



13.75 MW WIND POWER PROJECT IN DAVANGERE, KARNATAKA, INDIA



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Summary:

Verification purpose: Sargam Retails Pvt. Limited has commissioned the LGAi Technological Center, S.A. (Applus+ Certification) to carry out the verification of the project “13.75 MW wind power project in Davangere, Karnataka, India” with regard to the relevant requirements of VCS guideline version 4.0 and VCS standard, version 4.1. The project involves installation and operation of 13.75 MW (5 WTG of Suzlon make 1.5 MW and 5 WTG of 1.25 MW) wind power project in the state of Karnataka, India. The generated electricity supplied to Karnataka Power Transmission Company Limited (KPTCL) via Indian Unified grid through power purchase agreement.

Start date of the project activity is 31-March-2009 which is the date of commissioning of first WTG of the project. This is the day on which the project has started emission reductions. This is in accordance with the registered RCP VCS PDD (version 03, dated: 26-February-2021 and VCS standard version 4.1. The project is also registered under CDM and the UNFCCC reference number is 3700. An undertaking has been submitted by PP for double counting would never happen with any other GHG program. During the current monitoring period, project activity undergoes continued operation and no major breakdown had taken place.

The monitoring period covered in the verification is 31-March-2019 to 30-June-2021 (inclusive both days). During the current verification period, the project activity has supplied 66,684.00 MWh of electricity, and thus contributing to the GHG reductions 62,808 tCO₂e.

A risk-based approach has been followed to perform this verification activity. In the course of verification, 05 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 DOE with sufficient evidence to verify the fulfilment of the stated criteria of VCS.

LGAi Technological Center S.A. (Applus+ Certification) (Hereafter referred as Applus+ Certification) has been appointed by Sargam Retails Pvt. Limited to perform the verification of the “13.75 MW wind power project in Davangere, Karnataka, India” under VCS standard v.4.1 and guideline version 4.0. 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 “AMS-I. D version 18.0”
- the project's monitoring plan is assessed against “AMS-I. D version 18.0”

- the projects compliance with, the requirements of Article 12 of the Kyoto Protocol, the CDM Modalities and Procedures as agreed in the Marrakech Accords under decision 3/CMP.1, the annexes to this decision, subsequent decisions and guidance made by COP/MOP & CDM Executive Board and other relevant rules, including the Host Country legislation and sustainability criteria along with VCS guideline v.4.0 and standard, version 4.1
- CDM Validation and Verification Standard for project activities, version 03.0
- CDM Project Standard for project activities, version 03.0
- CDM project cycle procedure for project activities, version 03.0
- VCS standard, version 4.1
- VCS guideline, version 4.0

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 verified emission reductions (VERs).

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, review against registered PD and Final Validation report, CDM Project Standard for project activities, version 03.0; CDM Project Cycle Procedure for project activities, version 03.0 and VCS program guideline v.4.0 and standard version 4.1.

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

The only purpose of the verification is its usage during the issuance process as part of the VCS 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 assessment 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 Sargam Retails Pvt. Limited to perform the verification of the project entitled “13.75 MW wind power project in Davangere, Karnataka, India” under VCS guideline version 4.0 and standard 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 is assessed against “AMS-I. D version 18.0”
- the project's monitoring plan is assessed against “AMS-I. D version 18.0”
- 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 guideline and standard version 4.1
- CDM Validation and Verification Standard for project activities, version 03.0
- CDM Project Standard for project activities, version 03.0
- CDM project cycle procedure for project activities, version 03.0
- VCS standard, version 4.1
- VCS guideline, version 4.0
- 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 emission reductions (VERs).

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 PD and registered approved methodology AMS-I. D version 18.0. 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 4.1 and guideline version 4.0, including the approved baseline and monitoring methodology AMS-I. D version 18.0. 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, CDM project cycle procedure for project activities, version 03.0 and VCS program guideline v.4.0 and standard version 4.1

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 invoices follows the paper trail back to the raw data such as meter reading records and invoices. There are no material errors, overestimation of ER, omission or misstatement. The verification team has reviewed all the documents like commissioning certificates, JMR, invoices etc.

1.3 Level of Assurance

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

1.4 Summary Description of the Project

The main purpose of this project activity is to generate clean form of electricity through 13.75 Wind Power Plants in the state of Karnataka. The project activity is installation of 10 WTGs of total generating capacity of 13.75 MW (5 WTG of 1.5 MW and 5 WTG of 1.25 MW) at Davangere district of the state of Karnataka. The generated electricity has been sold to Karnataka Power Transmission Company Limited (KPTCL) via unified Indian Grid through power purchase agreement. The main features of the technology are as follows:

S-82 1.5 MW		S-64 1,25 MW	
Rated Power	1500 kW	Rated Power	1250 kW
Rotor diameter	82 m	Rotor diameter	64 m
Swept area	5,281 m ²	Swept area	3m217 m ²
No. of blades	3	No. of blades	3
Cut in wind speed	4 m/s	Cut in wind speed	3.5 m/s
Cut out wind speed	20 m/s	Cut out wind speed	20 m/s
Rotor speed	20.3 rpm	Rotor speed	20.3 rpm
Regulation	Pitch	Regulation	Pitch
Hub height	78.5 m	Hub height	74.5 m
Generator Type	Asynchronous	Generator Type	Asynchronous
Insulation	Class H	Insulation	Class 'H'

During the Current Monitoring Period from 31-March-2019 to 30-June-2021 (First and last date included) the project activity has supplied 66,684 MWh of electricity, and thus contributing to the GHG reductions 62,808 tCO₂e.

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 V.4.1 and guideline, version 4.0 and is conducted using standard auditing techniques to assess the correctness of the information provided by the project participants. Before the assessment begins, members of the team covering the technical scope(s), sectoral scope(s), and relevant host country experience for evaluating the VCS project activity are appointed.

