



VERIFICATION REPORT

KALANDONGER WIND POWER PROJECT IN RAJASTHAN



South Asia

Document Prepared By

TÜV SÜD South Asia Pvt.Ltd

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Summary:

TÜV SÜD South Asia Pvt. Ltd. has performed the third verification of the aforementioned VCS project activity. The verification is based on the currently valid documentation of the VCS and United Nations Framework Convention on Climate Change (UNFCCC)¹.

The Verification has been conducted for the monitoring period 01/06/2018 to 31/03/2020.

The verification process includes three phases:

- Desk review of documents;
- On-site audit and follow-up interviews with the relevant personnel;
- Resolution of outstanding issues and the issuance of final verification report and opinion.

The project activity is the implementation of a 75.6 MW wind power project consisting of 36 Wind Electric Generators (WTGs) of individual capacity 2.1 MW, at Kaladonger village in Rahasthan, India by M/s Bindu Vayu Urja Private Limited (BVUPL).

The electricity generated by the project is exported to the NEWNE electricity grid. The project activity is therefore displaces an equivalent amount of electricity which would have otherwise been generated by fossil fuel dominant electricity grid.

The first WTG is commissioned on 18 February 2012.

4 Clarification Requests (CLs) and 2 Corrective Action Requests (CARs) have been raised during the course of verification process and has been successfully closed. No Forward Action Request (FAR) was/were raised during this monitoring period.

¹ The project is registered under Clean Development Mechanism (CDM) of UNFCCC with 10 years crediting period (Reference No: 9342) on 31-Dec-2012.¹ Crediting period of the project under CDM starts on 31-December-2012 and ends on 30-December-2022

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1 INTRODUCTION

1.1 Objective

TÜV SÜD has been commissioned by the aforementioned client to perform an independent verification assessment.

The objective of the verification work is to comply with the requirements of Verified Carbon Standards requirements. According to this assessment TÜV SÜD shall:

- ensure that the project activity has been implemented and operated as per the registered PDD, and that all physical features (technology, project equipment, monitoring and metering equipment) of the project are in place,
- ensure that the published MR and other supporting documents provided are complete, verifiable and in accordance with applicable VCS and CDM VVS requirements,
- ensure that the actual monitoring systems and procedures comply with the monitoring systems and procedures described in the monitoring plan and the approved methodology,
- evaluate the data recorded and stored as per the applicable requirements.
- assessment of the sustainability monitoring parameters as per the VCS requirements

1.2 Scope and Criteria

The scope of any assessment is defined by the underlying legislation, regulation and guidance given by relevant entities or authorities. In the case of VCS project activities, the scope is set by:

- VCS v4.0 requirements
- Clean Development Mechanism Validation And Verification Standard (VVS) for Project Activities v2.0
- Baselines and monitoring methodologies (including GHG inventories)
- Environmental issues relevant to the applicable sectoral scope
- Current technical and operational knowledge of the specific sectoral scope and information on best practice
- Stakeholder consultation and feedback

The verification process is not meant to provide any form of consulting for the project participant (PP). However, stated requests for clarifications, corrective actions, and/or forward actions may provide input for improvement of the project design.

Once TÜV SÜD receives the MR, it is made available on the VCS Registry through a dedicated interface on the Verified Carbon Standards website. The Verification shall commence only after the project documents are listed on the registry.

1.3 Level of Assurance

The errors identified in the project are below the threshold limit of materiality and hence not material. The GHG emission reductions are calculated without material misstatements

1.4 Summary Description of the Project

The project activity is the implementation of a 75.6 MW wind power project consisting of 36 Wind Electric Generators (WTGs) of individual capacity 2.1 MW, at Kaladonger village in Rahasthan, India by M/s Bindu Vayu Urja Private Limited (BVUPL).

