



GRID CONNECTED WIND POWER PROJECT BY M/S. D. J. MALPANI IN RAJASTHAN



Document Prepared by

LGAI Technological Center S.A. (Applus+ Certification)

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Summary:

The project activity is a grid connected wind-based power generation project having 5 WTGs with 1.5 MW capacity each with total installed capacity of 7.5 MW. The project activity is located in Rajasthan state of India. The purpose of the project activities to generate energy electricity by the utilization of solar energy and further selling the generated energy to the Indian grid. In this process there is no consumption of any fossil fuel and hence it does not lead to any greenhouse gas emissions. Thus, electricity would be generated through sustainable means without causing any negative impact on the environment.

LGAI Technological Center S.A. (Applus+ Certification) (Hereafter referred as Applus+ Certification) has been appointed by “M/s DJ Malpani” to perform the Joint validation and verification of the “Grid Connected Wind Power Project by M/s. D. J. Malpani in Rajasthan”.

Revalidation of the Renewal of Crediting Period purpose: The project is registered with VCS with Project ID 1021. Start date of the project activity is the 21-March-2011. The First Crediting Period was from 21-March-2011 to 20-March-2021 and Second Crediting Period chosen 21-March- 2021 to 20-March-2031.

Verification purpose: The main purpose of this verification activity is to have an independent third party for the assessment of the project design, monitoring report to ensure a thorough assessment of the proposed project activity against the applicable CDM and VCS requirements.

Start date of the project activity is the 21-March-2011. On this day the 1st WTG was commissioned. The monitoring period for this VCS verification is 01-September-2020 to 31-August-2021 (including both days) and the project activity achieved 9,721 tCO_{2e} emission reductions during this monitoring period thereon displaced 10,366.817 MWh amount of electricity from the generation-mix of power plants connected to the Indian Grid, which is mainly dominated by thermal/fossil fuel-based power plant.

Monitoring period of first crediting period is 01-September-2020 to 20-March-2021 and VCUs generated during this period is 2,262 tCO₂.

Monitoring period of second crediting period is 21-March-2021 to 31-August-2021 and VCUs generated during this period is 7,459 tCO₂.

The scope of the verification is the independent and objective review of the Joint Project Description (PD) and Monitoring Report (MR). The joint PD & 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 project activities, version 03.0, review against previous registered project documents, CDM Project Standard for project activities, version 03.0, CDM project cycle procedure for project activities, version 03.0, VCS program guideline version 4.0 and VCS Standard version 4.1.

A risk-based approach has been followed to perform this RCP validation and verification activity. In the course of verification, 07 Corrective Action request (CAR) and 00 Clarification Requests (CLs) were raised and successfully closed. No FAR was raised during this RCP validation and verification. The review of the joint PD & MR and additional documents related to baseline and monitoring methodology; the subsequent background investigation, follow-up interviews and PP have provided LGAI Technological Center S.A. (Applus+ Certification) with sufficient evidence to verify the fulfilment of the stated criteria of VCS.

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

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INTRODUCTION

1.1 Objective

LGAI Technological Center S.A. (Hereafter referred as Applus+ Certification) has been appointed by “M/s D J Malpani” to perform the RCP validation and verification of the “Grid Connected Wind Power Project by M/s. D. J. Malpani in Rajasthan” under guideline version 4.0 and VCS standard version 4.1. The objective of this validation for renewal of crediting period and verification activity is to have an independent third party for the assessment of the project design, Joint PD & MR and Final Joint Validation and 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 “AMS-I. D, of version 16.0” (MP: 01-September-2020 to 20-March-2021)
- The project's baseline is assessed against “AMS-I. D of version 18.0 (MP: 21-March-2021 to 31-August-2021)
- The project’s monitoring plan is assessed against “AMS-I. D of version 16.0”(MP: 01-September-2020 to 20-March-2021)
- The project’s monitoring plan is assessed against “AMS-I. D of version 18.0” (MP: 21-March-2021 to 31-August-2021)
- the projects 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 guideline version 4.0 and standard version 4.1
- CDM validation and verification standard for project activities, Version 03.0
- CDM Project Standard for project activities, version 03.0
- CDM project cycle procedure for project activities, version 03.0
- VCS program guideline v4.0
- VCS standard v4.1

Revalidation is seen as necessary to provide assurance to stakeholders on the quality of the project and its intended generation of verified emission reductions (VERs) for the renewed crediting period & 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 emission reductions (VERs).

1.2 Scope and Criteria

The scope is defined as an independent and objective review of the Joint PD and Monitoring report (MR) is prepared as per the approved methodology AMS-I.D version 16 & AMS-I.D, version 18.0 for the 2nd crediting period and also followed the registered VCS PD and applied methodology AMS-I,D, version 16 The Joint VCS PD and 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 4,1 and guideline version 4.0, including the approved baseline and monitoring methodology AMS-I.D version 16 & AMS-I.D, version 18.0 The RCP validation & 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, CDM project cycle procedure for project activities, version 03.0 and VCS program guideline version 4.0 and VCS standard version 4.1

The validation & 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 Joint VCD PD and Monitoring report. In line with Guidelines for Application of materiality in validation & verifications, the validation/verification team has conducted a complete verification of all the information presented in the Joint VCS PD and monitoring report and data presented ex-ante Emission reduction sheet and monitored data presented in the emission reduction calculation spread sheet. It invoices follows the paper trail back to the raw data such as meter reading records and invoices. There are no material errors, overestimation of ER, omission or misstatement. The validation/verification team has reviewed all the documents like commissioning certificates, Monthly Meter Readings, electricity sales records etc.

1.3 Level of Assurance

The validation/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 through site photographs shared by PP to arrive at positive validation and verification conclusions.

1.4 Summary Description of the Project

The project activity includes installation of wind power project of total capacity of 7.5 MW which includes 5 WTG of 1.5 MW capacity each. 5 Wind Turbine Generators (WTGs) .5 MW capacity each. The project activity is located in Jaisalmer districts of Rajasthan state of India.

The project activity supplying the generated electricity to unified Indian grid. The purpose of the project activity is to generate electrical energy through sustainable means using wind power resources. The project activity is estimated to generate 14,374 MWh of electricity annually, thus reducing GHGs to the tune of 13,433 tCO₂/ annum for entire crediting period of 10 years. .

The start date of operation of the project activity is 21-March-2011, which is the earliest date of commissioning of the *windmill* of the project activity and 30-March-2011 which is date of the commissioning of the last WTG of the project activity.

Expected annual and total emission reductions during the proposed renewed crediting period are 13,433 tCO_{2e} and 134,330 tCO_{2e} respectively. In current monitoring period from 01-September-2020 to 31-August-2021 (First and last date included) the project activity has supplied 10,366.817 MWh of electricity resulting in GHG emission reductions of 9,721 tCO_{2e}.

2 VALIDATION AND VERIFICATION PROCESS

2.1 Method and Criteria

Validation and Verification Scope: The scope is defined as an independent and objective review of the Joint VCS PD & Monitoring report. The RCP VCS PD and 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 4.1 and guideline version 4.0, including the approved baseline and monitoring methodology AMS-I.D (Version 16) and AMS-I.D, (Version 18). The validation and verification were based on the requirements in the Validation and Verification Standard for project activities, version 03.0, Project standard for project activities, version 03.0, and VCS guideline version 4.0 and standard, version 4.1.

The validation and verification are 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 combined project description and the Monitoring report

Validation and 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 Version 4.1 and VCS guideline, version 4.0 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:

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

The prepared Joint RCP validation and 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
Jitendra Mohan Singh	LA/TE	YES	YES	NA	YES
Mr. Denny Xue	TR	YES	YES	NA	NA

The complete list of CVs is included as Appendix 3 of this report.

Document review

The Joint PD & MR version 1 submitted by the PP was reviewed against the approved methodology 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, video conferencing 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 Joint RCP PD and MR Version 02 dated: 22-October-2021 submitted by PP 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 Joint Validation & Verification of the final documentation including the final Joint validation & 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 RCP validation and verification process are listed in appendix 1 of this report.

2.3 Interviews

A remote audit was conducted for the project activity on 12-October-2021. Remote audit was conducted due to on-going COVID-19 pandemic situation in the entire state of India. Taking into account the rules of relevant national and local authorities (local to the DOE offices as well as to locality of the site visits), World Health Organization (WHO) recommendations, policies of the DOE and other relevant travel restrictions and guidance (for example, a requirement to self-isolate upon return). Moreover, The VCS Program does not explicitly mandate site visits 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, v4.1.

The VVB has taken alternative measures to reach reasonable level of assurance and conducted remote audit through Skype/Telephone 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.

Technical details & metering/monitoring arrangement verified through onsite photographs/name plates and calibration certificates shared by PP. All the documents were cross checked to ensure conservative estimation of emission reduction.

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 meters, the generation, recording, 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, JMR sheets, invoice, calibration certificates, s, etc. were also verified. The names of the persons interviewed during remote audit through MS team & telephonic interview is given below;

No.	Interviewee			Date	Subject	Team member
	Last name	First name	Affiliation			
1.	Durgavale	Mr. Sagar	Site In-charge	12-October-2021 (Through Skype video conference call)	Project Implementation, JMR & invoicing procedure, calibration, grievance mechanism, Management practices, data storage, QA/QC	Mr. Jitendra Mohan Singh
2.	Banker	Mr. Kailash	DGM			
3.	Sharma	Barun	Consultant EKI Energy Services Ltd.			
4.	Ghosh	Bibhushita				

2.4 Site Inspections

Duration of Remote Audit: 12-October-2021 (Via video conferencing)				
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 VCS PD is actually practised onsite. Also, assessment team checked any change in host country criteria which may affect the baseline of the project activity.	Jaisalmer District, Rajasthan States, India (Through Skype Video conference call)	12-October-2021	Mr. Jitendra Mohan Singh

2.5 Resolution of Findings

The objective of this phase of the Validation and Verification was to resolve the requests for corrective actions and clarification and any other outstanding issues from previous validation which need to be clarified for Applus+ Certification's 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 Joint PD & MR Version 02 submitted by PP 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.

