



**Verification and certification report form for CDM project activities**  
(Version 01.0)

**VERIFICATION AND CERTIFICATION REPORT**

<b>Title of the project activity</b>	Vaayu India Wind Power Project in Gujarat
<b>Reference number of the project activity</b>	4700
<b>Version number of the verification and certification report</b>	02
<b>Completion date of the verification and certification report</b>	08/08/2017
<b>Monitoring period number and duration of this monitoring period</b>	Monitoring period number-05 01/01/2015 to 31/03/2017 (both days are included)
<b>Version number of monitoring report to which this report applies</b>	2
<b>Crediting period of the project activity corresponding to this monitoring period</b>	Fixed, 01/06/2011-31/05/2021, 10 years
<b>Project participant(s)</b>	Vaayu (India) Power Corporation Private Limited
<b>Host Party</b>	India
<b>Sectoral scope(s), selected methodology(ies), and where applicable, selected standardized baseline(s)</b>	Sectoral Scope 1 - Energy industries (renewable/ non-renewable sources). "Consolidated baseline methodology for grid connected electricity generation from renewable sources" ACM0002 (Version 11, EB 52)
<b>Estimated GHG emission reductions or net anthropogenic GHG removals for this monitoring period in the registered PDD</b>	239,278 tCO <sub>2</sub> e
<b>Certified GHG emission reductions or net anthropogenic GHG removals for this monitoring period</b>	192,213 tCO <sub>2</sub> e
<b>Name of DOE</b>	Earthood Services Private Limited
<b>Name, position and signature of the approver of the verification and certification report</b>	 Dr. Kaviraj Singh Managing Director

**SECTION A. Executive summary**

&gt;&gt;

**Brief summary of the project activity:**

The project activity involves electricity generation by wind electric convertors and supplying the generated electricity to the NEWNE grid (Now part of integrated Indian Grid). The project being a renewable energy generation activity, it leads to removal of fossil fuel dominated electricity generation. The project activity results in reductions of greenhouse gas (GHG) emissions that are real, measurable, and verifiable and plays beneficial role in the mitigation of climate change.

The project activity consists of 64 WTGs (0.8 MW capacity each), making the total installed capacity to be 51.2 MW in Jamnagar district in Gujarat, India. The WTGs are of Enercon (E-53) make. Enercon India Limited is the supplier of WTGs and the O&M contractor for the project activity. It is to be noted that name of company "Enercon India Limited" is changed as "Wind World (India) Limited from 01/01/2013 onwards, the same is verified through the name change consent issued by Government of India/18/.

The WTGs have been commissioned between 25/06/2010 and 04/07/2011. The same was verified against the commissioning certificates/14/.

All 64 WTGs are fully functional and the assessment team verified this during the site visit. The assessment team confirms that the total emission reductions achieved under this monitoring period 01/01/2015 – 31/03/2017 (including both days) is 192,213 tCO<sub>2</sub>e.

The basic details of the project activity are mentioned below:

Project title	Vaayu India Wind Power Project in Gujarat
UNFCCC registration number	4700
Earthhood reference number	CDM.VER.17.17
Date of registration	09/05/2011
Sectoral scope	1 - Energy industries (renewable/ non-renewable sources).
Methodology/ies applied	Consolidated baseline methodology for grid connected electricity generation from renewable sources, ACM0002, Version 11
Project participant	Vaayu (India) Power Corporation Private Limited
Location of Project Activity	Jamnagar and Rajkot district, Indian State of Gujarat

**Scope of verification:**

Vaayu (India) Power Corporation Private Limited has contracted Earthhood Services Private Limited (Earthhood) to conduct the verification and certification of emission reductions reported for the CDM project activity 4700 "Vaayu India Wind Power Project in Gujarat" in India for the period 01/01/2015 to 31/03/2017 (including both days).

The verification is the periodic independent review and *ex post* determination by Earthhood of the monitored reductions in GHG emissions that have occurred because of the registered CDM project activity during the defined monitoring period.

The scope of the verification is to establish/verify that:

- The project activity has been implemented and operated as per the registered PDD and that all physical features (technology, project equipment, and monitoring and metering equipment) of the project are in place;
- The monitoring report and other supporting documents provided are complete in accordance with the latest applicable version of the completeness checklist for requests for issuance of CERs, verifiable, and in accordance with applicable CDM requirements;
- The actual monitoring systems and procedures comply with the monitoring systems and procedures described in the monitoring plan, any registered monitoring plan, the approved methodology including applicable tool(s) and/or, where applicable, the approved standardized baseline;
- The data recorded and stored as per the monitoring methodology including applicable tool(s) and, where applicable, the standardized baseline.

**Verification Process:**

The verification process involved following;

- Contract with Vaayu (India) Power Corporation Private Limited for the scope of verification;
- Publication of monitoring report
- Desk review
- Physical on-site inspection
- Issuance of verification findings
- Reporting, calculation checks, QA/QC and resolution of findings

- Issuance of draft verification report
- Independent technical review of the project documentation
- Issuance of the final verification report
- Submission of the request for issuance, as appropriate

Major verification milestones are stated below;

Monitoring report publication:	10/05/2017
Desk review:	28/05/2017- 02/06/2017
On-site assessment:	16/06/2017 and 17/06/2017
Reporting, calculation checks and QA/QC:	20/07/2017
Draft Verification Report	17/07/2017
Final Verification Report (after internal quality check)	08/08/2017

#### Conclusion:

Earthood has performed the fifth verification of the CDM project “Vaayu India Wind Power Project in Gujarat” having UNFCCC Ref. Number 4700. The verification includes confirming the implementation of the monitoring plan of the PDD and the application of the monitoring methodology as per ‘Consolidated baseline methodology for grid connected electricity generation from renewable sources’ ACM0002 Version 11. Earthood confirms that the monitoring system is in place and the emission reductions are calculated without material misstatements. The emission reductions from the CDM project activity 4700 “Vaayu India Wind Power Project in Gujarat” in India during the period 01/01/2015-31/03/2017 (including both days) amount to 192,213 tCO<sub>2</sub>e.

### SECTION B. Verification team, technical reviewer and approver

#### B.1. Verification team member

No.	Role	Type of resource	Last name	First name	Affiliation (e.g. name of central or other office of DOE or outsourced entity)	Involvement in			
						Desk review	On-site inspection	Interview(s)	Verification findings
1.	Team Leader, Methodological Expert and Local Expert (India)	EI	Soni	Ravi Kant	Central Office	Y	Y	Y	Y
2.	Verifier	EI	Soni	Ravi Kant	Central Office	Y	Y	Y	Y
3.	Technical Expert (TA1.2)	EI	Soni	Ravi Kant	Central Office	Y	Y	Y	Y
4.	Financial/ Other Expert	NA	-	-	Not required	NA	NA	NA	NA
5.	Trainee	NA	-	-	-	-	-	-	-

#### B.2. Technical reviewer and approver of the verification and certification report

No.	Role	Type of resource	Last name	First name	Affiliation (e.g. name of central or other office of DOE or outsourced entity)
1.	Technical reviewer	IR	Singh	Kaviraj	Central Office
2.	Technical Expert (TA1.2)	IR	Singh	Kaviraj	Central Office

3.	Approver	IR	Singh	Kaviraj	Central Office
----	----------	----	-------	---------	----------------

## SECTION C. Application of materiality

### C.1. Consideration of materiality in planning the verification

No.	Risk that could lead to material errors, omissions or misstatements	Assessment of the risk		Response to the risk in the verification plan and/or sampling plan
		Risk level	Justification	
1.	Omissions and misstatements in data transfer from hand written data in the JMR to ER calculation sheet.	Low	Ineffective quality control of data transfer due to unclear QA/QC procedure.	Quality procedure followed at site to be checked. It is to be demonstrated by the PP that how to transfer data and how this can be crosschecked. Relevant site personnel will be interviewed to confirm whether procedure is actually Conducted.
2.	Missing data due to failure of measurement equipment	Low	The monitoring plan defines emergency procedures in case malfunctioning or failure of meter. There are check meters are also installed onsite.	It is to be checked if related main meters are installed as per monitoring plan. Relevant site personnel will be interviewed to confirm whether the emergency procedure is known to them. To be checked if the equipment is malfunctioning and the accuracy and reliability of data for the concerned period cannot be ensured, the relevant emission reductions have been claimed or not.

