WIND GROUPED PROJECT BY HERO FUTURE ENERGIES PRIVATE LIMITED (EKIESL-VCS-AUG-16-03)

Document Prepared By

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

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Summary:

Verification purpose: LGAI Technological Center S.A. (Applus+ Certification) (Hereafter referred as Applus+ Certification) has been appointed/2/ by "Hero Future Energies Private Limited" to perform the 4th verification (01-April-2021 to 30-June-2022) of the "Wind Grouped project by Hero Future Energies Private Limited (EKIESL-VCS-Aug-16-03)" (VCS ID 1582)[1/4/]. 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 VCS requirements.

The purpose of the project activities to generate energy electricity by the utilization of wind energy and further selling the generated energy to the Indian grid. The power (electricity) thus produced by the project activity would be transmitted to Indian electricity grid. Therefore, the project activity is displacing an equivalent amount of electricity which would have been otherwise generated in fossil fuel dominant electricity grid. The project activity is installation and operation of a 50 Wind Turbine Generators (WTG s) of total generating capacity of 100 MW, located Dhar district of Madhya Pradesh, India. The project activity utilizes 50 Gamesa made G97 WTGs each with capacity of 2.0 MW. The Project Activity was commissioned on 29-March-2016/01/. The monitoring period for this VCS verification is 01-April-2021 to 30-June-2022 (including both days) and the project activity achieved 271,146 tCO_2e emission reductions during this monitoring period thereon displaced 277,331.40 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.

The scope of the verification is the independent and objective review of the Monitoring Report (MR)/5/. 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 project activities, version 03.0/13/, review against registered VCS PD/4/ and final validation report, CDM validation and verification standard for project activities, version 03.0/13/, VCS program guide version 4.3/8/ and VCS Standard Version 4.4/8/

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) were raised and successfully closed. No FAR was raised during this verification. 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 LGAI Technological Center S.A. (Applus+ Certification) with sufficient evidence to verify the fulfilment of the stated criteria of VCS.

[1] https://registry.verra.org/app/projectDetail/VCS/1582

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 document verifications. The entire documents checked/verification conducted to arrive at positive verification conclusions.

CONTENTS

1. INTRODUCTION

1.1 Objective

LGAI Technological Center S.A. (Applus+ Certification) (Hereafter referred as Applus+ Certification) has been appointed by "*Hero Future Energies Private Limited*" to perform the 4th verification of the "*Wind Grouped project by Hero Future Energies Private Limited (EKIESL-VCS-Aug-16-03)*" under VCS Project guide, version 4.3 and VCS standard, version 4.4. The objective of this verification activity is to have an independent third party for the assessment of the project design, Monitoring Report and Final Verification report and to ensure a thorough assessment of the proposed project activity against the applicable CDM and VCS requirements. In particular;

- The project's baseline is assessed against ACM0002, version 17.0/15/
- The project's monitoring plan is assessed against "ACM0002, version 17.0/15/
- 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 program guide, version 4.3 and VCS standard, version 4.4
- CDM validation and verification standard for project activities, version 03.0/13/
- VCS program guide version 4.3/8/
- VCS standard version 4.4/8/

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.

1.2 Scope and Criteria

The scope is defined as an independent and objective review of the Monitoring report (MR)/5/ prepared as per the registered VCS PD/4/ and registered approved methodology ACM0002, version 17/15/. 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 4.4 and programme guide, version 4.3, including the approved baseline and monitoring methodology ACM0002, version 17. The verification was based on the requirements in the CDM validation and verification standard for project activities, Version 03.0 and VCS program guide version 4.3 and VCS Standard Version 4.4.

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. It 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. Verification team conducted onsite audit to verify metering/monitoring arrangement. The verification team has reviewed all the documents like commissioning certificates/1/, technical specification/16/, O & M practices/7/, Credit Report /JMR as per Monthly Generation Report /9/, invoices/9/, grievance register/12/ etc.

1.3 Level of Assurance

Applus + Certification has planned and performed the verification by obtaining evidence and other information and explanations that assessment team considers necessary to give reasonable assurance that reported estimated GHG emission reductions are fairly stated. All documentary evidences were checked, a site audit was conducted to verify metering/monitoring arrangement to arrive at a verification conclusion by the assessment team.

In our opinion, the estimated GHG emissions reductions were calculated correctly on the basis of the approved baseline and monitoring methodology ACM0002, version 17.0 and the VCS Standard Version 4.4.