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

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

The prepared 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
Mr. Jitendra Mohan Singh	LA/TE	YES	YES	NA	YES
Mr. Denny Xue	TR	YES	YES	NA	NA

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

Document review

The Monitoring Report version 1 submitted by the PP was reviewed against the approved methodology, registered PD, 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 13-December-2021 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 17-November-2021 due to on going COVID-19 pandemic situation in the entire state of India. Taking into account the rules of relevant national and local authorities (local to the DOE offices as well as to locality of the site visits), World Health Organization (WHO) recommendations, policies of the DOE and other relevant travel restrictions and guidance (for example, a requirement to self-isolate upon return). Moreover, The VCS Program does not explicitly mandate site visits as part of the validation and verification process, only that VVBs must achieve a reasonable level of assurance on all validations and verifications (per Section 4.1.2 of the VCS Standard, version 4.1).

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 VERRA¹.

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

During the remote audit, the PP representatives were questioned about the implementation of the project activity. Several topics like the verification of commissioning date of meters, the generation, recording, and monitoring of the data and the error accountability were discussed. To cross check the information provided by PP, various documents like technical specifications, commissioning certificates, PPA, JMR sheets, invoice, calibration certificates, s, etc. were also verified. The names of the persons interviewed during remote audit through Zoom & telephonic interview is given below;

Sr. No.	Interviewee			Date	Subject	Team member
	Last name	First name	Affiliation			
1.	Bankar	Kailas	Project Head M/s. D.J. Malpani	17- November- 2021 (Via Skype)	Project Implementation, JMR & invoicing procedure, calibration, grievance mechanism	Jitendra Mohan Singh
2.	Durgavale	Sagar	Manager -RE Project M/s. D.J. Malpani			
3.	Moonis	Mohamad	Consultant EKI Energy Services Ltd		Monitoring Report, Emission	

¹ <https://verra.org/covid-19-travel-guidance/>

					Reductions calculation	
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2.4 Site Inspections

Duration of Remote Audit: 17-November-2021 (Via Skype video conference)				
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.	Video conferencing (Via skype)	17-November-2021	Mr. 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 13-December-2021 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	00	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

Areas of verification findings	No. of CL	No. of CAR	No. of FAR
Establishment and description of baseline scenario	00	00	00
Demonstration of additionality	00	00	00
Emission reductions	00	01	00
Calibration details	00	02	00
Monitoring plan	00	00	01
No Net harm assessment	00	00	00
Local stakeholder consultation	00	01	00
Others (please specify)	00	00	00
Total	00	05	00

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

2.5.1 Forward Action Requests

This is 1st periodic verification in 2nd CP (overall 3rd verification) of the project activity under VCS apart from three verifications under CDM. there were no FARs raised during the validation or previous verification of CDM or VCS.

2.6 Eligibility for Validation Activities

This section is not applicable for present verification as LGAI holds the accreditation to perform Validation Activities under the VCS.

3 VALIDATION FINDINGS

3.1 Participation under Other GHG Programs

The project activity is also registered as a CDM project activity (UNFCCC ID 3700) and CERs have been issued from 07-January-2011 to 30-September-2016. The current monitoring period covered from 31-March-2019 to 30-June-2021). There is no overlap with the CDM monitoring period as verified from the UNFCCC website. Project Proponent has provided a declaration that the PP will not claim emission reduction from the CDM or any other GHG program for the current monitoring period, The project is not registered under any other emissions trading program or any other mechanism that includes GHG allowance trading PP also confirms that net GHG emission reductions or removals generated during this monitoring period shall not be used for compliance under any such programs or mechanisms. This was confirmed through a declaration submitted by the PP and hence accepted by the assessment team.

3.2 Methodology Deviations

The project activity used AMS-I.D version 18.0 which is as per the registered RCP VCS 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

Project Proponent has applied following project description deviation: In the previous monitoring period (01-October-2016 to 30-March-2019), two Project Description Deviations were requested.

Deviation 1²:

PP had proposed change in crediting period of the project activity from existing renewable crediting period to 10 years fixed crediting period. The fixed crediting period of the project activity is now from 31-March-2009 to 30-March-2019. The change in crediting period change does not affect the applicability of current methodology, additionality and baseline of the project activity.

Deviation 2;

As per registered VCS PD, the calibration frequency is once in a quarter and the same is mentioned in PPA. However, calibration of meters is not in control of PP and same is done by state electricity board. The state electricity board does not follow any fixed calibration frequency; hence deviation is requested for change in calibration frequency as once in five years. This calibration frequency is as per CEA notification on metering regulation available at http://www.aegcl.co.in/Metering_Regulations_Of_CEA_17_03_2006.pdf The updated version available from the year 2019 also upholds the same frequency of testing of meters. This can be found at http://www.cea.nic.in/reports/regulation/CEA_metering_regulation_amendment_2019.pdf

The change in calibration frequency does not have any impact on ER calculations as during monthly reading state electricity board official and PP representative check the meter conditions. Also both parties accepts the reading and PP raise the invoice to state electricity board based on monthly JMR reading. Thus, financial obligations are involved which ensures that meters are running accurately.

Project description deviation during current monitoring period:

In the current Monitoring Period, the PP has requested for project description deviation in calibration frequency to meet the requirement of power purchase agreement:

As per the Section 5.2 of the registered VCS RCP PD, the calibration of energy meters (including both main meter and check meter) would be carried on an annual basis. However, according to the Power Purchase Agreement (PPA) signed with BESCO, calibration should ideally be carried out on quarterly basis. Therefore, to maintain the practice expected by BESCO Standard, the PP has done the quarterly calibration. Wherever there has been delay, error factor has been applied.

² 10-year fixed crediting period was incorrectly applied, and that the current 10-year, twice renewable crediting period is correct.

The change in the calibration frequency in the current monitoring period (31-March-2019 to 30-June-2021) will not have any impact on the ER calculations. Both parties, the PP and the state electricity board - BESCOM accepts the meter reading and PP raise the invoice to BESCOM based on monthly JMR reading. Due to the financial obligations for the PP and the state electricity board - BESCOM, both parties ensure that the meters are running accurately. Hence, acceptable to VVB.

VVB has also included the project description deviation in Section 3.3 of verification report as per requirement of VCS verification template..

3.4 Grouped Project

The project is not a grouped project activity. thus, section is not applicable for this project activity.