### C.2. Consideration of materiality in conducting the verification

>>

In accordance with CDM VVS Version 9 para 361 the prescribed thresholds for materiality for CDM PAs (materiality is not applicable for CDM PoAs as per 359 (a) of CDM VVS Version 9) are as under;

Emission Reductions (tCO <sub>2</sub> e)/year	500,000 or more	300,001 to 499,999	300,000 or less	Small Scale CDM PAs	Micro Scale CDM PAs
Materiality Threshold (para 361)	0.5%	1.0%	2.0%	5.0%	10.0%

The applicable materiality threshold is 2% as project activity.

Particulars / Monitoring Report	MR Version (Public)	MR Version (Revised/Final)
Emission Reductions Achieved (tCO <sub>2</sub> e) in this monitoring period	192,656 tCO <sub>2</sub> e	192,213 <sup>1</sup> tCO <sub>2</sub> e
Applicable Threshold (%) as per para 361 of CDM VVS Version 9	2%	2%

<sup>1</sup> In order to address delay in calibration identified during the current monitoring period, the PP has applied the error factor to the parameter EG<sub>PJ,y</sub> hence amount of emission reductions in the final MR are lesser as compared to the same reported in the published MR.

The verification team has identified the impact of errors observed and those were corrected by PP during verification for all monitoring parameter at individual level. The extrapolated impact on ERs is also provided for parameters individually and in aggregated manner in the end.

Monitored Parameter (Symbol / Description*)	Reporting Frequency	Number of Discrete Data (Total)	Sample selected for verification	Type of error identified	Impact on ERs	
					ERs impacted (Sample)	ERs impacted (Population based on extrapolation)
<b>EG<sub>PJ,y</sub></b>	Monthly	27(100%)	27(100%)	No errors were identified during the verification of data from the source.	No impact.	No Impact as the complete reported data was verified.
<b>EG<sub>GETCO,Export</sub></b>	Monthly	27(100%)	27(100%)	No errors were identified during the verification of data from the source.	No impact.	No impact
<b>EG<sub>GETCO,Import</sub></b>	Monthly	27(100%)	27(100%)	No errors were identified during the verification of data from the source.	No impact.	No impact

\*Description of monitoring parameters is provided under section E.6.2 of this report.

Based on the above table it can be confirmed that the materiality threshold is not breached applicable for the registered PA as per CDM VVS.

## **SECTION D. Means of verification**

### **D.1. Desk review**

>>

Earthood conducted a desk review as under;

- A review of the data and information presented to verify their completeness;
- A review of the monitoring plan, the monitoring methodology including applicable tool(s) and, where applicable, the applied standardized baseline, paying particular attention to the frequency of measurements, the quality of metering equipment including calibration requirements, and the quality assurance and quality control procedures;
- An evaluation of data management and the quality assurance and quality control system in the context of their influence on the generation and reporting of emission reductions;

In addition to the monitoring documentation, Earthood has reviewed;

- The registered PDD Version 03 dated 19/01/2011, and the monitoring plan;
- The Validation Report Version 02 dated 09/04/2011;
- Validation Opinion on changes in PDD, Report No-8109817473 – 13/029, dated 14/05/2013
- The applied monitoring methodology ('Consolidated baseline methodology for grid connected electricity generation from renewable sources' ACM0002 Version 11);
- The monitoring report (all versions) to verify that it is as per the standardized format;

- Any other information and references relevant to the project activity's emission reductions (e.g. IPCC reports, data on electricity generation in the national grid or laboratory analysis and national regulations).

The complete list of documents reviewed is included under Appendix 3.

## D.2. On-site inspection

Duration of on-site inspection: 16/06/2017 and 17/06/2017				
No.	Activity performed on-site	Site location	Date	Team member
1.	<p>An assessment of the implementation and operation of the registered project activity as per the registered PDD or any approved revised approved PDD;</p> <p>A review of information flows for generating, aggregating and reporting the monitoring parameters;</p> <p>Interviews with relevant personnel to determine whether the operational and data collection procedures are implemented in accordance with the monitoring plan in the PDD;</p> <p>A cross check between information provided in the monitoring report and data from other sources such as plant logbooks, inventories, purchase records or similar data sources;</p> <p>A check of the monitoring equipment including calibration performance and observations of monitoring practices against the requirements of the PDD, the applied methodology including applicable tool(s), and, where applicable, the applied standardized baseline;</p> <p>A review of calculations and assumptions made in determining the GHG data and emission reductions;</p> <p>An identification of quality control and quality assurance procedures in place to prevent or identify and correct any errors or omissions in the reported monitoring parameters</p>	Jamnagar	16/06/2017 and 17/06/2017	Ravi Kant Soni

**D.3. Interviews**

No.	Interviewee			Date	Subject	Team member
	Last name	First name	Affiliation			
1.	Borah	Deepjyoti	Vaayu (India) Power Corporation Private Limited	16/06/2017 and 17/06/2017	Electricity Generation Records ( monthly energy statements, Invoices and break up sheets), Reliability & accuracy of readings considered for emission reduction calculations, Calibration procedure	Ravi Kant Soni
2.	Chopra	Deepika	Vaayu (India) Power Corporation Private Limited	16/06/2017 and 17/06/2017	Monitoring and measuring system, Collection of measurements, Observations of established practices and Data Verification of monitoring parameters	Ravi Kant Soni
3.	Kaudani	Abhay	WWIL	16/06/2017 and 17/06/2017	Calibration procedure of meters	Ravi Kant Soni

**D.4. Sampling approach**

No sampling approach has been chosen. However, for the verification of geo-coordinates of WTG, the sample size (11) was determined in accordance with the 'Sampling and survey for CDM project activities and programmes of activities' V06/22/, as explained in section E.3.

**D.5. Clarification requests, corrective action requests and forward action requests raised**

Areas of verification findings	No. of CL	No. of CAR	No. of FAR
Compliance of the monitoring report with the monitoring report form	-	-	-
Compliance of the project implementation with the registered PDD	-	-	-
Post-registration changes	-	-	-
Compliance of the monitoring plan with the monitoring methodology including applicable tool and standardized baseline	-	CAR #1	-
Compliance of monitoring activities with the registered monitoring plan	-	-	-
Compliance with the calibration frequency requirements for measuring instruments	-	CAR #3	-
Assessment of data and calculation of emission reductions or net removals	-	-	-
Others (Inconsistencies, typo errors))	-	CAR #2	-
<b>Total</b>	-	3	-

**SECTION E. Verification findings****E.1. Compliance of the monitoring report with the monitoring report form**

<b>Means of verification</b>	The monitoring report form used is CDM-MR-FORM version 05.1, which was the appropriate form, and the latest version available at the time of verification. All the sections of the form were filled as per the guidelines and gave all the relevant details.
<b>Findings</b>	CAR#2 was raised and resolved. Please refer to appendix 4 for details
<b>Conclusion</b>	The monitoring report is found to be complying with the monitoring report form.