1.4 Summary Description of the Project

The project activity is a wind-based power generation project. The project activity involves installation of 50 Wind Turbine Generators (WTG s) of total generating capacity of 100 MW, located Dhar district of Madhya Pradesh, India. The Project activity is promoted by M/s Hero Future Energies Private Limited. The monitoring period this VCS verification covered from 01-April-2021 to 30-June-2022 (inclusive of both dates) and the project activity achieved 271,146 tCO_2e emission reductions during this monitoring period. The start date of the Project Activity is 29-March-2016 as 1st WTG were commissioned on this date. Assessment team checked the commissioning status of the project activity with the commissioning Certificates and during on-site visit and found correct. The project is implemented as per the description in the registered VCS PD/4/. No event observed during the current monitoring period which can alter or deviate from the methodology requirement.

2. VERIFICATION PROCESS

2.1 Method and Criteria

Verification Process: The project assessment is based on the "CDM validation and verification standard for project activities, Version 03.0, VCS standard, version 4.4, VCS program guide version 4.3 and is conducted using standard auditing techniques to assess the correctness of the information provided by the project participants. Before the assessment begins, members of the team covering the technical scope(s), sectoral scope(s), and relevant host country experience for evaluating the VCS project activity are appointed.

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

1. A desk review of the Monitoring report against the registered VCS PD /04/ and final validation report;
2. Site Visit;
3. The resolution of outstanding issues and the issuance of the final verification report and opinion.

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

In order to ensure transparency, assumptions must be clear and stated explicitly and background material must also be referenced. 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 validating the identified criteria.

Appointment of the assessment team

According to the sectoral scope / technical area and experience in the sectoral or national busin ess environment, Applus+ Certification has composed a project assessment team in accordance with the appointment rules in the internal Quality Management System of Applus+Certification.

The composition of audit team shall be approved by the 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
Mr. Pankaj Kumar	LA/TE	YES	YES	NA	YES
Miss. Ritu Singh	obs[2]	YES	YES	NA	YES
Mr. Simon Shen	TR	YES	YES	NA	YES

[2] obs= Observer

The detail regarding the assessment team is provided below in this report as Appendix 3.

Document review

The Monitoring report version 01/05/ submitted by the PP was reviewed against the approved methodology/15/, approved registered VCS PD/04/, final validation report and other relevant criteria to verify the correctness, credibility, and interpretation of the presented information.

Further, 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.

Site Visit

An Onsite Inspection is conducted by Applus+ Certification. Audit team performed physical interview with project stakeholders to confirm selected information and to resolve issues identified in the document review. The detail is provided in this report.

Resolution of Clarification and Corrective Action Request

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

The final MR Version 02/05/ 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 verification of the final documentation including the 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 PP the positive verification opinion and relevant documents are submitted to the VCS board 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

No.	Interviewee			Date	Subject	Team member
	Last name	First name	Affiliation			
1.	Joshi	Jigar	Site-Incharge	07-January -2023	Project Implementation, JMR & invoicing procedure, calibration, grievance mechanism, Management practices, data storage, QA/QC	Mr. Pankaj Kumar / Ms. Ritu Singh
2.	-	Vijayanand	Head - HSE			
3.	Kumar	Dheeraj	Villager			
4.	Patil	Shital	EKI Energy Services Ltd.		GHG calculations, MR and ER preparation, Data collection, data storage, QA/QC	

2.4 Site Visits

Duration of on-site inspection: 07-January-2023				
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.	Dhar district of Madhya Pradesh, India	07-January-2023	Mr. Pankaj Kumar / Ms. Ritu 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 from verification 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 MR Version 02/05/ 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	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	01	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
Total	**00**	**04**	**00**

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

2.5.1 Forward Action Requests

This is 4th verification of the project activity and no FAR was raised from Validation or previous Verification.

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 is not applied under any other GHG program like CDM, GS. hence not applicable. Assessment team verified the same with other GHG mechanism's project interface. Moreover, PP has also submitted an officially attested declaration letter /10/to assessment team regarding no participation in other GHG program for the concerned monitoring period. Found acceptable.

3.2 Methodology Deviations

This section is not applicable for present verification as no methodology deviation sought during this verification and also in the earlier verifications by project participant. Further no deviation obtains by PP during previous verification too.

3.3 Project Description Deviations

This section is not applicable for present verification as no project description deviation sought during this verification and also in the earlier verifications by project participant. Further no deviation obtained by PP during previous verification too.

3.4 Grouped Project

The project does not involve any addition of new project activity in this monitoring period. However, project falls under the category of grouped project.

4. VERIFICATION FINDINGS

4.1 Project Implementation Status

During the Onsite Inspection with PP representatives & plants in-charge and subsequent document verification; commissioning certificates, PPA, Credit Report /JMR as per Monthly Generation Report and invoices, it was concluded that the project is implemented as per the requirement of the registered VCS PD and approved monitoring plan. During the current monitoring period, it was observed that no unforeseen incident/event evolved which can impact the operation of the project activity which was verified from breakdown records. The project undergone continuous operation and only scheduled maintenance is observed as per the manufacturer's specification which is acceptable to the assessment team and evident from Credit Report /JMR as per Monthly Generation Report. The project activity entails installations of wind turbines having a total capacity of 100 MW, fifty wind turbines installed in this project activity.

