



CHAKALA WIND POWER PROJECT IN MAHARASHTRA



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Summary:

Verification purpose: The project undertaken by Bindu Vayu Urja Private Limited (BVUPL) has set up 39 MW wind power project in Chakla Village in the state of Maharashtra. The project was registered with UNFCCC on 31-December-2012¹. The project activity comprises of 26 Wind Electric Generators (WTGs) with a capacity of 1.5 MW each which export power to the national grid. Thus the project has contributed to reduction of GHG emissions by displacing fossil fuel dominated grid based electricity with renewable energy – wind energy based renewable electricity.

Start date of the project activity is 30-December-2011. An undertaking has been submitted by PP for double counting confirming that no GHG reduction will be claimed in any other GHG mechanism for current monitoring period. Project activity undergoes continued operation and no major breakdown had taken place except routine maintenance/shutdown.

This is 5th verification and certification for the greenhouse gas (GHG) emission reductions reported from 'Chakala wind power project in Maharashtra' for the monitoring period 01-June-2021 to 29-December-2021 (Inclusive of both days), under the crediting period 30-December-2011 to 29-December-2021. The total emission reductions achieved for the project activity during the monitoring period has been 37,335 tCO₂e. An undertaking from the project participant confirms that project will not claim any other scheme benefits for the concerned monitoring period.

A risk-based approach has been followed to perform this verification activity. In the course of verification, 04 Corrective Action requests (CAR), 00 Clarification Requests (CLs) and 00 Forward action requests (FARs) were raised and successfully closed. The review of the Monitoring report and additional documents related to baseline and monitoring methodology; the subsequent background investigation, follow-up interviews and PP have provided VVB with sufficient evidence to verify the fulfilment of the stated criteria of VCS.

¹ <https://cdm.unfccc.int/Projects/DB/BV011356940326.49>

LGAI Technological Center S.A. (Applus+ Certification) (Hereafter referred to as Applus+ Certification) has been appointed by 'Bindu Vayu Urja Private Limited' to perform the 5th periodic verification of the "Chakala wind power project in Maharashtra" under VCS standard 4.2 and project guide version 4.1. The objective of this verification activity is to have an independent third party for the assessment of the project design, monitoring report and Final Verification report and to ensure a thorough assessment of the proposed project activity against the applicable CDM and VCS requirements. In particular; the project's baseline, monitoring plan is assessed against the applied methodologies "ACM0002 version 13.0 - Consolidated baseline methodology for grid-connected electricity generation from renewable resources. The project's compliance with the requirements of Article 12 of the Kyoto Protocol, the CDM Modalities and Procedures as agreed in the Marrakech Accords under decision 3/CMP.1, the annexes to this decision, subsequent decisions and guidance made by COP/MOP & CDM Executive Board and other relevant rules, including the Host Country legislation and sustainability criteria along with VCS program guide 4.1 and standard, version 4.2

- CDM Validation and Verification Standard for project activities, version 03.0
- CDM Project Standard for project activities, version 03.0
- VCS standard version 4.2
- VCS program guide version 4.1

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

The scope of the verification is the independent and objective review of the monitoring report (MR). The MR is reviewed against the relevant criteria (see above) and decisions by the CDM Executive Board and VCS executive board, including the approved baseline and monitoring methodology. The verification was based on the guidance given in the CDM Validation and Verification Standard for the project activities, version 03.0, review against registered VCS-PD and Final Validation report, CDM Project Standard for project activities, version 03.0 and VCS program guide, version 4.1 and standard version 4.2.

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 VCUs. The verification is not meant to provide any consulting towards the project participants. However, stated requests for clarifications and/or corrective actions may have provided input for improvement of the monitoring report combined.

The only purpose of the verification is its usage during the issuance process as part of the VCS project cycle. Therefore, LGAI Technological Center S.A. (Applus+ Certification) can't be held liable by any party for decisions made or not made based on the verification opinion, which will go beyond that purpose.

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

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1 INTRODUCTION

1.1 Objective

LGAI Technological Center S.A. (Hereinafter referred as Applus+ Certification) has been appointed by Bindu Vayu Urja Private Limited (BVUPL) to perform the 5th periodic verification of the project entitled “Chakala wind power project in Maharashtra” under VCS standard version 4.2 and program guide version 4.1. The objective of this verification activity is to have an independent third party for the assessment of the project design, monitoring report and final verification report and to ensure a thorough assessment of the proposed project activity against the applicable CDM and VCS requirements. In particular; the project's baseline and monitoring plan is assessed against applied methodologies –

- ACM0002 (version 13.0) “Consolidated methodology for grid-connected electricity generation from renewable sources”
- The project's compliance with the requirements of Article 12 of the Kyoto Protocol, the CDM Modalities and Procedures as agreed in the Marrakech Accords under decision 3/CMP.1, the annexes to this decision, subsequent decisions and guidance made by COP/MOP & CDM Executive Board and other relevant rules, including the Host Country legislation and sustainability criteria along with VCS program guide, version 4.1 and standard version 4.2.
- CDM Validation and Verification Standard for project activities, version 03.0
- CDM Project Standard for project activities, version 03.0

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

1.2 Scope and Criteria

The scope is defined as an independent and objective review of the Monitoring report (MR) prepared as per the registered VCS-PD and registered approved methodologies ACM0002 version 13.0. The MR is reviewed against the criteria stated in Article 12 of the Kyoto Protocol, the CDM modalities and procedures as agreed in the Marrakech Accords and the relevant decisions by the CDM Executive Board and VCS standard, version 4.2 and VCS Program guide version 4.1, including the approved baseline and monitoring methodologies applied. The verification was based on the requirements in the CDM validation and verification standard for project activities, Version 03.0, CDM Project Standard for project activities, version 03.0 and VCS program guide, version 4.1 and standard version 4.2.

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

1.3 Level of Assurance

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

1.4 Summary Description of the Project

Bindu Vayu Urja Private Limited (BVUPL) is working into the renewable energy sector with an objective to build wind power assets in India. BVUPL has set up 39 MW wind power project in Chakla Village in the state of Maharashtra. The project activity comprises of 26 Wind Electric Generators (WTGs) with a capacity of 1.5 MW each.

