised the MR and provided the PRC details in section 3 of the revised version of MR. Hence, CL#01 is closed.				

CAR ID	01	Section no.	4.1	Date: 17-February-2022
Description of CAR				
- During review of monitoring report following inconsistencies observed: - Monitoring report is not inline with VCS MR template v.4.1. Version is not consistent throughout the MR. Corrective action sought. - Section 1.1 of Monitoring report is not inline with the guidelines to complete VCS MR template guidelines v.4.1. thus, corrective action sought. - Date format throughout the MR is not inline with guidelines to complete VCS MR template v.4.1. thus, corrective action sought. - PP is requested to submit copies of Commissioning certificates of the project activity to the assessment team. - PP is requested to submit the technical specifications of installed technologies in the project activity. Corrective action sought.				
Project participant response				Date: 19-August-2022

1. Monitoring report is made inline with VCS MR template v.4.1. Version is made consistent throughout the MR.
2. Section 1.1 of Monitoring report is made inline with the guidelines to complete VCS MR template guidelines v.4.1.
3. Date format throughout the MR is made inline with guidelines to complete VCS MR template v.4.1.
4. Copies of Commissioning certificates of the project activity is submitted to the assessment team.
5. The technical specifications of installed technologies in the project activity are submitted.
Documentation provided by project participant
Revised MR
Commissioning certificates
Technical specifications of installed technologies in the project activity
VVB assessment
Date: 09-September-2022
1. PP has now used the latest version 4.1 of the monitoring template which is found ok.
2. PP has now revised the MR and updated the section 1.1 as per VCS MR guideline.
3. PP has now revised and made the date as per guideline throughout the revised version of the MR. Hence, it is acceptable.
4. PP has provided the copy of commissioning certificate dated 14-April-2022 which is verified and found ok.
5. Technical specification of the boiler and turbine has been provided by the PP to the assessment team and is acceptable.
Hence, CAR#01 is closed.

CAR ID	02	Section no.	4.1	Date: 17-February-2022
Description of CAR				
1. PP is requested to submit an undertaking for no any double accounting for current monitoring period and for project activity is participated in other GHG program other than VCS.				
2. In table 1, PP has provided information related to Sustainable Development contribution made by project activity. However, to verify the same, supporting document is missing i.e., training records etc. thus kindly submit.				
Project participant response				Date: 19-August-2022
1. Undertaking for no double counting is submitted				
2. Supportive documents for Sustainable Development contribution made by project activity are provided				
Documentation provided by project participant				
Undertaking				
Training records				
VVB assessment				Date: 09-September-2022

1. Assessment team has checked the provided documents and found undertaking for no double counting for current monitoring period is missing. From CDM website it has been observed that the project 2998 has claimed the issuance for the same monitoring period 01 Dec 2012 - 30 Sep 2018 as VCS. It has also observed that the project is under 'Awaiting issuance request'. Hence PP needs to clarify how double counting will be avoided for the same monitoring period.
2. PP has not provided training records and employment evidences for sustainable development contribution.
Hence CAR#02 is open.
Project participant response
Date: 15-September-2022
1. The monitoring report for the same monitoring period 01 Dec 2012 - 30 Sep 2018 is webhosted on CDM web page. PP will claim the credits only from VCS mechanism and not from CDM mechanism for this period. PP will claim the credits from CDM mechanism for period 01-October 2018 to 16-February 2020. Undertaking for no double counting is submitted.
2. training records and employment evidences for sustainable development contribution
Documentation provided by project participant
1. Undertaking for no double counting
2. Training records and employment evidences
VVB assessment
Date: 21-September-2022
1. PP has now submitted the undertaking dated 12/09/2022 for no double counting for current monitoring period. Hence, acceptable.
2. PP has now submitted the training records, attendance register and salary slip for employment evidence.
Hence CAR#02 is closed.

