29.70 MW WIND POWER PROJECT IN KARNATAKA, INDIA

Document Prepared By: 4K Earth Science Private Limited

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Summary:

4K Earth Science Private Limited (4KES) has been contracted by, "Kosher Climate India Private Limited.[1]" to undertake verification and certification for the greenhouse gas (GHG) emission reductions reported from'29.7 MW Wind Power Project in Karnataka, India' for the monitoring period 01/01/2012 to 31/12/2017 in the initial monitoring report version 1 date 27/07/2021 /1/.

The project involves installation and operation of 18 Nos. of Wind Turbine Generators (WTGs) each of 1.65 MW capacity manufactured and supplied M/s.Vestas Wind Technology India Pvt Ltd. The project activity involves generation of electricity and sell the generated electricity to the local distribution & supply company whilst Bangalore Electricity Supply Company (BESCOM), which forms the part of Southern Regional Grid of India. The transmission of electricity will be through the infrastructure build and operated by Karnataka Power Transmission Corporation Limited (KPTCL). Acciona Wind Energy Private Limited (AWEPL) (herein after referred as Project Proponent) has signed a long term Power Purchase Agreement (PPA) /2/ to supply electricity to BESCOM.

A risk-based approach has been followed to perform the 01st consolidated verification of the project activity. In the course of the verification, 03 Corrective Action Requests (CARs) and 05 Clarification (CL) were raised.

The management of 'Acciona Wind Energy Private Limited'responsible for the preparation of the Electricity Generated data (hourly, monthly & yearly) and the reported GHG emissions reductions on the basis set out within the project final monitoring report Version 02.1 dated 11/08/2021 /3/. The calculation and determination of GHG emission reductions from the project is the responsibility of the management of the Kosher Climate India Private Limited. The development and maintenance of

[1] Kosher Climate India Private Limited has contracted 4KES authorised by the project owner. Kosher Climate is responsible for drafting of Monitoring report and the contracting of the VVB.

records and reporting procedures are in accordance with the Monitoring Report Version 2.1 dated 11/08/2021 /3/.

It is our responsibility to express an independent GHG verification opinion on the GHG emissions and on the calculation of GHG emission reductions from the project for the period 01/01/2012 to 31/12/2017 based on the reported emission reductions in the final monitoring report Version 02.1 dated 11/08/2021 for the period stated above.

Based on an understanding of the risks associated with reporting GHG emissions data and the controls in place to mitigate these, 4KES planned and performed our work to obtain the information and explanations that we considered necessary to provide sufficient evidence for us to give reasonable assurance that this reported amount of GHG emission reductions for the period is fairly stated.

4KES confirms the following;
Reporting period:01/01/2012 to 31/12/2017

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)
2012	69,871	0	0	69,871
2013	94,882	0	0	94,882
2014	90,020	0	0	90,020
2015	84,265	0	0	84,265
2016	87,639	0	0	87,639
2017	85,695	0	0	85,695
Total	512,372	0	0	512,372

1 INTRODUCTION

1.1 Objective

4KES has been contracted by 'Kosher Climate India Private Limited.' to perform verification of its registered VCS project '29.70 Wind Power Project in Karnataka, India' VCS 0051, for the reported GHG emission reductions for the given monitoring period 01/01/2012 to 31/12/2017 (both dates included). The VCS projects must undergo an independent third-party verification and certification of emission reductions as the basis for issuance of Voluntary Emission Reductions (VERs).

The objectives of this verification exercise are, by review of objective evidence, to establish that:

- The project activity has been implemented and operated as per the project description (PD) and that all physical features (technology, project equipment, and monitoring and metering equipment) of the project are in place;
- Monitoring report and other supporting documents are complete;
- The data is recorded and stored as per the monitoring methodology and approved monitoring plan.
- To confirm that the monitoring system is implemented and fully functional to generate Voluntary Emission Reductions (VERs/VCUs) without any double counting, and
- To establish that the data reported are accurate, complete, consistent, transparent and free of material error or omission by checking the monitoring records and the emissions reduction calculation.

1.2 Scope and Criteria

The scope of verification is to assess the claims and assumptions made in the VCS monitoring report (MR) against the VCS criteria, including but not limited to, VCS standard, applied methodology and other relevant rules and requirements established for VCS project activities.

The Verification is not meant to provide any consulting towards the project participants. However, stated requests for clarification and/or correction actions request may have provided inputs for improvement of the project design.

1.3 Level of Assurance

The verification team verified the complete monitoring data for all the parameters of the monitoring plan and confirms that the reported emission reductions are free from any type of material errors. Therefore, 4KES confirms that the verification is conducted with reasonable level of assurance.

1.4 Summary Description of the Project

The 29.70 MW Wind Power Project in Karnataka, India (herein after referred as project) comprises of 18 WTGs each of 1650 kW / 1.65 MW capacity. The 18 WTGs were installed in two locations namely Anaburu and Arasinagundi Villages under Jagalur Taluk, Davangere District, Karnataka State, India (country).

The 18 WTGs were installed in two phases whilst, on 06/06/2008 (8 Nos. of WTGs) at Arasinagundi site and on 29/09/2008 (10 Nos. of WTGs) at Anaburu Site. The WTGs for this project activity was supplied by Vestas Wind Technology Private Limited, the first electricity generation date is recorded as 06/06/2008 which is also the start date of the crediting period under VCS.

This is the second periodic verification of the project under VCS, the first verification was performed for the period 06/06/2008 to 21/11/2008. The chosen monitoring period i.e. 01/01/2012 to 31/12/2017 is within the crediting period i.e. 06/06/2008 to 31/05/2018 which is acceptable to the verification team.

The WTG installation at sites Anabaru and Arasinagundi are located at a latitude and longitude of between 14°28' – 14°34' N and 76°20' – 76°23' E.

Geographical Coordinates of individual WTGs are presented below: Arasinagundi (AG) and Anabaru (AN).