Power generation using wind is achieved by deploying 36 wind turbine generators (WTGs). Wind power generation is an environmentally safe and sound technology. The WTGs supplied by Suzlon Energy Limited to the project participant. The components were manufactured in India and assembled at the project site. There is no transfer of technology from outside the host country for this project activity. The project uses Suzlon's wind energy technology and implements 36 number of WTGs of S95 model with a capacity of 2100kW each.

The wind power generated from the project site is displacing the electricity generated from thermal power stations feeding into NEWNE grid and would be replacing the usage of diesel generators for meeting the power demand during shortage periods. Since wind power is Green House Gas (GHG) emissions free, the power generated is preventing the anthropogenic green house gas (GHG) emissions generated by the fossil fuel based thermal power stations comprising coal, diesel, furnace oil and gas.

The first Wind Electric Generator is commissioned on 18 February 2012.

2 VERIFICATIONPROCESS

2.1 Method and Criteria

The information provided by the project participants is assessed by applying the means of verification specified in the VCS v4, Toolkit and the VVS.

Once TÜV SÜD receives the Monitoring Report and a confirmation from any PP to upload, the MR is made available on the VCS Registry.

A competent assessment team is selected prior to the start of the verification. The team is selected to cover the technical area(s), sectoral scope(s) and relevant host country experience for evaluating the VCS project activity. Additionally, a competent Technical Reviewer or Technical Reviewer Team is appointed to conduct checks on quality and completeness.

The verification team performs first a desk review, followed by an on-site visit, which results in the formation of a draft report and a list of findings. The next step involves the evaluation of the findings through direct communication with the PPs and then finally the preparation of the verification report. This verification report and other supporting documents then undergo an internal quality control by the CB “Environment and energy” before submission to the VCS.

2.2 Document Review

The documents referred during the course of this verification are provided in Appendix 1.

2.3 Interviews

The VVB has not conducted the on-site inspection for this current monitoring period due to obligations imposed by COVID 19. However the VVB has ensured that reasonable level of assurance has been achieved as per Verra regulations on the relaxation of mandatory site visits by the VVB due to Covid-19. The VVB has conducted telephonic interviews and video calls to discuss with the client regarding the data and documents pertaining to the current verification period. The interviews and discussions were conducted successfully.

No.	Interviewee			Date	Subject	Team member
	Last name	First name	Affiliation			
1.	Sharma	Mukti Bihari	M/s. Bindu Vayu Urja Private Limited	28 October 2020	Plant technology and monitoring	Eswar Murty
2	Sharma	Barun	EKI Energy Services	28 October 2020	CDM Monitoring	Eswar Murty
3	Rao	Anjali	EKI Energy Services	28 October 2020	CDM Monitoring	Eswar Murty

2.4 Site Inspections

Please see 2.3

2.5 Resolution of Findings

CL from this verification

CL ID	01	Section no.	1.5	Date:	28/10/2020
Description of CL					
PP to submit all the commissioning certificates of the WTGs – and the commissioning dates should be in line with the schedule mentioned in the MR.					
Project participant response					Date: 30/10/2020
All commissioning certificates of the WTGs used for this project activity are being submitted now and commissioning dates for respective WTGs are mentioned in the have now been revised in the VCS MR					
Documentation provided by project participant					
Commissioning certificates					
VVB assessment					Date: 10/11/2020
The commissioning certificates have been submitted. Hence the issue is closed.					

CL ID	02	Section no.	Appendix X	Date:	28/10/2020
Description of CL					
Calibration certificates for year 2019 – 2020 for Main meter and back up meter at GSS end are to be provided					
Project participant response					Date: 30/10/2020
Calibration certificates for year 2019-2020 for main and back-up meter at GSS end has been provided now.					
Documentation provided by project participant					
Calibration certificates					
VVB assessment					Date: 10/11/2020
The calibration certificates have been provided. Hence the issue is closed.					