Areas of validation and verification findings	No. of CL	No. of CAR	No. of FAR
Project design document and Monitoring report	00	01	00
Description of project activity	00	02	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	01	00
Demonstration of additionality	00	00	00
Emission reductions	00	02	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	00	00

Areas of validation and verification findings	No. of CL	No. of CAR	No. of FAR
Total	00	07	00

The list of findings and the resolution is presented in Appendix 2 of this report.

2.5.1 Forward Action Requests

NO FAR was raised during the earlier validation and verification.

3 VALIDATION FINDINGS

3.1 Project Details

The project activity has been undertaken to harness the available wind power potential in the State of Rajasthan, India. The project activity will install and operate 5 numbers of Suzlon Limited make 1500 kW (1.5 MW) state-of art Wind Turbine Generators (WTG) aggregating to a total installed capacity of 7.5 MW.

The project activity is estimated to generate 14,374 MWh of electricity per annum, which is supplied to Unified Indian grid. The project activity will help in greenhouse gas (GHG) emission reduction by using renewable resources (wind energy) for generating power which otherwise would have been generated using grid mix power plants, which is dominated by fossil fuel based thermal power plants. The project activity is a green field project aimed at utilizing wind to produce power.

The project activity is located at Jaisalmer district of Rajasthan state of India. Geo coordinates checked on Google earth and verification team conclude geo coordinates of project locations are consistent with Joint PD AND MR.

Sr. No.	Location No.	Khasra No.	Village	Taluka	Latitude	Longitude
1.	AK-278	83/P, 76/P	Sangana	Fatehgarh	N 26° 47' 48.7"	E 71° 08' 12.6"
2.	AK-283	147/P	Asayach	Jaisalmer	N 26° 48' 54.9"	E 71° 07' 04.6"
3.	AK-262	370/P	Chord	Fatehgarh	N 26° 45' 32.0"	E 71° 09' 49.3"
4.	AK-321	310/P	Chord	Fatehgarh	N 26° 47' 36.7"	E 71° 10' 15.8"
5.	AK-331	94/P	Asayach	Jaisalmer	N 26° 49' 45.3"	E 71° 07' 59.6"

The details of WTG's commissioning and location are as follows:

WTG ID	Date of Commissioning	Village	Taluka
AK-283	21-March-2011	Sangana	Fatehgarh
AK-331	21-March-2011	Asayach	Jaisalmer

AK-278	30-March-2011	Chord	Fatehgarh
AK-262	30-March-2011	Chord	Fatehgarh
AK-321	30-March-2011	Asayach	Jaisalmer

Assessment team checked the technical details of the project activity from the manufactures specification and the detail are as follow:

WTG - S-82, 1.5 MW

1.	Main Data	
	Turbine type	Horizontal axis turbine
	Rated Power	1500 kW
	Rotor Diameter	82 m
	Hub height (including foundation)	Approximately 78.5 m
	Rotational Speed	15.6 to 18.4 rpm
2.	Rotor	
	Number of rotor blades	3
	Rotor Orientation	Upwind
	Material	Epoxy bonded fiber glass
3.	Gear Box	
	Type of Gear Box housing	One planetary stage / Two helical stages
	Ratio	1: 95.09
	Power	1650 kW
	Type of cooling	Forced oil cooling lubrication system
4.	Generator System	
	Generator type	Single speed induction generator with slip rings, variable rotor resistance via Suzlon Flexi slip system
	Rated power	1500 kW
	Speed at rated power	1511 rpm
	Rated voltage	690 V AC (phase to phase)
	Frequency	50 Hz
	Insulation Class	Class H
5.	Tower	
	Tower type	Tubular tower (corrosion proof painting on inner and outer surface) with welded steel plates
	Tower Height	76 m
6.	Operational Parameters	
	Cut-in wind speed	4 m/s

	Rated wind speed	14 m/s
	Cut-off wind speed	20 m/s
	Survival wind speed	52.5 m/s

The project activity doesn't involve any GHG emission sources. The estimated annual average and the total CO_{2e} emission reduction by the project activity over the second crediting period of 10 years are expected to be 13,433 tCO_{2e} and 134,330 tCO_{2e} respectively. The validation team confirmed that emission reduction forecast is reasonable if the underlying assumptions do not change.

The validation team confirms that the project activity falls under the category 1 'Project' as per para 3.9.1 of the VCS standard version 4.1, as it has potential to reduce GHG emission less than 300,000 tCO_{2e}/year. The spatial extent of project boundary is the Indian grid. The project activity will supply electricity to the Indian Grid through transmission lines connected through sub-stations.

Since the project activity generates electricity through wind energy, a clean renewable energy source it doesn't cause any negative impact on the environment and thereby contributes to climate change mitigation efforts.

Validation team confirmed that the project activity is not a grouped project.

There are no laws and regulations governing the power generation using wind energy. The project is a voluntary effort by the project proponent. There is no legal requirement on the choice of a particular technology for power generation. The project activity conforms to all the applicable laws and regulations in India.

The project ownership is the legal right to control and operate the project activities. M/s D. J. Malpani is the project proponent (PP) of project activity and they have the legal right to control and operate the project activities

Assessment team checked onsite and confirms that the details of the project proponent areas below

Organization name	M/s. D. J. Malpani
Contact person	Mr. Kailas Banker
Title	Project In charge
Address	Malpani Estate, Kasara Dumala, Sangamner, Maharashtra -422 605 India
Telephone	+91 9765800988
Email	kailas@malpani.com

Assessment team also checked the details of other entity and found correct. The details are as below:

Organization name	EKI Energy Services Limited
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Role in the project	Project Consultant
Contact person	Mr. Bibhushita Ghose
Title	Assistant Manager - Operations
Address	Plot No 48, Scheme 78, Vijay Nagar Part- II, Indore 452010, Madhya Pradesh, India
Telephone	0731 428 9086
Email	registry@enkingint.org

21-March-2011 is the project start date which has been already validated during the initial validation and VVB confirms that the start date based on the validated information in the initial validation of this VCS project activity.

PP has chosen 10-year renewable crediting period. The 1st crediting period was from 21-March-2011 to 20-March-2021. It was confirmed that current Joint PD & MR is being developed under the second crediting period which will start from 21-March-2021 and thus second crediting period is from 21-March-2021 to 20-March-2031 (both days inclusive).

The project activity is not a part of grouped project. Leakage management is not applicable to current project.

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

Estimated average annual GHG emission reductions from the project activity are 13,433 tCO_{2e} per year, which is less than 300,000tCO_{2e} per year. Hence the project scale of the project activity will become "Projects".

The estimated GHG Emission Reductions will depend upon the actual energy supplied to grid by the project activity. The tentative Emission Reduction for the project activity instances being included in the grouped project activity are as follows:

Year	Estimated GHG emission reductions or removals (tCO _{2e})
2021-2022	13,433
2022-2023	13,433
2023-2024	13,433
2024-2025	13,433
2025-2026	13,433

2026-2027	13,433
2027-2028	13,433
2028-2029	13,433
2029-2030	13,433
2030-2031	13,433
Total estimated ERs	134,330
Total number of crediting years	10
Average annual ERs	13,433

Designated National Authority (DNA) of the host country (India) has stipulated four indicators for sustainable development in the interim approval guidelines for Clean Development Mechanism (CDM) projects in India. The project proponent believes that the project activity has contributed to sustainable development in terms of the four indicators as follows

The project promotes sustainable development through the following aspects:

1. Environmental: Since the project activity leads to cleaner production of energy, it is leading to displacement of fossil fuel-based energy.
2. Social: Setting up of the project activity has created new job openings hence is supporting employment of the local people around.
3. Cleaner Air: Since the project activity leads to lesser GHG emission it results in better air quality.

Being a renewable resource, using wind energy to generate electricity contributes to resource conservation.

Thus, the project causes no negative impact on the surrounding environment contributing to environmental well-being. CAR 01 and CAR 02 were raised on this section and closed successfully. Please refer Appendix 2 for further details

3.2 Participation under Other GHG Programs

The project was registered under UNFCCC CDM programme on 14-February-2012 (CDM reference no. 5794¹). PP has declared that project is not currently seeking registration under any other GHG programs, and the project has not participated under any other GHG program and any other GHG program has not rejected the project activity.

CAR 04 were raised on this section and closed successfully. Please refer Appendix 2 for further details.

¹ <https://cdm.unfccc.int/Projects/DB/LRQA%20Ltd1329231564.5/view?cp=1>

3.3 Safeguards

3.3.1 No Net Harm

As PP does not see and identify any potential negative environmental and socio-economic impacts, hence this section is not required. Assessment team also cross checked by interviewing stakeholders during remote visit and confirm that there are no any potential negative environmental and socio economic impacts attributed to the project activity.

3.3.2 Local Stakeholder Consultation

Local stakeholder consultation has been conducted at the time of project registration hence not applicable in the current monitoring period. No grievances received during the current monitoring period, However, CAR 03 were raised on this section and closed successfully. Please refer Appendix 2 for further details.

3.3.3 Environmental Impact

The project activity involves power generation using wind energy and no environmental impact. Assessment team confirms this based on its local and sectoral expertise.

3.3.4 Public Comments

The Global Stakeholder Consultation commenting period had been completed before first crediting period. No comments had been received in the commenting period

3.3.5 AFOLU-Specific Safeguards

Not applicable as this is non-AFOLU project.

3.4 Application of Methodology

3.4.1 Title and Reference

CDM Methodology: AMS-I. D version 18.0 - Grid Connected Renewable Electricity Generation. The assessment team has confirmed that the selected baseline methodology is the approved baseline methodology available on UNFCCC web site. The applied methodology is the latest version. The selected baseline methodology, i.e., AMS-I. D is correctly applied to this type of project. All the applicability criterion of applied methodology is appropriately justified in the updated Joint PD AND MR by the project participant.