4 VERIFICATION FINDINGS

4.1 Project Implementation Status

The project activity is installation of 13.75 MW wind power project by Sargam Retails Private Limited (SRPL). The project consists of Suzlon make 5 WTG of 1.5 MW each and 5 WTG of 1.25 MW each installed at Davangere district in Karnataka, India. During the remote audit (Skype video conferencing), it was concluded that the project is implemented as per the instruction of the CDM registered PDD and RCP VCS PD and this is verified from the commissioning certificate. During the current monitoring period it was observed that no unforeseen situation evolved which can impact the operation of the project activity. The same was verified through the breakdown summary sheet 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. The WTG wise location (latitudes and longitudes) are confirmed and same are as follows:

Cap. (MW)	Location No.	R.S. No.	Village	Taluka	District	Latitude (N)	Longitude (E)
1.5	K-543	111	Yaraganal	Honnali	Davangere	14°09'17.4"	75°30'11.9"
1.5	K-544	111	Yaraganal	Honnali	Davangere	14°09'10.4"	75°30'17.6"
1.5	K-549	28	Kudurekonda	Honnali	Davangere	14°09'03.2"	75°30'23.1"
1.5	K-550	28	Kudurekonda	Honnali	Davangere	14°08'57.2"	75°30'29.9"
1.5	K-551	28	Kudurekonda	Honnali	Davangere	14°08'51.2"	75°30'36.7"
1.25	W K-538	111	Yaraganal	Honnali	Davangere	14°08'45.3"	75°30'43.7"
1.25	W K-539	111	Yaraganal	Honnali	Davangere	14°08'39.5"	75°30'50.9"
1.25	W K-540	111	Yaraganal	Honnali	Davangere	14°08'13.3"	75°31'32.4"
1.25	W K-541	111	Yaraganal	Honnali	Davangere	14°08'07.4"	75°31'38.8"
1.25	W K-542	111	Yaraganal	Honnali	Davangere	14°07'59.5"	75°31'44.1"

The project location is confirmed by the assessment team through Interview of PP, commissioning certificates and site photographs. The location is also confirmed from the registered VCS PD and previous verification reports of the project activity including coordinates is as mentioned in the registered PD and found correct.

The commissioning dates of WTGs are provided below:

WTG ID	Capacity and Number of WTGs	Date of Commissioning
K-543, K-544, K-549, K-550, K-551	1.5 MW x 05 No.s	31-March-2009
K-538, K-539, K-541, K-542	1.25 MW x 04 No.s	31-March-2009
K-540	1.25 MW x 01 No.	29-May-2009

Commissioning of WTGs are checked with the commissioning certificates issued by state utility and found correct. Assessment team also confirmed through interview with PP representative that there are no changes the project design and the project implemented as the description provided in VCS PD of 2nd CP.

The specification of WTGs has been checked with WTG technical specification and commissioning Certificates. The same has also been verified with the photographs of sites and name plates. PP has provided the break down details of the project WTGs during the monitoring period which is verified from the plant breakdown log records and interview with site team. There was no major breakdown or shutdowns during the monitoring period which might affect the applicability of methodology or might cause material errors in emission reductions. The details specification of WTGs are as follows:

Suzlon-1.5 MW (Class S-82)

Rated Power	1,500 kW
Rotor diameter	82 m
Swept area	5,281 m ²
No. of blades	3
Cut in wind speed	4 m/s
Cut out wind speed	20 m/s
Rotor speed	20.3 rpm
Regulation	Pitch
Hub height	78.5 m
Generator Type	Asynchronous
Insulation	Class H

Suzlon 1.25 MW (Class S-64)

Rated Power	1,250 kW
Rotor diameter	64 m
Swept area	3m217 m ²
No. of blades	3
Cut in wind speed	3.5 m/s
Cut out wind speed	20 m/s
Rotor speed	20.3 rpm
Regulation	Pitch
Hub height	74.5 m
Generator Type	Asynchronous
Insulation	Class 'H'

The assessment team confirmed through interview with representatives of PP on Skype video conference that there are no proposed or actual changes to the project design during this monitoring

period. The project design as mentioned in registered CDM PDD, VCS PD and monitoring report submitted is implemented as per the requirement of the monitoring plan & applied methodology AMS.I-D version 18.0. The organisational role and responsibility as mentioned in the registered VCS PD is followed onsite. The calibration of energy meter is done once in 5 years. PP has requested deviation in calibration frequency in accordance with regulation of the Central Electricity Authority for meter installation. Please refer description in Deviation section this report. All the emergency preparedness as mentioned in the registered VCS PD 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 NCDMA as explained below:

Social well-being:

The project helps in generating employment. The project activity leads to development in infrastructure in the region like development of roads and also may promote business with improved power generation.

Economic well-being:

The project is a clean technology investment in the region, which would not have been taken place in the absence of the VCS benefits. The project activity also helps to reduce the demand supply gap in the state

Environmental well-being:

Wind power being a renewable source of energy, it reduces the dependence on fossil fuels and conserves natural resources which are on the verge of depletion. Due to its zero emission the Project activity also helps in avoiding significant amount of GHG emissions. The project activity generates power using zero emissions wind-based power generation which helps to reduce GHG emissions and specific pollutants like SO_x, NO_x, and SPM associated with the conventional thermal power generation facilities.

Technical well-being:

The operation of project activity leads to promotion of wind power generation and encourages other entrepreneurs to participate in similar projects.

The project activity is also registered as a CDM project activity (UNFCC ID 3700) and CERs have been issued from 07-January-2011 to 30-September-2016. The current monitoring period covered from 29-March-2019 to 30-June-2021). There is no overlap with the CDM monitoring period as verified from the UNFCCC website. Project Proponent has provided a declaration that the PP will not claim emission reduction from the CDM or any other GHG program for the current monitoring period, The project is not registered under any other emissions trading program or any other mechanism that includes GHG allowance trading PP also confirms that net GHG emission reductions or removals generated during this monitoring period shall not be used for compliance under any such programs or mechanisms. This

was confirmed through a declaration submitted by the PP and hence accepted by the assessment team.