The project activity helps to reduce the supply demand gap in the state and also helps in contributing to the sustainable development by using wind energy as the source of power generation and reduction of GHG Emissions. In the project site, there are other wind projects owned by other customers connected to the same substation. There is an apportioning procedure which is approved by the state nodal agency for apportioning the electricity to each and every customer.

During the Current Monitoring Period from 01-June-2021 to 29-December-2021 (First and last date included) the project activity has supplied 39,189 MWh of electricity, and thus contributing to the GHG reductions 37,335 tCO_{2e}.

2 VERIFICATION PROCESS

2.1 Method and Criteria

Verification Process: The project assessment is based on the Clean Development Mechanism Validation and Verification Standard for project activities, version 03.0 and VCS standard 4.2 and VS program guide, version 4.1 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:

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

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

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

Appointment of the assessment team

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

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

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

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

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

Name	Role	SS Coverage	TA Coverage	Financial aspect	Host country experience
Jitendra Mohan Singh	LA/TE	YES	YES	NA	YES
Denny Xue	TR	YES	YES	NA	NA

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

Document review

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

Follow-up interviews

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

Resolution of Clarification and Corrective Action Request

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

The final MR Version 03 submitted by PP on 02-April-2022 serves as the basis for the final assessment presented. Additional changes to the project during the verification process are not considered to be significant with respect to the main CDM/VCS objectives. The two CDM/VCS main objectives are the reduction of anthropogenic GHG emissions and the contribution of sustainable development to the host country.

Internal quality control

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

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

2.2 Document Review

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

2.3 Interviews

A remote audit was conducted for the project activity on 28-March-2022. Remote audit was conducted due to ongoing COVID-19 pandemic situation in the entire country of India. Taking into account the rules of relevant national and local authorities (local to the DOE offices as well as to locality of the remote audits), 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 remote audits as part of the validation and verification process, only that VVBs must achieve a reasonable level of assurance on all validations and verifications (per Section 4.1.2 of the VCS Standard, 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 equipments, generation records, and monitoring of the data and the error accountability were discussed. To cross check the information provided by PP, various documents like technical specifications, commissioning certificates, PPA, Joint Meter readings, invoices, calibration certificates etc. were also verified. The names of the persons interviewed during remote audit through skype & telephonic interview is given below;

Organization	Name of Persons/Designation	Topics discussed	Team Member
Bindu Vayu Urja Private Limited (BVUPL)	Mr. Kiran Chaudhary	Project activity implementation Operation, Calibration, O&M practices, ENERGY GENERATION RECORDS etc. LSC mechanism Mechanical maintenance Electrical maintenance Project description Invoicing practices	Jitendra Mohan Singh
Local Stakeholder (Local Villager)	Mr. Ravinder Kumar	Local Area Development, Local issues	
Local Stakeholder (Local Villager)	Mr. Pramod Deshmukh	Local Area Development, Local issues	
Infinite Solutions	Ms. Nitya Sharma	MR, ER calculations etc.	

During the remote audit, the PP representatives were questioned about the implementation of the project activity (All WTGs involved in the project activity) . Several topics like the verification

of commissioning date of equipments, the generation, recording, and monitoring of the data and the error accountability were discussed. Various documents like the Joint Meter Readings, invoices, on-site Photographs includes Wind Turbine Generator nos., meter specifications, were verified on skype video call to establish the current status and the implementation of the Project Activity.

2.4 Site Inspections

Remote Audit: 28-March-2022				
No.	Activity performed on-site	Site location	Date	Team member
1.	Assessment team checked the implementation of the project, Baseline emission, Emission reduction calculation, technical description of the project and Monitoring. Assessment team also checked that whether the monitoring plan as described in the CDM PDD is actually practised onsite. Also assessment team checked any change in host country criteria which may affect the baseline of the project activity.	Remote audit (Through Skype)	28-March-2022	Jitendra Mohan Singh

2.5 Resolution of Findings

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

The final MR Version 03 submitted by project owners on 02- April-2022 serves as the basis for the final assessment presented. Additional changes to the project during the verification process are not considered to be significant with respect to the main CDM/VCS objectives. The two CDM/VCS main objectives are the reduction of anthropogenic GHG emissions and the contribution of sustainable development to the host country.

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

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

2.5.1 Forward Action Requests

This is 5th periodic verification of the project activity and no FAR was raised from previous validation or/and during this verification process.

2.6 Eligibility for Validation Activities

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

3 VALIDATION FINDINGS

3.1 Participation under Other GHG Programs

The project activity is first registered under CDM (<https://cdm.unfccc.int/Projects/DB/BVQI1356940326.49>) with fixed crediting period as 02-January-2013 to 01-January-2023. PP has verified and has issuance of CERs under CDM for the monitoring period – 02-January-2013 to 28-October-2013. The project activity was registered under VERRA (<https://registry.verra.org/app/projectDetail/VCS/1197>).

As per the MR and undertaking provided, PP would not consider the credit from any other mechanism for the current monitoring period. The undertaking is provided to confirm that there is no any double accounting for current monitoring period. Further, assessment team confirms that the project activity is not participating in any other form of environmental credits. Also, the project activity is not registered for REC benefits. The same was verified by checking the REC website.

3.2 Methodology Deviations

The project activity has applied correct methodology which are as per the registered CDM PDD and thus no deviation is sought regarding the methodology. The project complies with all the requirement of the methodology and thus deviation to the methodology is not a requirement for the present project activity.

3.3 Project Description Deviations

The monitoring plan of registered CDM PDD includes four monitoring parameters viz. $E_{GPJ,y}$ (net electricity export), $E_{exp,y}$ (Electricity export by each WTG), $E_{imp,y}$ (Electricity import) and $E_{WTG,i,y}$ (Quantity of electricity generated by the individual WTGs of the PP in year y). Now the parameter $E_{WTG,i,y}$ (Quantity of electricity generated by the individual WTGs of the PP in year y) is not part of monitoring plan. This deviation was approved during previous periodic verification period. Since as per the registered CDM PDD, the emission reduction calculation is based on $EG_{PJ,y}$ (ex-post) and $EF_{grid,CM,y}$ (ex-ante fixed) and value of $EG_{PJ,y}$ is directly obtained from the JMRs issued by state authority; the estimation of emission reduction is conservative, correct and accurate. Moreover, the change in monitoring plan does not have any impact on methodology, additionality and appropriateness of baseline scenario, and the project remains in compliance with the applied methodology and VCS requirements. Further, assessment team confirms that there is no deviation sought by PP for current monitoring period.