3.4.2 Applicability

Applicability criteria for the applied methodology in the VCS Joint PD and MR against these criteria are assessed by the validation team by means of document review and interviews. Thus, the validation team

confirms that the Project Participant has correctly applied the approved methodology and the selected version of the methodology is valid at the time of validation.

Sl. No.	CDM Methodology Requirement	Project Justification	Means of Validation																									
01	<p>1. This methodology comprises renewable energy generation units, such as photovoltaic, hydro, tidal/wave, wind, geothermal and renewable biomass:</p> <p>a) Supplying electricity to a national or a regional grid.</p> <p>Supplying electricity to an identified consumer facility via national/regional grid through a contractual arrangement such as wheeling.</p>	<p>The project activity is a Renewable Energy Project i.e. Wind Power Project which falls under applicability criteria option 1(a) i.e., "Supplying electricity to a national or a regional grid". Hence the project activity meets the given applicability criterion.</p>	<p>The validation team by means of remote audit interview and supportive documents confirms that the project activity is renewable energy project involving wind energy. Hence, the criterion is applicable.</p>																									
02	<p>Illustration of respective situations under which each of the methodology (i.e. "AMS-I.D.: Grid connected renewable electricity generation", "AMS-I.F.: Renewable electricity generation for captive use and mini-grid" and "AMS-I.A.: Electricity generation by the user) applies is included below</p> <table border="1"> <thead> <tr> <th></th> <th>Project Type</th> <th>AMS-I.A</th> <th>AMS-I.D</th> <th>AMS-I.C</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Project supplies electricity to a national/regional Grid</td> <td></td> <td>√</td> <td></td> </tr> <tr> <td>2</td> <td>Project displaces grid electricity consumption (e.g. grid import) and/or captive fossil fuel electricity generation at the user end (excess electricity may be supplied to a grid)</td> <td></td> <td></td> <td></td> </tr> <tr> <td>3</td> <td>Project supplies electricity to an identified consumer facility via national/regional grid (through a contractual arrangement such as wheeling)</td> <td></td> <td>√</td> <td></td> </tr> <tr> <td>4</td> <td>Project supplies electricity to a mini grid¹ System where in the</td> <td></td> <td></td> <td></td> </tr> </tbody> </table>		Project Type	AMS-I.A	AMS-I.D	AMS-I.C	1	Project supplies electricity to a national/regional Grid		√		2	Project displaces grid electricity consumption (e.g. grid import) and/or captive fossil fuel electricity generation at the user end (excess electricity may be supplied to a grid)				3	Project supplies electricity to an identified consumer facility via national/regional grid (through a contractual arrangement such as wheeling)		√		4	Project supplies electricity to a mini grid ¹ System where in the				<p>The 1st option of Table 1 "Scope of AMS-I.D., AMS-I.F. and AMS-I.A. based on project types" of AMS I.D. Version 18, EB 81 is applicable.</p>	<p>The validation team by means of remote audit interview confirms that project will supply electricity to a nation grid (Indian grid). Hence, the mentioned criterion is applicable.</p>
	Project Type	AMS-I.A	AMS-I.D	AMS-I.C																								
1	Project supplies electricity to a national/regional Grid		√																									
2	Project displaces grid electricity consumption (e.g. grid import) and/or captive fossil fuel electricity generation at the user end (excess electricity may be supplied to a grid)																											
3	Project supplies electricity to an identified consumer facility via national/regional grid (through a contractual arrangement such as wheeling)		√																									
4	Project supplies electricity to a mini grid ¹ System where in the																											

	<p>baseline all generators use exclusively fuel oil and/or diesel fuel</p>					
	<p>5 Project supplies electricity to household users (included in the project boundary) located in off grid areas</p>					
03	<p>2. This methodology is applicable to project activities that:</p> <p>a. Install a Greenfield plant;</p> <p>b. Involve a capacity addition in (an) existing plant(s);</p> <p>c. Involve a retrofit of (an) existing plant(s);</p> <p>b) Involve a rehabilitation of (an) existing plant(s)/unit(s); or</p> <p>Involve a replacement of (an) existing plant(s).</p>	<p>The project is installation of new wind based electricity generation plants (not addition to existing system). Option (a) is applicable.</p>	<p>The validation team by means of remote audit interview confirms that project is installed of new wind-based electricity generation plants. Hence, the criterion is applicable.</p>			
04	<p>3. Hydro power plants with reservoirs that satisfy at least one of the following conditions are eligible to apply this methodology:</p> <p>a. The project activity is implemented in an existing reservoir with no change in the volume of reservoir;</p> <p>b. The project activity is implemented in an existing reservoir, where the volume of reservoir is increased and the power density of the project activity, as per definitions given in the project emissions section, is greater than 4 W/m² ;</p> <p>The project activity results in new reservoirs and the power density of the power plant, as per definitions given in the project emissions section, is greater than 4 W/m².</p>	<p>The project is wind power project and thus the criterion is not applicable to this project activity.</p>	<p>The validation team has confirmed project is wind power project.</p> <p>Hence, the criterion is not applicable.</p>			
05	<p>If the new unit has both renewable and non-renewable components (e.g. a wind/diesel unit), the eligibility limit of 15 MW for a small-scale CDM project activity applies only to the renewable component. If the new unit co-fires fossil fuel, the capacity of the entire unit shall not exceed the limit of 15 MW.</p>	<p>The project activity is a 7.5 MW wind electricity generation. Unit does not co-fire fossil fuels. Hence the criterion is not applicable to the project activity.</p>	<p>The validation team by means of remote audit interview and supportive documents confirm that the project is installation of 7.5 MW wind energy generation which is below threshold i.e. 15 MW for small-scale CDM project activities.</p> <p>Hence, the criterion is applicable.</p>			

06	Combined heat and power (co-generation) systems are not eligible under this category	The Project activity is a renewable wind energy project and is not a combined heat and power system. Hence the criteria is not applicable to the project activity	The validation team by means of remote audit interview confirms that project is a wind power project and does not involve combined heat and power (co-generation) systems. Hence, the criterion is not applicable.
07	In the case of project activities that involve the capacity addition of renewable energy generation units at an existing renewable power generation facility, the added capacity of the units added by the project should be lower than 15 MW and should be physically distinct ¹ from the existing units.	The project activity is Greenfield and there is no existing power generation facility at the site. Hence the criteria is not applicable to the project activity	The validation team by means of remote audit interviews and supporting documents confirm that the project does not involve capacity addition at existing units. Hence, the criterion is not applicable.
08	In the case of retrofit, rehabilitation or replacement, to qualify as a small-scale project, the total output of the retrofitted, rehabilitated or replacement power plant/unit shall not exceed the limit of 15 MW.	Not applicable, the wind project is a Green field project activity and this project is not the enhancement or up gradation project.	The validation team by means of remote audit interview confirms that the project is not enhancement or up gradation project. Hence, the criterion is not applicable.
09	In the case of landfill gas, waste gas, wastewater treatment and agro-industries projects, recovered methane emissions are eligible under a relevant Type III category. If the recovered methane is used for electricity generation for supply to a grid then the baseline for the electricity component shall be in accordance with procedure prescribed under this methodology. If the recovered methane is used for heat generation or cogeneration other applicable Type-I methodologies such as “AMS-I.C.: Thermal energy production with or without electricity” shall be explored.	The Project activity is a renewable wind power project and is not a landfill gas, waste gas, wastewater treatment and agro-industries projects or recovered methane emissions project. Hence the criterion is not applicable to the project activity.	The validation team by means of remote audit interview confirms that the project is a wind power project. Hence, the said criterion is not applicable.

10	In case biomass is sourced from dedicated plantations, the applicability criteria in the tool “Project emissions from cultivation of biomass” shall apply	The Project activity is a renewable wind power project and is not a biomass project. Hence the criteria are not applicable to the project activity.	The validation team by means of remote audit interview confirms that the project is a wind power project. Hence, the said criterion is not applicable.
Applicability of ‘Tool to calculate the emission factor for an electricity system’			
11	This tool may be applied to estimate the OM, BM and/or CM when calculating baseline emissions for a project activity that substitutes grid electricity that is where a project activity supplies electricity to a grid or a project activity that results in savings of electricity that would have been provided by the grid (e.g., demand-side energy efficiency projects).	Since the project activity is grid connected, this condition is applicable, and the emission factor has been calculated accordingly.	The validation team by means of site visit interview and supportive documents confirm that the project supplies electricity to the national grid i. e. Indian grid. Hence, the criterion is applicable.
12	Under this tool, the emission factor for the project electricity system can be calculated either for grid power plants only or, as an option, can include off grid power plants. In the latter case, the conditions specified in “Appendix 2: Procedures related to off grid power generation” should be met. Namely, the total capacity of off-grid power plants (in MW) should be at least 10 per cent of the total capacity of grid power plants in the electricity system; or the total electricity generation by off-grid power plants (in MWh) should be at least 10 per cent of the total electricity generation by grid power plants in the electricity system; and that factors which negatively affect the reliability and stability of the grid are primarily due to constraints in generation and not to other aspects such as transmission capacity.	Since the project activity is grid connected, this condition is applicable, and the emission factor has been calculated accordingly.	The validation team by means of site visit and supportive documents confirm that the project supplies electricity to the national grid i. e. Indian grid. Hence, the criterion is applicable.
13	In case of CDM projects the tool is not applicable if the project electricity system is located partially or totally in an Annex I country.	The project activity is located in India, a non-Annex I country. Therefore, this criterion is not applicable for the project activity.	The validation team by means of site visit and supportive documents confirm that the project is located in India.

			Hence, the criterion is applicable.
14	Under this tool, the value applied to the CO ₂ emission factor of biofuels is zero.	The project activity is a grid connected wind power project and not a hydro power plant. Therefore, this criterion is not applicable for the project activity.	The validation team by means of site visit and supportive documents confirm that the project is a wind power project. Hence this criterion is not applicable.