The assessment team observed that the project is in line with the registered PD and applied methodology and thus no clarification/deviation is sought. CL 00 and CAR 01 were raised during the verification process and closed successfully. Please refer below Appendix 2 for the detail closure of the CAR

Assessment team confirms following during the verification remote audit:

1. Start date of the project is 31-March-2009³ (as per commissioning Certificate of project activity).
2. An undertaking letter dated: 22-October-2021 has been submitted by PP for 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.
3. Assessment team confirms that this is 1st verification in 2nd CP (overall 3rd verification) under VCS and covers the activity from 31-March-2019 to 30-June-2021 (inclusive of both dates). Thus, VCS 2nd crediting period should be 10 years till end date of crediting period. 31-March-2019 is the start date and 30-March-2029 will be the end date of the crediting period.

The VCU for this monitoring period i.e., from 31-March-2019 to 30-June-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”. PP have submitted declaration dated 22-October-2021 for avoiding double counting of the emission reductions achieved during this monitoring period.

4. Assessment team checked and found that the Project proponent of the project activity is as below for the current monitoring period:

Organization name	Sargam Retails Pvt. Limited
Contact person	Mr. Prafulla Premchand Khinvasara
Title	Head _Wind Power Projects
Address	Malpani Estate, Kasara Dumala, Sangamner Ahmednagar Maharashtra, India – 422 605
Telephone	+91-9021032214
Email	prafulla@malpani.com

Organization name	EKI Energy Services Limited
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³ As per the definition of VCS Ver-4.1 Guidelines

Role in the Project	Carbon credit Advisory
Contact person	Mr. Manish Dabkara
Title	CEO & MD
Address	Office No 201, Plot No 48, Scheme 78, Part 2, Vijay Nagar, Indore-452010, Madhya Pradesh
Telephone	+91-9910771187
Email	registry@enkingint.org , moonis@enkingint.org

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

6. The quantified emission reduction calculation for the monitoring period is correct and justified. Assessment team also compared actual VERs with the estimated VERs and found that the actual VERs is 62,808 tCO_{2e} which is 3.6% higher than the estimated emission reduction 60,653 tCO_{2e} (26,900 tCO_{2e}/ 365 days x 823 days) during this monitoring period. The changes are due to seasonal variation in wind flow pattern which is not in control of PP.

Assessment team has also checked the additionality of the project by doing sensitivity analysis and found that increased in electricity generation is within the sensitivity range of 10% which below bench mark 12.25%. Also, as per sensitivity analysis in the registered CDM, an increase in 10% in annual electricity generation result in 11.01% of project IRR. The breaching values of Project IRR is 17.22%. Therefore, the increase in generation doesn't impact the additionality. Also, there is neither technological nor design changes in the project activity. The values from JMRS issued by state utility have been checked with the invoice values and found to be perfectly aligned. The high generation is due to seasonal variation during current monitoring period and not in control of PP. The project activity is otherwise operated according to its description in registered CDM PDD and VCS PD and no changes observed during the monitoring period. Thus, acceptable to assessment team.

4.2 Safeguards

4.2.1 No Net Harm

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

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. Further, as per the EIA notification dated 14-September-2006⁴, the wind power projects are exempted from environmental clearance. Hence, Environmental impact assessment is not required for this project activity.

The report on “Developmental Impacts and Sustainable Governance Aspects of Renewable Energy Projects” prepared by MNRE dated September 2013. This report clearly mentioned that wind power project activity operations do not result in direct air pollution, noise pollution. Hence verification team confirms that there are no any significant impacts due to implementation of project activity on air, water, soil quality and ambience are envisaged due to the project activity.

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 VCS PD which impacts local stakeholder consultation. 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. 4.1 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 etc.

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 VCS PD and MR.
Findings	CAR 03 was raised on this section and closed successfully. Please refer Appendix 2 for further details
Conclusion	<u>Baseline emission:</u> The baseline Emissions for a given year is calculated by multiplying the energy baseline (EB) with the regional grid emission factor of the grid. Formula Used: - $BE_y = EG_{PL,y} \times EF_{grid,y}$ BE_y - baseline emissions in year y (tCO₂) EG_{PJ,y} - Quantity of net electricity generation that is produced and fed into the grid as a result of the implementation of the CDM project activity in year y (MWh) EF_{grid,y} - Combined margin CO₂ emission factor for grid connected power generation in year y calculated using the latest version of the “Tool to calculate the emission factor for an electricity system” (t CO₂/MWh) Since project activity is greenfield project, Hence, $EG_{PJ,y} = EG_{PJ,facility,y}$ Where;