No	WTG ID	Latitude (°N)	Longitude (°E)
1	30166 (AG-01)	14.47483843	76.34994999
2	30167 (AG-02)	14.47622071	76.34911615
3	30168 (AG-03)	14.47770168	76.34873595
4	30169 (AG-04)	14.47905862	76.34792056
5	30170 (AG-05)	14.4804490	76.34716652
6	30171 (AG-06)	14.48224514	76.34583481
7	30172 (AG-07)	14.48371893	76.34587135
8	30173 (AG-08)	14.48534657	76.34559676
9	30436 (AN-01)	14.5839420	76.39723901
10	30437 (AN-02)	14.58197308	76.39601927
11	30438 (AN-03)	14.57905375	76.39291931
12	30439 (AN-04)	14.57716689	76.39296658
13	30440 (AN-05)	14.57508726	76.39244188
14	30441 (AN-06)	14.57290476	76.39131367
15	30442 (AN-07)	14.57003982	76.39328443

16	30443 (AN-08)	14.56706873	76.39135659
17	30444 (AN-09)	14.56497052	76.39054455
18	30445 (AN-10)	14.56267174	76.39003996

Verification team has verified the latitude and longitude using the web based search approach https://www.gps-coordinates.net// and found to be consistent.

During the current monitoring period which started form 01/01/2012 to 31/12/2017 (inclusive of both i.e. first and last day), the project activity has supplied 550,941 MWh of electricity to the grid, thereby resulted in an emission reduction of 512,372 tCO2e /4/.

2 VERIFICATIONPROCESS

The registered VCS project is undergoing second verification under VCS (Fixed Crediting period), the approach adopted to ensure the quality of emission reductions is described in the following sections.

2.1 Method and Criteria

4KES assessed and determined whether the proposed implementation and operation of the project activity, and the steps taken to report emission reductions comply with the criteria and relevant guidance provided by the VCS Board. The validation/verification process consist of the following three phases;

- A desk review of the VCS PD and VCS MR
- follow up interviews with project stakeholders
- The resolution of outstanding issues and issuance of final report and opinion.

The prepared verification report and other supporting documents then undergo an internal quality control before being submitted to the Verra Secretariat for issuance of credits as per VCS standard version 4.1 /5/.

2.2 Document Review

The verification is performed primarily as a document review of the approved VCS PD /8/ and registered CDM PDD /9/, previous MR and Verification report and associated documents as stated in detail in appendix 1 of this document. The assessment is performed by a verification team using a protocol. The cross checks between information provided in the Monitoring report, VCS PD and information from sources other than those used, if available, the team's sectoral or local expertise and, if necessary, independent background investigations.

2.3 Interviews

Due to COVID-19 pandemic lockdown and restrictions on travel Verification team could not conduct the site visit. Since the date of closure of lockdown was uncertain due to the increase spread of COVID-19 and hence VVB did not conduct site visit for this project activity. However, the verification team performed the Zoom remote interview with the PP and site person and reviewed documents to achieve a reasonable level of assurance in the verification. This is in line with Section 4.1.2 of the VCS Standard, v4.1 /5/ which 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. No sampling procedures were adopted in document verification and all the document were cross checked to ensure conservative estimation of emission reduction. Kindly find below names of the persons interviewed (Zoom remote interview).

Location	The Project Activity is located at Anabaru and Arasinagundi villages of the Jagalur Taluk, Davangere District, Karnataka state, India	
Dates	10/08/2021	
Key points discussed	**Name of person, interviewed**	**Designation, Organization**
Implementation, Monitoring, Operational data, Calibration, Data collection, QA/QC procedures, Calculation of ERs, VCS requirements	Mr. Siva Arulprakasam	Head of Operations, Acciona Wind Energy Private Limited
	Mr. Umamaheshwara Rao	Site–Incharge Acciona Wind Energy Private Limited
	Mr. Nagaraju Bellapu	Consultant, Kosher Climate India Private Limited

2.4 Site Inspections

As mentioned above, due lockdown due to COVID-19 pandemic and travel restrictions, Verification team could not conduct the site visit. Since the date of closure of lockdown was uncertain along with restrictions on travel, hence VVB could not perform physical verification of the site for this project activity. However, the verification team performed remote audit though following means:

- Zoom interview is conducted with PP and site person to understand the project design, monitoring procedure, any change in design or monitoring procedure, ER calculation etc.
- Plant photographs & energy meter photographs are checked to confirm the plant project design and energy meter specification
- Technical specification of WTGs is verified to confirm the plant specification and project design
- PPA signed with DISCOM is checked to confirm the monitoring procedure followed for billing which is used for emission reduction calculation.
- JMR/Form-B of monitoring period (signed by DISCOM and PP) are verified to confirm the electricity generated during the monitoring period
- Calibration Certificate of energy meters are verified to confirm the accuracy of energy meter and validity of calibration of energy meters used for monitoring

From the above assessment, verification team confirm that the project achieve a reasonable level of assurance in the verification. This is in line with Section 4.1.2 of the VCS Standard, v4.1 which 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.

2.5 Resolution of Findings

The objective of this step is to identify, discuss and conclude on the issues related to the monitoring, implementation and operations of the registered project activity that could impair the capacity of the registered project activity to achieve emission reductions or influence the monitoring and reporting of emission reductions. This is done based on the desk review and Zoom remote interview. The verification team prepares and/or updates a verification protocol (internal document) that records the conformities and non-conformities, which may be of following types;

CAR (Corrective Action Request) is raised if one of the following occurs:

- Non-compliance with the monitoring plan, the methodology or the standardized baseline are found in monitoring and reporting and has not been sufficiently documented by the project participants, or if the evidence provided to prove conformity is insufficient;

- Modifications to the implementation, operation and monitoring of the registered project activity has not been sufficiently documented by the project participants;
- Mistakes have been made in applying assumptions, data or calculations of emission reductions that will impact the quantity of emission reductions;
- Issues identified in a FAR during validation to be verified during verification or previous verification(s) have not been resolved by the project participants.