The commissioning details of the WTGs are provided in the table below:

SPV Name	Capacity (MW)	Village	District	State	Date of Commissioning
Clean Wind Power (Ratlam) Private Limited	100	Shergadh, Gandhwada, Borjhadi, Indrawal, Panda, Khiledi, Kisanpura, Chandoriya, Phuledi	Dhar	Madhya Pradesh	29-March-2016

All the WTGs of the project activity were commissioned on 29-March-2016. Assessment team checked the commissioning certificate/1/ and confirmed that the dates of Commissioning for the WTGs are correct. Assessment team also confirm during interview with the PPs representatives that there is no change in project design and the project is implemented as per the description provided in the VCS PD. The details of WEGs are provided below:

The project boundary includes the electricity generation equipment at the project site, substation and the regional grid (now Indian grid).

Assessment team also checked the Technical details of the wind turbines installed onsite from documents submitted by PP and previous verification reports. The same is cross checked from the photographs of the number plates, module capacity etc. submitted by PP & also cross checked from the technical details from Manufacturer.

Technical details of Gamesa G97 WTG is given below:

Rated power	2.0 MW
Cut-out speed	25 m/s
Cut-in speed	3 m/s
Rotor diameter	97m
Swept area	7390m^2
Control	Variable pitch and speed
Generator type	Doubly-fed generator

The assessment team confirmed that there is no proposed or actual change to the project design during this monitoring period. The project design as mentioned in the registered VCS PD is implemented and thus the same is acceptable to the assessment team. All required monitoring equipment's and procedures as mentioned in the registered VCS PD are available and implemented in an appropriate manner.

Locations (geo-coordinates) of all the WTGs:

Project Company Name	WTG Id.	Geo-coordinates	
		Latitude (N)	Longitude (E)
Clean Wind Power (Ratlam) Private Limited	BD-01	22° 51' 43.9308"	75° 07' 56.6296"
	BD-02	22° 51' 38.6892"	75° 08' 06.1345"
	BD-03	22° 51' 30.2616"	75° 08' 12.1269"
	BD-04	22° 51' 24.8472"	75° 08' 27.7371"
	BD-05	22° 51' 16.4232"	75° 08' 29.8690"
	BD-06	22° 51' 07.9128"	75° 08' 17.1575"
	BD-07	22° 50' 59.1576"	75° 08' 27.2545"
	BD-08	22° 50' 51.9504"	75° 08' 13.1062"
	BD-09	22° 50' 47.4756"	75° 08' 34.3303"
	BD-10	22° 50' 42.0324"	75° 08' 48.1143"
	BD-11	22° 50' 27.9456"	75° 09' 26.5198"
	BD-12	22° 50' 21.3684"	75° 09' 34.0208"
	BD-13	22° 50' 11.9544"	75° 09' 16.2562"
	BD-14	22° 50' 11.9544"	75° 09' 16.2562"
	BD-15	22° 50' 04.2828"	75° 09' 47.9649"
	BD-16	22° 49' 47.7840"	75° 09' 25.9122"
	BD-17	22° 49' 37.4448"	75° 09' 24.2514"
	BD-18	22° 49' 19.2036"	75° 09' 20.1610"
	BD-19	22° 49' 04.2456"	75° 09' 16.2149"
	BD-20	22° 49' 26.7780"	75° 08' 10.3897"
	BD-21	22° 49' 17.8608"	75° 08' 18.5901"
	BD-22	22° 49' 17.8644"	75° 08' 17.2920"
	BD-23	22° 48' 51.5052"	75° 09' 41.8092"
	BD-24	22° 48' 04.4676"	75° 09' 20.9881"
	BD-25	22° 48' 13.3848"	75° 09' 15.0701"
	BD-26	22° 48' 20.3796"	75° 09' 47.1044"
	BD-27	22° 47' 49.6896"	75° 10' 37.9280"
	BD-28	22° 48' 26.2908"	75° 10' 23.9439"
	BD-29	22° 48' 15.7212"	75° 10' 23.4395"
	BD-30	22° 48' 07.2540"	75° 10' 03.5400"
	BD-31	22° 47' 57.8508"	75° 10' 07.5974"
	BD-32	22° 47' 37.5720"	75° 10' 26.4428"
	BD-33	22° 47' 34.2780"	75° 10' 03.7803"
	BD-34	22° 47' 23.8380"	75° 09' 32.0955"