**E.2. Remaining forward action requests from validation and/or previous verification**

This is fifth verification of the project activity. There are no FAR(s) from validation/2/ or previous verification that needs to be closed during this verification.

**E.3. Compliance of the project implementation with the registered project design document**

Means of verification

This project activity is the generation of electricity from WTGs supplying the generated electricity to the NEWNE grid of India. The project is located at Chattar, Narmana, Seth Wadala, Jam Ambardi, Mevasa, Dhun Dhoraji, Sadodar, Bodi, Padavala and Machharda villages in Jamnagar and Rajkot districts Gujarat state in India and has an installed capacity of 51.2 MW (64 WTGs x 0.8 MW/WTG). This was confirmed from document review of commissioning certificates /14/.

The commercial operation of the project activity had been started on 25/06/2010 – 04/07/2011, which was verified vide commissioning certificates/14/ and corroborated by monthly JMRs/10/ issued by state utility, indicating the start date of commercial operation.

The technical specifications of WTGs were verified through the nameplate details (imprinted/placed at the bottom of WTG tower) available at the WTGs physically checked during the site visit and were found to be consistent with the details provided in the registered PDD.

The project is located between latitude 21°, 55' to 22°, 08' N and longitude 70°, 05' to 70°,19' E. Location of the project was verified through Latlong.net (<http://www.latlong.net> ) and found consistent with the same mentioned in the registered PDD and MR.

During the site visit, the verification team randomly selected 11 numbers of WTGs to physically confirm the geographical locations/coordinates by using hand held device. The sample size (11) was determined in accordance with the 'Sampling and survey for CDM project activities and programmes of activities' V06/22/ as per the assumptions marked below;

Producer Risk	10%
Consumer Risk	10%
AQL	0.5%
UQL	20%
Sample Size	11
Acceptance Number	0 (No discrepancy allowed)

The verified geo-coordinates of WTGs are mentioned below;

Sr.No	Location No-	Latitude (N)	Longitude (E)	Remark
1	3073	21° 49' 16"	70° 17' 18"	Accuracy 12 meters
2	3088	21° 51' 24"	70° 17' 41"	Accuracy 9 meters
3	63	22° 10' 40"	70° 19' 03"	Accuracy 8 meters
4	541	22° 03' 31"	70° 8' 52"	Accuracy 10 meters
5	903	22° 04' 26"	70° 15' 42"	Accuracy 12 meters
6	905	22° 06' 39"	70° 18' 26"	Accuracy 10 meters
7	910	22° 06' 52"	70° 18' 47"	Accuracy 6 meters
8	928	22° 13' 17"	70° 12' 20"	Accuracy 11 meters



9	942	22° 09' 13"	70° 14' 34"	Accuracy 9 meters
10	992	22° 05' 16"	70° 09' 34"	Accuracy 6 meters
11	1028	22° 06' 10 "	70°07' 41"	Accuracy 12 meters

The geo coordinates of the remaining WTGs forming part of the project activity, which were not visited physically were verified using Latlong.net (Ref: <http://www.latlong.net> ) and were found to be consistent with the same reported in the MR and under Appendix 2 of the registered PDD.

During the site visit it is observed that there 17 separate clusters of WTGs are made at the project site for the purpose of metering. Each cluster has dedicated main and the check meter at 33 kV. In all the clusters, only WTGs of project activity are connected and no WTGs of other project developer are there in the clusters. Similarly, the WTGs of other project developers (non-project activity) are also connected to separate clusters having exclusive dedicated metering arrangement at 33kV at project site. All the cluster meters (for the project activity and non-project activity are further connected to 220 kV Wind World sub-station at Sadodar. The electricity generated by all the WTGs (project and non-project) is been fed to the NEWNE grid at WWIL Sadodar substation.

There are 4 main meters installed at WWIL pooling substation (220/33 kV), known as revenue meters. Electricity exported and imported by all the WTGs (including non-project WTGs) is recorded through the revenue meters.

Net electricity supplied to the grid by each project developer is calculated by the state utility (GEDA) using apportioning procedure, adjusting the transmission loss between metering point at 33kV and the metering point at 220kV (Revenue Meters) at WWIL.

Apportioning procedure used in the calculation of net electricity supplied to the grid is correctly described in section C of the MR/05/ and in section B.7.2 of the registered PDD/01/. This was also verified by interviewing the staff at the sub-station and the officials of the state utility/20/.

The rated capacities of transformers were also indicated at the metering points located at the WWIL substation/20/ and the same was found to be consistent with description given in the registered PDD/01/. Furthermore, capacity of transformers verified through the specifications mentioned at the name plate of transformers/20/ and found consistent with registered PDD/01/ and MR.

The PP has signed PPA/15/ with state utility for the sale of electricity to the grid and has been supplying electricity in compliance with the PPA as confirmed from the monthly invoices /12/. The project was registered as a CDM project on 09/05/2011 /18/. The PP has considered a fixed crediting period for the project activity from 01/06/2011 to 31/05/2021. This is the fifth verification of the project activity covering the period from 01/01/2015 to 31/03/2017.

All 64 WTGs were fully functional and the assessment team verified this during the site visit/20/. In addition to the physical inspection of the site, the following documents have been reviewed by the assessment team during the site visit to verify the project implementation:

- i. Commissioning certificates
- ii. Power Purchase Agreement
- iii. Invoices raised by the PP to State utility
- iv. Testing certificates of all energy meters

The information relating to the project implementation, provided in the Monitoring Report/05/ is consistent with that stated in the registered PDD/01/. The data and variables provided in the monitoring report are the same as stated in the registered PDD. Total emission reductions achieved under this monitoring period 01/01/2015 to 31/03/2017 (including both days) is 192,213 tCO<sub>2</sub>e.

<b>Findings</b>	No finding was raised
<b>Conclusion</b>	<ul style="list-style-type: none"> <li>In view of the information's verified during the site visit, the verification team is able to confirm that all physical features (technology, project equipment, and monitoring and metering equipment) of the registered CDM project activity are in place and that the project participants have operated the project activity as per the registered PDD.</li> <li>No information with regard to data and variables was identified that may</li> </ul>

	<p>surpass the estimated quantity of ERs in the registered PDD.</p> <ul style="list-style-type: none"> <li>The emission reductions achieved during the current monitoring period are 192,213 tCO<sub>2</sub>e within the estimated quantity (239,278 tCO<sub>2</sub>e) in the registered PDD for the comparable period.</li> </ul>
--	--

#### **E.4. Post-registration changes**

##### **E.4.1. Temporary deviations from the registered monitoring plan, monitoring methodology or standardized baseline**

There are no temporary deviations from registered monitoring plan or applied methodology. It was verified and confirmed from the registered PDD/01/; the applied methodology/3/ and the on-site verification.

##### **E.4.2. Corrections**

There were no corrections identified in the registered PDD during the current monitoring period.

##### **E.4.3. Changes to the start date of the crediting period**

There is no change to the start date of the crediting period. It was verified and confirmed from the UNFCCC project webpage/17/.

##### **E.4.4. Inclusion of a monitoring plan to a registered project activity**

Not applicable

##### **E.4.5. Permanent changes from registered monitoring plan, monitoring methodology or standardized baseline**

The revision in monitoring plan was sought and approved by UNFCCC on 01/08/2013(Ref: PRC-4700-001). There were no permanent changes to the registered monitoring plan identified during the current monitoring period.