Clarification request (CL) is raised if information is insufficient or not clear enough to determine whether the applicable CDM requirements have been met. All CARs and CLs raised by the 4KES during verification shall be resolved prior to submitting a request for issuance.

FAR (Forward Action Request) is raised during verification if the monitoring and reporting require attention and/or adjustment for the next verification period.

During the Verification process, total 03 CARs and 05 CLs were raised and resolved satisfactorily. No FAR has been raised in the verification. The list of CARs/CLs raised and the response provided, the mean of validation, reasons for their closure and references to correction in the relevant documents are provided in Appendix-II of this report.

2.5.1 Forward Action Requests

No FAR raised during the current verification.

2.6 Eligibility for Validation Activities

4KES conducted the verification activity; the validation was performed by the other VVB. 4KES has a valid UNFCCC accreditation in the sectoral scope from UNFCCC. The accreditation scope can be checked from the below link: http://cdm.unfccc.int/DOE/list/DOE.html?entityCode=E-0069

3 VALIDATION FINDINGS

Use this section to provide details of all validation activities that took place during the verification, such as gap validation, validation of methodology deviations and project description deviations, and the inclusion of new project activity instances into grouped projects.

3.1 Participation under Other GHG Programs

The project is also registered as a CDM project with UNFCCC[2], the project activity has successfully claimed issuance of CERs under CDM the details are as follows:

- 20/11/2008 to 31/07/2009
- 01/08/2009 to 31/12/2009
- 01/01/2010 to 31/12/2010
- 01/01/2011 to 31/12/2011

The Project Proponent has decided to opt for 2nd issuance of emission reductions through the VCS for the period of starting from 01/01/2012 to 31/12/2017 (both days included).

Deceleration dated 25/07/2021 for not claiming emission / GHG reductions under CDM or any other GHG programs for the above stated monitoring period was made available to the verification team. Based on the deceleration submitted by the PP the verification team confirms that there would be no double counting associated with project activity under CDM / other GHG programs for the above stated monitoring period.

3.2 Methodology Deviations

The verification team confirms that the registered PD complies with the requirements in the applied monitoring methodology ACM 0002 version 6.0. /7/ Therefore, no methodology deviations are applied during the monitoring period. The verification team confirms that no deviations were observed during the current monitoring period.

3.3 Project Description Deviations

The project activity uses the Wind Turbine Generators to generate electricity and supply the generated electricity to the local distribution company whilst, BESCOM. The Verification Team based on the document review and discussions with the Operation & Maintenance team of AWEPL is able to conclude that the project activity has been installed and operated as per the

[2] https://cdm.unfccc.int/Projects/DB/DNV-CUK1216117082.43/view

description provided in the registered PD. There have been 'No deviations' found when compared to the previous monitoring period under VCS & CDM and the current claimable monitoring period.

3.4 Grouped Project

The project is not a grouped project. Therefore, this section is not applicable.

4 VERIFICATION FINDINGS

4.1 Project Implementation Status

The project activity involves installation and operation of 18 Nos.of Wind Turbine Generators spread across two locations namely, Anabaru & Arisnagundi

During the process of verification, 4KES confirmed the capacity, unique identification of all the 18 WTGs of this project activity, estimated power generation, arrangement for evacuation of electricity generated, technical specifications, date of commissioning, arrangements for Operation & Maintenance (O&M) and necessary clearances for operating the project activity.

Technical specifications of the WTGs installed were checked and the verification team did not find any deviation when compared to the registered VCD PD /8/, registered CDM PDD /10/ and the first VCS Monitoring Report /19/.

Description	Specifications
Tower/Rotor Height	78 Meter
Rotor Diameter	82 Meter
Installed electrical output	1,650 kW
Cut-in wind speed	3.5 m/s.
Rated wind speed	7.5 m/s.
Cut-out wind speed	20 m/s. (10 minute average)
Rotor swept area	5,281 sq. meters.
Rotational speed	14,4 rpm
Rotor material Blades Material	Carbon fibre/epoxy/wood/glass
Regulation	Active Stall

Generator	1-speed, water cooled.
Rated output	1,650 kW
Rotational speed at rated Power	1,012 rpm
Operating voltage	3 x 690 V
Frequency	50 Hz
Insulation class	F/B
Cooling system	Oil cooler/Radiator: Cooling capacity 37.5 kW Water cooler/Radiator: Cooling capacity 46.2 kW
Gear Box	1. step planet, 2. Step helical
Manufacturer	Vestas Wind Technology Pvt Ltd.
Gear ratio	1:70,2
Nominal load Gearbox Mechanical power	1,800 kW
Yaw Drive System	Planetary gear motor.
Yaw bearing	Ball bearing, internal gearing.
Aerodynamic brake	Hydraulic disc brake
Mechanical brake	Hydraulic disc brake
Control unit	SCADA

List of documents reviewed during the course of verification is presented under Appendix I of this report.

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.

There was changes w.r.t the energy meters during this consolidated monitoring period as verified during the remote audit and the discussion with PP, details are provided in the subsequent section of this report. The assessment team confirmed that there is no proposed or actual change to the project design during this monitoring period. The project design as mentioned in the registered VCS PD & monitoring report submitted is implemented and thus the same is acceptable to the assessment team. All required monitoring equipment's and procedures as

mentioned in the registered VCS PD & monitoring report are available and implemented in an appropriate manner.

The organisational role and responsibility as mentioned in the registered VCS PD & monitoring report is followed onsite. All the monitoring equipment was calibrated as per the specified interval in the registered VCS PD & monitoring report. All the emergency preparedness as mentioned in the registered VCS PD & monitoring report is followed onsite and no discrepancies were found regarding the same.

The assessment team found that the project is in line with the registered VCS PD and registered CDM PDD, monitoring report.