	BD-35	22° 47' 14.7552"	75° 09' 42.5720"
	BD-36	22° 50' 38.1444"	75° 09' 40.2509"
	BD-37	22° 46' 49.4976"	75° 09' 31.8804"
	BD-38	22° 46' 49.4832"	75° 09' 45.2778"
	BD-39	22° 46' 39.1044"	75° 09' 50.3157"
	BD-40	22° 46' 27.1128"	75° 09' 41.7443"
	BD-41	22° 46' 20.1360"	75° 09' 58.1837"
	BD-42	22° 46' 16.2552"	75° 09' 37.3478"
	BD-43	22° 45' 47.7108"	75° 09' 59.0913"
	BD-44	22° 45' 37.6632"	75° 09' 25.9061"
	BD-45	22° 45' 37.6632"	75° 09' 25.9061"
	BD-46	22° 45' 37.6632"	75° 09' 25.9061"
	BD-47	22° 45' 20.2968"	75° 09' 59.0931"
	BD-48	22° 45' 09.9360"	75° 08' 37.5553"
	BD-49	22° 45' 00.0180"	75° 08' 36.8436"
	BD-50	22° 45' 03.7332"	75° 09' 36.7372"

Geo coordinates were checked on the google earth and also cross-checked with validation report and verification team concluded that the geo coordinates of project locations are consistent with registered VCS PD.

The organisational role and responsibility as mentioned in the registered VCS PD is followed onsite confirmed during onsite visit. All the emergency preparedness as mentioned in the VCS registered VCS PD is followed onsite and no discrepancies were found regarding the same. Meters are calibrated as per calibration frequency in registered VCS registered VCS PD /4/. All the emergency preparedness as mentioned in the VCS registered VCS PD is followed onsite and no discrepancies were found regarding the same. Thus, completeness of the monitoring plan confirmed and there are no any material discrepancies between the actual monitoring system and the plan provided in the registered VCS PD.

CAR 01 is raised for the inconsistency with respect to MR template guidelines and CAR 02 is raised for supporting evidences for No-Double counting and closed successfully after proper response of PP.

Assessment team confirms following during the verification Onsite Inspection:

1. Start date of the project activity is 29-March-2016 as mentioned in the registered VCS PD/4/.
2. An undertaking letter dated 10-January-2023 has been submitted by PP for no double counting with any other GHG program. PP also has given a written declaration that project has not claimed other form of GHG credit for the concerned monitoring period. Assessment team also checked that the projects are not registered under the REC mechanism of India and the same can be cross-checked at *https://recregistryindia.nic.in*. PP has given a written declaration that the credit claimed under VCS for the current monitoring period is not claimed under any other GHG mechanism/10/.
3. Assessment team confirms that this is the 4th monitoring under VCS and covers the activity from 01-April-2021 to 30-June-2022 (inclusive of both dates). The project activity adopts renewable crediting period of 10 years period and can be renewed for maximum 2 times. The

project start date for this project is 29-March-2016. This is the day on which the first WTG was commissioned/1/. 29-March-2016 is the start date and 28-March-2026 will be end date of the crediting period.

The GHG credits from 01-April-2021 to 30-June-2022 will be claimed under VCS only. At any point of time during the crediting period, the project proponent will abide by the "No Double Counting"/10/.

4. Assessment team checked and found that the Project proponent of the project activity mentioned in Section 1.3 of monitoring report is correct/5/:

5. Assessment team also checked the details of other entity mentioned in Section 1.4 of monitoring report and found correct.

6. The quantified emission reduction calculation for the monitoring period is correct and conservative. Assessment team also compared actual VER with the estimated VER and found that the actual VER is 271,146 tCO_2e which is 26.70 % higher than the estimated emission reductions 213,998 tCO_2e (171,293 tCO_2e/365 days x 456 days) during this monitoring period which is due to the variations in wind flow pattern, grid availability and other parameters which are not in the control of PP. However, this higher value does not impact the additionality of the project – as per Section 2.5 of the registered VCS Joint PD & MR, if the PLF (20.0%) increases by 65.30% than the assumed value, the project IRR breaches the benchmark; but in this case, the actual PLF exceeds value by about 26.7 % so the project IRR does not breach the benchmark and it does not have any impact on project additionality. Hence accepted.

Sustainable development indicators

As a part of regional development efforts associated with the project, PP has supported many education, health & infrastructure related needs for local people. These are funded from the revenue generated from the operation of the project activity. In the absence of project activity, there would be no revenue generated from the project and hence the activity would have not occurred in the absence of the project activity.

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

4.2 Safeguards

4.2.1 No Net Harm

No potential environment or socio-economic matter was found during the documents review of VCS PD and grievance register/12/ etc. The project is renewable energy project and thus no negative impact observed due to project activity.

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[3] mentions

[3] https://smartnet.niua.org/sites/default/files/resources/report-on-developmental-impacts-of-RE.pdf

that solar/Wind power project activity operations do not result in direct air pollution, noise pollution. Moreover, also as per the Central Pollution Control Board of India notification [4] solar/wind project falls under White Category and are practically non-polluting. Assessment team checked and found this appropriate.