3.4 Grouped Project

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

4 VERIFICATION FINDINGS

4.1 Project Implementation Status

During the remote audit, it was concluded that the project is implemented as per CDM PDD/VCS PD and this is verified from the commissioning certificate, statutory clearances submitted. During

the current monitoring period it was observed that no unforeseen situation evolved which can impact the operation of the project activity. Scheduled maintenance was carried out as per the instruction of the manufacturer and the same is acceptable to the assessment team.

Project location is confirmed by the assessment team through interview with PP during remote audit and assessment of monitoring report. Assessment team also checked the technical details of the project through commissioning certificate, O & M agreement and photograph containing name plate. Further, latitude and longitude of the project activity with the help of Google earth software and site photographs taken by GPA app and found that the latitude and longitude is consistent with the VCS PDD/CDM PDD

The WTG locations and commissioning dates are provided in following table.

Sl. No	State	WTG number	Latitude (N)	Longitude (E)	Date of Commissioning
1	Maharashtra	C-38	21° 15' 30"	74° 19' 48"	30-December-2011
2	Maharashtra	C-39	21° 15' 17.2"	74° 19' 39.4"	30-December-2011
3	Maharashtra	C-40	21° 15' 13.6"	74° 19' 19.7"	30-December-2011
4	Maharashtra	C-41	21° 14' 58.2"	74° 19' 26.7"	30-December-2011
5	Maharashtra	C-42	21° 15' 48.2"	74° 19' 15"	22-February-2012
6	Maharashtra	C-43	21° 15' 35.7"	74° 19' 10.5"	30-December-2011
7	Maharashtra	C-44	21° 15' 23.9"	74° 19' 3.2"	30-December-2011
8	Maharashtra	C-45	21° 15' 10.5"	74° 18' 59.2"	30-December-2011
9	Maharashtra	C-46	21° 14' 57.1"	74° 19' 0.1"	30-December-2011
10	Maharashtra	C-47	21° 15' 46.2"	74° 18' 41.2"	15-February-2012
11	Maharashtra	C-48	21° 15' 33.2"	74° 18' 37.7"	12-January-2012
12	Maharashtra	C-49	21° 15' 20"	74° 18' 36.1"	15-February-2012
13	Maharashtra	C-50	21° 15' 6.6"	74° 18' 38"	03-January-2012
14	Maharashtra	C-51	21° 15' 47.8"	74° 18' 13.7"	20-January-2012
15	Maharashtra	C-52	21° 15' 33.4"	74° 18' 10.2"	20-January-2012
16	Maharashtra	C-53	21° 15' 56.1"	74° 18' 01.9"	22-February-2012
17	Maharashtra	C-54	21° 14' 43.8"	74° 18' 30.9"	30-December-2011
18	Maharashtra	C-55	21° 15' 35.4"	74° 17' 45.6"	30-December-2011
19	Maharashtra	C-56	21° 15' 23.3"	74° 17' 52"	30-December-2011
20	Maharashtra	C-57	21° 15' 15.5"	74° 18' 14.0"	12-January-2012
21	Maharashtra	C-58	21° 15' 1.1"	74° 18' 09"	30-December-2011
22	Maharashtra	C-59	21° 14' 41.2"	74° 17' 53.4"	15-February-2012
23	Maharashtra	C-60	21° 14' 29.6"	74° 18' 6.5"	15-February-2012
24	Maharashtra	C-63	21° 14' 31"	74° 17' 41.1"	12-January-2012
25	Maharashtra	C-64	21° 14' 23"	74° 17' 48.3"	13-January-2012
26	Maharashtra	C-66	21° 14' 48.5"	74° 16' 37.2"	15-February-2012

The technical specification of the WTG is as follows:

OPERATING DATA	
Rated power	1500 kW
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
Lifetime of the wind turbines	20 years
ROTOR DATA	
Type	3 Blades, Upwind / Horizontal axis
Diameter	82 m
Rotational speed at rated power	15.6 to 18.4 rpm
Rotor blade material	Epoxy bonded fibre glass
Swept area	5281 m ²
Power regulation	Active pitch regulated with Suzlon Flexi Slip System
GEARBOX	
Type	1 planetary stage / 2 helical stages
Ratio	1 : 95.09
Nominal load	1650 kW
Type of cooling	Forced oil cooling lubrication system
GENERATOR	
Type	Single speed induction generator with slip rings, variable rotor resistance via Suzlon Flexi slip system
Speed at rated power	1511 rpm
Rated power	1500 kW
Rated voltage	690 V AC
Frequency	50 Hz
Insulation	Class H
Enclosure	IP 54 / IP 23 (slip ring unit)
Cooling system	Air cooled
TOWER	
Type	Tubular tower (corrosion proof painting on inner and outer surface) with welded steel plates.
Tower Height	76 m
Hub height (including foundation)	Approximately 78.5 m
BRAKING SYSTEM	
Aerodynamic braking	3 Independent systems with blade pitching
Mechanical braking	Hydraulic fail safe disk brake system
YAW SYSTEM	
Type	Active electrical yaw motor
Bearing	Polyamide Slide bearing with gear ring & automatic greasing system
Protection	Cable twist sensor, proximity sensor
PITCH SYSTEM	
Type	3 independent blade pitch control with battery backup for each blade
Operating range	-5 ° to +90 °
Resolution	0.1 to 10 Deg

The start date of the project is 30-December-2011. This is the date, the first WTG was commissioned which is in line with VCS Standard version 4.2.

The assessment team confirmed through interview with O & M personnel during remote audit that there are no changes into the project design during this monitoring period. It was found that the monitoring plan was implemented as per the requirement of the CDM PDD & approved monitoring Plan and applied methodologies. The organisational role and responsibility as mentioned in the registered CDM PDD is followed onsite. The calibration of energy meter is carried out as per the required frequency mentioned in the CDM PDD. A delay was observed for the 4 months in the re-calibration and PP has applied maximum permissible error for the generation in this period as the delayed calibration certificate confirms that no error was present in the energy meters. All the emergency preparedness as mentioned in the registered CDM PDD is followed onsite and no discrepancies were found regarding the same.