Opinion:

Assessment team concludes the following:

a) There is no material discrepancies between project implementation and the project description provided in the registered PD/08/.

b) The monitoring plan is implemented completely and monitoring system (i.e., process and schedule for obtaining, recording, compiling and analysing the monitored data and parameters) is appropriate.

c) There is no material discrepancies between the actual monitoring system, and the monitoring plan set out in the project description and the applied methodology.

d) The GHG emission reductions or removals generated by the project have not included in an emissions trading program or any other mechanism that includes GHG allowance trading.

e) The project has not received or sought any other form of environmental credit, or has become eligible to do so since validation or previous verification.

f) The project is registered under VCS only.

In view of the information's as verified above the assessment team is able to conclude that the project has been implemented as described in the project description.

4.2 Safeguards

4.2.1 No Net Harm

The project activity is wind based electricity generation project and does not possess any activities which does not have any negative environmental and social impacts, hence the verification team is of the opinion this criteria is not applicable to this project activity.

4.2.2 Local Stakeholder Consultation

The local stakeholder consultation was held prior to the commissioning of the project. The identified stakeholders were informed through an invitation published in the local daily newspaper "Vijaya Karnataka" on 28/07/2007. The clipping of the invitation published in the newspaper in the local spoken language 'Kannada' and English translation of the same was made available to the verification team.

The local stakeholder consultation meeting as scheduled was held at 11:00 hours on 3rd August 2007 at Arasinagundi wind farm site to discuss and address the stakeholder concerns about the proposed project activity.

The verification team during the Zoom Meeting Call were informed by the Site-In charge about the provision made available to the stakeholders to communicate or write directly to the AWEPL head office in case on any concerns or suggestions about the project activity. However, as verified from the grievance register maintained at site, no concerns or comments received from any stakeholder during the monitoring period.

4.3 AFOLU-Specific Safeguards

Not Applicable.

4.4 Accuracy of GHG Emission Reduction and Removal Calculations

The GHG emission reductions were calculated correctly on the basis of the Approved Consolidated baseline methodology for grid-connected electricity generation from renewable sources, ACM 0002 (Version 6.0), 19th May 2006, the formulae given in the monitoring report version and also based on the registered PDD, validation opinion stated in the VCS validation and 1st verification report /11/.

Parameter monitored:

i.e.4 :- EGy (MWh)

Net electricity supplied to BESCOM facility using KPTCL network in year y

<table>
<tr><th></th><th>Discussion and verification assessment</th></tr>
<tr><td>Purpose of data</td><td>The net electricity supplied to the local grid, forms the basis to determine net emission reductions.</td></tr>
<tr><td>Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)</td><td>Two meters (main and check) are installed at the high voltage side of the each of the step-up transformers at the KPTCL substation – Hiremallanahole (HMP). The main and check meters have the same accuracy level of 0.2s. Both the energy meters are tri-vector meters.
Energy Meter Details of two sites provided below
Arasinagundi:
<table>
<tr><th colspan="5">ARA-HMP-01</th></tr>
<tr><th rowspan="2">Meter Change date</th><th colspan="2">Old Meters</th><th colspan="2">New Meters</th></tr>
<tr><th>Main Meter No</th><th>Check Meter No</th><th>Main Meter No</th><th>Check Meter No</th></tr>
<tr><td>4/6/2012</td><td>6675265</td><td>6760793</td><td>11071507</td><td>11071509</td></tr>
<tr><td>11/4/2014</td><td>11071507</td><td>11071509</td><td>13191099</td><td>No Change</td></tr>
<tr><td>27/10/2018</td><td>13191099</td><td>11071509</td><td>17074782</td><td>17074787</td></tr>
</table>
Anabaru site:
<table>
<tr><th colspan="5">ANA-HMP-03</th></tr>
<tr><th rowspan="2">Meter Change date</th><th colspan="2">Old Meters</th><th colspan="2">New Meters</th></tr>
<tr><th>Main Meter No</th><th>Check Meter No</th><th>Main Meter No</th><th>Check Meter No</th></tr>
<tr><td>4/6/2012</td><td>6767617</td><td>6774503</td><td>11071510</td><td>11071511</td></tr>
<tr><td>23/09/2015</td><td>11071510</td><td>11071511</td><td>No Change</td><td>14193209</td></tr>
<tr><td>12/5/2017</td><td>11071510</td><td>14193209</td><td>16196539</td><td>No Change</td></tr>
</table></td></tr>
</table>

Measuring/Reading/ Recording frequency	For all the meters involved, measurement is made continuous and recording is made monthly as verified from the monthly electricity data // and remote zoom meeting.
Data collection (from data generation, aggregation, to recording, calculation and reporting)	The monthly generation data will jointly monitored by the BESCOM and AWEPL officials. The JMRs / Form-B forms the basis for determining the net electricity supplied to the Grid. The monthly data will be stored in physical and electronic format and the Monitored Data will be kept for a minimum of two years after the end of the crediting period or the last issuance whichever is later.
Verified value	550,941 MWh (from 01/01/2012 to 31/12/2017) both days included
Cross checks	NA
QA/QC procedures applied	Verification team has checked the meter details during the remote interview and calibration records /11/ and found OK. The energy meters will be calibrated once every quarter / 3 months in a single calendar year as per PPA. There have been instances where there have been delay in calibration, the PP has applied the maximum permissible error factor and calculated the emission reductions. The approach and methodology applied is found to be conservative and agreeable to the verification team.

The calibration of meters for both the sites 25 times the dates ranging from 22/02/2012 to 11/10/2018, the verification team considered calibration certificates dated 11/10/2018 even though beyond end of crediting period (31/05/2018) to ensure the correctness of energy meters and electricity generation. The verification team observed during 12 instances the calibration was delayed the minimum delay in calibration was checked and verified as 2 days (14/11/2012 to 16/11/2012). The PP has applied the maximum permissible error factor 0.2% while deducing the emission reductions.