⁴ <http://www.environmentwb.gov.in/pdf/EIA%20Notification,%202006.pdf>

	$EG_{PJ, facility, y}$ = Quantity of net electricity generation supplied by the project plant/unit to the grid in year y (MWh) Ex-ante parameters: The baseline emission factors are taken ex-ante in line with the registered RCP VCS PD as well as cross checked with section validation report and found correct. Combined margin CO₂ emission factor ($EF_{grid, CM, y}$) is equal to 0.9419 tCO₂/MWh. The calculation approach was in line with the VCS PD. Values of ex-ante parameters are as follows: $EF_{grid, OM, y} = 0.9622$ tCO₂/MWh (Calculated using last 3 year (2016-17, 2017-18, 2018-19) generation-weighted average, sourced from Baseline CO₂ Emission Database, Version 15.0, published by Central Electricity Authority (CEA), Government of India) $EF_{grid, BM, y} = 0.8811$ tCO₂/MWh (Calculated as per "Tool to calculate the emission factor for an electricity system, version 07". as per the latest data available for the most recent year 2017-18. The data is obtained from "CO₂ Baseline Database for Indian Power Sector" version 15, published by the Central Electricity Authority, Ministry of Power, and Government of India) $EF_{grid, y} = EF_{grid, CM, y} = 0.9419$ tCO₂/MWh 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 CO₂ emission factor in year y (tCO₂/MWh) $EF_{grid, OM, y}$ = Operating margin CO₂ emission factor in year y (tCO₂/MWh) W_{OM} = Weighting of operating margin emissions factor (%) = 75% W_{BM} = Weighting of build margin emissions factor (%) = 25% After calculation, the Combined Emission factor is obtained as 0.9419 tCO₂/MWh. Ex-post parameters: The WTGs are located at Davangere district of Karnataka state, India. As per the registered monitoring plan and requirement of the applied methodology following parameters needs to be monitored: $EG_{PJ, facility, y}$ - Net electricity supplied to the grid by the project activity (MWh): This is calculated values based on monitored data of export, Import and transmission losses at 33 kV metering point and the 220 kV substation. 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 and the transmission losses obtained from credit reports provided by KPTCL/BESCOM as per below equation: $EG_{PJ, facility, y} = EG_{Exported} - EG_{Import} - EG_{Transmission Losses}$. The details of meter are provided in Section 4.5 of this report. Meters are calibrated as per calibration frequency i.e. once in five year. During the current monitoring, the net electricity supplied to grid by the project activity is 66,684.00 MWh. The same has been verified with the monthly credit reports (Form B) prepared by KPTCL/BESCOM. Also, the monthly invoices are cross verified and found that the value reported in the ER sheet is correct. $EG_{Exported}$ - Electricity exported by the WTGs of the project activity (MWh) $EG_{Imported}$ - Electricity imported from the grid by the WTGs of the project activity (MWh) The electricity export and Import has been measured continuously by bi-directional (Tri-vector) main and check energy meters of accuracy class 0.2s installed at 33 kV
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metering yard. The readings are recorded every month on JMR/ Form B which has been signed by the PP representative and KPTCL/BEACOM official. The details of meters are as follows:

WTGs	WTG Location No.	Main Meter Sl. No.	Check Meter Sl. No.
5 x 1.25 MW	K-538, K539, K-540, K-541, K542	08001351	08001352
5 x 1.5 MW	K-543, K544, K-549, K-550, K551	08001358	08001371

During the current monitoring period, project activity has exported 68,762.72 MWh of electricity to grid and imported 230.49 MWh of electricity from the grid. The values are verified with the JMRs/Form B and that the value considered is correct.

EG Transmission Losses- Electricity Losses in Transmission

The transmission losses are calculated as per formula given below:

EG Transmission Losses = Z * EG_{Exported}

Z = [(X-Y)/X] * 100

Where;

Z = % of line losses

X = Total exported electricity from all the metering points connected to the sub - station (as measured at 33 kV metering point of all the WTGs (PP + none PP) connected to the SS) hence X = X₁ + X₂ + X₃ + X_n

Y = Total exported electricity as measured at Sub - Station Bulk meter (i.e main and check meter at 220 kV SS).

The transmission loss is calculated by DISCOM and recorded every month in the JMR/Form-B. The total transmission losses during the current monitoring period is 903.30 MWh which is found correct. The is also cross checked with invoice and found consistent.

The verification team has crosschecked the emission reduction sheet and monitoring report data with the JMR sheet and invoice bills and found all the values are matching. Thus, the total net electricity supplied to grid by the project activity during the current monitoring period is 66,684.00 MWh. The calculation approach found in line with the VCS PD.

During the verification all relevant monitoring parameters (as listed in section B.7.1 of PDD) have been verified with regard to the appropriateness of the applied measurement / determination method, the correctness of the values applied for ER calculation, the accuracy, and applied QA/QC measures. The Verification team identified that the correct emission factor is reported under the section D.1 of the monitoring report to apply the appropriately report the emission factor. Based on above assessment the verification team confirms that requisite parameters are monitored in line with registered monitoring plan.

Baseline emissions are calculated as follows:

BE_y = EG_{PL,y} X EF_{grid,y}

BE_y - baseline emissions in year y (tCO₂)

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

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

In the current monitoring period:

	$EG_{PJ,y} = 66,684.00 \text{ MWh}$ $EF_{grid,y} = 0.9419 \text{ tCO}_2/\text{MWh}$ $BE_y = 66,684.00 \text{ MWh} * 0.9419 \text{ tCO}_2/\text{MWh}$ $= 62,808 \text{ tCO}_2 \text{ (Round down value)}$ As per applied methodology AMS-I.D, version 18.0 and the registered RCP VCS PD, project emission is considered zero as the project activity involved wind power generation. Leakage: As per applied methodology AMS-I.D, version 18.0 and VCS PD Leakage emissions are not considered for the project activity. Hence, $ER_y = BE_y - PE_y - Ly$ $= 62,808 \text{ tCO}_2 - 0 - 0$ $= 62,808 \text{ tCO}_2\text{e (rundown values)}$ Verification team confirms that the monitoring has been carried out in accordance with the monitoring plan contained in the registered RCP VCS PD. Assessment team confirmed that the GHG emission reductions and removals have been quantified correctly in line with the registered VCS PD Verification team confirms that the monitoring has been carried out in accordance with the monitoring plan contained in the registered VCS PD. Assessment team confirmed that the GHG emission reductions and removals have been quantified correctly in line with the registered VCS PD.
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4.5 Quality of Evidence to Determine GHG Emission Reductions and Removals

Means of verification	The verification team checked the break down log for the monitoring period. During the verification assessment the energy meters are also checked. The Calibration details of the monitoring meters are also checked with calibration certificates.			
Findings	CAR 04 and CAR 05 were raised on this section and closed successfully. Please refer Appendix 2 for further details			
Conclusion	Metering arrangement is L & T make bi-directional tri-vector meter (main and check meter) of accuracy class 0.2s. (L & T Make). The meter details and their calibration are provided below:			
	WTG Location	Meter no.	Calibration date	Validity of calibration
	K-538, K-539, K540, K-541, K- 542	Main Meter Sr.No.08001351	19-February-2019	18-May-2019
			21-August-2019	20-November-2019
			16-March-2021	15-June-2021
			18-September-2021	17-December-2021
		Check Meter 08001352	19-February-2019	18-May-2019
			21-August-2019	20-November-2019
			16-March-2021	15-June-2021
			18-September-2021	17-December-2021
	K-543, K- 544, K-549, K-550, K- 551	Main meter Sr.No.08001358	19-February-2019	18-May-2019
			21-August-2019	20-November-2019
			16-March-2021	15-June-2021
18-September-2021			17-December-2021	