CAR ID	03	Section no.	4.2.2	Date: 17-February-2022
Description of CAR				
PP is requested to submit records of ongoing local stakeholder consultation including grievance register etc. Kindly submit.				
Project participant response				Date: 19-August-2022
Records of ongoing local stakeholder consultation including grievance register is submitted				
Documentation provided by project participant				
Records of ongoing local stakeholder consultation and grievance register				
VVB assessment				Date: 09-September-2022
PP has not provided the record of local stakeholder consultation and grievance register.				
Hence, CAR#03 is open.				
Project participant response				Date: 15-September-2022
Record of local stakeholder consultation and grievance register is provided				
Documentation provided by project participant				
record of local stakeholder consultation and grievance register.				
VVB assessment				Date: 21-September-2022
PP has now provided the LSC record and grievance register.				
Hence CAR#03 is closed.				

Accuracy of GHG Emission Reduction and Removal Calculations

CAR ID	04	Section no.	4.4	Date: 17-February-2022
Description of CAR				
In section 4.2 of MR, PP has mentioned ex-post parameters related to the project activity. However, to verify the monitored values of the same, evidence documents are requested to submit to assessment team.				

Project participant response	Date: 19-August-2022
Evidence documents to verify the monitored values of ex-post parameters related to the project activity submitted to assessment team.	
Documentation provided by project participant	
Supportive documents	
VVB assessment	Date: 09-September-2022
PP has not provided the supportive documents i.e purchase receipt of rice husk and coal, transporter receipt etc. for ex-post parameters mentioned in section 4.2 of the MR.	
Hence CAR#04 is open.	
Project participant response	Date:15-September-2022
Invoices for rice husk purchase are provided.	
Documentation provided by project participant	
Invoice for rice husk purchase	
VVB assessment	Date:21-September-2022
PP has now submitted the supportive documents of purchase receipt of rice husk, coal and transportation record.	
Hence CAR#04 is closed.	

CAR ID	05	Section no.	4.4	Date: 17-February-2022
Description of CAR				
PP is requested to submit emission reduction sheet to assessment till CAR is raised and value of achieved emission reduction relevant to the monitoring period is reserved.				
Project participant response				Date: 19-August-2022
Emission reduction sheet is submitted to assessment team.				
Documentation provided by project participant				
Emission Reduction Spreadsheet				
VVB assessment				Date: 09-September-2022
PP has now submitted the ER spreadsheet which has been assessed by the team and found all the value of ER is relevant to this current monitoring period.				
Hence CAR#05 is closed.				

Quality of Evidence to Determine GHG Emission Reductions and Removals

CAR ID	06	Section no.	4.5	Date: 17-February-2022
Description of CAR				
Detailed information related to monitoring equipment is missing in MR. Moreover, supporting documents for the same is also missing. Thus, kindly submit supporting documents i.e., copies of calibration certificate relevant to the current monitoring period.				
Project participant response			Date: 19-August-2022	
Detailed information related to monitoring equipment is provided in revised MR.				
Documentation provided by project participant				
Calibration certificates of monitoring equipment's				
VVB assessment			Date: 09-September-2022	
PP has now revised the MR and provided the calibration details and breakdown details in Appendix 1 and Appendix 2 of the revised version of MR. PP has also submitted the copies of calibration certificates.				
Hence, CAR#06 is closed.				

APPENDIX 3: COMPETENCE OF TEAM MEMBERS AND TECHNICAL REVIEWERS

Verification team member

No.	Role	Type of resource	Last name	First name	Affiliation (e.g. name of central or other office of VVB or outsourced entity)	Involvement in			
						Desk review	On-site inspection	Interview(s)	Verification findings
1.	Lead Auditor/Technical Expert	OR	Kumar	Pankaj	TQC-Outsourced entity	Yes	No	Yes	Yes

Technical reviewer and approver of the verification and certification report

No.	Role	Type of resource	Last name	First name	Affiliation (e.g. name of central or other office of VVB or outsourced entity)
1.	Technical reviewer (TR)	EI	Shen	Simon	Applus+ Certification
2.	Approver	IR	Calle de Miguel	Agustin	Applus+ Certification