Year	**Calibration Details - ARA(HMP-01) & ANA (HMP-03)**				
	Calibration Date and Due date				
2012	22/02/2012	22/05/2012	**2015**	11/02/2015	11/05/2015
	04/06/2012	04/09/2012		18/05/2015	18/08/2015
	14/08/2012	14/11/2012		21/08/2015	21/11/2015
	16/11/2012	16/02/2013		20/11/2015	20/02/2016
2013	16/02/2013	16/05/2013	**2016**	19/02/2016	19/05/2016
	16/05/2013	16/08/2013		08/06/2016	08/09/2016

	19/08/2013	19/11/2013		16/09/2016	16/12/2016
	11/11/2013	11/02/2014		16/12/2016	16/03/2017
2014	11/02/2014	11/05/2014	2017	17/03/2017	17/06/2017
	16/05/2014	16/08/2014		10/07/2017	10/10/2017
	12/08/2014	12/11/2014		24/10/2017	24/01/2018
	11/11/2014	11/02/2015	2018	12/01/2018	12/04/2018
				11/07/2018	11/10/2018

The verification team based on the documentary evidence was able to note that during the course of the consolidated monitoring period, the Main Meter at both the sites Arasinagundi and Anabaru were replaced 5 Times and Check Meters were replaced 4 Times. The meters were replaced due to ageing factor, upgrading CT/PT and two instances of CT failure. Details are as follows:

Arasinagundi (ARA):

ARA-HMP-01				
Meter Change date	Old Meters		New Meters	
	Main Meter No	Check Meter No	Main Meter No	Check Meter No
4/6/2012	6675265	6760793	11071507	11071509
11/4/2014	11071507	11071509	13191099	No Change
27/10/2018	13191099	11071509	17074782	17074787

Anabaru (ANA):

ANA-HMP-03				
Meter Change date	Old Meters		New Meters	
	Main Meter No	Check Meter No	Main Meter No	Check Meter No
4/6/2012	6767617	6774503	11071510	11071511
23/09/2015	11071510	11071511	No Change	14193209
12/5/2017	11071510	14193209	16196539	No Change

The verification team based on the documentary evidence was able to note that during the course of the consolidated monitoring period, the Main Meter at both the sites Arasinagundi and Anabaru were replaced 5 Times and Check Meters were replaced 4 Times, details are as follows:

Finding: CL-05 and CL-05 were raised and successfully closed. Refer Appendix II for more details.

Opinion: The verification team confirms;

- The monitoring plan has been implemented as per the registered PD;
- The monitoring complies with the requirement of the applied methodologies;
- The information inflow (from data generation, aggregation, to recording, calculation and reporting) is included above under each parameters and confirms to the requirement of the PDD;
- The values included in the monitoring report and corresponding emission reduction sheets are verified and included under each monitoring parameter, wherever appropriate;

Parameters not monitored/ex-ante:

The following were fixed ex-ante at the time of registration. The data and values applied have been checked and verified by the verification team with registered VCS PD /8/ and CDM PDD /9/.

4.4.2 – $EF_{OM,Y}$

	Discussion and verification assessment
Purpose of data	Caluclation of Baseline Emissions – Data used for Operating margin emission factor for southern regional grid of India
Verified value	1.004 tCO_2/MWh
Source of value	Central Electricity Authority of India (CEA) published data
Justification	Values are checked from registered VCS PD and registered CDM PDD Calculated as per ACM0002 with 3 years vintage data and option of ex-ante calculation based on Simple Operating Margin Method. Computed once during PDD finalization (ex-ante).

4.4.3 – $EF_{BM,Y}$

	Discussion and verification assessment
Purpose of data	Calculation of Baseline Emissions – Data used for Build margin emission factor for southern regional grid of India
Verified value	0.711 tCO_2/MWh
Source of value	Central Electricity Authority of India (CEA) published data

Justification	Values are checked from registered VCS PD and registered CDM PDD Calculated as per ACM0002 with 3 years vintage data and option of ex-ante calculation based on "20% of total generation approach". Computed once during PDD finalization (ex-ante).

4.4.4 – $EF_{,Y}$

	Discussion and verification assessment
Purpose of data	Calculation of Baseline Emissions – Combined margin CO_2 emission factor for southern regional grid.
Verified value	0.93 tCO_2/MWh
Source of value	Central Electricity Authority of India (CEA) published data
Justification	Values are checked from registered VCS PD and registered CDM PDD Calculated as per ACM0002 with 3 years vintage data and option of ex-ante calculation based on 75% of OM and 25% of BM values approach». Computed once during PDD finalization (ex-ante).

Opinion:

In the opinion of assessment team, the assumptions, emission factors and default values that were applied in the calculations have been justified.

Assessment of Data and Calculation of GHG emission reductions:

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

BE_y = Baseline emissions in a year y (tCO_2)

$EG_{p,j,y}$ or EG_y = Quantity of net electricity supplied to the grid as a result of the Implementation of the project activity in year y (MWh)

$EG_{P,J,y} = EG_y$

$EF_{CO2,grid,y}$ = CO_2 emission factor of the grid in year y (tCO_2/MWh)

The Combined margin CO_2 emissions factor in year y (tCO_2 /MWh), $EF_{grid,CM,y}$,is fixed ex-ante for the duration of the crediting period and is 0.93 tCO_{2e} /MWh.

The electricity supplied to grid for this monitoring period is 550,941 MWh.

The baseline emission calculated for the reported monitoring period is 512,372 tCO2e

whilst, **BEy = 512,372 tCO2**

Project Emissions

No project emission is applicable to this project activity, since the project involves the usage of renewable wind energy for electric power generation, the process of electricity generation does not involve any combustion of any fossil fuels. Hence, the project emissions are nil, the same is acceptable to the verification team.

i.e. PE_y = 0 tCO2e

Leakage

No leakage has been considered for the project activity.