##### **E.4.6. Changes to the project design of a registered project activity**

Not applicable

##### **E.4.7. Types of changes specific to afforestation and reforestation project activities**

Not applicable

#### **E.5. Compliance of monitoring plan with the monitoring methodology including applicable tool and standardized baseline**

<b>Means of verification</b>	<p>The monitoring plan as contained in the registered PDD/01/ was reviewed against the monitoring requirements of the applied methodology "Consolidated baseline methodology for grid connected electricity generation from renewable sources" ACM0002 Version 11. Based on the review it was found the monitoring plan outlined in the registered PDD includes all the required parameters to be monitored in the context of project design and description, allows proper determination of emission reductions in accordance with the PDD /01/, and applied methodology ACM0002 version 11 /03/.</p> <p>It was observed during the site visit that, the WTGs (project activity and non-project) are connected to the common metering system at 220/33 kV WWIL sub-station (At Sadodar)</p> <p>Hence, in order to calculate the net electricity exported to the grid by the WTGs of the project activity, the state electricity utility uses an apportioning procedure that has been correctly described in section C of the MR/05/ and in section B.7.2 of the registered PDD/01/. This was also verified by interviewing the staff at the sub-station and the officials of the state utility/20/.</p> <p>The apportioning procedure is carried out by the state utility and the PP has no role in this calculation. It was confirmed from the representatives of the O&amp;M provider during the site visit, that the procedure to derive the electricity exported to the grid</p>
------------------------------	---

	<p>by each project owner is completely under jurisdiction of the state utility.</p> <p>Values of the parameter “Net electricity supplied to the grid by project” is directly sourced from the monthly “Share certificates” issued by GETCO/11/ that indicates the share of electricity for project activity received at the WWIL sub-station.</p> <p>The Share certificates are prepared and endorsed by GETCO, an external government agency and the PP has no influence in the entire procedure. Hence, the data issued by the state electricity board through the Share certificate is deemed authentic.</p> <p>During the site visit, it was observed that, the WTGs belonging to the project activity are connected to the grid through an appropriate power evacuation system. Appropriate metering system and calculation procedures are transparently described in the monitoring plan to enable accurate determination of emission reductions achieved by the project activity.</p>
<b>Findings</b>	CAR #1 was raised and resolved
<b>Conclusion</b>	The monitoring plan outlined in the registered PDD is in accordance with the applied methodology /03/ and correctly applied by the registered CDM project activity.

## E.6. Compliance of monitoring activities with the registered monitoring plan

### E.6.1. Data and parameters fixed ex ante or at renewal of crediting period

#### E.6.1.1. Operating Margin Emission Factor of NEWNE Regional Electricity Grid ( $EF_{grid,OM,y}$ , tCO<sub>2</sub>e/MWh)

<b>Means of verification</b>	The value of this parameter is considered as 1.00498 .This was checked with the registered PDD /01/ and CO2 Baseline Database for Indian Power Sector”, version 05 published by the Central Electricity Authority, Ministry of Power, Government of India /16/.
<b>Findings</b>	No finding was raised
<b>Conclusion</b>	The value in the monitoring report /05/ and corresponding emission reduction calculations spreadsheet /07/ are consistent with the registered PDD (page 32). The applied value is correct and justified.

#### E.6.1.2. Build Margin Emission Factor of NEWNE Regional Electricity Grid ( $EF_{grid,BM,y}$ , tCO<sub>2</sub>e/MWh)

<b>Means of verification</b>	The value of this parameter is considered as 0.67518.This was checked with the registered PDD /01/ and CO2 Baseline Database for Indian Power Sector”, version 05 published by the Central Electricity Authority, Ministry of Power, Government of India /16/.
<b>Findings</b>	No finding was raised
<b>Conclusion</b>	The value in the monitoring report /05/ and corresponding emission reduction calculations spreadsheet /07/ are consistent with the registered PDD (page 32). The applied value is correct and justified.

#### E.6.1.3. Combined Margin Emission Factor of NEWNE Regional Electricity Grid ( $EF_{grid,CM,y}$ , tCO<sub>2</sub>e/MWh)

<b>Means of verification</b>	The value of this parameter is considered as 0.92252.This was checked with the registered PDD /01/ and CO2 Baseline Database for Indian Power Sector”, version 05 published by the Central Electricity Authority, Ministry of Power, Government of India /16/.
<b>Findings</b>	No finding was raised
<b>Conclusion</b>	The value in the monitoring report /05/ and corresponding emission reduction calculations spreadsheet /07/ are consistent with the registered PDD (page 24). The applied value is correct and justified.

## E.6.2. Data and parameters monitored

E.6.2.1. Net electricity supplied to the grid by the Project activity  $EG_{PJ,y}$  (MWh)

Means of verification	Criteria/Requirements	Assessment/Observation
	Measuring /Reading /Recording frequency	The parameter is calculated and recorded on monthly basis; however, the input values used to calculate the value of $EG_{PJ,y}$ are continuously monitored and monthly recorded.
	Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes. The reporting frequency is in line with the monitoring plan as outlined in the registered PDD/01/ and monitoring methodology/03/.
	Monitoring equipment	<p>No monitoring equipment is used as this parameter is calculated using the measured values.</p> <p>The WTGs belongs to project activity are connected to 17 clusters and each cluster have exclusive dedicated metering arrangement at 33kV at project site.</p> <p>Similarly, the WTGs of other project developers (non-project activity) in the wind farm are also connected to separate clusters having exclusive dedicated metering arrangement at 33kV at project site. All the cluster meters (for the project activity and non-project activity) are further connected to different Vacuum Circuit Breaker metering yards (VCB) which ultimately linked to common metering system(GETCO meters) at 220 kV Sadodar sub-station maintained by WWIL.</p> <p>Based on the data recorded at cluster metering points (33 kV) and at GETCO main meters, the net electricity supplied to the grid by project developer is calculated by GEDA after adjusting the transmission losses and share certificates for each project developer is prepared.</p> <p>Share certificate issued by GETCO/11/ on monthly basis, indicates the value of <math>EG_{PJ,y}</math>.</p> <p>Since the calculation of <math>EG_{PJ,y}</math> is completely under jurisdiction of state utility and PP don't have</p>

		any interference in the calculation procedure, hence values of $EG_{PJ,y}$ are directly sourced from share certificates.
	Is accuracy of the monitoring equipment as stated in the monitoring plan? If the monitoring plan does not specify the accuracy of the monitoring equipment, does the accuracy of the monitoring equipment comply with local/national standards, or as per the manufacturer's specification?	Not applicable
	Is the accuracy valid for the entire measuring range or do different accuracy levels apply to different measuring ranges?	Not applicable
	Calibration frequency /interval:	Not applicable
	Is the calibration interval in line with the monitoring plan and/or methodology? If the monitoring plan does not specify the frequency of calibration, is the selected frequency in accordance with the local/national standards, or as per the manufacturer's specifications?	Not applicable
	Is the calibration of measuring equipment carried out by an accredited person or institution?	Not applicable
	Is(are) calibration(s) valid for the whole reporting period?	Not applicable
	Is the calibration carried out for a measuring range comparable with the range for which measurements have been carried	Not applicable

	out?	
	How were the values in the monitoring report verified?	<p>Monthly values for entire monitoring period are reported in the ER calculation were verified from the share certificates/11/ issued by state utility and found to be consistent.</p> <p>Value of this parameter for the current monitoring period was verified as 208,358.084 MWh.</p> <p>(After applying the error factor due to delay in calibration)</p>
	If applicable, has the reported data been cross-checked with other available data?	The monthly reported values were further crosschecked with the monthly invoices raised by the PP /12/ to state utility and found to be consistent.
	Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	No separate QA/QC procedures required to be followed.
	In case project participants have temporarily not monitored the parameter, has either i) a deviation been approved by the CDM EB or ii) has the parameter been estimated as stipulated by Appendix 1 to the CDM Project Standard?	No such issues.
<b>Findings</b>	CAR #1 and CAR #3 was raised and resolved	
<b>Conclusion</b>	<p>The parameter has been monitored appropriately, in accordance with the registered monitoring plan (as per measurement methods and procedures to be applied) and applied methodology. The monitoring results were recorded consistently as per the approved frequency in the monitoring plan.</p> <p>The verification team is able to confirm that the project is implemented as per the registered PDD and there is no discrepancy observed between the actual monitoring system and the monitoring plan set out in the registered PDD.</p> <p>The emission reduction calculation for the project activity is estimated based on the electricity supplied by the WTGs. Monthly values of electricity generated inserted in the ER sheet was verified with the monthly share certificates provided by the project participant/11/. Since 100% data was verified, the team could ascertain that the values taken for emission reduction calculation are free from material errors.</p>	