Short CVs of the Team:

- Pankaj Kumar** worked as team leader – Bihar for South Asia Climate Proofing and Growth Development (CPGD) – Climate Change Innovation Programme (CCIP) supported by DFID that seeks to mainstream climate change resilience into planning and budgeting at the national and sub-national level in India, Pakistan, Nepal, and Afghanistan. Pankaj Kumar has worked previously with IL&FS Infrastructure Development Corporation and BUIDCO (Bihar Urban Infrastructure Development Corporation), Govt. Of Bihar as Environmental Specialist for WB & ADB funded projects. Prior to this, he worked with Carbon Check (UNFCCC accredited DoE), Johannesburg, RSA as Team Leader for validation, verification of around 100 GHG projects in Asia, Africa, USA, Asia Pacific & Americas. Pankaj is accredited Lead Auditor, Validator, Verifier and Technical Expert for Sectoral Scope/Technical Area – 1.1, 1.2, 3.1 & 13.1 by UNFCCC DoE (Designated Operational Entity), APPLUS, Spain. He is also member of task force on climate change & human health, Health Department, GoB and on roster of UNICEF's WASH experts.

He is an experienced, qualified and result oriented Environment Professional having more than 14 yrs. Of relevant experience in Climate Change (Mitigation & Adaptation), Environmental Due Diligence, Disaster Risk Reduction, Validation and Verification of GHG project under CDM, Verified Carbon Standard, Gold Standard & Social Carbon Standard, Brazil. He provides technical support for environmental investigative, consultative and remedial projects involving air, water and soil, Waste management, EIA, Environmental Compliance, ISO 14001, OHSAS 18001, GHG accounting (ISO 14064) and Carbon foot printing.

Pankaj Kumar is Masters in Environment Management from Forest Research Institute (University), I.C.F.R.E, Dehradun, which is Centre of Excellence in South East Asia for Forestry education & research and PGDEL from National Law School of India University, Bangalore (India).

2. **Mr. Simon Shen:** Mr. Simon Shen (Master's Degree in Thermal Energy Engineering, Bachelor's Degree in Environmental Engineering) is an Auditor appointed by Applus+ LGAI for the GHG project assessment, auditing and technical review. He has more than 6 years of work experience in CDM/GS4GG/VCS project assessment and review with Applus+, apart from the years of experience working as GHG Auditor and ISO 9001/14001 in TUV SUD for 3.5 years before he joined Applus+. Mr. Simon Shen has extensive experience also as former Applus+ Shanghai CDM Technical Manager.

APPENDIX 4: ABBREVIATIONS

Abbreviations	Full texts	
BM	Build Margin	
CAR	Corrective Action Request	
CDM	Clean Development Mechanism	
CER	Certified Emission Reduction(s)	
CL	Clarification Request	
CM	Combined Margin	
CO ₂	Carbon Dioxide	
CO ₂ e	Carbon Dioxide equivalent	
DNA	Designated National Authority	
DR	Document Review	
EF	Emission Factor	
ER	Emission Reductions	
FAR	Forward Action Request	
GHG	Greenhouse gas(es)	
GWP	Global Warming Potential	
PP	Project Participant	
	VVB	Validation/Verification Body