Emission reductions

Emission reductions are calculated as follows:

ERy = BEy – PEy – LEy

= 512,372 **tCO_2e (Rounded down)**

Opinion:

The verification team confirms that

- The complete data set for the identified and required parameters for the operational days in the current monitoring period was available;
- The reported data has been cross checked with available records, as indicated in the section 4.4 above under each monitored data, wherever appropriate;
- The baseline, project and leakage emissions have been determined in accordance with the requirement of the applied methodologies, as contained in the final monitoring report and corresponding emission reductions spreadsheet;
- The assumptions, emission factors and default values used are justified, as indicated in the section 4.4 above

4.5 Quality of Evidence to Determine GHG Emission Reductions and Removals

Evidences (Documents/Zoom interviews) referred for verification of individual monitoring parameter and fixed parameters are defined under section 4.4. We further confirm that, sufficient evidence covering the entire monitoring period and at the required frequency were available. A list of referred documents for verification is also included in Appendix 1 of this report.

4.6 Non-Permanence Risk Analysis

Not applicable.

5 VERIFICATION CONCLUSION

4K Earth Science Pvt. Ltd (4KES), contracted by 'Kosher Climate India Private Limited', has performed the independent verification of the emission reductions for the VCS project activity (VCS ID- 0051) "29.70 MW Wind Power Project in Karnataka, India" for the monitoring period 01-January-2012 to 31-December-2017 as reported in the Monitoring Report Version 2.01 dated 11/08/2021. The project proponent whilst 'Acciona Wind Energy Private Limited' are responsible for the collection of data in accordance with the monitoring plan and the reporting of GHG emissions reductions from the project activity. It is our responsibility to express an independent verification statement on the reported GHG emission reductions from the project activity.

4KES commenced the verification on the basis of the baseline and monitoring methodology ACM 0002 version 6.0, the monitoring plan contained in the registered VCS PD /08/ and VCS

Standard, version 4.1, Monitoring Report (Version 2.01 dated 11/08/2021) as per the process described under Section 2 of this report.

4KES verification approach is based on the understanding of the risks associated with reporting of GHG emission data and the controls in place to mitigate these. 4KES planned and performed the verification by obtaining evidence and other information and explanations that 4KES considered necessary to give reasonable assurance that reported GHG emission reductions are fairly stated.

In our opinion the GHG emissions reductions reported for the project activity for the period 01-January-2012 to 31-December-2017 are fairly stated in the Monitoring Report Version 2.01 dated 11/08/2021. The GHG emission reductions were calculated correctly on the basis of Approved Consolidated baseline methodology for grid-connected electricity generation from renewable sources, Version 6.0, and the VCS standard.

Verification period: From 01-January-2012 to 31-December-2017

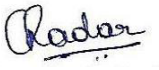
Verified GHG emission reductions and removals in the above verification period:

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)
2012	69,871	0	0	69,871
2013	94,882	0	0	94,882
2014	90,020	0	0	90,020
2015	84,265	0	0	84,265
2016	87,639	0	0	87,639
2017	85,695	0	0	85,695
Total	**512,372**	**0**	**0**	**512,372**

Approved by

Chandrakala R.

Director Date:17-August-2021



4K Earth Science Private Limited Place: Bangalore, India

APPENDIX I: LIST OF DOCUMENTS

/1/	/1.1/ Monitoring Report, Version 01, dated 02/07/2021 (Initial Version) /1.2/ Monitoring Report, Version 02.0, dated 05/08/2021
/2/	Power Purchase Agreements signed between AWEPL & BESCOM, dated 17/03/2008 & 02/05/2008
/3/	Monitoring Report, Version 02.1 dated 11/08/2021 (Final Version)
/4/	Emission Reduction Calculation Sheet – Version 2 (final)
/5/	VCS Standard Version 4.1, 22 April 2021
/6/	Deceleration from PP for not claiming credits under other GHG Programs, Dt: 25/07/2021
/7/	Consolidated baseline methodology for grid-connected electricity generation from renewable sources, Version 6.0, 19th May 2006
/8/	VCS Registered PD - https://registry.verra.org/app/projectDetail/VCS/51
/9/	Registered CDM PDD – https://cdm.unfccc.int/Projects/DB/DNV-CUK1216117082.43/view
/10/	Stakeholder Invitation Paper Clipping
/11/	1st Verification Report under VCS – https://registry.verra.org/app/projectDetail/VCS/51
/12/	Lr No: EE€/SRS/CTA/IPP/08-09/593-604, Dated 12/06/08. Commissioning certificate of 8 Nos. x 1.65 MW (location nos: AG-1, AG-2, AG-3,AG-4,AG-5, AG6,AG-7 and AG-8)
/13/	Lr No: EE€/SRS/CTA/IPP/08-09/1342-54 Dated 30/09/08. Commissioning certificate of 10 Nos. x 1.65 MW (location nos: AN-1, AN-2, AN-3,AN-4,AN-5, AN 6,AN-7,AN-8,AN-9, and AN-10)
/14/	Host Country Approval, Dated 17/03/2008 , Ref No: 4/18/2007/CCC
/15/	Host Country Approval, Dated 29/07/2009 after the name change of Project Proponent
/16/	Consolidated JMR / Form-B Statements (from 01/01/2012 to 31/12/2017)
/17/	Consolidated Calibration Certificates (from 01/01/2012 to 31/12/2017)
/18/	Guidelines For Assessing Compliance With The Calibration Frequency Requirements https://cdm.unfccc.int/Reference/Guidclarif/iss/iss_guid05.pdf
/19/	First VCS Monitoring Report for period (06/06/2008 to 21/11/2008) https://registry.verra.org/app/projectDetail/VCS/51

