VERIFICATION REPORT

RENEWABLE POWER PROJECT BY AXIS WIND FARMS (MPR DAM) PRIVATE LIMITED

Document Prepared By

TÜV SÜD South Asia Pvt Ltd

Project Title	Renewable Power Project by Axis Wind Farms (MPR Dam) Private Limited
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Report Title	VCS Verification of “Renewable Power Project by Axis Wind Farms (MPR Dam) Private Limited”
Client	Axis Wind Farms (MPR Dam) Private Limited
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Work Carried Out By	Shailendra Kewat (Assessment Team Leader & Verifier) Eswar Murty (TR)

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).

The Verification has been conducted for the monitoring period 02/10/2019 to 31/12/2020.

The verification process includes three phases:

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

The main purpose of this project activity is to generate clean form of electricity through renewable wind energy source. The project involves the implementation of 100 MW wind power project in Andhra Pradesh state of India by Axis Wind Farms (MPR Dam) Private Limited (AWFPL).

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

The project is fully commissioned on 30/03/2017.

2 Clarification Requests (CLs) and 1 Corrective Action Request (CAR) have been raised during the course of verification process and has been successfully closed. No Forward Action Request (FAR) was raised during this monitoring period.

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 PD, 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.

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.

The VVB confirms that a reasonable level of assurance has been achieved during the verification process.

1.4 Summary Description of the Project

The project involves the installation of wind Power Project. The total installed capacity of the project is 100 MW, which involves operation of wind power projects in the state of Andhra Pradesh of India. The details of the project locations are mentioned in the table below:

Name of Investor	Capacity (MW)	Village(s)	Tehsil / Mandal	District	State
Axis Wind Farms (MPR Dam) Private Limited	100 MW	Ipperu	Kuderu	Anantapuram	Andhra Pradesh

The Geo-Coordinates of all the WTGs involved in the project activity is provided in the table below:

WTG no	Latitude (N)	Longitude (E)
MPR 01	14° 50' 10.7556"	77° 23' 12.1804
MPR 02	14° 50' 02.0256"	77° 23' 29.2367"
MPR 03	14° 49' 54.7248"	77° 23' 40.2233"
MPR 04	14° 44' 46.7376"	77° 21' 28.7729"
MPR 05	14° 44' 41.3556"	77° 20' 58.3010"
MPR 06	14° 46' 45.4332"	77° 20' 42.9873"
MPR 07	14° 49' 12.3204"	77° 24' 38.6315"
MPR 08	14° 50' 41.5572"	77° 24' 29.9906"
MPR 09	14° 50' 28.7772"	77° 24' 36.2687"
MPR 10	14° 50' 04.9128"	77° 25' 03.2868"
MPR 11	14° 49' 49.7208"	77° 25' 06.6286"
MPR 12	14° 46' 32.5956"	77° 20' 19.4172"
MPR 13	14° 46' 16.2048"	77° 20' 22.3838"
MPR 15	14° 45' 14.2776"	77° 19' 27.8421"
MPR 14	14° 46' 08.4612"	77° 20' 38.6797"
MPR 16	14° 45' 45.4680"	77° 19' 27.9395"
MPR 17	14° 44' 51.4212"	77° 20' 34.3447"

MPR 18	14° 44' 38.4648"	77° 21' 48.8706"
MPR 19	14° 45' 54.9468"	77° 19' 23.3941"
MPR 21	14° 45' 01.7460"	77° 21' 36.9895"
MPR 23	14° 45' 14.2884"	77° 21' 50.7949"
MPR 24	14° 51' 06.8940"	77° 22' 02.9782"
MPR 25	14° 50' 57.6816"	77° 22' 19.6636"
MPR 26	14° 50' 47.1156"	77° 22' 28.4760"
MPR 27	14° 50' 34.8792"	77° 22' 29.2786"
MPR 30	14° 48' 44.0208"	77° 21' 52.7650"
MPR 31	14° 48' 36.4716"	77° 22' 02.6457"
MPR 32	14° 48' 31.5504"	77° 22' 35.3550"
MPR 33	14° 48' 22.0212"	77° 22' 35.0172"
MPR 34	14° 48' 12.6108"	77° 22' 36.1515"
MPR_20	14° 46' 59.0556"	77° 21' 12.2493"
MPR_22	14° 46' 47.4708"	77° 21' 09.6843"
MPR_28	14° 46' 53.7924"	77° 21' 40.3386"
MPR_29	14° 46' 31.4040"	77° 21' 22.3136"
MPR 35	14° 44' 23.2440"	77° 21' 58.4986"
MPR 36	14° 44' 09.8052"	77° 21' 43.0135"
MPR_37	14° 45' 01.5120"	77° 20' 04.7061"
MPR_38	14° 45' 11.8044"	77° 20' 03.1448"
MPR_39	14° 45' 20.9268"	77° 19' 55.3874"
MPR_40	14° 45' 30.2148"	77° 19' 59.9987"
MPR_41	14° 46' 21.7416"	77° 21' 19.4351"
MPR_42	14° 45' 03.8016"	77° 20' 54.6314"
MPR_43	14° 45' 28.9944"	77° 21' 21.8416"
MPR_44	14° 45' 16.8480"	77° 21' 16.8978"