4.2.2 Local Stakeholder Consultation

Local stakeholder consultation has been conducted at the time of project registration. For on-going stakeholder's communication, PP have maintained grievance register/12/ at the site office. All the stakeholders are happy with the implementation and operation of the project activity and no negative comments envisaged for the project activity. Complaint/suggestion/feedback register is maintained at site as a part of ongoing communication with stakeholders in line with clause 3.18.19 of VCS Standard, version 4.4 and appropriate actions taken time to time by PP.

Assessment team checked the grievance register provided by PP and found that local stakeholders can anytime lodge their grievances if any in the register over the operational life time of the project. During current monitoring period no grievance was received. Thus, assessment team is of the opinion that the ongoing stakeholder mechanism is adequate and appropriate. CAR 03 was raised during the verification process and closed successfully. Please refer Appendix 2 of this report for the detail closure of the CAR.

4.3 AFOLU-Specific Safeguards

This section is not applicable as this project activity is a non-AFOLU project activity.

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 VCS PD/4/
Findings	CAR 04 was raised during the verification process and closed successfully. Please refer Appendix 2 of this report for the detail closure of the CAR.
Conclusion	As per the registered PD and applied methodology, Formula used to calculate achieved emission reduction is as follow; $ER_y = BEy - PEy$ As per registered PDD, the build margin and operating margin CO_2 emission factor of Indian grid is taken from Central Electricity Authority: CO_2 Emission Database CEA CO_2 Baseline database Version 11.

[4] https://cpcb.nic.in/openpdffile.php?id=TGF0ZXN0RmlsZS9MYXRlc3RfMTE4X0ZpbmFsX0RpcmVjdGlvbnMucGRm

Thus,

$EF_{OM,y}$ = 0.9941 tCO_2/MWh

$EF_{BM,y}$ = 0.9285 tCO_2/MWh

& $EF_{CM,y}$ = 0.9777 tCO_2/MWh

The baseline emissions are calculated as below,

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

Where;

BE_y : Baseline Emissions in year y (tCO_2e)

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

$EF_{grid, CM, y}$ = CO_2 emission factor of the grid in year y (tCO_2/MWh)

The calculation of yearly baseline emissions is provided in the table below:

Year	Net Electricity Export(MWh)	Baseline Emission Factor(tCO2/MWh)	Baseline Emissions(tCO_2)
2021	167,924.20	0.9777	164,179
2022	109,407.20	0.9777	106,967
Total	**277,331.40**		**271,146**

BE_y = 277,331.40MWh * 0.9777 tCO_2/MWh

=**271,146 tCO_{2e}** (round down values)

Monitored Parameters:

1. **$EG_{facility,y}$** : Quantity of net electricity supplied (MWh) to the grid as a result of the implementation of the project activity instances in year y (MWh).

The Net electricity supplied to the grid by the project activity is calculated as a difference of electricity exported to the grid, electricity imported from the grid obtained from joint meter reading certificates/credit notes issued by state electricity board as per below equation:

$EG_{facility,y} = EG_{Export} - EG_{Import}$

The joint reading at metering point is carried out once in a month in presence of O&M officials and state electricity board personnel. The calculations/measurement of net electricity supplied to grid is under purview of state electricity board and the PP/Project activity Instance owner has no role on it. PP/Project activity Instance owner received value of net electricity supplied to grid and hence this parameter is mentioned as a part of monitoring plan.

The verification team has checked the Credit Report /JMR as per Monthly Generation Report 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 MR. Assessment team found 277,331.40 MWh value correct and inline with the JMR and invoices. Thus accepted.

Value monitored:

Year	$EG_{facility,y}$ (MWh)
2021	167,924.20
2022	109,407.20
Total	277,331.40

Project emissions:

As per methodology, for renewable energy projects, there is no project emissions occurred. Hence, $PE_y = 0\ tCO_2e$

Leakage Emission:

As per methodology ACM0002, Version 17.0, no Leakage emissions are considered. The main emission potentially giving rise to leakage in the context of electrical sector projects is emission arising due to activities arising such as power plant construction and upstream emission from fossil fuel use (e.g. extraction, processing, and transport). These emission sources are neglected.

As per methodology, for renewable energy projects, there is no any leakage emissions occurred. Hence, $LE_y = 0$

Hence, net GHG reduction and removals

Year	Baseline emissions or removals (tCO_2e)	Project emissions or removals (tCO_2e)	Leakage emissions (tCO_2e)	Net GHG emission reductions or removals (tCO_2e)
01-April-2021 to 31-December-2021	164,179	0	0	164,179
01-January-	106,967	0	0	106,967

	2022 to 30-June-2022				
	Total	271,146	0	0	271,146

VVB confirmed that GHG reductions and removals have been quantified correctly and in line with monitoring procedure in VCS PD and applied methodology.