APPENDIX II: VERIFICATION FINDINGS

Clarification Requests

CL ID	01	Section no.	-	Date:03/08/2021
Description of CL				
Project Developer Name used in the registered PDD and Section 1.1, 1.3 and 4.3 of the Monitoring Report are not consistent, the same needs to be clarified.				
Project participant response				**Date:05/08/2021**
The correct developer name is Acciona Wind Energy Pvt. Ltd. However in the initial PDD the name was wrongly mentioned as Accion Wind Energy Pvt. Ltd. This was later corrected during the subsequent verifications. Please refer latest MR. Also the UNFCCC project page and VCS project page reflect correct name ie, Acciona Wind Energy Pvt. Ltd The clarification is now provided in footnote 1 of the MR.				
Documentation provided by project participant				
1. Revised MR.				
DOE assessment				**Date: 14/08/2021**
The verification team performed additional checks to verify the mismatch in entity name between the registered CDM PDD and VCS PD and Monitoring Report, the following documents were assessed to authenticate the usage of correct Project Proponent name: 1. First VCS Monitoring Report dated 03/04/2009 2. First VCS Verification Report, dated: 11/05/2009 3. Revised Host Country Approval dated: 29/07/2009 During the Zoom Call the issue of name mismatch was put forth to the Project Proponent. The verification team was informed about change of name of the entity from Accion Wind Energy Pvt. Ltd. to Acciona Wind Energy Pvt. Ltd. The same entity name has been uniformly quoted in all the documents, communications to VCS Board and UNFCCC Executive Board. The verification team based on the document review and discussions with the Project Proponent deems that references to Accion Wind Energy Pvt. Ltd. in any document previous to these dates is to be construed as reference to Acciona Wind Energy Pvt. Ltd. The Verification Team based on the clarification and input appended in the revised MR was able to close clarification request (CL01).				

CL ID	02	Section no.	-	Date:03/08/2021
Description of CL				
Under section 1.1 of the monitoring report, the structure used to define the Sustainable Development of NCDMA needs clarity.				
Project participant response				**Date:05/08/2021**
The sustainable development demonstration under section 1.11 of the MR has been corrected in line with the NCDMA guidelines.				
Documentation provided by project participant				
Revised MR.				
DOE assessment				**Date: 14/08/2021**
The host country National CDM Authority (NCDMA) governed by Ministry of Environment, Forest and Climate Change (MoEF) has defined the 4 Indicators for Sustainable Development, the Verification Team sought clarification regarding the structuring of the indicators. The Project Proponent revised the Monitoring Report to reflect the indicators as prescribed by the NCDMA. The clarification provided is found agreeable to the Verification Team, hence CL02 is closed.				

CL ID	03	Section no.	-	Date:03/08/2021
Description of CL				
Section 1.6 of the monitoring report. The Project Developer is requested to provide clarity on the adherence of crediting period guidelines of VCS.				
Project participant response				**Date:05/08/2021**
In section 1.6 the project crediting period has been corrected to fixed crediting for 10 years and not applicable to renew further in accordance to the VCS project standard version4.0				
Documentation provided by project participant				
Revised MR.				
DOE assessment				**Date: 14/08/2021**
The Verification Team found the there was a typographical error while mentioning type of crediting period. The correction appended in the revised Monitoring Report is found to be acceptable to the verification team hence CL03 is closed.				

CL ID	04	Section no.	-	Date:03/08/2021

Description of CL	
Section 5.4 and Emission Reduction Calculation Sheet – The Emission Reductions for two years (whilst 2013 & 2014) has been consistently higher than the ex-ante estimation of emission reductions. Project Developer to confirmthat the project activity has operated as per the description provided in the registered PDD and VCS Guidelines.	
Project participant response	**Date:05/08/2021**
The Power generation of the wind power projects are majorly depends on the availability of wind density and wind speed. Hence the higher generation in the years 2013 and 2014 is due to the higher PLF availability due to the consistent wind flow. The incremental generation with respect to estimated value in the PPD in 2013 and 2014 is 7.9% and 2.02% respectively which is in the considerable limits. Moreover the Net generation and the emission reductions for the current monitoring period is lesser than the ex-ante estimated values in the PDD which is conservative.	
Documentation provided by project participant	
Revised MR Revised ER.	
DOE assessment	**Date: 14/08/2021**
The Verification Team noted that the project activity for two consecutive years had exceeded the estimated electricity generation by 7.9% in the year 2013 and 2.02% in the year 2014. The verification team was able to assess that for the entire duration of this monitoring period ranging from 2012 to 2017, only two years the generation had been higher and the for the remaining years the generation has been lower the estimated generation whilst (12% for 2015, 9% for 2016 and 11% for 2017) based on the above assessment the Verification Team is of the opinion that the Plant Load Factor or Flow of Wind, Grid Availability are not in the control of the Project Proponent. The approach adopted by the Project Proponent to calculate Emission Reductions for this monitoring period is conservative and the clarification provide is agreeable to the verification team, hence CL 04 is closed.	

CL ID	05	Section no.	-	Date:03/08/2021
Description of CL				

Section 4.2, Appendix –I of monitoring report and Emission Reduction Calculation Sheet – Based on the review of documents it is evident that meter changes and calibration of meters have been performed on multiple instances. The Project Developer has accounted for the delay in calibration and applied error factor while calculating the Emission Reductions. The Project Developer is requested to clarify on the following: 1. Reasons for meter change is not clearly stated 2. Methodology applied for factoring the meter changes while calculating the Emission Reductions.

Project participant response	**Date:05/08/2021**
1. Reason for change of meters and respective calibration error correction requirement applied has been provided in appendix1 as remarks in the same table. 2. Methodology and procedure applied while factoring the calibration error and emission reduction calculations has been described in Appendix 1 on of the Monitoring report.	

Documentation provided by project participant
Revised MR. Revised ER.