MPR_45	14° 45' 37.8216"	77° 21' 07.6310"
MPR_46	14° 46' 30.3060"	77° 20' 52.9532"
MPR_47	14° 49' 01.3512"	77° 21' 40.6498"
MPR_48	14° 49' 12.5040"	77° 21' 41.1050"
MPR_49	14° 48' 50.7708"	77° 24' 46.6506"
MPR_50	14° 48' 50.7708"	77° 24' 46.6506"

The project activity has not been registered under any other GHG program at this moment.

The project is utilizing wind energy for generating clean electricity and selling it to grid which would have otherwise been generated through fossil fuel dominated power plants, contributing to reduction in specific emissions (emissions of pollutant) including GHG emissions and also reducing its dependence on fossil fuels for energy requirements.

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.

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.	Prasad	Durga	GREENKO GROUP (Plant-Head)	24/02/2021	Plant technology and monitoring	Shailendra Kewat
2	Barve	Samarth	Infinite Solutions	24/02/2021	Monitoring	Shailendra Kewat

2.4 Site Inspections

Please see 2.3

2.5 Resolution of Findings

CL from this verification

CL ID	01	**Section no.**	4.2	**Date:** 02/03/2021
Description of CL				
There are two JMRs for the month of March-2020 and one of them mentioned about generation data for 31/03/2019 to 01/04/2019. Please clarify the discrepancy.				
Project participant response				**Date:** 31/03/2021
There are three JMRs in the month of March -2020 for the billing date 01/03/2020 to 30/03/2020, 30/03/2020 to 31/03/2020, 31/03/2020 to 01/04/2020 which can be implemented in the Revised ER sheet Version 2.0 as well as throughout Revised MR Version 2.0.				
Documentation provided by project participant				
Revised ER Sheet Version 2.0 Revised MR Version 2.0 March 2020 – JMRs/Invoices				

DOE assessment	**Date:** 09/04/2021
Revised MR and ER sheet has been received. CL is closed	

CL ID	02	**Section no.**		**Date:** 02/03/2021
Description of CL				
Import data does not match with JMR for the following months. Jan-20, March-20, Apr-20, Jul-20, Oct-20, Nov-20. Moreover PP has to clarify whether data from “KWH” considered for calculation or from “KVAH”				
Project participant response				**Date:** 31/03/2021
Import data are made consistent with JMR for the following months Jan-20, March-20, April-20, Jul-20, Oct-20, Nov-20 The value of electricity exported to the grid is taken in the form of KWh (which is active power) from Joint meter Reading report taken at 220 KV substation forms the basis for calculation of the emission reductions; which can be cross checked from the invoice raised to DISCOM/State Utility. The value of electricity import from the grid is taken in the form of KVAH (which is apparent power) from Joint meter Reading report taken at 220 KV substation. The same is cross verified by invoices raised by DISCOM/State Utility. As per state government norms the billing/Invoices done for the import energy in the project activity in the form of KVAH based billing https://www.apspdcl.in/pdf/Tariff_Order_2013_14.pdf				
Documentation provided by project participant				
Revised ER Sheet 2.0 Revised MR Version 2.0				
DOE assessment				**Date:** 09/04/2021
Now data is consistent in ER sheet. CL is closed				

CARs from this verification

CAR ID	01	**Section no.**		**Date:** 02/03/2021
Description of CAR				
Apportioning formula considered for the month of Dec-20 has to be explained in MR as well.				
Project participant response				**Date:** 31/03/2021
The apportioning procedure/formula has been updated in the section 4.3 of the monitoring report. Hence Revised MR Version 2.0				
Documentation provided by project participant				
Revised MR Version 2.0				
DOE assessment				**Date:** 09/04/2021
Revised MR received. CAR is closed				

2.6 Eligibility for Validation Activities

Not applicable

3 VALIDATION FINDINGS

3.1 Participation under Other GHG Programs

The project activity is registered under VCS with reference number 1790. The project proponent has provided undertaking that it will not claim any GHG credits in any GHG program other than that under VERRA during the current monitoring period.

3.2 Methodology Deviations

NA

3.3 Project Description Deviations

There is no deviation with respect to the project activity during the current monitoring period.