**E.6.2.2. Net Electricity export recorded at Wind World (India) Limited Substation,  
EG<sub>GETCO,Export</sub> (kWh)**

Means of verification	Criteria/Requirements	Assessment/Observation
	Measuring /Reading /Recording frequency	The parameter is continuously monitored and monthly recorded.  This parameter is not directly used in calculation of emission reductions.
	Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes. The reporting frequency is in line with the monitoring plan as outlined in the registered PDD/01/ and monitoring methodology/03/.
	Monitoring equipment	Energy meters of accuracy class 0.2s are used.
	Is accuracy of the monitoring equipment as stated in the monitoring plan? If the monitoring plan does not specify the accuracy of the monitoring equipment, does the accuracy of the monitoring equipment comply with local/national standards, or as per the manufacturer's specification?	The accuracy of the monitoring equipment used to measure the values is 0.2s, which is as per the registered PDD/01/ which is as per the norm defined in the PPA/15/.
	Is the accuracy valid for the entire measuring range or do different accuracy levels apply to different measuring ranges?	Yes. The accuracy of monitoring equipment is valid for the entire range.
	Calibration frequency /interval:	Calibration frequency of the meters is once in 3 years.
	Is the calibration interval in line with the monitoring plan and/or methodology? If the monitoring plan does not specify the frequency of calibration, is the selected frequency in accordance with the local/national standards, or as per the manufacturer's specifications?	Yes. The calibration frequency is in line with the monitoring plan as outlined in the registered PDD/01/.
	Is the calibration of measuring equipment carried out by an accredited person or institution?	Yes the calibration is conducted by state utility which NABL Accredited entity/13/.
	Is(are) calibration(s) valid for the whole reporting period?	Delay in calibration of cluster meters and GETCO meters (Revenue meters) identified during the current monitoring period. Delay in calibration of meters is appropriately addressed (please refer section E.7 of this report for further details).

	Is the calibration carried out for a measuring range comparable with the range for which measurements have been carried out?	Yes. The calibration is carried out appropriately.
	How were the values in the monitoring report verified?	Monthly values for entire monitoring period are reported in the ER calculation sheet were verified from the monthly JMRs /10/ issued by state utility showing cost of export/import and found to be consistent.  Value of this parameter for the current monitoring period was verified as 1,797,991,000 kWh.
	If applicable, has the reported data been cross-checked with other available data?	Not applicable
	Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes, all the stakeholders, namely, the Grid Authority (GEDA), the PP and the WWIL (O&M Contractor), implemented the adequate QA/QC procedures. The data transfer process for the said parameter is as follows: The meters installed are sealed in presence of representatives of WWIL and grid representative for ensuring the correct monitoring of the power exported. The values are also recorded in presence of both the parties (WWIL & GETCO). The values that are used for emission reduction calculation are directly source form the 'Certificate of share of electricity'/11/ and the same document is also used for invoicing and payments of power sell to the grid.
	In case project participants have temporarily not monitored the parameter, has either i) a deviation been approved by the CDM EB or ii) has the parameter been estimated as stipulated by Appendix 1 to the CDM Project Standard?	No such issues.
<b>Findings</b>	CAR #1 and CAR #3 was raised and resolved	
<b>Conclusion</b>	The parameter has been monitored appropriately, in accordance with the registered monitoring plan (as per measurement methods and procedures to be applied) and applied methodology. The monitoring results were	



	<p>recorded consistently as per the approved frequency in the monitoring plan.</p> <p>The verification team is able to confirm that the project is implemented as per the registered PDD and there is no discrepancy observed between the actual monitoring system and the monitoring plan set out in the registered PDD.</p> <p>The emission reduction calculation for the project activity is estimated based on the electricity supplied by the WTGs. Monthly values of electricity generated inserted in the ER sheet was verified with the share certificates provided by the project participant/11/. Since 100% data was verified, the team could ascertain that the values taken for emission reduction calculation are free from material errors.</p>
--	--

**E.6.2.3. Net Electricity import recorded at Wind World (India) Limited Substation, EG<sub>GETCO,import</sub> (kWh)**

Means of verification	Criteria/Requirements	Assessment/Observation
	Measuring /Reading /Recording frequency	The parameter is continuously monitored and monthly recorded.  This parameter is not directly used in calculation of emission reductions.
	Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes. The reporting frequency is in line with the monitoring plan as outlined in the registered PDD/01/ and monitoring methodology/03/.
	Monitoring equipment	Energy meters of accuracy class 0.2s are used.
	Is accuracy of the monitoring equipment as stated in the monitoring plan? If the monitoring plan does not specify the accuracy of the monitoring equipment, does the accuracy of the monitoring equipment comply with local/national standards, or as per the manufacturer's specification?	The accuracy of the monitoring equipment used to measure the values is 0.2s, which is as per the registered PDD/01/ which is as per the norm defined in the PPA/15/.
	Is the accuracy valid for the entire measuring range or do different accuracy levels apply to different measuring ranges?	Yes. The accuracy of monitoring equipment is valid for the entire range.
	Calibration frequency /interval:	Calibration frequency of the meters is once in 3 years.
	Is the calibration interval in line with the monitoring plan and/or methodology? If the monitoring plan does not specify the frequency of calibration, is the selected frequency in accordance with the local/national standards,	Yes. The calibration frequency is in line with the monitoring plan as outlined in the registered PDD/01/.

	or as per the manufacturer's specifications?	
	Does an accredited person or institution carry out the calibration of measuring equipment?	Yes the calibration is conducted by state utility which NABL Accredited entity/13/.
	Is(are) calibration(s) valid for the whole reporting period?	Delay in calibration of cluster meters and GETCO meters (Revenue meters) identified during the current monitoring period. Delay in calibration of meters is appropriately addressed (please refer section E.7 of this report for further details).
	Is the calibration carried out for a measuring range comparable with the range for which measurements have been carried out?	Yes. The calibration is carried out appropriately.
	How were the values in the monitoring report verified?	Monthly values for entire monitoring period are reported in the ER calculation sheet were verified from the monthly JMRs /10/ issued by state utility showing cost of export/import and found to be consistent.  Value of this parameter for the current monitoring period was verified as 25,044,000 kWh.
	If applicable, has the reported data been cross-checked with other available data?	Not applicable
	Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes, all the stakeholders, namely, the Grid Authority (GEDA), the PP and the WWIL (O&M Contractor), implemented the adequate QA/QC procedures. The data transfer process for the said parameter is as follows: The meters installed are sealed in presence of representatives of WWIL and grid representative for ensuring the correct monitoring of the power imported. The values are also recorded in presence of both the parties (WWIL & GETCO). The values that are used for emission reduction calculation are directly source form the 'Certificate of share of electricity'/11/ and the same document is also used for

		invoicing and payments of power sell to the grid.
	In case project participants have temporarily not monitored the parameter, has either i) a deviation been approved by the CDM EB or ii) has the parameter been estimated as stipulated by Appendix 1 to the CDM Project Standard?	No such issues.
<b>Findings</b>	CAR #1 and CAR #3 was raised and resolved	
<b>Conclusion</b>	<p>The parameter has been monitored appropriately, in accordance with the registered monitoring plan (as per measurement methods and procedures to be applied) and applied methodology. The monitoring results were recorded consistently as per the approved frequency in the monitoring plan.</p> <p>The verification team is able to confirm that the project is implemented as per the registered PDD and there is no discrepancy observed between the actual monitoring system and the monitoring plan set out in the registered PDD.</p> <p>The emission reduction calculation for the project activity is estimated based on the electricity supplied by the WTGs. Monthly values of electricity generated inserted in the ER sheet was verified with the share certificates provided by the project participant/11/. Since 100% data was verified, the team could ascertain that the values taken for emission reduction calculation are free from material errors.</p>	