CL ID	03	Section no.	Data	Date:	28/10/2020
Description of CL					
1. Joint Energy Meter Reading data (break up of Net Export Units (kWh) as recorded at Main Meter or RVPNL) for 6.3 MW and 52.5 MW for the months of October 2019 is missing. Kindly provide 2. As per the ABT Meter Replacement SEL letter Pg 08, dated 17/04/2017, Main Meter UPP31771 is replaced with RJB90204 and Back up meter UPP31772 is replaced with RJB90205. Calibration certificates valid for year 2018-2019 are also provided for replaced meters. However, all the invoices submitted to Grid authority refer to the old meters only. Kindly clarify and provide the necessary supporting evidence.					
Project participant response					Date: 30/10/2020
1. Joint Energy Meter Reading data (break up of Net Export Units (kWh) as recorded at Main Meter or RVPNL) for 6.3 MW and 52.5 MW for the months of October 2019 has been attached in this submission. 2. PP has confirmed that the meter serial numbers provided in the invoices for this project activity is a typographical error and the invoices from current month Sep 2020 onwards will be updated with the current meter details. Further, the current updated meter numbers can be traced from JMRs provided for the current monitoring period.					

Documentation provided by project participant	
1. Joint Energy Meter Reading data (break up of Net Export Units (kWh) as recorded at Main Meter or RVPNL) for 6.3 MW and 52.5 MW for the months of October 2019 2. Invoice for the month of September 2020	
VVB assessment	Date: 10/11/2020
The Joint meter reading data and the invoice has been verified by the audit team and found to be correct. Hence the issue is closed.	

CL ID	04	Section no.	Data	Date: 28/10/2020
Description of CL				
PP to provide monthly generation data sheets for the monitoring period.				
Project participant response				Date: 30/10/2020
Monthly generation sheets for this monitoring period have been attached in this submission				
Documentation provided by project participant				
Monthly generation sheets				
VVB assessment				Date: 10/11/2020
The monthly generation data has been checked and found to be correct. Hence the issue is closed.				

CARs from this verification

CAR ID	01	Section no.	1.7	Date: 28/10/2020
Description of CAR				
Pg 5 of the MR-The location details provided for WTGs – the location no. column is inconsistent with the data provided in CDM MR-01- v04-31/12/2012 to 06/01/2014. Kindly correct				
Project participant response				Date: 30/10/2020
The location details has now been revised in the VCS MR v02				
Documentation provided by project participant				
VCS MR V02				
VVB assessment				Date: 10/11/2020
The location details are now found to be in line. Hence the issue is closed.				

CAR ID	02	Section no.	4.2	Date: 28/10/2020
Description of CAR				
1. Data and Parameters Monitored – EGPJ,y - Quantity of net electricity exported to the grid during the year y is not in line with the PDD and methodology ACM 0002 v12.3.0. Changes should reflect in all sections of MR 2. Value monitored provided is inconsistent with data provided in ER excel file				
Project participant response				Date: 30/10/2020
1. Data and Parameters Monitored – EGPJ,y - Quantity of net electricity exported to the grid during the year y are now being revised in the VCS MR V02 and made consistent with the registered VCS PD. 2. Values in the VCS MR and ER calculation sheet are now consistent with each other.				
Documentation provided by project participant				

VCS MR V02, ER calculation sheet	
VVB assessment	Date: 10/11/2020
The parameter is now in line with the PDD and the methodology. Hence the issue is closed.	

2.6 Forward Action Requests

No Forward Action Requests.

2.7 Eligibility for Validation Activities

Not applicable

3 VALIDATION FINDINGS

3.1 Participation under Other GHG Programs

The PP has participated under CDM mechanism of UNFCCC. The UNFCCC reference is 9342².

The PP would not consider the credit from any other mechanism for the current monitoring plan. The undertaking is provided to confirm that there is no any double accounting for current monitoring period.