3.4.3 Project Boundary

The spatial boundary includes the power plant/unit and all power plants/units connected physically to the electricity system that the project power plant is connected to as verified from the applied methodology AMS -I.D - Version 18.0. VVB could confirm this during the remote audit, also from the commissioning certificates. The assessment team was able to confirm that all the identified emission sources which are impacted by the project activity are addressed by the approved methodology and can be seen in the Table below.

Source		Gas	Included?	Justification/Explanation
Baseline	Combustion emissions from generating grid connected electricity	CO ₂	Yes	Major source of emission
		CH ₄	No	Minor Source of emission can be neglected
		N ₂ O	No	Minor source of emission can be neglected
Project	Emissions from the project activity	CO ₂	No	No project emission involves as project activity utilizes renewable resource i.e. wind energy
		CH ₄	No	No project emission involves as project activity utilizes renewable resource i.e. wind energy
		N ₂ O	No	No project emission involves as project activity utilizes renewable resource i.e. wind energy

The assessment team confirms that the Joint PD & MR has correctly described the project boundary, including the physical delineation of the project activity and complies with VCS standard version 4.1

3.4.4 Baseline Scenario

National policies and circumstances relevant to the baseline of the project activity:

The Electricity Act (EA), 2003 provides an enabling framework for accelerated and more efficient development of the power sector. The EA seeks to encourage competition with appropriate regulatory intervention. Competition is expected to yield efficiency gains and in turn result in availability of quality supply of electricity to consumers at competitive rates.

The Section 3 (1) of the Electricity Act 2003 requires the Central Government to formulate, inter alia, the National Electricity Policy in consultation with Central Electricity Authority (CEA) and State Governments. The provision is quoted below²:

“The Central Government shall, from time to time, prepare the National Electricity Policy and tariff policy, in consultation with the State Governments and the Authority for development of the power system based on optimal utilization of resources such as coal, natural gas, nuclear substances or materials, hydro and renewable sources of energy”.

Further, as per section 5.2.12 of the National Electricity Policy³:

Even with full development of the feasible hydro potential in the country, coal would necessarily continue to remain the primary fuel for meeting future electricity demand.

The National Electricity Plan also emphasizes the use of other fossil fuel like gas, LNG, Lignite, other imported fossil fuels in meeting the future electricity need. It further emphasizes on the Renovation and Modernization (R&M) of the low performing thermal power stations in the country. This will enable to achieve improved PLF of the thermal power plant.

Further the project activity conforms to all the applicable laws and regulations in India:

- Power generation using wind energy is not a legal requirement or a mandatory option. There are state and sectoral policies, framed primarily to encourage wind power projects. These policies have also been drafted realizing the extent of risks involved in the projects and to attract private investments.
- The Indian Electricity Act, 2003 (May 2007 Amendment) does not influence the choice of fuel used for power generation.
- There is no legal requirement on the choice of a particular technology for power generation.
- Generation Based Incentives (GBI), announced by the Ministry of New and Renewable Energy (MNRE), for Grid Interactive Wind Power Projects commissioned after 17-December-2009, of Rs. 0.50 per unit of electricity fed into the grid with a cap of Rs. 62 Lakh/MW.

The implementation of the National Electricity Plan is clearly evident from the installed capacity in the project boundary i.e. the INDIAN Grid:

² <https://powermin.gov.in/en/content/electricity-act-2003>

³ <https://powermin.gov.in/en/content/national-electricity-policy>

As per CEA Report, the installed capacity (in MW) of INDIAN Grid region as on 30-November-2010⁴ is as follows:

Sr. No.	Power Sources	Installed Capacity, MW	Percentage, %
1	Thermal	83490.4	68.8
2	Nuclear	3460.0	2.9
3	Hydro	26068.4	21.5
4	RES	8263.3	6.8

It can be observed from the above statistics that INDIAN Grid Region is dominated mostly by fossil fuel based thermal power plants. The share of thermal based power generation is 83490.4 MW (68.8%) as against the contribution of Renewable Energy Sources i.e. 8263.3 MW (6.8%). The percentage of hydro power is also substantial in the project boundary i.e. 21.5%.

Thus, the national policy clearly prefers the installation of the fossil fuel based power plants which forms the basis of the project activity.

The assessment team assessed the validity of the updated baseline through an assessment of the following points:

- a) The impact of new relevant national and/or sectoral policies and circumstances on the baseline considering relevant guidance from the Board with regard to renewal of the crediting period of the VCS project activity
- b) The correctness of the application of the approved methodologies for the determination of the continued validity of the updated baseline and the estimation of GHG emission reductions for the applicable crediting period of the VCS project activity.
- c) The assessment of estimation of emission reductions for the applicable crediting period.

The validity of the baseline has been assessed as per the methodological tool "Assessment of the validity of the original/current baseline and update of the baseline at the renewal of the crediting period" version 03.0.1. The assessment is performed as follows:

Step 1: Assess the validity of the current baseline for the next crediting period.

Step 1.1: Assess compliance of the current baseline with relevant mandatory national and/or sectoral policies.

⁴ <http://cea.nic.in/> (Reference: Monthly Review of Power Sector Reports/November 2010/Sr. No.06/Chapter: All India generating installed capacity- region wise/Page 8)

The impact of the national and/or sectoral policies and circumstances upon the baseline scenario of the project activity has been assessed during the crediting period renewal of the project activity.

The Electricity Act of year 2003 is related to the laws relating to generation, transmission, distribution, trading and use of electricity and was in force at the time of the completion of the baseline study for the registered VCS PD. In accordance with the section 3 of the Electricity Act 2003, the Central Government notified the National Electricity Policy⁵ on 12-February-2005 which was in force at the time of completion of the baseline study as stated in the registered VCS PD of the project activity. This policy has not been revised since then and is currently in force as well.

In addition, the State Electricity Regulatory Commissions (SERCs) have announced preferential tariffs and Indian Renewable Energy Development Agency (IREDA) provides term loan assistance towards establishing biomass power projects. All these fiscal and financial incentives were in force at the time of completion of the baseline study for the registered VCS PD of the project activity and still continue to exist. The state electricity regulatory commission issues tariff order in respect of procurement of power generated wind generators and there is no mandatory national and/or sectoral policies have come into effect that would affect the compliance of the current baseline. Hence, it has been concluded that the current baseline complies with all relevant mandatory national and/or sectoral policies that have come into effect after the submission of the project activity for validation and are applicable at the time of requesting renewal of the crediting period.

Hence the current baseline remains the same as it was in the registered VCS PD. There has been no significant change in the relevant national and/or sectoral policies from the date of registration till now. In absence of the project activity, similar amount of electricity would have been generated by the Indian grid. Thus, the assessment team concludes that the baseline for the project activity remains same and is in line with the relevant mandatory national and/or sectoral policies.

Step 1.2: Assess the impact of circumstances

There are no impacts of circumstances existing at the time of requesting renewal of the crediting period on the current baseline scenario.

The assessment team has checked the baseline scenario identified at the validation of the project activity which was the electricity delivered to the grid by the project activity would have otherwise been generated by the operation of grid connected power plants and by the addition of new generation sources into the grid. The investment made by the PP was on voluntary level which intends to replace equivalent amount of electricity at grid from renewable source, hence the same baseline as identified in the previous crediting period is still valid for the project. Therefore, the assessment of the changes in market characteristics is not required for the renewal of the project's crediting period under VCS.

The current installed capacity of India is still predominantly fossil fuel-based power generation and therefore, is a major source of carbon dioxide emissions in India. The sector-wise details of installed capacity as provided in the Joint PD & MR have been checked. Hence, there exists

⁵<http://www.cercind.gov.in/Act-with-amendment.pdf>

scope for reducing the CO₂ emissions in the country by increased use of renewable energy sources. Furthermore, the project participant has considered the latest available CO₂ Baseline Database (CEA database, version 16) at the time of requesting renewal of the crediting period for establishing the baseline emission factor, which itself considered all the new circumstances. Hence it has been concluded that there is no impact of the circumstances existing at the time of requesting renewal of crediting period and the baseline remains unchanged.

Step 1.3: Assess whether the continuation of the use of current baseline equipment(s) or an investment is the most likely scenario for the crediting period for which renewal is requested.

This sub-step is not applicable since the identified baseline scenario at the validation of the project activity did not correspond to the continuation of use of the current equipment(s) without any investment. Further as explained earlier that the baseline scenario was the electricity import/generation from the power plants connected to the electricity grid. The project activity in green field project and there is no any baseline equipment or investment involved in project activity. Therefore, this condition is not applicable to the project activity.

Step 1.4: Assessment of the validity of the data and parameters

As per this step “where emission factors, values or emission benchmarks are used and determined only once for the crediting period, they should be updated, except if the emission factors, values or emission benchmarks are based on the historical situation at the site of the project activity prior to the implementation of the project and cannot be updated because the historical situation does not exist anymore as a result of the VCS project activity”.

The emission factor has been updated along with the approach used to calculate the emission factor in the revised Joint PD & MR and the same has been found correct by the assessment team for the second crediting period of the project activity.

Step 2: Update the current baseline and the data and parameters

Step 2.1: Update the current baseline

As the applied methodology AMS-I. D - Version 18.0, the baseline for the project remains the same as that in the registered VCS PD as “the electricity delivered to the grid by the project activity would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources, as reflected in the combined margin (CM) calculations described in the ‘Tool to calculate the emission factor for an electricity system’.

Step 2.2: Update the data and parameters

The approved baseline methodology, AMS-I.D - Version 18.0, has been used to determine the baseline and the estimation of emission reductions for the applicable crediting period. As referred in the methodology “Tool to calculate the emission factor for an electricity system” version 07.0 has been used to determine continued validity of the baseline based on combined margin (CM) calculations.

For the baseline scenario as per the applied methodology AMS –I.D - Version 18.0, the following applies

If the project activity is the installation of a new grid-connected renewable power plant/unit, the baseline scenario is electricity delivered to the grid by the project activity would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources, as reflected in the combined margin (CM) calculations described in the “TOOLO7: Tool to calculate the emission factor for an electricity system”.