### E.6.3. Implementation of sampling plan

<b>Means of verification</b>	Not applicable
<b>Findings</b>	Not applicable
<b>Conclusion</b>	Not applicable

### E.7. Compliance with the calibration frequency requirements for measuring instruments

Means of verification	As per the monitoring plan in the registered PDD/01/ the meters are to be tested and calibrated once in 3 years.					
	The project activity metering has been physically inspected during the site visit/20/. The details of monitoring equipment is involved in the project activity and their calibration dates are mentioned in Section C of the MR/05/ and are summarised in the tables below. All the meters are of accuracy class of 0.2s and calibration frequency of once in 3 years.					
	Cluster Meters installed at project site (33 kV) :					
	Meter serial No-	Make and accuracy class	Calibration date(s)	Calibration due date	Calibration delayed (Y/N)	Remark
	10059208	L&T and 0.2s	25/09/2013	25/09/2016	Y	Responsible authority did not conduct calibration after 25/09/2013,
	10059203					
	GJU60947	Secure and 0.2s				
GJU61707						
GJU61698						

GJU61321						hence delay for entire monitoring period is considered.
GJU61313						
GJU61690						
GJU61699						
GJU61322		26/09/2013	26/09/2016	Y		Responsible authority did not conduct calibration after 26/09/2013, hence delay for entire monitoring period is considered.
GJU61696						
GJU61310						
GJU61701						
GJU61693						
GJU61692						
GJU61691						
GJU60943						

**Meters installed at 220/33 kV WWIL substation(Revenue meters):**

Location	Meter serial No-	Make & Accuracy class	Calibration date(s)	Calibration due date	Calibration delayed (Y/N)
Sadodar substation	GJB01470	Secure and 0.2s	17/01/2012 and 30/09/2016	30/09/2019	Y Calibration delayed from 01/01/2015 to 29/09/2016, during the current monitoring period.
	GJU04175				
	GJU04176				
	KAB11082				

The above meter details have been verified through the following means:

- Physical inspection of the meters during the site visit
- Interviewing the staff at the sub-station
- The CMS of the O&M service provider located at the site
- Calibration certificates

The installation and working condition of the meters were checked during the on-site inspection and it was found to be satisfactory. These meters are duly approved, installed, tested, sealed and in the custody of the state utility. The PP has no control over the same.

As evident from the calibration details provided in the above table, there is delay in calibration of cluster meters as well as in GETCO meters identified during the current monitoring period.

Calibration of GETCO meters (Revenue meters) was due on 17/01/2015, but the same conducted on 30/09/2016, hence delay period from 01/01/2015 to 29/09/2016, is considered in the current monitoring period. The assessment team has verified the latest calibration certificates of GETCO meters and confirmed that meters were working satisfactory and within acceptable limits of accuracy.

It is noted that calibration of cluster meters was due on 25/09/2016 & 26/09/2016 as indicated in the above table; however, it is not carried by state utility until date.

As verified through section 7.2 of PPA/14/, state utility (GETCO is sole entity responsible for calibration and PP do not have any intervention with reference to the calibration and maintenance of energy meters. Although VPCPL (The PP) had requested state utility to conduct the calibration of cluster meters via letter, dated 26/07/2016/21/, that was acknowledged by responsible authority, nevertheless calibration is not conducted.

Under section 7.1 Clause (i) & (ii) Official of state utility (GETCO) and representative of PP jointly read the metering system on first day of every month,

	<p>also if the metering system and/or any component thereof are found to be outside the acceptable limits of accuracy or not functioning properly, it shall be repaired, re-calibrated or replaced by GETCO as soon as possible.</p> <p>The assessment team has interviewed the site personnel with reference to the functioning of clustering metering system and confirmed that all the cluster meters were working properly during the current monitoring period.</p> <p>It is worthy to note that, the state utility (GETCO) is a Government Organization and a 3rd party with respect to this CDM project and also the purchaser of electricity supplied to the grid by project, hence, the state utility ensures that the energy meters are in proper working condition, because all monetary transactions done based on these meter readings.</p> <p>As the recent calibration certificates for cluster meters were not available, hence the PP has considered the calibration delay for entire monitoring period (01/01/2015 to 31/03/2017) and applied factor (-0.4%) to the values of <math>EG_{PJ,y}</math> accordingly.</p> <p>Accordance with the guidelines outlined under paragraph 395(a) of VVS version 09, an error factor 0.2% should be applied for both export &amp; import i.e. the measured values in the delayed calibration period. However, the monthly share certificates issued by the state utility only provides the value of "Net electricity supplied to the grid by the project activity" (<math>EG_{PJ,y}</math>) and not the export and import values by the project activity. Hence the error for both export &amp; import has been taken into account and a cumulative error factor of -0.4% on the parameter <math>EG_{PJ,y}</math> is applied. The approach followed by the PP was found to be conservative and appropriate, hence accepted.</p> <p>These meters are duly approved, installed, tested, sealed and in the custody of the state utility. The PP has no control over the same.</p> <p>CEA Notification No. 502/70/CEA/DP&amp;D dated 17/03/2006/19/ which is considered as national standard mentions that "All interface meters shall be tested at least once in five years." Hence, the calibration frequency of once in 3 years, mentioned in the revised approved PDD for the meters is appropriate.</p>
<b>Findings</b>	CAR #3 was raised and resolved
<b>Conclusion</b>	<p>Based on the above mentioned means of verification, the assessment team confirms that:</p> <ul style="list-style-type: none"> <li>• The meter details are correctly mentioned in the MR</li> <li>• The meter details are consistent throughout all verified documents</li> <li>• The entire metering system is in the custody of the state utility. The PP has no control on the same</li> <li>• The responsibilities and authorities for monitoring and reporting are in accordance with what is stated in the monitoring plan.</li> <li>• The accuracy of the equipment used for monitoring is in accordance with the relevant guidance provided by the CDM Executive Board</li> <li>• The monitoring equipment are controlled and calibrated in accordance with the monitoring plan in the registered PDD.</li> </ul> <p>As per paragraph 321 (c) to (e) of the VVS, version 9.0, the verification team confirms that</p> <ul style="list-style-type: none"> <li>• The equipment used for monitoring is in accordance with the relevant guidance provided by the CDM Executive Board and it is controlled and calibrated in accordance with the monitoring plan</li> <li>• Monitoring results are consistently recorded as per approved frequency</li> <li>• Quality assurance and quality control procedures have been applied in accordance with the monitoring plan</li> </ul>

## E.8. Assessment of data and calculation of emission reductions or net removals

### E.8.1. Calculation of baseline GHG emissions or baseline net GHG removals by sinks

<b>Means of verification</b>	<p>The verification team verified that</p> <p>a) A complete set of data for the monitoring period was available for the monitoring period and the verification of each monitoring parameter is elaborated under Section E.6.2 of this report. The complete monitoring data is also presented in the corresponding ER sheet /07/ of final Monitoring</p>
------------------------------	---