APPENDIX 5: BREAKDOWN DETAILS

Month	Interruption days/ hours	Reason for interruption
Dec-12	Nil	-
Jan-13	Nil	-
Feb-13	Nil	-
Mar-13	6.80 hrs	Boiler PA Fan coupling problem
Apr-13	0.43 days/10.25 hrs	Boiler Stopped due to Bed Coil Leakage
May-13	5.17days/124 hrs	Plant stopped due to Bed Coil Leakage/ Electrical problem in 8mw TG Set
Jun-13	Nil	-
Jul-13	16.26 days/390.25 hrs	Plant stopped due to Boiler Super Heater Tube leakage
Aug-13	2.18 days/52.42 hrs	Boiler stopped due to Super Heater Tube leakage
Sep-13	1.84 days/44.25 hrs	Boiler stopped due to Economiser Tube leakage & TG trip
Oct-13	Nil	-
Nov-13	Nil	-
Dec-13	Nil	-
Jan-14	Nil	-
Feb-14	3.94 days/94.66 hrs	Boiler stopped due to Shaft broken in Head pulley of BC#3 & clinker formation
Mar-14	Nil	-
Apr-14	0.32 days/7.58 hrs	Boiler stopped due to PA Fan bearing damaged
May-14	4 days/96.08 hrs	Boiler stopped due to Planned Shutdown
Jun-14	Nil	-
Jul-14	Nil	-
Aug-14	Nil	-
Sep-14	Nil	-
Oct-14	Nil	-
Nov-14	5.65 days/135.50 hrs	Boiler stopped due to Planned Shutdown
Dec-14	Nil	-
Jan-15	25.756 days/18 hrs	Boiler Stopped due to Major Shutdown (Pressure parts

		replacement)
Feb-15	Nil	-
Mar-15	Nil	-
Apr-15	2.93 days/70.40hrs	Boiler stopped due to planned shutdown
May-15	Nil	-
Jun-15	0.04 days/59 mint	Boiler stopped due to drag chain feeder jammed(Boiler Steam pressure dropped) and TG triped
Jul-15	Nil	-
Aug-15	4.9 days/117.58hrs	Boiler stopped due to planned shutdown
Sep-15	Nil	-
Oct-15	Nil	-
Nov-15	Nil	-
Dec-15	Nil	-
Jan-16	Nil	-
Feb-16	4.92 days/118.17 hrs	Boiler stopped due to planned shutdown
Mar-16	Nil	-
Apr-16	Nil	-
May-16	Nil	-
Jun-16	Nil	-
Jul-16	Nil	-
Aug-16	9.92 days/238.27 hrs	Boiler Stopped due to planned shutdown,clinkar formation, TG tripped, and coal trial
Sep-16	Nil	-
Oct-16	0.003 days/0.08 hrs	Boiler stopped due to Turbine Tripped
Nov-16	Nil	-
Dec-16	6.20 days /148.78 hrs	Boiler Stopped due to planned shutdown and TG tripped
Jan-17	7.65 days/183.5 hrs	Boiler stopped due to Turbine tripped (Electrical Fault) and TG stopped due to sheer pin broken
Feb-17	0.005days/0.13 hrs	Boiler Stopped due to Power Supply Failure
Mar-17	1.34 days/32.25 hrs	Boiler Stopped due to Super Heater & Roof Pannel Tube leakage
Apr-17	15.35days/368.5 hrs	Boiler Stopped due to Super Heater & Roof Pannel Tube leakage and super heater tube failure

May-17	0.145 days/3.50 hrs	Boiler Stopped due to Super Heater Tube leakage
Jun-17	24.5 days/588.33 hrs	Boiler stopped due to Turbine MOP Failure & APH Tube replacement
Jul-17	0.09days/2.17 hrs	Boiler stopped due to Attend Gland leakage in Isolating valve of H.P Header
Aug-17	Nil	-
Sep-17	4.06 days/97.42 hrs	Boiler stopped due to planned shutdown (Turbine pinion replacement)
Oct-17	Nil	-
Nov-17	Nil	-
Dec-17	6.28 days/150.67 hrs	Boiler stopped due to Tube Leakage (Boiler Bank Area)
Jan-18	Nil	-
Feb-18	Nil	-
Mar-18	Nil	-
Apr-18	Nil	-
May-18	5.06 days/121.53 hrs	Boiler stopped due to planned shutdown
Jun-18	0.032days/0.78 hrs	Boiler stopped due to Replace vent valve of Turbine and due to electrical problem
Jul-18	Nil	-
Aug-18	Nil	-
Sep-18	Nil	-