The project activity involved setting up of WTGs to harness the power of wind to produce electricity and supply to the grid. In the absence of the project activity, the equivalent amount of power would have been supplied by the Indian grid, which is fed mainly by fossil fuel fired plants.

The combined margin ($EF_{grid,CM,y}$) is the result of a weighted average of two emission factor pertaining to the electricity system: the operating margin (OM) and build margin (BM). The calculations for this combined margin have been made based on data from an official source (where available) and made publicly available. The CEA database version 16 is the latest available data at the time of Joint PD and MR submission to VVB for validation hence same is accepted for the emission factor calculations.

Parameter	Value	Source
Operating margin CO ₂ emission factor for the project electricity system in year y ($EF_{grid,OM,y}$)	0.9568 tCO ₂ /MWh	This has been calculated as the last 3-year (2017-18, 2018-19, 2019-20) generation-weighted average, sourced from Baseline CO ₂ Emission Database, Version 16.0, March 2021 published by Central Electricity Authority (CEA), Government of India.
Build margin CO ₂ emission factor for the project electricity system in year y ($EF_{grid,BM,y}$)	0.8682 tCO ₂ /MWh	The value has been fixed ex-ante and calculated based on the most recent information available at the time of submission of PD and is fixed for the entire crediting period. The value of BM is directly ge, sourced from Baseline CO ₂ Emission Database, Version 16.0, March 2021 published by Central Electricity Authority (CEA), Government of India.
Combined margin CO ₂ emission factor for the project electricity system in year y ($EF_{grid,CM,y}$)	0.9346 tCO ₂ /MWh	Calculated as the weighted average of the operating margin (0.75) & build margin (0.25) values, sourced from Baseline CO ₂ Emission Database, Version 16.0, March 2021 published by Central Electricity Authority (CEA), Government of India.

The baseline emissions from the project have been calculated as per the “Tool to calculate the emission factor for an electricity system, version 07.0” with six separated steps. In addition, the calculation has been cross-checked with “Central Electricity Authority (CEA) database Version 16, March 2021” published by India’s Central Electricity Authority (CEA), which was the most recent source of data available at the time of submission of Joint PD and MR for the request for renewal of the crediting

period. The calculations of the operating margin, build margin and combined margin has been found correct by the assessment team.

3.4.5 Additionality

The additionality will be similar to the conditions mentioned in the registered and validated VCS PD of 1st crediting period. As per paragraph 3.8.9 of VCS standard, a full reassessment of additionality is not required when renewing the project crediting period. Therefore, it is not applicable during the validation of renewal of crediting period. Moreover, Regulatory Surplus has been demonstrated in accordance with the requirements set out in the VCS Program in Section 3.5 of Joint PD and MR. Assessment team confirms that there is no any regulation to install the wind projects and the project activity is a voluntary step taken by PP. In India, the fossil fuel based thermal power generation is dominant over the renewable based power generation, thus baseline scenario remains same as original. As discussed in section 3.5 of VCS Joint PD and MR, there is no any Impact of the national and/or sectoral policies and circumstances upon the baseline scenario of the project activity and project activity is additional as per CDM Tool for the demonstration and assessment of additionality and as per VCS Program rules.

Project compliance with applicable laws, statutes and other regulatory frameworks

The relevant applicable local laws and regulations related to the project are given below:

:Electricity Act 2003

National Electricity Policy 2005

Tariff Policy 2006

Central Electricity Authority Database 2019

The project is in compliance with the given laws. Assessment team confirms that the description of the VCS project activity, as contained in the VCS Joint PD & MR sufficiently covers all relevant elements, is accurate and complete and that it provides the reader with a clear understanding of the nature of the VCS project activity.

3.4.6 Quantification of GHG Emission Reductions and Removals

Quantification of Baseline emissions

The proposed project activity has applied baseline methodology as mentioned in the methodology AMS -I.D - Version 18.0. As per the paragraph 22 of the methodology: "Baseline emissions include only CO₂ emissions from electricity generation in power plants that are displaced due to the project activity. The methodology assumes that all project electricity generation above baseline levels would have been generated by existing grid-connected power plants and the addition of new grid-connected power plants".

The baseline emissions are calculated as follows

$$BE_y = EG_{PJ,y} * EF_{grid,CM,y}$$

Where:

BE_y = Baseline emissions in year y (tCO₂)

$EG_{PJ,y}$ = Quantity of net electricity generation that is produced and fed into the grid as a result of the implementation of the project activity in year y (MWh)

$EF_{grid,CM,y}$ = Combined margin CO₂ emission factor for grid connected power generation in year y calculated using the latest version of the “Tool to calculate the emission factor for an electricity system” (t CO₂/MWh)

Project Activity is greenfield project, Hence

$$EG_{PJ,y} = EG_{PJ,facility,y}$$

Where;

$EG_{PJ,facility,y}$ = Quantity of net electricity generation supplied by the project plant/unit to the grid in year y (MWh)

Calculation of the emission factor

Following the “Tool to calculate the emission factor for an electricity system, version 07.0”, the baseline grid emission factor has been updated as per “Baseline CO₂ Emission Database, Version 16.0, March 2021 published by Central Electricity Authority (CEA), Government of India.

The updated operating margin (OM) emission factor in the revised Joint PD & MR is 0.9568 tCO₂/MWh and the build margin (BM) emission factor is 0.8682 tCO₂/MWh. The assessment team has confirmed that this is the most recent data publicly available at the time of the validation for the renewal of the crediting period.

According to the “Tool to calculate the emission factor for an electricity system, version 07.0”, the default weights: $W_{OM}=0.75$ for Operating Margin and $W_{BM}=0.25$ for Build Margin in the second crediting period of wind power generation projects are adopted.

The combined margin emissions factor is calculated as follows:

$$EF_{grid,CM,y} = EF_{grid,OM,y} \times W_{OM} + EF_{grid,BM,y} \times W_{BM}$$

Where:

$EF_{grid,CM,y}$ = Combined margin CO₂ emission factor of national grid in year y (tCO₂/MWh)

$EF_{grid,OM,y}$ = Operating margin CO₂ emission factor of national grid in year y (tCO₂/MWh)

W_{OM} = Weighting of operating margin emissions factor (%)

$EF_{grid,BM,y}$ = Build margin CO₂ emission factor of national grid in year y (tCO₂/MWh)

W_{BM} = Weighting of build margin emissions factor (%)

$$EF_{grid,CM,y} = 0.9568 * 0.75 + 0.8682 * 0.25$$

$$= 0.9346 \text{ (tCO}_2\text{/MWh)}$$

The calculation of the $EF_{grid,CM,y}$ has been checked by the assessment team and was found consistent with the latest emission factor calculation tool.

The baseline emissions for the proposed project activity were calculated as follow:

$$BE_y = EG_{PJ,y} * EF_{grid,CM,y} = 14,374 \text{ MWh} * 0.9346 \text{ tCO}_2\text{e/MWh}$$

$$= 13,433 \text{ tCO}_2\text{e}$$

Annual average baseline emission is estimated to be **13,433 tCO_{2e}**.

Quantification of Project emissions (PE_y)

In accordance with Methodology AMS –I.D - Version 18.0, the proposed project activity is a wind power plant that does not use fossil fuels. Therefore, project emissions are considered zero.

PE_y = 0

Quantification of Leakage (LE_y)

In accordance with Methodology AMS –I.D - Version 18.0, as the project activity does not involve the energy generating equipment transfer to or from another activity, leakage is not considered.

Hence, **LE_y = 0**

Emission reductions

In accordance with Methodology AMS –I.D - Version 18.0, emission reductions were calculated as follows:

$$ER_y = BE_y - PE_y - Ly$$

Where:

- ER_y = Emission reductions in year y (t CO_{2e}/yr)
- BE_y = Baseline emissions in year y (t CO_{2e}/yr)
- PE_y = Project emissions in year y (t CO_{2e}/yr)
- Ly = Leakage emissions in year y (t CO₂)

The results of the emission reduction estimation of project activities in the first crediting period are shown in the table below:

Year	Estimated baseline emissions or removals (tCO _{2e})	Estimated project emissions or removals (tCO _{2e})	Estimated leakage emissions (tCO _{2e})	Estimated net GHG emission reductions or removals (tCO _{2e})
2021-2022	13,433	0	0	13,433
2022-2023	13,433	0	0	13,433
2023-2024	13,433	0	0	13,433

2024-2025	13,433	0	0	13,433
2025-2026	13,433	0	0	13,433
2026-2027	13,433	0	0	13,433
2027-2028	13,433	0	0	13,433
2028-2029	13,433	0	0	13,433
2029-2030	13,433	0	0	13,433
2030-2031	13,433	0	0	13,433
Total	134,330	0	0	134,330

The total emission reductions are 134,330 tCO_{2e} over 10 years (second) crediting period.

Through the assessment process validation team confirmed that:

- All the assumptions and data used by the project participants are listed including their references and sources;
- All documentation used by the project participants as the basis for assumptions and source of data is correctly quoted and interpreted in the Joint PD and MR;
- All values used in the Joint PD and MR are considered reasonable in the context of the VCS project activity;
- The baseline methodology has been applied correctly to calculate project emissions, baseline emissions, leakage and emission reductions;

All estimates of the baseline emissions can be replicated using the data and parameter values provided in the Joint PD and MR.

3.4.7 Methodology Deviations

The assessment team confirms that the Joint PD and MR complies with the requirements in the applied monitoring methodology AMS-I.D- Version 18.0. Hence, there is no any methodology deviation applicable for the project activity.

3.4.8 Monitoring Plan

The project monitoring plan is in compliance with the monitoring AMS -I. D - Version 18.0. Since the project is a wind energy generation activity, no indicators have been defined regarding project emissions. Leakage accounting has not been considered for the project since the renewable energy technology equipment used is new equipment and not transferred from another activity. The monitor-able action plan for the same has been included in section 5.3 of the Joint PD and MR. Validation team confirms that the project participant is able to implement the monitoring plan.