3.2 Methodology Deviations

NA

3.3 Project Description Deviations

NA

3.4 Grouped Project

NA

4 VERIFICATION FINDINGS

4.1 Project Implementation Status

²<https://cdm.unfccc.int/methodologies/DB/C505BVV9P8VSNNV3LTK1BP3OR24Y5L>

Power generation using wind is achieved by deploying 36 wind turbine generators (WTGs). Windpower generation is an environmentally safe and sound technology. The WTGs supplied by Suzlon Energy Limited to the project participant. The components were manufactured in India and assembled at the project site. There is no transfer of technology from outside the host country for this project activity.

The project uses Suzlon's wind energy technology and implements 36 number of WTGs of S95 model with a capacity of 2100kW each. The technical details are shown below:

The technical specification of the WTG is as follows:

OPERATING DATA	
Rated power	2100 KW
Rotor speed	12.1 to 17.6 rpm
Power regulation	Active pitch regulated
Cut-in wind speed	3.5 meter/second
Rated wind speed	11 meter/second
Cut-off wind speed	25 meter/second
Restart wind speed	23 meter/second
Wind class	IEC IIA
Estimated service life	20 years
Ambient temperature range-operation	-10°to+ 40°C
A factor	9.59 m/s
ROTOR DATA	
Diameter	95 meter
Rotor cone angle	5°
Rotor speed at rated power	15.83 rpm
Tip speed at rated power	78.7 m/s
Swept area	7085 metre ²
BLADES	
Type	SUZLON SB46
Length	46.3 m
Material	Glass fibre reinforced plastic/ Epoxy
GENERATOR	
Type	Asynchronous 3 phase induction generator with slip rings operated with rotor circuit inverter system.
Rated power	2.1 MW
Number of poles/Synchronous speed	4/1500 rpm
Frequency	50 Hz
Rated generator speed	1568 rpm
TOWER	
Type	Tubular steel tower
Tower Height	80 m

The first WTG was commissioned on 18 February 2020.

Means of verification	Referring to VCS v4 and p.360, p.361, p.363 and p.364 of CDM VVS PA, v2.0, the below tables provide a summary on the verification of each monitoring parameter listed in the registered monitoring plan.	
	Data / Parameter:	EG facility,y
	Data unit:	MWh

	Description:	Quantity of net electricity exported to the grid during the year y.																					
	Source of data used:	Monthly billing records issued by JVVNL																					
	Means of verification/Comments:	This value is calculated based on the difference between calculated values of “export” and calculated value “import”																					
	Cross-check	Invoices submitted																					
	Compliance with the calibration frequency requirements for measuring instruments																						
	The audit team has checked the calibration certificates and records of the monitoring equipment as given below and found to be in line with the calibration frequency specified in the monitoring plan.																						
	<table><tr><th>Equipment</th><th>Serial no</th><th>Calibration date</th><th>Valid till</th></tr><tr><td rowspan="2">Main Meter GSS end</td><td rowspan="2">RJB90204</td><td>17/04/2018</td><td>16/04/2019</td></tr><tr><td>03/04/2019</td><td>02/04/2020</td></tr><tr><td colspan="4"></td></tr><tr><td rowspan="2">Back up Meter GSS end</td><td rowspan="2">RJB90205</td><td>17/04/2018</td><td>16/04/2019</td></tr><tr><td>03/04/2019</td><td>02/04/2020</td></tr></table>			Equipment	Serial no	Calibration date	Valid till	Main Meter GSS end	RJB90204	17/04/2018	16/04/2019	03/04/2019	02/04/2020					Back up Meter GSS end	RJB90205	17/04/2018	16/04/2019	03/04/2019	02/04/2020
	Equipment	Serial no	Calibration date	Valid till																			
	Main Meter GSS end	RJB90204	17/04/2018	16/04/2019																			
03/04/2019			02/04/2020																				
Back up Meter GSS end	RJB90205	17/04/2018	16/04/2019																				
		03/04/2019	02/04/2020																				
Conclusion	The monitoring has been carried out in accordance with the monitoring plan contained in the registered PDD. All parameters were monitored and determined as per the registered monitoring plan. Referring to p.360, p.361, p.363 and p.364 of CDM VVS PA, v2.0, VVB confirms through video call and telephonic interviews and from the document review, the actual monitoring system complies with the registered monitoring plan. The substantiation of this conformity on information flow for these parameters including the values in the monitoring reports is reported in the above																						
	During the verification, all relevant monitoring parameters of the registered monitoring plan have been verified with regard to the appropriateness of the verification method, the correctness of the values applied for ER calculation, the accuracy and applied QA/QC measures. After appropriate corrections, carried out by the project participant, it is confirmed that all monitoring parameters have been measured / determined without material misstatements and are in line with all applicable standards and relevant requirements.																						
	All parameters required to be monitored are recorded at the intervals required by the registered monitoring plan and the applied methodology. On the basis of review of source and nature of available evidences and records, the verification team confirms the quality of evidence for emission reduction provided is sufficient as per CDM VVS PA, v2.0.																						