The Project participant contribution from the project activity towards sustainable development in accordance to host country:

As confirmed during the remote audit, the project displaces electricity produced in fossil fuel based power plants, by using clean renewable source to generate electricity and thereby contributes to sustainable development through reduction in greenhouse gas (GHG) emissions. It has also been confirmed that the project implementation has led in contribution to SDG 07, 08 and SDG 13 (as stated in section 1.11 of the submitted MR). The project supplies clean, affordable and renewable energy (39,189 MWh net electricity under the monitoring period) without reliance on fossil fuels for generation of electricity to meet the growing demands in the region. The generated electricity avoided release of 37,335 tCO₂ in to the atmosphere. The project has created job opportunities through Operation and Maintenance (O & M) work for WTGs and has employed total 9 nos. for O & M work out of which, 5 nos. of people are from local villages who are unskilled workers at the project site. Remaining 4 nos. are skilled workers. The employment is of full-time purpose.

The project is not involved in any other form of GHG emission program and VCUs generated from this verification will not be used for other trading program to avoid any kind of double counting. The same is confirmed by the PP during the verification remote audit. Assessment team also conducted independent review regarding the same and found that the statement of the PP is accurate and project is not involved in any other kind of GHG trading for the present verifications/monitoring period.

The assessment team observed that the project is in line with the registered CDM PDD and applied methodologies and thus no clarification/deviation is sought.

Assessment team confirms following during the verification remote audit:

1. Start date of the project is 30-December-2011.
2. An undertaking letter has been submitted by PP for no double counting with any other GHG program. PP also has given a written declaration that project will not claim other form of GHG credit for the concerned monitoring period.
3. Assessment team confirms that this is 5th monitoring under VCS and covers the activity from 01-June-2021 to 29-December-2021 (inclusive of both dates). VCS crediting period is of 10

- years (fixed) with 30-December-2011 as the start date and crediting period end date as 29-December-2021.
4. GHG credits from 01-June-2021 to 29-December-2021 will be claimed under VCS only. At any point of time during the crediting period, the project proponent will abide by the “Double Counting”.
 5. Assessment team checked and found that the Project proponent of the project activity is as below for the current monitoring period:

Organization name	Bindu Vayu Urja Private Limited
Contact person	Mr. Ravinder Kumar Rana
Title	Assistant Manager
Address	8001, 8 th Floor, Q-City, Nanakramguda, Gachibowli, Hyderabad 500032, Telangana, India
Telephone	+ 91 9907534900
Email	Ravinder@mytrah.org

6. The quantified emission reduction calculation for the monitoring period is correct and conservative. Assessment team also compared actual VCUs with the estimated VCUs and found that the actual VCUs are 37,335 tCO₂e which are 13.49% lower than the estimated emission reductions i.e. 43,159 tCO₂e during this monitoring period.

Finding: CAR 01, 02 and 03 were raised and successfully closed. Please refer Appendix 4 for more information.

4.2 Safeguards

4.2.1 No Net Harm

No potential environment or socio-economic matter was found during the discussion with PP during remote audit. The project is renewable energy project and thus no negative impact observed onsite as confirmed by PP during remote audit.

The project activity promotes environmental and socio-economic well-being as it results in zero GHG emissions due to installation and operation of clean, renewable energy technology for electricity generation. The report on “Developmental Impacts and Sustainable Governance Aspects of Renewable Energy Projects” prepared by MNRE dated September 2013 clearly mentioned that wind-based power project activity operations do not result in direct air pollution, noise pollution.

However, assessment team still conducted the No net harm assessment for some of the parameters and the result is described below:

Sr. No.	Indicator	Assessment team opinion
1	Air quality	The project generates clean energy which replaces the fossil fuel intensive electricity generation. Also report on “Developmental Impacts and Sustainable Governance Aspects of Renewable Energy Projects” prepared by MNRE dated September 2013 clearly mentioned that wind plant operations do not result in direct air pollution. Therefore, it is validated that mitigation measures were robustly implemented on ground for air quality issues project will have a positive impact on air quality.
2	Soil condition	There are negligible impacts envisaged during operation of the project activity being wind power-based power project. For mitigating the impacts during construction, various mitigation measures were taken which is validated from the plant records of PP and the interview with local villagers. It was also confirmed that, the vegetation planted at project site helps to reduce soil erosion. The same is confirmed during the discussion with stakeholders during remote audit. Therefore, it can be concluded that the project has no effect on soil conditions during its operation because it has no waste coming out.
3	Biodiversity	During the verification remote audit, it was observed that the condition of ground vegetation is good and no rare species is found in the around area. The project site is not on the migration route of migratory bird nor is the project affecting aquatic life. With the implementation of Project, the green cover has increased at the Project site; the biodiversity in the vicinity will be improved with the vegetation improvement.
4	Employment Generation	The project activity employed local population as skilled workers as well as security guards. The personnel employed by the project activity are also provided trainings and exposed to various awareness programs therefore a positive indicator has been accepted.

Sr. No.	Indicator	Assessment team opinion
5	Livelihood of the poor	The project is associated with infrastructure development like roads in the nearby areas and promoting economic activities like grants to local school and communities' temples etc. Also, project employed local villagers as guards for the security of power project.

4.2.2 Local Stakeholder Consultation

All the stakeholders are happy with the implementation and operation of the project activity and no negative comments envisaged for the project activity. There was no change in project description from the CDM PDD. Complaint/suggestion/feedback register is maintained at site as a part of ongoing communication with stakeholders in line with clause 3.16.17 of VCS Standard, ver. 4.2 and appropriate actions taken time to time by PP. Assessment team confirmed the same during the remote audit and document review i. e. grievance register.