Parameters determined ex-ante:

The baseline emission factor of 0.9346 tCO₂/MWh is determined ex-ante based on the most recent information available at the time of requesting for the renewal of the crediting period, which is calculated

as a combined margin (CM), consisting of the combination of OM and BM emission coefficient. The parameters applied in the calculation are validated by the assessment team to be credible.

Parameter determined ex-post:

The project applies monitoring methodology AMS-I.D - Version 18.0. “Grid connected renewable electricity generation”, as per the methodology, monitoring shall consist of metering the “Quantity of net electricity supplied to the grid as a result of the implementation of the CDM project activity in year y”.

Quantity of net electricity supplied to the grid as a result of the implementation of the CDM project activity in year y ($EG_{PJ, facility, y}$);

The net electricity supplied from the project WTGs is evacuated at 33kV through common feeder lines to a substation (33 kV/220 kV) wherein the electricity is stepped up to 220 kV. There shall be feeder-wise monitoring arrangement to measure the electricity export and electricity import using tri vector energy meters of 0.2s accuracy class.

The electricity (export and import) for the connected WTGs shall be apportioned on monthly basis by the State Utility at 33 kV/220 kV level on the basis of generation ratio at the applicable metering point (ratio of controller reading of connected WTG to the controller reading for all WTGs connected to the applicable metering point) and the electricity (export, import etc.) recorded by the energy meters at 33 kV/220 kV GSS on monthly basis.

Further, the stepped-up electricity (at 220 kV) shall then be sent to a common delivery point at the 220 kV level. The common metering point at 220 kV GSS concurrently records total electricity (total export and total import) receiving from all connected metering points. The common metering point shall consist of both main & check meters of accuracy class of 0.2s. The meters shall record the total electricity exported by the wind farm and the total electricity imported by the wind farm. PP & State Utility shall record the export/import in monthly Joint Metering Reports (JMR) The billing of the net energy supplied will be done based on the energy break up available at the metering at 220kV level after discounting for the transmission losses.

The total transmission loss occurred during export of the electricity between the 33/220 kV level pooling station & 220 kV level common delivery point is calculated as the difference between total aggregated reading of exports for all metering points at 33/220 kV level and the total reading of exports for same metering points recorded at the 220 kV level. Similarly, transmission loss occurred during import of the electricity is also calculated.

The net electricity supplied to the grid by the given WTG for the given month (net export kWh) is obtained by subtracting electricity import from electricity export.

The monitoring plan describes the organizational structure, roles and responsibility, the monitoring instruments, data monitoring procedures, emergency preparedness and the management system. During the remote audit assessment team has confirmed that the monitoring is planned in a reasonable manner and considered feasible to be implemented by the PP. All the monitored data will be archived electronically for a period of 2 years after the crediting period. Accuracy, calibration, periodical testing

and maintenance procedures of monitoring equipment is clearly mentioned in the section 5.2 of Joint PD and MR. Assessment team has reviewed the same and is convinced that the same is adequate and will lead to correct measurement of the net electricity exported to the grid.

3.5 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	
NA	NA	NA	NA	NA

4 VERIFICATION FINDINGS

4.1 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 monitoring plan in the Joint PD & 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 Joint PD & MR.
Findings	CAR 05, CAR 06 & CAR 07 were raised on this section and closed successfully. Please refer Appendix 2 for further details
Conclusion	<p>Ex-ante Parameter:</p> <p>For 1st Crediting Period:</p> <p>EF_{grid, OM, y} : Parameter is fixed ex-ante for the entire 1st crediting period and as per the registered CDM PDD and VCS PD same is fixed 0.9942 tCO₂/MWh.</p> <p>EF_{grid, BM, y} : Parameter is fixed ex-ante for the entire 1st crediting period and as per the registered CDM PDD and VCS PD same is fixed 0.8123 tCO₂/MWh..</p> <p>Ex ante value of OM and BM emission factor is taken from CEA database, version 06 published in March 2011. Verification team checked the EF value and found in consistent with registered CDM PDD and VCS PD.</p> <p>EF_{CO2,grid,y} : Parameter is fixed ex-ante for the entire 1st crediting period and as per the registered CDM PDD and VCS PD same is fixed 0.9487 tCO₂/MWh. Verification team found same was used in the ER calculations.</p> <p>Ex ante value of emission factor is calculated based on above parameters and their weighing - 75% and 25% respectively). Verification team checked the EF value and found in consistent with registered PD.</p> <p>For 2nd Crediting Period</p>

	<p>EF_{grid,OM,y}= Parameter is fixed ex-ante for the entire 2nd crediting period which has been calculated This has been calculated as the last 3-year (2017-18, 2018-19 and 2019-20) generation-weighted average, sourced from Baseline CO₂ Emission Database, Version 16.0, March 2021 published by Central Electricity Authority (CEA), Government of India . The calculated value of OM is 0.9568 tCO₂/MWh.</p> <p>EF_{grid,BM,y}= Parameter is fixed ex-ante for the entire 2nd crediting period . The value of BM has been sourced from the CEA CO₂ baseline database, version 16. The values of BM is is calculated to be 0.8682 tCO₂/MWh. .</p> <p>EF_{grid,CM,y} = Parameter is fixed ex-ante for the entire 2nd crediting period The calculated value of CM is 0.9346 tCO₂/MWh. The same has been calculated as the weighted average of the.</p> <p>Baseline Emissions: The baseline Emissions for a given year is calculated by multiplying the energy baseline with the grid emission factor. The grid in this case would be the 'Indian Grid' Formula Used: -</p> $BE_y = EG_{PJ, facility, y} \times EF_{grid, CM, y}$ <p>Where:</p> <p>BE_y = Baseline Emissions due to displacement of electricity during the year y (tCO₂)</p> <p>EG_{PJ, facility, y} = Net units of electricity due to substituted in the grid during the year y (MWh)</p> <p>EF_{grid, CM, y} = Emission Factor of the grid (tCO₂/ MWh) and y is any year within the crediting period of the project activity.</p> <p>Monitored Parameter:</p> <p>EG_{PJ, facility, y} = 10,366.817 MWh</p> <p>The verification team has checked the entire monthly Breakup net report for net electricity generated & supplied to the grid and crosschecked same with the invoices raised by PP towards State Utilities for the monitoring period. All values are found correct. All the parameters are monitored and recorded as per the monitoring plan in the joint PD & MR. The verification team has crosschecked the revised emission reduction sheet and monitoring report data with the monthly Breakup sheet and invoice and found all the values are matching.</p> <table border="1"> <thead> <tr> <th>Year</th> <th>Crediting Period</th> <th>MWh</th> </tr> </thead> <tbody> <tr> <td>01-September-2020 to 31-December-2020</td> <td rowspan="2">First Crediting Period</td> <td>1,454.56</td> </tr> <tr> <td>01-January-2021 to 20-March 2021</td> <td>930.79</td> </tr> </tbody> </table>	Year	Crediting Period	MWh	01-September-2020 to 31-December-2020	First Crediting Period	1,454.56	01-January-2021 to 20-March 2021	930.79
Year	Crediting Period	MWh							
01-September-2020 to 31-December-2020	First Crediting Period	1,454.56							
01-January-2021 to 20-March 2021		930.79							

	21-March-2021 to 31-August-2021	Second Crediting Period	7981.46
	Total		10,366.817
<p>Monitoring Period under first Crediting Period (21-March-2011 to 20-March-2021):</p> <p>Baseline Emission in 2020 from 01-September-2020 to 31-December-2020, $BE_y = 1,454.56 \text{ MWh} * 0.9487 \text{ tCO}_2\text{e/MWh}$ $= 1,379 \text{ tCO}_2\text{e}$ (Rounded Down Value)</p> <p>Baseline Emission in 2021 from 01-January-2021 to 20-March-2021, $BE_y = 930.79 \text{ MWh} * 0.9487 \text{ tCO}_2\text{e/MWh}$ $= 883 \text{ tCO}_2\text{e}$ (Rounded Down Value)</p> <p>Monitoring Period under Second Crediting Period (21-March-2021 to 20-March-2031):</p> <p>Baseline Emission in 2021 from 21-March-2021 to 31-August-2021, $BE_y = 7,981.46 \text{ MWh} * 0.9346^6 \text{ tCO}_2\text{e/MWh}$ $= 7,459 \text{ tCO}_2\text{e}$ (Rounded Down Value)</p> <p>Total Baseline Emission achieved throughout current Monitoring Period (01-September-2020 to 31-August-2021) = 1,379 + 885 + 7,459 $= 9,721 \text{ tCO}_2\text{e}$</p> <p>$PE_y$ = As per applied methodology, all renewable energy power generation project activities, emissions due to the use of fossil fuels for the backup generator can be neglected. As the project activity involved wind power project emissions (PE_y) are taken as zero.</p> <p>Leakage: As per applied methodology, leakage emissions are not considered for the project activity.</p> <p>$ER_y = BE_y - PE_y - L_y$ $= 9,721 - 0 - L_y$ $= 9,721 \text{ tCO}_2\text{e}$</p> <p>Assessment team confirms that the monitoring has been carried out in accordance with the monitoring plan contained in the registered VCS PD and Joint RCP PD & MR.</p>			

⁶ From 21-March-2021, second crediting period of the project activity started so the Combined Margin Emission Factor of second crediting period 0.9346tCO₂/MWh has been applied.