The estimated emission reduction achieved from the project activity for the current monitoring period is 213,998 tCO_2e based on the number of days covered during the current monitoring period which comes out to be 456 days. Whereas the actual emission reductions achieved during the current monitoring period are 271,146 tCO_2e. The actual VCUs are 26.70 % higher than the estimated VCUs. This variation is majorly due to the variations in wind flow pattern, grid availability and other parameters which are not in the control of Project Proponent. Hence, this change will not affect the additionality of the project. The VVB confirms that these doesn't have impact on additionality and it is below the bench march. Hence accepted.

4.5 Quality of Evidence to Determine GHG Emission Reductions and Removals

Means of verification	The verification team checked the Calibration details of the monitoring meters with the calibration certificates.
Findings	CAR 4 was raised during the verification process and closed successfully. Please refer Appendix 2 of this report for the detail closure of the CAR.
Conclusion	Assessment team has checked calibration certificates/11/ and found that meters are calibrated and calibration is valid for current monitoring period. Verification team confirms that all the energy meters (main and check meter) installed at the substation are of accuracy class of 0.2s and are calibrated as per the calibration frequency mentioned in monitoring plan in VCS PD i.e. The calibration frequency of meters is once in 5 years. Readings are cross checked with back up meter. No delayed calibrations were observed in the project activity for this monitoring period. All the meters are of same accuracy class i.e., 0.2s as per the requirement of the registered VCS PD/4/. During Onsite Inspection with O&M personnel also confirms the same. The calculation of net electricity supplied to grid is under purview of state electricity board and PP does not have control on it. Calibration details of the monitoring meters checked with calibration certificates submitted by PP and found that calibration frequency of 5 years is complied. Thus, no delayed

	calibration is observed and thus the same is found appropriate. (refer Appendix-5). The break down log is checked and there is no major breakdown during the monitoring period. No unforced error observed. No sampling procedure applied for monitoring of the data parameter and entire documents were checked by the assessment team to arrive at positive verification conclusions. The monitoring plan is followed at the project site. The monitoring meters were calibrated in line with the registered monitoring plan and there was no delay in calibration observed. Thus, assessment team concluded that the evidences are sufficient in quantity, and appropriate for the quality, to determine the GHG reductions and removals. 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.

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	
NA	NA	NA	NA	NA

5. VERIFICATION OPINION

Applus+ Certification has been engaged/02/ by M/s Hero Future Energies Private Limited to perform the 4th verification (01-April-2021 to 30-June-2022) of the "Wind Grouped project by Hero Future Energies Private Limited (EKIESL-VCS-Aug-16-03)".

The project participants are responsible for the preparation of the GHG emissions data and the reported GHG emissions reductions on the basis set out within the project's monitoring plan in the registered VCS PD /4/ and the applied methodology ACM0002, version 17.

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. Further, 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 document verifications. The entire documents checked/Power plant verification conducted to arrive at positive verification conclusions. The verification team 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 VCS PD /4/;
- 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.
- A Reasonable Level of assurance was achieved as planned, during verification process.

Verification period: 01-April-2021 to 30-June-2022 (inclusive of both days)

Verified GHG emission reductions and removals in the above verification period, broken down by calendar year:

Year	Baseline emissions or removals (tCO_2e)	Project emissions or removals (tCO_2e)	Leakage emissions (tCO_2e)	Net GHG emission reductions or removals (tCO_2e)
01-April-2021 to 31-	164,179	0	0	164,179

December-2021				
01-January-2022 to 30-June-2022	106,967	0	0	106,967
Total	271,146	0	0	271,146

Estimated ex-ante GHG emission reductions and removals and the achieved emission reductions and removals for this monitoring period:

Year	Ex-ante emissions reductions/ removals	Achieved emissions reductions/ removals	Percent difference	Justification for the difference
01-April-2021 to 31-December-2021	129,056	164,179	27.22 %	This variation is majorly due to the variations in wind flow pattern, grid availability and other parameters which are not in the control of PP. However, this higher value does not impact the additionality of the project – as per Section 2.5 of the registered VCS Joint PD & MR, if the PLF (20.0%) increases by 65.30% than the assumed value, the project IRR breaches the benchmark; but in this case, the actual PLF exceeds value by about 27.22 % so the project IRR does not breach the benchmark and it does not have any impact on project additionality. Hence accepted.
01-January-2022 to 30-June-2022	84,942	106,967	25.93 %	This variation is majorly due to the variations in wind flow pattern, grid availability and other parameters which are not in the control of PP. However, this higher value does not impact the additionality of the project – as per Section 2.5 of the registered VCS Joint PD & MR, if the PLF (20.0%) increases by 65.30% than the assumed value, the project IRR breaches the benchmark; but in this case, the actual PLF exceeds value by about 25.93 % so the project IRR does not breach the benchmark and it does not have any impact on project additionality.
Total	213,998	271,146	26.70%	-