4.2 Safeguards

No Net Harm

The project VVBs not have any negative environmental impacts.

4.3 Local Stakeholder Consultation

No comments have been received during stakeholder consultation.

4.4 AFOLU-Specific Safeguards

Not applicable.

4.5 Accuracy of GHG Emission Reduction and Removal Calculations

Calculation of baseline GHG emissions or baseline net GHG removals by sinks

Means of verification	The assessment of data and the calculation of baseline emission reduction in the MR and the ER excel sheet have been verified as per the following set of supporting documents: 1. Export and Import data 2. VER spreadsheets
Conclusion	Calculations applied formulae and method for calculation of baseline emission are in accordance with the registered monitoring plan and are in line with the requirements of the applied methodology.

Calculation of project GHG emissions or actual net anthropogenic GHG removals by sinks

Means of verification	The verification team assessed whether the data and calculations of GHG emission reductions achieved resulting from the project activity. 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 registered monitoring plan
Conclusion	Project emissions are zero as per the requirement of the methodology and registered CDM PDD.

Calculation of leakage GHG emissions

Means of verification	The verification team assessed whether the data and calculations of GHG emission reductions achieved resulting from the project activity. 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 registered monitoring plan
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Conclusion	Leakage emissions are not applicable according to the applied methodology and registered CDM PDD
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4.6 Quality of Evidence to Determine GHG Emission Reductions and Removals

Means of verification	No lack of evidence and missing data were detected during this monitoring period. All values as per the monitoring plan were crosschecked by the verification team against basic monitored data and the calculations were found to be correct. The verification team confirms that all assumptions, emission factors and default values have been correctly justified. All the emission factors, application of maximum permissible errors and default values are explicitly mentioned in the monitoring report. Hence the VVB confirms that the methods and formulae used to obtain the emissions are appropriate. No reporting risks have been identified for the data reported. Troubleshooting procedure, maintenance and calibration of monitoring equipment, monitoring measurements and reporting, record handling and maintenance, reviewing monitored data are available at the plant. All the monitored data are archived partially in electronic and paper form. The data will be kept for the whole crediting period and 2 years after the last crediting period thereby meeting the requirement of the monitoring plan.
Conclusion	The formulae and the methods referred in the MR and the emission reduction calculation spread sheet comply with the methods described in the registered PDD. No lack of evidence and missing data were detected during this monitoring period. All values as per the monitoring plan were crosschecked by the verification team against basic monitored data and the GHG emission calculation is found correct. TUV SUD confirms that all assumptions, emission factors and default values have been correctly justified. All the emission factors and default values are explicitly mentioned in the monitoring report. Calculations applied formulae and method for calculation of GHG emission are in accordance with the registered monitoring plan and are in line with the requirements of VCS, the applied methodology and p. 372, p.373 of CDM VVS PA ver 2.0.