4.2 Quality of Evidence to Determine GHG Emission Reductions and Removals

Means of verification	<p>The verification team checked the break down log sheet for the monitoring period. The feeder wise location of the wind power plant was also confirmed during the interview with PP and same was verified with the Joint PD and MR and previous verification report. The metering arrangement is tri-vector bi-directional energy meters of Secure Make; accuracy class 0.2s (main and check) at the State Electricity Board (SEB) substation. These meters record parameters including electricity exported & imported.</p> <p>These electricity meters are being used by state electricity board for the net export units report monthly Breakup of net export units. The Net electricity supplied to the grid is then calculated from export and import values. The net electricity exported to the grid is also cross checked from the invoices raised to respective state electricity board which is in line with Methodology requirement for small scale project activity.</p> <p>Electricity export to the grid and import from the grid is metered by main and backup tri-vector energy meters. The main meter reading is taken jointly on a fixed day of every month for the preceding month at the delivery point and signed by the representatives of state utility and O&M personnel. In the event of failure of main meter, the check meter will be used in monitoring the electricity data. The agency is experienced in the monitoring system and is managing O&M of numerous other wind farm projects. The verification team therefore is of the opinion that the project participant through the O&M agency is capable of implementing the monitoring plan in the context of the project activity.</p> <p>Calibration of all the meters was conducted by state electricity board officials as per the industry standards. However, the calibration is done once in 3 years. The details of Calibration of the meters as confirmed during remote audit and details of calibration certificates are mentioned below as confirmed with calibration certificates provided by PP:</p> <p>The meters are Secure make and accuracy class of the substation meters is 0.2s Calibration Frequency –Once in 3 years.</p> <p>Calibration Details of Meters at 33kV/220 KV metering point:</p> <table border="1"> <thead> <tr> <th>Location</th> <th>Meter No.</th> <th>Type</th> <th>Calibration Date</th> <th>Validity of Calibration</th> </tr> </thead> <tbody> <tr> <td>SEL 81</td> <td>RJB90208</td> <td>Main Meter</td> <td>20-April-2018, 17-June-2019</td> <td>19-April-2021, 16-June-2022</td> </tr> <tr> <td>SEL 81</td> <td>RJB90209</td> <td>Back Up Meter</td> <td>20-April-2018, 17-June-2019</td> <td>19-April-2021, 16-June-2022</td> </tr> <tr> <td>SEL 204</td> <td>RJB85056</td> <td>Main Meter</td> <td>12-June-2019</td> <td>11-June-2022</td> </tr> </tbody> </table>	Location	Meter No.	Type	Calibration Date	Validity of Calibration	SEL 81	RJB90208	Main Meter	20-April-2018, 17-June-2019	19-April-2021, 16-June-2022	SEL 81	RJB90209	Back Up Meter	20-April-2018, 17-June-2019	19-April-2021, 16-June-2022	SEL 204	RJB85056	Main Meter	12-June-2019	11-June-2022
Location	Meter No.	Type	Calibration Date	Validity of Calibration																	
SEL 81	RJB90208	Main Meter	20-April-2018, 17-June-2019	19-April-2021, 16-June-2022																	
SEL 81	RJB90209	Back Up Meter	20-April-2018, 17-June-2019	19-April-2021, 16-June-2022																	
SEL 204	RJB85056	Main Meter	12-June-2019	11-June-2022																	

	<table border="1"> <tr> <td>SEL 204</td> <td>RJB85057</td> <td>Back Up Meter</td> <td>12-June-2019</td> <td>11-June-2022</td> </tr> </table>	SEL 204	RJB85057	Back Up Meter	12-June-2019	11-June-2022
SEL 204	RJB85057	Back Up Meter	12-June-2019	11-June-2022		
Findings	NA					
Conclusion	<p>The energy meter recording the export and import from the grid at substation is under the control and supervision of state electricity board officials. Similarly, O&M contractor is responsible for monitoring of the generation data at CMS.</p> <p>PP representatives confirmed that the CMS data as well as JMR sheets and invoices will be kept for 2 years following the end of the crediting period. During site visit and discussion with PP, assessment team confirm that the data will be kept for 2 years following the end of the crediting period.</p> <p>The responsibilities and authorities of project management, data handling and recording, measurement methods and QA/QC procedure have been systematically established and formalized and the same was verified during the site visit by interviewing O&M personnel and checking of records/logbooks maintained at site.</p> <p>Hence assessment team confirmed that the value of net electricity exported to the grid as used in emission reduction calculation is correct.</p> <p>The verification team therefore is of the opinion that the project participant through the O&M agency is capable of implementing the monitoring plan in the context of the project activity.</p> <p>Remote audit and interview with O&M personnel also confirms that the operational and organizational chart as mentioned in Joint PD and MR is as per the site practice and thus assessment team confirms that the details are correct.</p> <p>The break down log is checked and found that the WTGs undergone scheduled maintenance and break down. No unforced error observed, and feeder wise WTG location is also checked and found correct.</p> <p>Assessment team checked the calculation of estimated VER vs. Actual VER. As per the registered PDD the amount of VERs annually is 2,262 tCO₂e for first crediting period and 7,459 tCO₂e for second crediting period. The days involved in present monitoring period are 365 days within which first 201 days are under First Crediting Period and next 164 days are under Second Crediting Period. Therefore, on pro-rate basis the estimated VERs for the monitoring period is 13,545 tCO₂e (first crediting period + second crediting period). Actual VERs obtained for the monitoring period 9,721 tCO₂e and thus the actual VER is 28.23 % lower than the estimated VER.</p> <p>As actual VER is less than estimated VER for current monitoring period, assessment team checked the same found to be appropriate and accepted.</p> <p>Remote audit and interview with site personnel also confirms that the operational and organizational chart as mentioned in registered VCD PD and</p>					

	Joint PD & MR is as per the site practice and thus assessment team confirms that the details are correct. No unforced error observed.
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5 VALIDATION AND VERIFICATION CONCLUSION

RCP Validation Conclusion:

Applus+ Certification has been engaged by M/s D.J Malpani to perform the Validation for Renewal of Crediting Period (RCP) and verification of the “Grid Connected Wind Power Project by M/s. D. J. Malpani in Rajasthan”.

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 Joint VCS PD & MR and the applied methodology AMS-I. D Version 18.0

Our Validation 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 board. Our approach is risk-based, drawing on an understanding of the risks associated with estimated GHG emissions data and the controls in place to mitigate these. The validation can confirm that:

- The projects description 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 guideline version 4.0 and standard version 4.1
- The project’s baseline and additionality are assessed against “AMS-I. D, Version 18.0.
- The project’s monitoring plan is assessed against “AMS-I. D, version 18.0.
- A risk-based approach has been followed to perform this validation activity. The review of the project description and additional documents related to baseline and monitoring methodology; the subsequent background investigation, follow-up interviews with Project Owner have provided LGAI Technological Center S.A. (Applus+ Certification) with sufficient evidence for positive validation opinion as per the requirement of VCS.

The project is expected to generate 13,433 tCO₂e per year during the length of entire crediting period (21-March-2021 to 20-March-2031).

Verification Conclusion:

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. 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 registered VCD PD (1st CP) Joint PD and MR;
- The monitoring plan is as per the applied methodology;

- The monitoring process in Monitoring Report is as per the PD
- The development and maintenance of records and reporting procedures are in accordance with the monitoring plan;
- The installed equipment being essential for generating emission reduction runs reliably and is calibrated appropriately
- The monitoring system is in place and generates GHG emission reductions data;
- The GHG emission reductions are calculated without material misstatements.
- No limitation observed for the present verification

Verification period: 01-September-2020 to 20-March-2021 (first and last date included) under 1st CP; 21-March-2021 to 31-August-2021 (1st & last date included) under 2nd CP Verified GHG emission reductions and removals in the above verification period are reported the Joint PD & MR version 02, dated 22-October 2021 found correct: Verified GHG emission reductions and removals in the above verification period:

Net Emission Reduction from 01-September-2020 to 20-March-2021 (Monitoring Period under First Crediting 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-September-2020-31-December-2020	1,379	0	0	1,379
01-January-2021-20-March-2021	883	0	0	883
Total	2,262	0	0	2,262

Net Emission Reduction from 21-March-2021 to 31-August-2021(Monitoring Period under Second Crediting 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)
21-March-2021 - 31-August-2021	7,459	0	0	7,459
Total	7,459	0	0	7,459

The total emission reduction for current monitoring period (01-September-2020 to 31-August-2021) is
 = (2,262 + 7,459) tCO₂e
 = 9,721 tCO₂e.

The total monitoring period (01-September-2020 to 31-August-2021) is of 365 days within which first 201 days are under 1st CP and next 164 days are under 2nd CP. The estimated annual emission reduction

for 1st CP as per registered VCS PD is 13,636 tCO₂ and for 2nd CP is 13,433 tCO₂ for second crediting period. The estimated emission reduction for the first 201 days is 7,509 tCO₂e (13,636 tCO₂/MWh * 201 days/365 days). The estimated emission reduction for the next 164 days is 6,036 tCO₂e (13,433 tCO₂e/MWh * 164 days/365 days). The estimated emission reduction in current monitoring period is 13,545 tCO₂e (7,509 tCO₂e + 6,036 tCO₂e). The emission reductions achieved during the current monitoring period is 9,721 tCO₂e which is 28.23% lower than the estimated values.