	Check Meter Sr. No. 08001371	19-February-2019	18-May-2019
		21-August-2019	20-November-2019
		16-March-2021	15-June-2021
		18-September-2021	17-December-2021
The calibration frequency of meters is quarterly which is in line with the PPA signed by PP with BESCOM. PP has also request project description deviation during current monitoring period in calibration frequency i.e. quarterly to keep the compliance of PPA. Assessment team found meter doesn't cover calibration from 19-May-2019 to 20-August-2019; from 21-November-2019 to 15-March-2021 and from 16-June-2021 to 30-June-2021. The error found in latest calibration of meters are within permissible. Hence PP has applied 0.2% error factor in export, import and transmission losses calculation for the delayed period to arrive net electricity exported to grid which is found is conservative and acceptable to DOE. Assessment team confirms that all the energy meters (both main and check meter) of accuracy class of 0.2s are calibrated as per the national standards followed by the electricity board, Meter of Karnataka site is calibrated by NCE sub-division of Bangalore Electricity Supply Company Limited and meter at Gujarat Site is calibrated by Baroda Calibration Services, NABL accredited Laboratory.			

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.	NA	NA	NA	NA

5 VERIFICATION CONCLUSIONS

Applus+ Certification has been engaged by Sargam Retails Pvt. Limited to perform the verification of the "13.75 MW wind power project in Davangere, Karnataka, India"

The management of 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 VCS PD and MR and the approved methodology AMS.I-D version 18.0.

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 4.1. 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 PD
- the development and maintenance of records and reporting procedures are in accordance with the monitoring plan

- the installed equipment being essential for generating emission reduction runs reliably;
- 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 31-March-2019 to 30-June-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)
31-March-2019 to 31-December-2019	25,023	0	0	25,023
01-January-2020 to 31-December-2020	26,875	0	0	26,875
01-January-2021 to 30-June-2021	10,910	0	0	10,910
Total	62,808	0	0	62,808

The quantified emission reduction calculation for the monitoring period is correct and justified. Assessment team also compared actual VER with the estimated VER and found that the actual VERs is 62,808 tCO₂e which is 3.6% higher than the estimated emission reduction 60,653 tCO₂e (26,900 tCO₂e/ 365 days x 823days) during this monitoring period. The changes are due to seasonal variation in wind flow pattern which is not in control of PP. The project activity is otherwise operated according to its description in registered PD and no changes observed during the monitoring period.

Assessment team has also checked the additionality of the project by doing sensitivity analysis and found that increased in electricity generation is within the sensitivity range of 10% which below bench mark 12.25%. Also, as per sensitivity analysis in the registered CDM, an increase in 10% in annual electricity generation result in 11.01% of project IRR. The breaching values of Project IRR is 17.22%. Therefore, the increase in generation doesn't impact the additionality. Also, there is neither technological nor design changes in the project activity. The values from JMRs issued by state utility have been checked with the invoice values and found to be perfectly aligned. The high generation is due to seasonal variation during current monitoring period and not in control of PP. The project activity is otherwise operated according to its description in registered CDM PDD and VCS PD and no changes observed during the monitoring period. Thus, acceptable to assessment team.

APPENDIX I: DOCUMENTS REVIEWED DURING VERIFICATION

No.	Author	Title	References to the document	Provider
1.	NA	Commissioning certificate	Commissioning of WTGs	Project participant
2.	NA	Contract of the other entity with the DOE	Contract of the other entity with the DOE	Project participant
3.	NA	The operational lifetime of the project activity from the manufacturer = (Technical specifications)	Technical specifications of turbines	Project participant
4.	NA	Power Purchase agreement for the Karnataka site	Dated:25-July-2009	Project participant
5.	NA	Power Purchase agreement for the Karnataka site	25-July-2009	Project participant
6.	NA	Registered RCP VCS PD https://registry.terra.org/app/projectDetail/VCS/927	Version 03, Dated: 26-February-2021	Project participant
7.	NA	Initial Monitoring report Final Monitoring Report	Version 01, dated 09-November-2021 Version 03, dated 13-December-2021	Project participant
8.	NA	Emission Calculation sheet	Version 01, dated 09-November-2021	Project participant
9.	NA	Emission Calculation sheet	Version 03, dated 13-December-2021	Project participant
10.	NA	Tools/ guidelines used in the project activity - UNFCCC Methodology: AMS-I.D version 18.0 - VCS verification report template Version 4.0 - VCS Standard, version 4.1	UNFCCC CDM web site VERRA website	UNFCCC & VERRA
11.	NA	Calibration details of the project activity undergoing verification	Calibration certificates	Project participant
12.	NA	Credit Report (JMR) records+ Invoices for the complete monitoring period	JMR copies Invoices for the complete Monitoring period	Project participant
13.	NA	Break down details of the complete monitoring period	Log Sheet	Project participant
14.	NA	VCS Declaration	Declaration dated 22-October-2021	Project participant
15.	NA	RCP Validation report for project activity (Report ID 10839ME)	Version 03 dated 03-March-2021	Project participant
16.	NA	Previous Verification report (2 nd MP under 1 st CP)	Version 01 dated 15-october-2020	Project participant
17.	NA	Grievances Registers	-	Project participant

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

Project Implementation Status

CAR ID	01	Section no.	4.1	Date: 17-November-2021
Description of CAR				
During desk review, following inconsistencies observed: 1. Font size of the Key project information on the title page of the MR is not in line with VCS MR Template v4.0. Thus, Corrective action sought. 2. The title of the project mentioned in the key project information is not in line with VCS project webpage and VCS RCP PD. Thus, corrective action sought. 3. The monitoring period mentioned throughout the MR is not in line with the ER sheet and signed contract for verification. 4. Title of Ministry responsible for the sustainable development and National designated authority of India, throughout the MR is not in line with the official webpage. Thus, corrective action sought.				
Project participant response				Date: 03-December-2021
1. Font size of the Key project information on the title page of MR is now updated as per VCS MR template v4.0. 2. The title of the project mentioned in the key project information is now updated as per the VCS project webpage and VCS RCP PD. 3. The monitoring period throughout the MR has been revised as per the signed contract and the ER Sheet. 4. The title of ministry responsible for the sustainable development and National Designated Authority of India has been updated as per the official website.				
Documentation provided by project participant				
<i>Updated MR</i>				
DOE assessment				Date: 07-December-2021
1. PP has now corrected the font size in revised MR. 2. The title of the project the key project information has been corrected by PP in revised MR. 3. PP has now corrected the monitoring period throughout MR 4. The title of The Ministry i.e. "Ministry of Environment, Forests and Climate Change (MoEFCC)" responsible for the sustainable development and national designated authority of India is now corrected by the PP. CAR closed.				