4.3 AFOLU-Specific Safeguards

Not applicable

4.4 Accuracy of GHG Emission Reduction and Removal Calculations

Means of verification	The verification team assessed whether the data and calculations of GHG emission reductions achieved resulting from the MR. The verification team has checked whether calculations of baseline GHG emissions, project GHG emissions and leakage GHG emissions have been carried out in accordance with the formulae and methods described in the monitoring plan of the CDM PDD and MR.				
Findings	No findings raised				
Conclusion	Baseline emission: The baseline Emissions for a given year is calculated by multiplying the energy baseline (EB) with the grid emission factor of the grid.				
	Formula Used: - $BE_y = EG_y \times EF_{\text{electricity}, y}$ Where; $BE_y = \text{Baseline emission in tCO}_2\text{e}$ EG_y = net quantity of electricity generation as a result of the project activity $EF_{\text{electricity}, y}$ = CO₂ emission factor for the electricity displaced due to the project activity during the year y in tCO₂/MWh Ex-ante parameters: <table><tr><th>Parameter</th><th>Description</th><th>Source/Justification</th></tr></table>			Parameter	Description
Parameter	Description	Source/Justification			

	EF _{grid,OM,y} tCO ₂ /MWh	Operating margin CO ₂ emission factor in year y	Calculated as per “Tool to calculate the emission factor for an electricity system, version 2.2.1” as 3-year generation weighted average using data for the years 2008-09,2009-10 and 2010-11. The data are obtained from “CO ₂ Baseline Database for Indian Power Sector” version 07, published by the Central Electricity Authority, Ministry of Power, Government of India. The value 0.9851 is used for the calculation of the Baseline Emission and is found to be consistent with the registered VCS PD/03/.
	EF _{grid,BM,y} tCO ₂ /MWh	Build margin CO ₂ emission factor in year y	Calculated as per “Tool to calculate the emission factor for an electricity system, version 2.2.1” as 3-year generation weighted average using data for the years 2009-2010, 2010-2011 & 2011-2012. The data is obtained from “CO ₂ Baseline Database for Indian Power Sector” version 07, published by the Central Electricity Authority, Ministry of Power, Government of India. The value 0.8587 is used for the calculation of the Baseline Emission and is found to be consistent with the registered VCS PD/03/.
	EF _{grid,CM,y} tCO ₂ /MWh	Combined margin CO ₂ emission factor in year y	Combined margin emission factor has been calculated by the Central Electricity Authority in accordance with CDM methodology: ACM0002 and tool to calculate the emission factor for an electricity system. The combined margin emissions factor is calculated as follows: $EF_{grid,CM,y} = EF_{grid,OM,y} * W_{OM} + EF_{grid,BM,y} * W_{BM}$ Where: EF _{grid,BM,y} = Build margin CO ₂ emission factor in year y (tCO ₂ /MWh) EF _{grid,OM,y} = Operating margin CO ₂ emission factor in year y (tCO ₂ /MWh) W _{OM} = Weighting of operating margin emissions factor (%) = 75% W _{BM} = Weighting of build margin emissions factor (%) = 25% The value 0.9527 is used for the calculation of the Baseline Emission and is found to be consistent with the registered VCS PD/03/.
	Monitored Parameter:		
	Parameter	Description	Source/Justification

	EG _{PJ,y}	Quantity of net electricity exported to the grid during the year y	Net electricity exported to the grid is calculated based on 'export' and 'import' values which are calculated and are available in the Joint Meter Reading (JMRs) and transmission loss incurred in the transmission line between the project and the interconnection point (i.e. sub-station). PP has submitted copies of JMRs which were checked to confirm the 'export' and 'import' values and calculation presented in the ER sheet confirms the net electricity export to the grid. The values from JMRs were further cross checked with the invoices submitted and found correct. The value is 39,189 MWh.
	EG _{exp,y}	Electricity exported from each WTG of the project activity during the year y	Electricity exported to the grid is calculated based on values from the Joint Meter Reading (JMRs). PP has submitted copies of JMRs which were checked to confirm the 'export' values and calculation presented in the ER sheet confirms the electricity export to the grid. The value is 39,387 MWh MWh.
	EG _{imp,y}	Electricity imported from each WTG of the project activity during the year y	Electricity imported from the grid is calculated based on values from the Joint Meter Reading (JMRs). PP has submitted copies of JMRs which were checked to confirm the 'import' values and calculation presented in the ER sheet confirms the electricity import from the grid. The value is 198 MWh.

The verification team has checked the entire monthly Energy generation records applicable for the monitoring period as per the project activity applied for verifications and found the monitoring parameter is monitored and recorded as per the monitoring plan in the registered CDM PDD. The net electricity supplied by project activity to grid is calculated by subtracting total electricity imported by project from grid from total electricity delivered by project to grid.

The verification team has crosschecked the emission reduction sheet and monitoring report data with the energy generation reports and found all the values are matching.

The calculation of baseline emissions is as below,

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

$$BE_y = 39,189 \times 0.9527$$

$$BE_y = 37,335 \text{ tCO}_2\text{e (round down values)}$$

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-June-2021 to 29-December-2021	37,335	0	0	37,335
Total	37,335	0	0	37,335

Project emissions: The project activity involves in harnessing wind power. Hence, in line with the applied methodology, project emissions are zero.

Leakage emissions: The project activity involves in harnessing wind power. Hence, in line with the applied methodology, leakage emissions are zero.

Thus, Emission Reductions are:

The emission reductions (ER_y) by the Project activity during a given year y is the difference between baseline emissions (BE_y), project activity emissions (PE_y) and leakage, as follows

$$ER_y = BE_y - PE_y - LE_y$$

$$= 37,335 - 0 - 0$$

	= 37,335 tCO₂e VVB confirmed that GHG reductions and removals have been quantified correctly and in line with monitoring procedure in CDM PDD and applied methodology.
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4.5 Quality of Evidence to Determine GHG Emission Reductions and Removals