APPENDIX 1: DOCUMENTS REVIEWED OR REFERENCED (VERIFICATION)

No.	Author	Title	References to the document	Provider
1.	VCS	VCS webpage for the project, VCS ID 1021.	https://registry.verra.org/app/projectDetail/VCS/1021	
2.	NA	Commissioning certificates of the Solar plants	-	PP
3.	NA	AMS-I.D. - "Grid connected renewable electricity generation",	version 16.0	
4.	UNFCCC	AMS-I.D. - "Grid connected renewable electricity generation",	version 18.0	
5.	NA	Contract of the project participant with the DOE	Contract document signed between PP and DOE	PP
6.	NA	CO ₂ Baseline Database for the Indian Power Sector published by the Central Electricity Authority (CEA), Ministry of Power, Govt. of India	Version 16.0	
7.	NA	The operational lifetime of the project activity from the manufacturer = (Technical specifications)	Manufacturer technical specifications	PP
8.	NA	Registered VCS PD, version 03	02-April-2013	PP
		Registered CDM PDD, version 02.3	09-February-2012	
		VCS Validation report by LRQA, version 03.1	10 February 2012	
		VCS Verification report by 4k Earth Science, version 01	19-December-2020	
9.	NA	Calibration Certificates of energy meters	NA	PP
10.	NA	Joint Project Description and Monitoring Report, version 01	27-September-2021	PP

No.	Author	Title	References to the document	Provider
		Joint Project Description and Monitoring Report, version 02	22-October-2021	
11.	NA	Emission reduction sheet version 01 Emission reduction sheet version 02	27-September-2021 22-October-2021	PP
12.	NA	O & M Agreements	-	PP
13.	UNFCCC	Assessment of the validity of the original/current baseline and update of the baseline at the renewal of the crediting period, version 3.0.1	-	
14.	NA	Power Purchase Agreements (PPAs)	-	PP
15.	NA	Tools/ guidelines used in the project activity <ul style="list-style-type: none"> • Glossary of CDM terms version 07 • VCS standard Version 4.1 • VCS Program Guide 4.0 • VCS verification report template version 4.0 • Tool to calculate the emission factor for an electricity system” version 07.0 	UNFCCC CDM/VCS web site	UNFCCC
16.	NA	Monthly statement- JMR & invoices for the complete monitoring period	-	PP
17.	NA	Declaration regarding no participation in other GHG program for the concerned monitoring period	04-October-2021	PP
18.	NA	Breakdown details for the monitoring period	-	PP
19.	NA	Employment records for plant persons	-	PP
20.	NA	Grievance Register maintained at site	-	PP
21.	NA	CDM validation and verification standard for project activities, Version 03.0	-	UNFCCC
22.	NA	Validation & previous Verification Report	-	PP
23.	NA	Breakdown details of the power plant	-	PP

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

Table 1. Remaining FAR from previous verification

FAR ID	NA	Section no.		Date :
Description of FAR				
<i>No FAR was raised during validation and previous verification of this project activity.</i>				
Project participant response				Date :DD/MM/YYYY
NA				
Documentation provided by project participant				
NA				
DOE assessment				Date: DD/MM/YYYY
NA				

Table 2. CL from this RCP validation and verification

CL ID	00	Section no.		Date :
Description of CL				
<i>No CL observed</i>				
Project participant response				Date :
NA				
Documentation provided by project participant				
NA				
DOE assessment				Date:
NA				

Table 3. CAR from this validation and verification

CAR ID	01	Section no.	Title page	Date: 14-October-2021
Description of CAR				
Font size used for Project key information mentioned on the title page is not in line with the guidelines to complete VCS Joint PD & MR, version 4.0. thus corrective action sought.				
Project participant response				Date: 22-October-2021
Font size of title page has been corrected as per guidelines to complete Joint PD&MR.				

Documentation provided by project participant	
Updated Joint PD-MR	
DOE assessment	Date: 28-October-2021
PP has rectified the font size used project key information mentioned on the title page, Assessment team found it inline with guidelines to complete VCS Joint PD & MR template version 4.0. Thus, accepted and CAR is closed.	

CAR ID	02	Section no.	2.2	Date: 14-October-2021
Description of CAR				
Section 1.1 of Joint Project Description and Monitoring report is not inline with the guidelines to complete VCS Joint PD & MR template version 4.0. A brief description of the scenario existing prior to the implementation of the project is missing in this section. Corrective action sought.				
Project participant response				Date: 22-October-2021
Pre project scenario has been provided in section 1.1 of Joint PD&MR.				
Documentation provided by project participant				
Updated Joint PD&MR				
DOE assessment				Date: 28-October-2021
PP has briefly mentioned about scenario existing prior to the implementation of the project activity in the section 1.1 of joint PD and MR version 02. Assessment team found it correct and inline with the guidelines to complete the VCS joint PD & MR template version 4.0. thus CAR is Closed.				

CAR ID	03	Section no.	2.2	Date: 14-October-2021
Description of CAR				
Description related to mechanism for on-going communication with local stakeholders is not mentioned in Section 2.2 of Joint Project Description and Monitoring report. Corrective action sought				
Project participant response				Date: 22-October-2021
Ongoing Consultation of local stakeholder has been provided in Joint PD&MR.				
Documentation provided by project participant				
Updated Joint PD&MR.				
DOE assessment				Date: 28-October-2021
PP has provided information related to the mechanism for on-going communication with local stakeholders and assessment team verified that PP use grievance register to register any grievance and suggestion at project site in order to maintain proper communication with local stakeholder. Copy of same grievance register also submitted to assessment team. Thus CAR is closed.				

CAR ID	04	Section no.	3.2	Date: 14-October-2021
Description of CAR				
Declaration from PP regarding participation in other trading / GHG programs, rejection under other GHG program etc. is not submitted by PP. PP requested to submit the same.				
Project participant response				Date: 22-October-2021
Declaration regarding participation in other trading / GHG programs, rejection under other GHG program has been submitted to assessment team.				
Documentation provided by project participant				
Declaration regarding double counting and rejection under other GHG program.				
DOE assessment				Date: 28-October-2021
PP have submitted revised undertaking for no double counting of the ERs achieved and found correct. CAR closed.				

CAR ID	05	Section no.	3.4.6	Date: 14-October-2021
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Description of CAR	
Notation of Parameters used in formula to calculate Combined Margin is not in line with the TOOL07. Further, formula used to calculate PP is requested to clarify the same. Combined Margin value used to calculate baseline emission in Section 6.2 of Joint PD and MR is not consistent. Corrective action is sought.	
Project participant response	Date: 22-October-2021
Notation of parameters have been corrected as per methodology. Formula has been used as per methodology AMS-I,D, Version 18.0. Combined Margin value has been changed as per latest CEA database.	
Documentation provided by project participant	
Updated Joint PD&MR.	
DOE assessment	Date: 28-October-2021
In revised Joint PD and MR version 02, PP has corrected notation to represent Combined margin Emission Factor and formula used to calculate the same found as per the Tool 7.s Moreover, Value for Combined margin emission factor (0.9346 tCO ₂ /MW) also made consistent throughout the Joint PD & MR. thus accepted and CAR is Closed.	

CAR ID	06	Section no.	3.4.6	Date: 14-October-2021
Description of CAR				
Data/parameter($EG_{PJ,y}$) and equation to calculate baseline emission is not in line with the paragraph 26 of applied methodology. During Further, feeder wise connection of WTGs and line diagram of metering arrangement are not provided in Joint PD and MR Corrective action is sought.				
Project participant response				Date: 22-October-2021
Correction has been done in Joint PD&MR as per paragraph 26 of applied methodology (AMS-I.D, Version 18.0). WTG and metering location diagram has been provided in joint PD&MR.				
Documentation provided by project participant				
Updated Joint PD&MR.				
DOE assessment				Date: 28-October-2021
In Joint PD and MR version 02: 1. PP has rectified monitoring parameter notation ($EG_{PJ,y}$) and mentioned as ($EG_{PJ, facility,y}$). Same found in line with the applied methodology "AMS I.D version 18" thus accepted and CAR is Closed. 2. PP has provided Feeder wise connection of WTG as well as line diagram of the same in section 5.3. Thus, accepted and CAR is closed,				

CAR ID	07	Section no.	4.2	Date: 14-October-2021
Description of CAR				
Apportioning applied for the import value of March 2021 in the Emission Reduction sheet version 01 is not appropriate and conservative. Corrective action is sought				
Project participant response				Date: 22-October-2021
Appropriate and conservative apportioning has been used in import value of March 2021 in Emission Reduction Sheet.				
Documentation provided by project participant				

Updated ER Sheet	
DOE assessment	Date: 28-October-2021
PP has revised the ER sheet and correctly applied apportioning for March 2021. Thus, accepted and CAR is closed.	

Table 4.FAR from this RCP validation and verification

FAR ID	Null	Section no.		Date:
Description of FAR				
No FAR is raised				
Project participant response				Date:DD/MM/YYYY
NA				
Documentation provided by project participant				
NA				
DOE assessment				Date:DD/MM/YYYY
NA				

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 DOE or outsourced entity)	Involvement in			
						Desk review	On-site inspection	Interview(s)	Verification findings
1.	Lead Auditor/Technical Expert	OR	Singh	Jitendra Mohan	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 DOE or outsourced entity)
1.	Technical reviewer (TR) / Technical Expert (TE)	EI	Xue	Denny	Applus+ Certification
2.	Approver	IR	Calle de Miguel	Agustin	Applus+ Certification

Short CVs of the Team:

1. **Mr. Jitendra Mohan Singh**, has done Advanced MSc in Sustainable Energy Systems and Management from International Institute of Management, University of Flensburg, Germany and B.Tech. in Agricultural Engineering from Allahabad University. He has more than (17) years of working experience in different organisations like IARI, ICAR, IIT Delhi, CAPART, SMEC and Perenia Carbon and MB Power (Madhya Pradesh) Ltd. He was also RIT expert(adhoc) in UNFCCC from 2010 to 2013. Currently, he is empanelled with Applus+ Certification since 2020 and has been involved in more than 20 Verifications of PAs as Auditor, Lead Auditor Technical Expert for Renewable and non-Renewable as well as Energy Demand.

2. **Mr. Denny Xue**, has a bachelor's degree on Thermal Energy Engineering and Master's Degree on Environmental Engineering. He has more than 10 years of experience on CDM project development. Before he joined Applus+ LGAI, he has been worked for Shanghai Chuanji Investment and Management which is a CDM consultancy company as a project manager for CDM project development. He is working with Applus+ since 2011 carrying out Validation and verification for CDM/GS/VCS project under scope 1 and 13 as auditor, lead auditor, technical expert and technical reviewer.

APPENDIX 4: ABBREVIATIONS

Abbreviations	Full texts
BM	Build Margin
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CER	Certified Emission Reduction(s)
CEA	Central Electricity Authority
CL	Clarification request
CM	Combined Margin
CMS	Central Monitoring system
CO ₂	Carbon dioxide
CO _{2e}	Carbon dioxide equivalent
DNA	Designated National Authority
DOE	Designated Operational Entity
DR	Document Review
EF	Emission Factor
EIA	Environmental Impact Assessment
ER	Emission Reductions
FAR	Forward Action Request
GHG	Greenhouse gas(es)
GWP	Global Warming potential
PP	Project Participant
RWPNL	Rajasthan Rajya Vidyut Prasaran Nigam Limited