3.4 Grouped Project

NA

4 VERIFICATION FINDINGS

4.1 Project Implementation Status

The proposed project involves the installation of wind Power Project. The total installed capacity of the project is 100 MW, which involves operation of wind power projects in the state of Andhra Pradesh of India. The details of the project locations are mentioned in the table below:

Commissioning date	Capacity (MW)	Village(s)	Tehsil / Mandal	District	State
30/03/2017	100 MW	Ipperu	Kuderu	Anantapuram	Andhra Pradesh

The project is utilizing wind energy for generating clean electricity for supplying to grid which would have otherwise been generated through fossil fuel dominated power plants, contributing to reduction in specific emissions (emissions of pollutant) including GHG emissions and also reducing its dependence on fossil fuels for energy requirements.

The audit team has checked the commissioning certificates to confirm the location and the implementation of the project and found all 50 WTGs were commissioned on 30/03/2017.

Monitoring parameters:

<table>
<tr><td>Means of verification</td><td>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.
<table>
<tr><th>Data / Parameter:</th><th>$EG_{PJ, y}$</th></tr>
<tr><td>Data unit:</td><td>MWh</td></tr>
<tr><td>Description:</td><td>Quantity of net electricity generation supplied by the project plant/unit to the grid in year y (MWh)</td></tr>
<tr><td>Source of data used:</td><td>JMR as per Monthly Generation Report</td></tr>
<tr><td>Means of verification/Comments:</td><td>The difference of final value of export and import is used for monthly values of net electricity supplied to the grid by the project activity and same value will be considered for ER calculations.

Verification team has checked the JMR to check net generation value and same has been cross verified with sales invoices raised by PP.</td></tr>
<tr><td>Cross-check</td><td>Electricity Sales invoices submitted</td></tr>
</table>
Compliance with the calibration frequency requirements for measuring instruments

As per the registered monitoring plan, the meters are to be calibrated in every five years but as a conservative approach state electricity board is doing it every year and same has been considered for this MP and confirmed by cross-checking the calibration records. The details of the calibration of meters are given in the table below.</td></tr>
<tr><td>Conclusion</td><td>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</td></tr>
</table>

	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 section. 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.

Calibration of the meters

Equipment	Serial no	Accuracy	Make	Calibration date	Valid till
Main meter	16400232	0.2s	L&T	21/02/2019 23/01/2020	22/01/2021
Check meter	16400234	0.2s	L&T	21/02/2019 23/01/2020	22/01/2021
Standby Meter	16400235	0.2s	L&T	21/02/2019 23/01/2020	22/01/2021

4.2 Safeguards

4.2.1 No Net Harm

The project do not have any negative environmental impacts.

4.2.2 Local Stakeholder Consultation

Local stakeholder consultation has been conducted at the time of project registration. As confirmed by PP during interviews, for on-going stakeholders communication, PP has maintained feedback/complaint register at the site office. Local stakeholders can anytime lodge their grievances if any in the register over the operational life time of the project.

During current monitoring period no grievance was received. Thus, assessment team is of the opinion that the ongoing stakeholder mechanism is adequate and appropriate."

4.3 AFOLU-Specific Safeguards

Not applicable.

4.4 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. Joint meter readings 3. VER spreadsheets 4. Sales Invoices
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
Conclusion	Leakage emissions are not applicable according to the applied methodology and registered CDM PDD

4.5 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.

4.6 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 PD and monitoring plan approved by the VCS;
  Tthe approved monitoring plan in the approved PD 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 02 October 2019 to 31 December 2020

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

Year	Baseline emissions or removals (tCO_2e)	Project emissions or removals (tCO_2e)	Leakage emissions (tCO_2e)	Net GHG emission reductions or removals (tCO_2e)
2019	18,825	0	0	18,825
2020	184,343	0	0	184,343
Total	**203,168**	0	0	**203,168**

APPENDIX 1: DOCUMENTS REVIEWED

No.	Author	Title	References to the document
1	UNFCCC	CDM VVS for PA v2.0	
2	UNFCCC	ACM0002 – "Consolidated baseline methodology for grid-connected electricity generation from renewable sources", Version 18.1	-
3	Verra	VCS Standard v4.0	-
4	Infinite Solutions	VCS MR – Version 2.0	31/03/2021
5	Infinite Solutions	ER Calculation sheet Version 2	31/03/2021
6	Infinite Solutions	VCS MR – Version 2.0	15/04/2021
7	Infinite Solutions	ER Calculation sheet Version 2	15/04/2021
8	Southern Power Distribution Company of A.P. Limited (SPDCAPL)	Commissioning Certificates for 100 MW wind plant	30/03/2017
9	Yathva Energy Solutions Private Limited	Calibration test certificates for main and check meters	21/02/2019 23/01/2020
10	SPDCAPL	Monthly Joint meter reading report for 100 MW wind power plant.	2019 and 2020
11	Axis Wind Farms (MPR Dam) Private Limited	Monthly invoices for 100 MW wind power plant.	2019 and 2020
12	Google Earth	GPS coordinates for WTGs	
13	Infinite	Site photographs of WTGs and energy meters	

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