APPENDIX 1: DOCUMENTS REVIEWED OR REFERENCED

No.	Author	Title	References to the document	Provider
1.	State Utility	Commissioning certificates of all WTGs.	Commissioning of the wind power project	PP
2.	Applus	Contract of the project participant with the DOE. Ref. No. A+SH_SYST_TQC_VCS_VER_44122	23-November-2022	PP
3.	NA	The operational lifetime of the project activity from the manufacturer (Technical specifications)	Manufacturer technical specifications	PP
4.	NA	Registered VCS PD and validation report	https://registry.verra.org/app/projectDetail/VCS/1582	PP
5.	NA	Monitoring report Version 01 (Initial) Monitoring report Version 02 (Final)	23-November-2022 01-February-2023	PP
6.	NA	Emission reduction sheet version 01 Emission reduction sheet version 02	23-November-2022 01-February-2023	PP
7.	PP	O & M Agreement	-	PP
8.	NA	Tools/ guidelines used in the project activity • VCS Program Definitions, version 4.3 • VCS standard Version 4.4 • VCS Program Guide 4.3 • VCS verification report template version 4.1		VERRA
9.	State Utility for share certificates, PP for invoice	Credit Report /JMR as per Monthly Generation Report and Invoices		PP
10.	PP	Declaration regarding no participation in other GHG program for the concerned monitoring period	10-January-2023	PP
11.	NA	Calibration details of the project activity undergoing verification	Calibration certificates	PP
12.	NA	Grievance Register maintained at site	-	PP

No.	Author	Title	References to the document	Provider
13.	UNFCCC	CDM validation and verification standard for project activities, Version 03.0	-	UNFCCC
14.	PP	Shutdown details for the Project Activity Maintenance log book	-	PP
15.	UNFCCC	CDM methodology ACM0002	version 17	UNFCCC
16.	NA	Technical datasheet for WTG		PP
17.	PP	Photographs of WTGs, Energy meters		PP
18.	PP	Power Purchase Agreement	-	PP
19.	VERRA	Previous verification reports	https://registry.verra.org/app/projectDetail/VCS/1582	VERRA

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

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

FAR ID	00	Section no.		Date :
Description of FAR				
Project participant response				Date :
Documentation provided by project participant				
VVB assessment				Date:

Table 2. CL from this verification

CL ID	00	Section no.		Date :
Description of CL				
NA				
Project participant response				Date:
Documentation provided by project participant				
VVB assessment				Date:

Table 3. CAR from this verification:

CAR ID	01	Section no.	4.3	Date: 09-January-2023
Description of CAR				
VVB has found inconsistency in the font used in the submitted MR. PP is requested to refer VCS MR template version 4.1 and revise accordingly.				
Project participant response				Date:01-February-2023
Font is being corrected in monitoring report.				
Document submitted				Date:01-February-2023
MR V02				
VVB assessment				Date:15-February-2023
PP has revised the Font used in the MR inline with VCS MR template version 4.1. Thus, CAR is Closed.				

CAR ID	02	Section no.	1.9, 1.10	Date: 09-January-2023
Description of CAR				
1. PP shall provide an undertaking for no double counting of GHG reductions claimed for current monitoring period. 2. As part of ongoing LSC, PP is requested to submit the grievance register for verfication by VVB. 3. PP is requested to submit the PPA signed with plant and the grid.				
Project participant response				**Date:01-February-2023**
1. An undertaking for no double counting of GHG reductions claimed for current monitoring period is being provided. *2. Grievance register is being provided.* *3. PPA is being provided.*				
Project participant response				**Date:01-February-2023**
1. Undertaking letter. *2. Grievance register* *3. PPA*				
VVB assessment				**Date:15-February-2023**
1. PP has submitted the undertaking letter for no any double counting for current monitoring period dated 10-January-2023 and for project activity PP not claiming any ERs other than VCS verified by assessment team. Thus, **CAR is closed.** 2. PP has submitted Grievance Registers of the all units of the project activity. Assessment team found no major grievances has been made by local stakeholders during current monitoring period. Thus, **CAR is closed**. 3. PP has submitted the PPA signed with plant and the grid to the assesssment team and same is found consistent. Thus, accepted. **CAR is Closed.**				

CAR ID	03	Section no.	1.9, 1.10	Date: 09-January-2023
Description of CAR				
PP is requested to submit evidence for the contributions towards the SDG targets which are mentioned in the table 1 of the MR.				
Project participant response				**Date:01-February-2023**
Traing records are being provided.				
Project participant response				**Date:01-February-2023**
Training records				
VVB assessment				**Date:15-February-2023**
PP has submitted the evidence for the contributions towards the SDG targets which are mentioned in the table 1 of the MR and same is found correct. Thus, **CAR is Closed.**				

CAR ID	04	Section no.	4.3	Date:09-January-2023
Description of CAR				
PP is requested to provide following documents to verify the deatils given in MR, 1. Calibration certificates of meters 2. Meter specifications technical brochure.				