Means of verification	The verification team checked the shutdown/break down log for the monitoring period. During the verification of remote audit, the energy meters are also checked. The Calibration details of the monitoring meters are also checked with calibration certificates.
Findings	CAR 04 was raised and successfully closed. Please refer Appendix 4 for more information.
Conclusion	Energy generated from the wind farm is being recorded at the metering point at the HT end of the respective Pooling station which is considered as the energy for billing. The station may be having more than one metering point depending on the No. of feeders connected by No. of Wind farms. This entire meter is termed as Feeder meter/s. The total energy recorded in the feeder meter/s is considered as the energy for billing. 2 nos. of meters – main and check meters are installed for energy generation recording which were checked during the remote audit. In normal case, energy generation recorded in the main meter is considered. In case of fault in the Main meter, check Meter reading will be considered (However no such case has been occurred). The meter reading is taken jointly by MSETCL (representative of state grid)/ MSEDCL and the company/ its representative every month. The Main meter reading is jointly certified by the above entity. MSEDCL provides credit notes on generation through a letter. The energy referred in the credit note is considered for raising invoice and accordingly payment will be received from MSEDCL. All the meters are calibrated by MSEDCL once a year. The energy meters of accuracy class of 0.2s. Based on the submitted documents and verification during the remote audit, VVB confirmed that the value of net electricity exported to the grid as used in emission reduction calculation is correct. The calibration details of meters used during the current monitoring period is provided in Appendix 5 of this report. There has been delayed in calibration of meter from 19-May-2021 to 21-September-2021. However, current monitoring period covered the period from 01-June-2021 to 29-Decememebr-2021, Thus, delay in calibration of meter were considered from 01-June-2021 to 21-September-2021. The observed error during calibration is within permissible error. Hence, PP has applied maximum permissible error of 0.2 % in export (

	deducted) and import (added) to arrive net electricity exported to grid for the complete month of delayed in which delayed calibration identified as a conservative approach in line with the requirement of sub-para 366(a) of VVS 03.0. Thus, acceptable to VVB. The calibration of the energy meters was carried out by meter testing division of Maharashtra State Electricity distribution Company Ltd., accredited by NABL (National Accreditation Board for Laboratory, Govt of India) to carry out the testing of the meters which is as per the national regulation and thus traceability of the Calibration is also confirmed by the verification team. It is reported that the data will be kept for 2 years following the end of the crediting period or till the last issuance of VCUs for the project activity whichever occurs later. 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 remote audit. Remote audit and interview with site personnel also confirms that the operational and organizational chart as mentioned in registered CDM PDD is as per the site practice and thus assessment team confirms that the details are correct. The shutdown / break down reports are checked and found that the plant undergone scheduled maintenance and break down. Assessment team checked the routine maintenance log book and confirmed that it does not have any impact on project design and monitoring procedures. No unforced error observed. Assessment team confirmed that data/ information used for determining GHG reductions and removals were sufficient in quantity and of appropriate quality. Calibration certificates of meters/ QA/QC procedure checked and found to be appropriate.
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4.6 Non-Permanence Risk Analysis

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

5 VERIFICATION CONCLUSION

Applus+ Certification has been engaged by Bindu Vayu Urja Private Limited to perform the 5th periodic verification of the “Chakala wind power project in Maharashtra”

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

Our Verification approach was based on the requirements as defined under the Kyoto Protocol, Marrakesh accord, as well as those defined by the CDM Executive Board and VCS Standard version 4.2. Our approach is risk-based, drawing on an understanding of the risks associated with reporting GHG emissions data and the controls in place to mitigate these. The verification can confirm that:

- the project is operated as planned and described in the project document;
- the monitoring plan is as per the applied methodology;
- the monitoring process in Monitoring Report is as per the CDM PDD
- the development and maintenance of records and reporting procedures are in accordance with the monitoring plan
- the monitoring system is in place and generates GHG emission reductions data;
- the GHG emission reductions are calculated without material misstatements.
- A reasonable level of assurance was achieved during the verification.
- No limitation observed for the present verification

Verification period: From 01-June-2021 to 29-December-2021 (first and last date included).

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

Year	Baseline emissions or removals (tCO ₂ e)	Project emissions or removals (tCO ₂ e)	Leakage emissions (tCO ₂ e)	Net GHG emission reductions or removals (tCO ₂ e)
01-June-2021 to 29-December-2021	37,335	0	0	37,335
Total	37,335	0	0	37,335

The estimated emission reduction achieved from the project activity for the current monitoring period is 43,159 tCO₂e, whereas actual emission reductions achieved are 37,335 tCO₂e, which is 13.49% lower than estimated emission reductions. As actual VCUs are lower than estimated

value for the MP which is due to climatic factors affecting wind power generation and grid availability and other parameters which are not in the control of PP. Another reason for low ex-post values is breakdown occurred during current monitoring period, the details of same is mentioned in Appendix-2 of monitoring report. VVB confirms that value is conservative and thus acceptable to VVB.

APPENDIX I: DOCUMENTS REVIEWED DURING VERIFICATION

No.	Author	Title	References to the document	Provider
1.	NA	Monitoring Report, (Initial Version) Monitoring Report, (Final Version)	Version 01, dated 02-June-2021 Version 03 dated 02- April-2022	PP
2.	NA	Emission Reduction sheet (Initial Version) Emission Reduction sheet (Final Version)	Version 01, dated 02-June-2021 Version 02 dated 02- April-2022	PP
3.	NA	Registered CDM PDD Registered VCS PD CDM Validation report 4 th Verification report	Version 07 dated 29-December-2012 Version 06 dated 15-May-2014 Version 01 dated 30-December-2012 Version 01 dated 01-September-2021	UNFCCC / VERRA
4.	NA	VCS Standard VCS Programme guide VCS Validation Verification Manual	Version 4.2 Version 4.1 version 3.2	VERRA
5.	NA	Technical specifications / photographs of turbines, electricity meters etc. Single line diagram and meter locations / Layout		PP
6.	NA	Power purchase agreement for the WTGs	13-June-2012 (for all WTGs)	PP
7.	NA	Commissioning Certificates for the WTGs installed	C-38 to C-43, C-45 to C-46, C-54, C-55. C-56 and C-58: dated 30-December-2011 C-50: Dated 03-January-2012 C-48, C-57, C-63: dated 12-January-2012 C-64: dated 13-January-0212 C-51 and C-52: dated 30-January-2012 C-47 and C-49, C-59, C-60, C-66: dated 15-February-2012 C-42, C-53: dated 22-February-2012	PP