CAR ID	02	Section no.	4.2	Date: 17-November-2021
Description of CAR				
In Section 2.2, PP has mentioned the local stakeholder consultation held during the project construction stage. However, PP has not described the process for, and the outcomes from, ongoing communication with local stakeholders as per requirement of Para 3.16.3 and 3.16.4 of the VCS standard V.4.1. Corrective action is sought.				
Project participant response				Date: 03-December-2021
The process for, and outcomes from, ongoing communication with local stakeholders as per the requirement of Para 3.16.3 and 3.16.4 of the VCS standard V.4.1 has now been described in Section 2.2.				
Documentation provided by project participant				
1. Updated MR				
DOE assessment				Date: 07-December-2021
PP has now included the ongoing communication with local stakeholders in in Section 2.2 of revised MR. kept provision for submitting comments/grievances/suggestions from local stakeholders through direct mail and also submitted copy of grievance registered to assessment. There is no any grievances registered during current monitoring period as verified from the supporting evidences submitted by PP. CAR closed.				

Accuracy of GHG Emission Reduction and Removal Calculations

CAR ID	03	Section no.	4.4	Date: 17-November-2021
Description of CAR				
1. The monitoring parameter mentioned in section 4.2 of MR is not consistent with the RCP VCS PD, Also, parameter used in formula to calculate net exported electricity is not consistent with VCS PD. Corrective action is sought. 2. Comparisons of estimated and actual achieved emission reductions are not mentioned in Section 5.4 of MR. actual archived emission reduction. Further, actual emission reduction achieved by the project activity is 5.3% higher that estimated, PP is requested to clarify the same.				
Project participant response				Date: 25-November-2021
1. The monitoring parameter mentioned in section 4.2 of MR is now updated as the RCP VCS PD. The parameter used in formula to calculate net exported electricity is now updated as per the registered VCS RCP PD. 2. Comparisons of estimated and actual achieved emission reduction are now added in the Section 5.4 of MR. The clarification of actual emission reduction achieved by the project activity 5.3% higher than that estimated reduction has now been described in the Section 5.4.				
Documentation provided by project participant				
1. Updated MR.				

DOE assessment	Date: 07-December-2021
1. PP has corrected the data/parameter to be monitored in section 4.2 of revised MR. Hence OK. 2. PP has now added the comparisons of estimated vs actual emission reduction achieved. The actual emission reductions achieved by the project activity is 5.3% higher than the estimated. However, the response of PP is not appropriate. CAR OPEN.	
Project participant response	Date: 13-December-2021
Additional clarifications have been now described in the section 5.4. The clarifications are as following – “As per the Section 3.5 of RCP VCS PD and Section B.5. of the registered CDM PDD of the same project, the benchmark for sensitivity analysis is 12.25%. The 3.6% increase in emission reduction due to increase in electricity generation is still within the benchmark of 12.25%. Hence, the benchmark is not breached and the project activity is still additional.”	
DOE assessment	Date: 18-December-2021
The actual emission reduction achieved is 5.3 % higher than the estimated during the monitoring period. This is due to higher electricity generation compared to estimated generation in registered VCS PD (for the equivalent period) during the monitoring period which is due to natural phenomena and nature dependent. Assessment team has also checked the additionality of the project by doing sensitivity analysis and found that increased in electricity generation is within the sensitivity range of 10% which below bench mark 12.25%. Also, as per sensitivity analysis in the registered CDM, an increase in 10% in annual electricity generation result in 11.01% of project IRR. The breaching values of Project IRR is 17.22%. Therefore, the increase in generation doesn't impact the additionality. Also, there is neither technological nor design changes in the project activity. The values from JMRs issued by state utility have been checked with the invoice values and found to be perfectly aligned. The high generation is due to seasonal variation during current monitoring period and not in control of PP. The project activity is otherwise operated according to its description in registered CDM PDD and VCS PD and no changes observed during the monitoring period. Thus, acceptable to assessment team. CAR closed.	

Quality of evidence to determine GHG emission reduction and removals

CAR ID	04	Section no.	4.5	Date: 17-November-2021
Description of CAR				
In section 4.2 of MR, the calibration frequency of meter for monitoring in EG_{exported} , EG_{import} and EG_{net} is not consistent . PP is requested to clarify the same				
Project participant response				Date: 03-December-2021

The calibration frequency of meter for monitoring is now described in the Section 4.2 and is now consistent for EG_{exported} , EG_{import} and EG_{net} .

Documentation provided by project participant

1. Updated MR

DOE assessment

Date: 07-Decemeber-2021

The response of PP is not in line with the revised MR. Also, in Registered RCP VCS PD, calibration frequency is mentioned annually under data/parameter $EG_{PJ, \text{facility}, y}$. PP is requested to clarify.