3. JMR/Invoices and ER sheet.
Project participant response **Date:01-February-2023**
1. Calibration certificates of meters are provided. 2. Meter specifications technical brochure is provided. 3. JMR/Invoices and ER sheet are provided.
Documentation provided by project participant
1. Calibration certificates of meters 2. Meter specifications technical brochure. 3. JMR/Invoices and ER sheet.
VVB assessment **Date:15-February-2023**
1. PP has submitted the calibration certificate covering the complete monitoring period to the assessment team and same is found consistent with the calibration dates mentioned in the revised MR V02. Thus, **CAR is Closed**. 2. PP has submitted meter specification technical brochure to the assessment team and same is found correct. Thus, **CAR is Closed**. 3. PP has submitted the JMR/Invoices and ER sheet to the assessment team and the given values are found correct & conservative. Thus, **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	PANKAJ	KUMAR	TQC-Outsourced entity	Yes	Yes	Yes	Yes
2.	Observer	OR	RITU	SINGH	TQC-Outsourced entity	Yes	Yes	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	Shen	Simon	Applus+ Certification
2.	Approver	IR	Calle de Miguel	Agustin	Applus+ Certification

Short CVs of the Team:

1. **Mr. Pankaj Kumar** has done M. Sc in Environment Management from Forest Research Institute, Dehradun and B. Sc. (Hons.) in Environment & Water Management from Magadh University, Bihar, India. He has also done Post Graduate Diploma in Environmental Law from NLSIU, Bangalore. He has more than 12 years of working experience in GHG Assessments and has participated during his career in Agencies and DOEs like MITCON, Agrinergy, Carbon Check and is empanelled with Applus+ Certification since 2015 for the performance of CDM/VCS/GS project assessments. He has extensive experience in the Renewable, Waste Management and Energy Demand Scopes of UNFCCC CDM and has done more than 100 Validations and Verifications of PAs and PoAs as Lead Auditor, Technical Expert and Technical Reviewer, mainly in Asia, Africa, USA, Asia Pacific and Americas under CDM, Verified Carbon Standard, Gold Standard & Social Carbon Standard, Brazil. He is an experienced, qualified and result oriented Environment and climate change professional having 16 yrs. of relevant experience in Climate Change (Mitigation & Adaptation), Environmental Due Diligence, Disaster Risk Reduction, Climate finance, adaptation planning, capacity building, validation and verification of GHG project. He can also provide technical support for environmental investigative, remedial projects involving air, water and soil, Waste management, EIA, Environmental Compliance, ISO 14001, OHSAS 18001, GHG accounting (ISO 14064) and Carbon foot printing. Mr. Pankaj Kumar is based in Patna, India. Mr. Pankaj Kumar may participate as part of the Audit Team as Lead Auditor and Technical Expert for the assessment.

2. **Ms. Ritu Singh** has done Masters in Environmental Science from Central University of South Bihar, Gaya and bachelor of Science in Zoology from Magadh Mahila College, Patna University, India. She has done Masters' research focused on solid waste management during and post covid-19 pandemic and conducted a survey in Medical Colleges of Bihar to study the trends of waste management. Currently, She is working in True Quality Certifications Pvt. Ltd. (An outsource entity for LGAI Technological Center, S.A. (Spain) "Applus+ Certification") since 2021 and has been involved in supporting Audit teams for Verifications of Project Activities (Renewable and non-Renewable projects) under CDM/VCS/GS4GG programs.

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

APPENDIX 4: ABBREVIATIONS

Abbreviations	Full texts
BM	Build Margin
CAR	Corrective Action Request
CDM	Clean Development Mechanism
VER	Verified 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)
PP	Project Participant
PLF	Plant Load Factor
MR	Monitoring Report
JMR	Joint Metering Report
PPA	Power Purchase Agreement
WTG	Wind Turbine Generator
VCS	Voluntary Carbon Standard
VVB	Validation and Verification Body

APPENDIX 5: CALIBRATION DETAILS

Meter Details	Main meter	Check meter
Meter serial number	MPC74061	MPC74060
Meter make	Secure	Secure
Accuracy class	0.2s	0.2s
Calibration date	13-March-2016	13-March-2016
Due date of calibration	12-March-2021	12-March-2021
Calibration date	03-January-2020	03-December-2019
Due date of calibration	02-January-2025	02-December-2024