No.	Author	Title	References to the document	Provider
8.	NA	ACM0002: Grid-connected electricity generation from renewable sources	Version 13.0	UNFCCC
9.	NA	Remote auditing for verification of measuring and monitoring procedure, • Video recordings & snapshots of the project site/equipment's • Interviews and data/log review	28-March-2022	PP
10.	NA	Credit notes for the entire monitoring period	01-June-2021 to 29-December-2021	PP
11.	NA	Invoices raised during the monitoring period	01-June-2021 to 29-December-2021	PP
12.	NA	Organization structure/chart		PP
13.	NA	Declaration of No Double Counting	30-03-2022	P

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

Summary of findings	CAR	CL	FAR
	04	00	00

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

FAR ID	Section no.	Date:
Description of FAR		
Project participant response		Date:
Documentation provided by project participant		
DOE assessment		Date:

Table 2. CAR from this verification

CAR ID	Section no.	Date
01	4.1	28-March-2022
Description of CAR		
1. Remove additional space provided while writing the date in table on page 1. 2. Provide page number in the footer in line with the VCS Monitoring Report Template version 4.1 3. Subscript the values/numbers wherever applicable throughout the MR 4. Complete all sections using Arial or Franklin Gothic Book 10.5 point, black, regular (non-italic) font in line with the VCS Monitoring Report Template version 4.1. It is observed that PP has used different font colour, font size in section 1 and 4. PP shall thoroughly check the MR again and make appropriate corrections. 5. Spelling mistakes/short form of the months observed (e. g. 'Decembe' instead of December / 'Mar' instead of March in the MR. PP shall write complete month. Further, date format shall be DD-MM-YYYY as per the template guideline. PP shall thoroughly check the MR again and make appropriate corrections (e. g. table in section 5.4 and appendix 1 mention date in different format).		
Project participant response		Date: 30-March-2022

1. The additional space is removed in the Revised MR version 02. 2. In line with the VCS monitoring report template version 4.1, page numbers are added 3. Values are subscripted throughout the MR. 4. All sections are completed in Franklin Gothic Book 10.5 in revised MR version 2.0 5. Spelling and formats are corrected in the Revised MR version 2.0	
Documentation provided by project participant	
Revised MR Version 2.0	
DOE assessment	Date: 31-March-2022
1. The additional space while writing the date is now removed which is checked and confirmed. Hence this part of CAR is closed. 2. PP has now provided page numbers in the footer in the revised MR which is checked and confirmed. Hence this part of CAR is closed. 3. The necessary changes have been made in the MR which is checked and confirmed. Hence this part of CAR is closed. 4. Revised MR is completed using Franklin Gothic Book 10.5 point, black, regular (non-italic) font which is checked and confirmed. Hence this part of CAR is closed. 5. Revised MR now mentioned correct month names and a consistent date format – DD-Month-YYYY is now used. Hence this part of CAR is closed.	
CAR is closed.	

CAR ID	02	Section no.	4.1	Date: 28-March-2022
Description of CAR				
1. In section 1.5, it is written that, ‘... start date for this project is said to be 30-December-2011...’. As per the submitted copies of commissioning certificates, the earliest date of commissioning is 30-December-2011. The use of verb – ‘said to be’ is unclear and same shall be corrected. 2. In section 1.8, methodology number is written as ACM002 which is incorrect. In the same section, it is mentioned that Tools for the demonstration and assessment of additionality is used however applicability of the same in current monitoring period is unclear to the assessments team. 3. In section 1.11, Provide a brief description that includes the following (no more than 100 words): A summary description of project activities implemented during the monitoring period that result in SD contributions (i.e., technologies/measures implemented, activity location) in line with the VCS Monitoring Report Template version 4.1 4. In the same section i. e. 1.11, it is mentioned that, ‘The project activity involves 52.5 MW wind power project in the state of Gujarat in India.’ As per registered VPA DD, complete project is located within the state of Maharashtra. 5. In section 1.11 table 1, under ‘Contributions Over Project Lifetime’, it is mentioned that, ‘Prevented the release of 588,769 Tonnes of carbon in the atmosphere’. It is unclear how the project helps to reduce carbon and not CO₂.				
Project participant response				Date: 30-March-2022

1. This has been corrected in Revised MR sheet Version 02. 2. The applied methodology is ACM0002 is corrected. The tool for the demonstration and assessment of additionality is not used in the current monitoring period and this has been removed from the revised MR Version 02, 3. Section 1.11 is updated in revised MR version 2.0 and provided with the description of project activities implemented during the monitoring period which results in the SD contribution. 4. The project activity is situated in the Maharashtra which is made consistent throughout the revised MR version 2.0. 5. The section 1.11 is corrected in the revised MR version 2.0	
Documentation provided by project participant	
Revised MR Version 2.0	
DOE assessment	Date: 31-March-2022
1. Section 1.5 is revised to correct the sentence. Hence this part of CAR is closed. 2. Methodology number is corrected to ACM0002 and reference to Tool for the demonstration and assessment of additionality is now removed which is acceptable. Hence this part of CAR is closed. 3. PP has revised section 1.11 providing a brief description of the project in line with the template requirement which is checked and confirmed. Hence this part of CAR is closed. 4. PP has now mentioned correct state i. e. Maharashtra in section 1.11. Hence this part of CAR is closed. 5. PP has corrected and mentioned tCO₂ which is acceptable. Hence this part of CAR is closed.	
CAR is closed.	

CAR ID	03	Section no.	4.1	Date: 28-March-2022
Description of CAR				
1. In section 3.1, it is mentioned that, 'Due to delay in calibration, the error factor is applied conservatively for current monitoring period and emission reductions are reduced accordingly'. The submitted ER sheet and monitoring plant in the MR does not substantiate this statement. Moreover, submitted calibration certificates mentions date of meter testing as 19-May-2020 and 20-May-2020 which are not applicable for current monitoring period (01-June-2021 to 29-December-2021) as calibration frequency is annual as per the Monitoring plan. 2. Feeder wise location of meter in Appendix 1 of MR is not consistent with the calibration certificate. 3. Invoice values for cross check is not in line with the WTGs wise invoices raised by PP				
Project participant response				Date: 30-March-2022

1. The section 3.1 has been corrected. The calibration details are as follows-

Calibration date	Calibration due date	New calibration	Calibration due date
19/05/2020	18/05/2021	22/09/2021	21/09/2022

The Calibration details is delayed by 4 months, Hence 0.2s is applied in the generation of June 2021, July 2021 August 2021, September 2021 in revised ER sheet and same has been replicated in the revised MR version 2.0.