4.7 Non-Permanence Risk Analysis

Not applicable.

5 VERIFICATION CONCLUSION

The VVB confirms that

- the development and maintenance of records and reporting procedures are in accordance with the registered monitoring plan;
- the project is operated as planned and described in the project design document approved by the EB;
- 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 monitoring plan in Monitoring Report is as per the PDD and monitoring plan approved by the EB;
- the approved monitoring plan in the approved PDD is as per the applied methodology;
- There is an audit trail that contains the evidence and records that validate the stated figures.

Based on the information we have seen and evaluated, we confirm that the project activity achieved the verified amount of reductions in anthropogenic emissions by sources of greenhouse gases that would not have occurred in the absence of the project activity

Verification period: From 01 Jun 2018 to 31 March 2020

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)
2018	88,368	0	0	88,368
2019	111,911	0	0	111,911
2020	20,530	0	0	20,530
Total	220,809	0	0	220,809

APPENDIX 1: DOCUMENTS REVIEWED

No	Author	Title	References to the document
1	EKI Energy Services	VCS MR – Version 2.0	30/10/2020
2	UNFCCC	CDM VVS for PA v2.0	-
3	UNFCCC	ACM0002 – “Consolidated baseline methodology for grid-connected electricity generation from renewable sources”, Version 12.3.0	-
4	Superintending Engineer (RDPPC) & RVPNL	WTG commissioning certificates for KD 01,02,03,04,05,06 & 07	20/07/2012
5	Superintending Engineer (RDPPC) & RVPNL	WTG commissioning certificates for KD 58 KD 12,13,14,27,28	31/03/2012 30/03/2012
6	Superintending Engineer (RDPPC) & RVPNL	WTG commissioning certificates for KD 24,40,78	23/03/2012
7	Superintending Engineer (RDPPC) & RVPNL	WTG commissioning certificates for KD 29,67,76	28/03/2012
8	Superintending Engineer (RDPPC) & RVPNL	WTG commissioning certificates for KD 30,54,68,77,79	27/03/2012
9	Superintending Engineer (RDPPC) & RVPNL	WTG commissioning certificates for KD 35,37,39,57,59,60,& 61	14/03/2012
10	Superintending Engineer (RDPPC) & RVPNL	WTG commissioning certificates for KD 36	18/02/2012
11	Superintending Engineer (RDPPC) & RVPNL	WTG commissioning certificates for KD 38,55,56	25/03/2012
12	Superintending Engineer (RDPPC) & RVPNL	WTG commissioning certificates for KD 82	10/09/2012
13	Darsh Calibrations Pvt Ltd	Calibration certificates for energy meters – Back up meter GSS end – RJB 90205	17/04/2018 – 16/04/2019
14	Darsh Calibrations Pvt Ltd	Calibration certificates for energy meters – Main meter GSS end – RJB 90204	17/04/2018 – 16/04/2019
15	Darsh Calibrations Pvt Ltd	Calibration certificates for energy meters – Back up meter GSS end – RJB 90205	03/04/2019 – 02/04/2020
16	Darsh Calibrations Pvt Ltd	Calibration certificates for energy meters – Main meter GSS end – RJB 90204	03/04/2019 – 02/04/2020
15 17	M/s. Bindu Vayu Urja Private Limited	No Double Counting Declaration	11/08/2020
18	Suzlon Energy Ltd	Joint Meter Reading	01/06/2018 – 31/03/2020
19	M/s. Bindu Vayu Urja Private Limited	Monthly Invoices	01/06/2018 – 31/03/2020
20	M/s. Bindu Vayu Urja Private Limited	Monthly Invoice – September 2020	19/10/2020
21	M/s. Bindu Vayu Urja Private Limited	Clarification letter – typo error in invoicing	09/11/2020
22	Verra	VCS Standard v4.0	