	<p>Report /05/.</p> <ul style="list-style-type: none"> <li>b) The information provided in the monitoring report was cross checked with other sources, wherever appropriate and available, and such information is also included under Section E.6.2 of this report. .</li> <li>c) The calculations of baseline emissions as presented in the corresponding ER sheet of final Monitoring Report were checked and found to be consistent with the formulae and methods described in the registered monitoring plan and the applied methodology.</li> <li>d) All assumptions used in the emission calculations were found appropriate and therefore justified</li> <li>e) Appropriate emission factors and other reference values have been correctly applied. This has also been elaborated under Section E.6.1 of this report.</li> <li>f) No standardized baseline was prescribed in the registered PDD and therefore it has not been applied.</li> <li>g) There is no pro-rate approach (para 402(g) of CDM VVS Version 09) was applied in the current monitoring period as entire monitoring period falls into period that is after the end of first commitment period of Kyoto Protocol.</li> </ul> <p>The baseline emissions are the product of net electricity exported to the grid <math>EG_{PJ,y}</math> expressed in MWh of electricity produced by the renewable generating unit multiplied by the grid emission factor. Baseline emission factor is calculated as combined margin, consisting of a combination of operating margin (OM) and build margin (BM) factors.</p> $BE_y = EG_{PJ,y} * EF_{grid,CM,y}$ <p>Where:</p> <p><math>BE_y</math>: Baseline Emissions in year y; t CO<sub>2</sub></p> <p><math>EG_{PJ,y}</math> : Net Electricity supplied to the grid in year y</p> <p><math>EF_{grid,CM,y}</math> = Combined margin CO<sub>2</sub> emission factor (tCO<sub>2</sub>/MWh)</p> <p>As per the registered PDD, combined margin emission factor is 0.92252 tCO<sub>2</sub>/MWh. Hence, the baseline emissions for the project activity for the current monitoring period are as follows.</p> $BE_y = 208,358.084 * 0.92252 = 192,213 \text{ tCO}_2\text{e}$
<b>Findings</b>	CAR #3 was raised and resolved
<b>Conclusion</b>	<p>The verification team confirms that</p> <ul style="list-style-type: none"> <li>a) The complete data was available and is duly reported;</li> <li>b) As indicated above, the description with regard to cross-check of reported data is included under respective parameter (refer Section E.6.2 of this report);</li> <li>c) Appropriate methods and formulae for calculating baseline GHG emissions or baseline net GHG removals were followed;</li> <li>d) Appropriate emission factors and other reference values were correctly applied.</li> <li>e) There is no pro-rate approach (para 403(e) of CDM VVS Version 09) was applied in the current monitoring period as entire monitoring period falls into period that is after the end of first commitment period of Kyoto Protocol.</li> </ul>

### E.8.2. Calculation of project GHG emissions or actual net GHG removals by sinks

<b>Means of verification</b>	The registered PDD/1/ and applied monitoring methodology/3/ does not prescribe any project emissions to be considered. The onsite visit and project design also did not reveal any potential source to be considered in this regard.
<b>Findings</b>	No finding was raised
<b>Conclusion</b>	No project emissions were required to be calculated.

### E.8.3. Calculation of leakage GHG emissions

<b>Means of verification</b>	The registered PDD and applied monitoring methodology does not prescribe any leakage emissions to be considered. The onsite visit and project design also did not reveal any potential source to be considered in this regard.
<b>Findings</b>	No finding was raised
<b>Conclusion</b>	No project emissions were required to be calculated

#### E.8.4. Summary of calculation of GHG emission reductions or net anthropogenic GHG removals by sinks

<b>Means of verification</b>	As elaborated above, the entire emission reductions from the project activity were based on baseline emissions. The calculations presented in this regard in the final monitoring report and corresponding ER calculation sheet were found appropriate and complying with the provisions prescribed in the registered monitoring plan of registered PDD and applied methodology. The verification team confirms that an audit trail that contains the evidence and records that validated the stated figures were checked and found acceptable.
<b>Findings</b>	CAR #3 was raised and resolved
<b>Conclusion</b>	The verification team confirms that <ul style="list-style-type: none"> <li>a) The complete data was available and is duly reported;</li> <li>b) As indicated above, the description with regard to cross-check of reported data is included under respective parameter (refer Section E.6.2 of this report);</li> <li>c) Appropriate methods and formulae for calculating baseline GHG emissions or baseline net GHG removals, project emissions and leakage emissions were followed;</li> <li>d) Appropriate emission factors and other reference values were correctly applied.</li> <li>e) There is no pro-rate approach (para 403(e) of CDM VVS Version 09) was applied in the current monitoring period as entire monitoring period falls into period that is after the end of first commitment period of Kyoto Protocol.</li> </ul> <p>The total number of ERs achieved during the current monitoring period is 192,213 tCO<sub>2</sub>e.</p>

#### E.8.5. Comparison of actual GHG emission reductions or net anthropogenic GHG removals by sinks with estimates in registered PDD

<b>Means of verification</b>	As verified and evident from the final Monitoring Report /05/ and corresponding ER sheet /07/, the actual emission reductions achieved by the project activity in the current monitoring period were found less than( 19.67% downside) the estimated quantity in the registered PDD/1/ for the comparable period. This is largely due to low plant load factor achieved during the current monitoring period. Considering, there is no increase in ERs than the estimated amount; it was found acceptable to the assessment team.
<b>Findings</b>	No finding was raised
<b>Conclusion</b>	The actual emission reductions achieved by the project activity are lower than the estimated quantity of ERs in the registered PDD. Accordingly, the verification team accepted it.

#### E.8.6. Remarks on difference from estimated value in registered PDD

<b>Means of verification</b>	The actual emission reductions were less than the estimation in the revised approved PDD for an equivalent length of the monitoring period therefore no further explanation is required.
<b>Findings</b>	No finding was raised
<b>Conclusion</b>	The actual ERs are less than the estimated quantity of ERs as given in the registered PDD, which is appropriate and accepted.

#### E.8.7. Actual GHG emission reductions or net anthropogenic GHG removals by sinks during the first commitment period and the period from 1 January 2013 onwards

<b>Means of verification</b>	Based on the assessment done in section E.8.1 to E.8.6, the verification team is able to certify that the emission reductions from the CDM project activity 4700 "Vaayu India Wind Power Project in Gujarat " in India during the period 01/01/2015 to 31/03/2017 (including both days) is 192,213 tCO <sub>2</sub> e.
<b>Findings</b>	No finding was raised
<b>Conclusion</b>	Actual GHG emission reductions achieved during period starting from 1 <sup>st</sup> January 2013 onwards was verified as 192,213 tCO <sub>2</sub> e .

**SECTION F. Internal quality control**

An independent technical review team (one or more members) to confirm if the internal procedures established and implemented by Earthood were duly complied with and such opinion/conclusion is reached in an objective manner that complies with the applicable CDM rules/requirements reviews a draft verification report that is prepared by verification team. The technical review team is collectively required to possess the technical expertise of all the technical area/sectoral scope the project activity relates to. All team members of technical review team are independent of the verification team.

During the technical review process additional findings may be identified or the closed out findings may be opened, which needs to be satisfactorily resolved before the request for issuance is submitted to UNFCCC. The independent technical reviewer may either approve the report as such or reject/return the same in such case providing the comments/findings/issues that needs to be resolved by the verification team. The decision taken by the Technical Reviewer is final and is authorized by the Managing Director on behalf of Earthood Services Private Limited.