DOE assessment	**Date: 14/08/2021**
The Project Proponent has applied the maximum permissible error for 02.s Accuracy Class Energy Meters, for both delay in calibration and meter replacement. The methodology adopted to apply the error factor while computing the emission reductions is acceptable. This approach has resulted in further reduction of estimated emission reductions which was earlier estimated to be 532,926 tCO2e and the current estimated emission reductions works out to be 512,372 tCO2e. The conservative approach and clarification provided by the PP are found to be satisfactory, hence CL 05 is closed.	

Corrective Action Requests

CAR ID	01	**Section no.**	-	**Date :**03/08/2021
Description of CAR				
Section 1.8 of the monitoring report provides reference to the Tools & Methodologies, the Project Developer is requested to demonstrate the consistency of the tools used at the time of registration and current monitoring period.				
Project participant response				**Date:05/08/2021**

Tools and reference methodologies used has been corrected in the monitoring report in consistent with the registered PD.
Documentation provided by project participant
Revised MR.
DOE assessment | **Date: 14/08/2021**
The correct version of methodology has been applied in revised Monitoring Report which is consistent with registered PD. Corrections are found to be correct and agreeable, hence CAR 01 is closed.

CAR ID	02	**Section no.**	-	**Date :**10/08/2021
Description of CAR				
Section 1.5 & 1.6 of the monitoring report – crediting period start date is not in conjunction with the guidelines prescribed by VCS.				
Project participant response				**Date:11/08/2021**
The crediting period start date provided in the section 1.5 & 1.6 is based on the commissioning date of 1st WTG which is in conjunction with the guidelines prescribed by VCS.				
Documentation provided by project participant				
Revised MR.				
DOE assessment				**Date: 14/08/2021**
The crediting period start date and project start date have been applied correctly and it is adhereing to the guidelines prescribed in Section 3.7 & 3.7.1 of the VCS Standard v4.0, based on this assessment CAR 02 has been closed.				

CAR ID	03	**Section no.**	-	**Date :**10/08/2021
Description of CAR				
PP is requested to share the precise GPS coordinates of the installed WTGs.				
Project participant response				**Date:11/08/2021**
The GPS coordinates of all WTGs are now provided section 1.7 of MR				
Documentation provided by project participant				

Revised MR.
DOE assessment | **Date: 14/08/2021**
The geographical coordinates of each WTGS (all 18 Nos.) have been provided in Section 1.7 of the MR. The details provided has been verified and cross checked, hence CAR 03 has been closed.

Forward Action Requests

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

APPENDIX III: TEAM COMPETENCE

Certificate of Competence							
Name	☒ Mr. ☐ Ms.	**Ma Paa Puratchikkanal**					
Qualification Procedure		*Fulfils the requirement as per the appointment of personnel procedure of 4KES for Validation and Verification of CDM/VCS/GS/GHG Projects.*					
Appointed to work as:							
		CDM Validator/Verifier	**Team Leader**	**Team Member**	**Technical Expert**	**Technical Reviewer**	**Financial Expert**
Appointed		Yes	Yes	Yes	Yes	Yes	No
Appointed Date		27-04-2021					
Authorized to work as Technical Expert for:							
Authorized Technical Area		**Sectoral Scope**		**TA Code**	**Technical Area within the scope**		
		Energy industries (renewable - / non-renewable sources)		1.1	Thermal energy generation		
		Energy industries (renewable - / non-renewable sources)		1.2	Renewables		
		Energy demand		3.1	Energy demand		
		Construction		6.1	Construction		
		Waste handling and disposal		13.1	Solid waste and wastewater		
		Waste handling and disposal		13.2	Manure		
		Agriculture		15.1	Agriculture		
Authorized to work as Local Expert for:							
Country/Countries		India					
Compliance check by: Anand S. R.							

Certificate of Competence							
Name	☐ Mr. ☒ Ms.	**Indumathi .C**					
Qualification Procedure		*Fulfils the requirement as per the appointment of personnel procedure of 4KES for Validation and Verification of CDM/VCS/GS/GHG Projects.*					
Appointed to work as:							
		CDM Validator/Verifier	**Team Leader**	**Team Member**	**Technical Expert**	**Technical Reviewer**	**Financial Expert**
Appointed		Yes	Yes	Yes	Yes	Yes	No
Appointed Date		27-04-2021					
Authorized to work as Technical Expert for:							
Authorized Technical Area		**Sectoral Scope**		**TA Code**	**Technical Area within the scope**		
		Energy industries (renewable - / non-renewable sources)		1.1	Thermal energy generation		
		Energy industries (renewable - / non-renewable sources)		1.2	Renewables		
		Energy demand		3.1	Energy demand		
		Waste handling and disposal		13.1	Solid waste and wastewater		
		Waste handling and disposal		13.2	Manure		
Authorized to work as Local Expert for:							
Country/Countries		India					
Compliance check by: Anand S. R.							

APPENDIX IV: ABBREVIATIONS

ACM	Approved Consolidated Methodology
AWEPL	Acciona Wind Energy Private Limited
BESCOM	Bangalore Electricity Supply Company
BM	Build Margin
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CEA	Central Electricity Authority
CL	Clarification Request
CT	Current Transformer
EB	Executive Board
EIA	Environmental Impact Assessment
ER	Emission Reductions
FAR	Forward Action Request
GHG	Greenhouse Gases
IPCC	Intergovernmental Panel for Climate Change
KPTCL	Karnataka Power Transmission Corporation Limited
KW	Kilo Watt
MP	Monitoring Period
MR	Monitoring Report
MW	Mega Watt
MWh	Mega Watt hour

PD	Project Description
PPA	Power Purchase Agreement
PP	Project Proponent
PT	Potential Transformer
QA/QC	Quality Assurance/Quality Control
tCO_2	Tonnes of Carbon Dioxide
UNFCCC	United Nations Framework Convention on Climate Change
VCS	Verified Carbon Standard
VCSA	Verified Carbon Standard Association
VCU	Verified Carbon Unit
4KES	4K Earth Science Private Limited