CAR OPEN

Project participant response

Date: 13-December-2021

As per the Power Purchase Agreement (PPA), all the main and check meters shall be tested for accuracy every calendar quarter with reference to a portable standard meter which shall be accuracy class of 0.1%. The portable standard meter shall be owned by the Bangalore Electricity Supply Company Limited (BESCOM) at its own cost and expense and tested and certified a least once every year against an accepted laboratory standard meter in accordance with electricity standards. The calibration frequency mentioned annually under data/parameter $EG_{PJ, \text{facility}, y}$ is for the testing and certification of portable standard meter owned by BESCOM. Also, $EG_{PJ, \text{facility}, y}$ is a calculated value from EG_{exported} and EG_{exported} . So, the calibration of meter equipment (main meter and check meter) of EG_{exported} and EG_{exported} are described. $EG_{PJ, \text{facility}, y}$ is a calculated value. The main and check meters for EG_{exported} and EG_{exported} are calibrated on quarterly basis.

Documentation provided by project participant

1. Updated MR
2. Calibration certificates

DOE assessment

Date: 18-December-2021

As per registered RCP VCD PD, all the main and check meters shall be tested for accuracy every calendar quarter with reference to a portable standard meter which shall be accuracy class of 0.1%. The portable standard meter shall be owned by the Bangalore Electricity Supply Company Limited (BESCOM) at its own cost and expense and tested and certified a least once every year against an accepted laboratory standard meter in accordance with electricity standards. The calibration frequency mentioned annually under data/parameter $EG_{PJ, \text{facility}, y}$ is for the testing and certification of portable standard meter owned by BESCOM. The same is in line with the PPA signed with BESCOM. Moreover, $EG_{PJ, \text{facility}, y}$ is a calculated value from EG_{exported} and EG_{exported} . So, the calibration of meter equipment (main meter and check meter) of EG_{exported} and EG_{exported} are described. $EG_{PJ, \text{facility}, y}$ is a calculated value. The calibration frequency of main and check meters installed to monitor EG_{exported} and EG_{exported} is on quarterly basis.

CAR closed.

CAR ID	05	Section no.	4.5	Date: 17-November-2021
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Description of CAR			
PP has submitted copies of calibration certificates to the assessment team, However, during review of the same, Team found that certificates is not consistent with the project's WTGs.			
Moreover, Information related to the monitoring meters and its calibration is also missing in the MR. thus corrective action sought.			
Project participant response			Date: 03-December-2021
1. The calibration certificates are now provided as per the WTGs. There are two sets of WTGs in the project activity – 5 WTGs of 1.25 MW capacity and 5 WTGs of 1.5 MW capacity. Both sets of WTGs have different set of main meter and check meter and therefore different set calibration certificates. The calibration certificates for each set of WTGs are now provided. Details of calibration certificates are described below table. The serial numbers of each meter can be cross-checked in the calibration certificates.			
WTGs	WTG Location No.	Main Meter Sl. No.	Check Meter Sl. No.
5 x 1.25 MW	K-538, K539, K-540, K-541, K542	08001351	08001352
5 x 1.5 MW	K-543, K544, K-549, K-550, K551	08001358	08001371
2. Information related to the monitoring meters in the Section 4.2 of MR and Appendix 1 of the MR			
Documentation provided by project participant			
1. Updated MR 2. Relevant calibration certificates as per the WTGs			
DOE assessment			Date: 07-December-2021
PP has submitted the calibration certificate of meters. The same has been checked by assessment team and observed that information of meter calibration mentioned in MR doesn't cover complete monitoring period (31-March-2019 to 30-June-2021).			
Further observed that there is delay in calibration of meter installed at Calibration details of Meters at 220 kV Substation.			
CAR OPEN			
Project participant response			Date: 13-December-2021
The calibration mentioned in MR doesn't cover the complete monitoring period (31-March-2019 to 30-June-2021) because there has been delay in calibration. Therefore, error factor of 0.2% has been applied where there has been delay in calibration (as per the meter accuracy 0.2s). All the calibration certificates of meters are now mentioned in the MR.			
Documentation provided by project participant			
1. Updated MR 2. Calibration certificates			
DOE assessment			Date: 18-Decemeber-2021

PP has now updated the calibration information in revised monitoring report. Assessment team found mere doesn't cover calibration from 19-May-2019 to 20-August-2019; from 21-November-2019 to 15-March-2021 and from 16-June-2021 to 30-June-2021. The error found in latest calibration is within permissible and PP has applied 0.2% error factor in export, import and transmission losses calculation for the delayed period to arrive net electricity exported to grid which is found is conservative and acceptable to DOE.

CAR closed.

FAR from this verification

FAR ID	00	Section No.	Date:
Description of FAR			
N/A			
Project participant response			Date: DD/MM/YYYY
NA			
Documentation provided by project participant			
NA			
DOE assessment			Date: DD/MM/YYYY
NA			

APPENDIX 3: COMPETENCE OF TEAM MEMBERS AND TECHNICAL REVIEWERS

Verification team member

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

Technical reviewer and approver of the verification and certification report

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

Short CVs of the Team:

1. Mr. Jitendra Mohan Singh, has done Advanced MSc in Sustainable Energy Systems and Management from International Institute of Management, University of Flensburg, Germany and B.Tech. in Agricultural Engineering from Allahabad University. He has more than (20) years of working experience in different organisations like IARI, ICAR, IIT Delhi, CAPART, SMEC and Perenia Carbon India Pvt Ltd., M B Power (Madhya Pradesh) Ltd., under various categories of projects stating from Renewable to waste projects. Currently, he is associated with True Quality Certification Services Pvt Ltd and is empanelled with APPLUS certification to carry out GHG audit covering the sectoral scope 1, 3, 13 Technical Areas 1.2/1.1/13.1. Prior to this, Jitendra was validator and Verifier (Auditor) with Carbon Check covering the sectoral area 1,3,13 and Technical Expert with 4K Earth Science and EPIC Sustainability. He was also RIT expert (adhoc) at UNFCCC from 2010 to 2012 for assessment of projects submitted for registration and Issuance. .

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

APPENDIX 4: ABBREVIATIONS

Abbreviations	Full texts
BM	Build Margin
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CER	Certified Emission Reduction(s)
CEA	Central Electricity Authority
CL	Clarification request
CM	Combined Margin
CMS	Central Monitoring system
CO ₂	Carbon dioxide
CO 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
BESCOM	Bangalore Electricity Supply Company Limited
RBI	Reserve Bank Of India
PP	Project Participant