2)Feeder wise location of meter in Appendix 1 is added in the revised MR version 2.0

3)The invoices are neither raised feeder wise nor WTG wise. They are raised grouply for some WTG's and separately for others. The invoices raised are as grouped as follows-

1.	C38, C39,C40,C41,C43,C44,C45,C46,C54,C55,C56,C58
2.	C42, C53
3.	C47,C49,C59,C60,C66
4.	C48, C57,C63
5.	C50
6.	C51,C52
7.	C64

Documentation provided by project participant

Revised MR Version 2.0

DOE assessment

Date: 31-March2022

1. PP has submitted copies of calibration certificates. It was observed that there is a delayed calibration in year 2021. The delayed calibration certificate was checked to confirm that there is no error identified. Hence applicable of maximum permissible error of 0.2s is acceptable. The revised MR and ER sheet submitted mentions this delayed calibration and its effect on ER calculation which is checked and accepted. Hence, this CAR is closed.
2. PP has revised Appendix 1 of MR to include feeder wise location of energy meters which is checked and confirmed. Hence this part of CAR is closed.
3. PP has submitted copies of Invoices raised to MSEDCL. It is observed and confirmed that invoices are not raised for individual WTGs but are raised for group of WTGs. Hence, it is not possible for PP to submit WTG wise invoices which is accepted and CAR is closed.

CAR is closed.

CAR ID	04	Section no.	4.5	Date: 28-March-2022
Description of CAR				
PP has provided breakdown details for the period prior to current monitoring period which shall be removed and breakdown details for current MP only shall be kept in the table.				
Project participant response				Date: 30-March-2022
The breakdown details are revised and are only mentioned for current MP in the revised MR Version 2.0				
Documentation provided by project participant				
Revised MR version 2.0				
DOE assessment				Date: 31-March-2022
Revised MR Appendix 2 provided breakdown details for the WTGs which are valid for current monitoring period and were confirmed during the remote audit. Hence, CAR is closed.				

APPENDIX 3: COMPETENCE OF TEAM MEMBERS AND TECHNICAL REVIEWERS

Verification team member

No.	Role	Type of resource	Last name	First name	Affiliation (e.g. name of central or other office of 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)	EI	Xue	Denny	Applus+ Certification
2.	Approver	IR	Calle de Miguel	Agustin	Applus+ Certification

Short CVs of the Team:

1. **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, India. He has more than (18) years of working experience in different organizations like IARI, IIT Delhi, ICAR, IRADe, CAPART, SMEC and Perenia Carbon and M B Power (Madhya Pradesh) Ltd. in the area of Agriculture, Energy & Environment and Climate Change. He also worked on contract basis (adhoc) as a RIT expert in UNFCCC from 2010 to 2013. Currently, he is empanelled with Applus+ Certification since 2020 and has been involved Verifications of Pas/PoAs as Lead Auditor and Technical Expert for Renewable and non-Renewable as well as Energy Demand.

2. **Mr. Denny Xue** (Master's Degree in Environmental Engineering, Bachelor's Degree in Thermal Engineering) is an Auditor appointed by Applus+ LGAI for the GHG project assessment, auditing and technical review. He has more than 6 years of work experience in CDM/GS4GG/VCS project assessment and technical review with Applus+. Before he joined Applus+ LGAI, he has been working for Shanghai Chuanji Investment and Management which is a CDM consultancy company as a project manager for CDM project development.

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
CO ₂	Carbon Dioxide
CO ₂ e	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

APPENDIX 5: CALIBRATION DETAILS

Location no	Date of Commissioning	WTG capacity (Mw)	Metering Point	Metering Make	MSEDC L Main meter Serial Number	MSEDC L Check meter Serial Number	Calibration date	Calibration due date	New calibration	Calibration due date
C54	30-December-2011	1.5	Gangapur 11	Elster	02811287	02811288	19-May-2020	18-May-2021	22-September-2021	21-September-2022
C55	30-December-2011	1.5								
C56	30-December-2011	1.5								
C58	30-December-2011	1.5								
C57	12-January-2012	1.5								
C63	12-January-2012	1.5								
C64	13-January-2012	1.5								
C59	15-February-2012	1.5								
C60	15-February-2012	1.5								
C66	15-February-2012	1.5								
C53	22-February-2012	1.5								
C38	30-December-2011	1.5	Gangapur 11	Elster	02831554	02831555	19-May-2020	18-May-2021	22-September	21-September

C39	30- Decemb er-2011	1.5							ber- 2021	ber- 2022
C40	30- Decemb er-2011	1.5								
C41	30- Decemb er-2011	1.5								
C43	30- Decemb er-2011	1.5								
C44	30- Decemb er-2011	1.5								
C46	30- Decemb er-2011	1.5								
C50	03Dece mber- 2012	1.5								
C51	20- January- 2012	1.5								
C52	20- January- 2012	1.5								
C48	12- January- 2012	1.5								
C47	15- February- 2012	1.5								
C49	15- February- 2012	1.5								
C42	22- February- 2012	1.5								

APPENDIX 6: BREAKDOWN DETAILS

Location No.	Reason of Breakdown	Start date	Stop date	Duration
C50	Rep Pitch Freq Conv Pitch2 ErrStop	02 June-2021	04-June-2021	48
C45	Rep Pitch CANComFail	02 June-2021	03-June-2021	23
C66	Rep Pitch CANComFail	15-July-2021	19- July -2021	96
C47	SFS CrowbarCurrent LimitExceeded Stop	17-July-2021	25-July-2021	192
C63	Rep Pitch FreqConvPitch3 ErrStop	19-July-2021	20-July-2021	24
C60	reduced power	30-July-2021	30-July-2021	15
C56	SFS CrowbarCurrent LimitExceeded Stop	01-August-2021	01-August-2021	11
C47	SFS CrowbarCurrent LimitExceeded Stop	02-August-2021	04-August-2021	48
C40	Rep Pitch FreqConvPitch2 ErrStop	01-September-2021	02-September-2021	18