**SECTION G. Verification opinion**

Earthood Services Private Limited (Earthood), contracted by Vaayu (India) Power Corporation Private Limited, has performed the independent verification of the emission reductions for the CDM project activity 4700 "Vaayu India Wind Power Project in Gujarat" in India for the monitoring period 01/01/2015 -31/03/2017 (including both days) as reported in the Monitoring Report (public) Version 1 dated 03/05/2017. The Vaayu (India) Power Corporation Private Limited is responsible for the collection of data in accordance with the monitoring plan and the reporting of GHG emissions reductions from the project activity.

Earthood commenced the verification based on the baseline and monitoring methodology ACM 0002 Version 11, the monitoring plan contained in the registered PDD Version 03 dated 19/01/2011, Monitoring Report (public) Version 1 dated 03/05/2017.

ESPL confirms that the monitoring system is in place and the emission reductions are calculated without material misstatements. This verification report has been prepared using the latest available template specified by UNFCCC and complies with the instructions to follow as per para 406 and 407 of CDM VVS Version 9.

Earthood's 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. Earthood planned and performed the verification by obtaining evidence and other information and explanations that Earthood considered necessary to give reasonable assurance that reported GHG emission reductions are fairly stated.

The verification team confirms that:

- The project activity was found completely implemented as per the description given in the registered PDD.
- The actual operation conforms to the description in the registered PDD.

**SECTION H. Certification statement**

Earthood Services Private Limited (Earthood), contracted by Vaayu (India) Power Corporation Private Limited, has performed the independent verification of the emission reductions for the CDM project activity 4700 "Vaayu India Wind Power Project in Gujarat" in India for the monitoring period 01/01/2015 -31/03/2017 (including both days) as reported in the Monitoring Report (Final) Version 2 dated 10/07/2017. The Vaayu (India) Power Corporation Private Limited is 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

Earthood commenced the verification based on the baseline and monitoring methodology "Consolidated baseline methodology for grid connected electricity generation from renewable sources" ACM0002 Version 11, the monitoring plan contained in the PDD Version 03 dated 19/01/2011, Monitoring Report (public) Version 1 dated 03/05/2017 as per the methodology described under Section D of this report.

Earthood's 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. Earthood planned and performed the verification by obtaining evidence and other information and explanations that Earthood 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 01/01/2015 - 31/03/2017 are fairly stated in the Monitoring Report (final) Version 2 dated 10/07/2017. The GHG emission reductions were calculated correctly based on the approved baseline and monitoring methodology ACM0002 Version 11 and the monitoring plan contained in the PDD Version 03 dated 19/01/2011.

Earthood Services Private Limited is able to certify that the emission reductions from the CDM project activity 4700 "Vaayu India Wind Power Project in Gujarat" in India during the period 01/01/2015 – 31/03/2017 (including both days) amount to 192,213 tCO<sub>2</sub>e.

**Verified and certified emission reductions as per commitment period:**

<b>Commitment period</b>	<b>Amount</b>
Upto 31/12/2012	Nil
From 01/01/2013 onwards	192,213 tCO <sub>2</sub> e

## Appendix 1. Abbreviations

Abbreviations	Full texts
ABT	Availability Based Tariff
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CDM PCP	Clean Development Mechanism Project Cycle Procedure
CDM PS	Clean Development Mechanism Project Standard
CDM VVS	Clean Development Mechanism Validation and Verification Standard
EB	Executive Board
EF	Emission Factor
EPC	Engineering ,Procurement and Construction
ER	Emission Reductions
ESPL	Earthood Services Private Limited
CEA	Central Electricity Authority
CER	Certified Emission Reduction
CL	Clarification Request
DOE	Designated Operational Entity
DNA	Designated National Authority
EIL	Enercon(India) Limited
FAR	Forward Action Request
GEDA	Gujarat Electricity Development Authority
GETCO	Gujarat Electricity Transmission Company
GHG	Greenhouse Gas(es)
GUVNL	Gujarat Urja Vikas Nigam Limited
GHG	Greenhouse Gas(es)
GOI	Government of India
IRR	Internal Rate of Return
IPCC	Intergovernmental Panel on Climate Change
JMR	Joint Meter Reading
MP	Monitoring Plan
MR	Monitoring Report
MWh	Megawatt hour
PDD	Project Design Document
PPA	Power Purchase Agreement
PP	Project Participant
PRC	Post Registration Changes
PS	Project Standard
RMP	Revised Monitoring Plan
TR	Technical Review
UNFCCC	United Nations Framework Convention on Climate Change
VIPCL	Vaayu (India) Power Corporation Private Limited
VVS	Validation and Verification Standard
UID	Unique Identification number
UNFCCC	United Nations Framework Convention on Climate Change
WTG	Wind Turbine Generator
WEC	Wind Energy Converter
WWIL	Wind World India Limited

## Appendix 2. Competence of team members and technical reviewers

Competence Statement			
<b>Name</b>	Ravi Kant Soni		
<b>Country</b>	India		
<b>Education</b>	B. Tech. (Mechanical Engineering) M. Tech. (Energy Management)		
<b>Experience</b>	7 Years		
<b>Field</b>	Energy and Climate Change		
Approved Roles			
<b>Team Leader</b>	YES		
<b>Validator</b>	YES		
<b>Verifier</b>	YES		
<b>Methodology Expert</b>	AMS-I.D., AMS-I.C., ACM0002		
<b>Local Expert</b>	YES(India)		
<b>Financial Expert</b>	NO		
<b>Technical Reviewer</b>	YES		
<b>TA Expert (1.2)</b>	YES		
<b>Reviewed by</b>	Abhishek Mahawar	<b>Date</b>	09/09/2016
<b>Approved by</b>	Kaviraj Singh	<b>Date</b>	09/09/2016

Competence Statement			
<b>Name</b>	Kaviraj Singh		
<b>Country</b>	India		
<b>Education</b>	Ph.D. (Environmental Engineering), IIT Delhi Masters (Energy & Environmental), DAVV Indore		
<b>Experience</b>	8 Years +		
<b>Field</b>	Climate Change & Environment		
Approved Roles			
<b>Team Leader</b>	YES		
<b>Validator</b>	YES		
<b>Verifier</b>	YES		
<b>Methodology Expert</b>	AMS-I.D., AMS-II.D., ACM0006, AMS-I.A., AMS-I.C., AMS-II.B., AMS-III.H, ACM0002, ACM0001		
<b>Local expert</b>	YES (India)		
<b>Financial Expert</b>	NO		
<b>Technical Reviewer</b>	YES		
<b>TA Expert</b>	YES (TA 1.1, TA 1.2, TA 13.1, TA 13.2)		
<b>Reviewed by</b>	Abhishek Mahawar	<b>Date</b>	08/09/2016
<b>Approved by</b>	Ashok Gautam	<b>Date</b>	08/09/2016

### Appendix 3. Documents reviewed or referenced

No.	Author	Title	References to the document	Provider
1	PP	Registered PDD	Version 03 ,Dated 19/01/2011	Other
2	Det Norske Veritas(DNV)	Validation report	Rev.02 ,Dated 09/04/2011	Other
2.1	ESPL	Verification report for the period from 01/09/2013 to 31/12/2014	Version 02, dated 10/06/2015	Other
2.2	TUV Nord	Validation Opinion on changes in PDD	Report No-8109817473 – 13/029 , dated 14/05/2013	Other
3	UNFCCC	Consolidated baseline methodology for grid connected electricity generation from renewable sources, ACM0002	Version 11	Other
4	PP	Monitoring Report (publication)	Version 1, dated 03/05/2017	VIPCPL
5	VIPCPL	Monitoring Report (final)	Version 2, dated 10/07/2017	VIPCPL
6	VIPCPL	ER Spread sheet (initial version)	dated 03/05/2017	VIPCPL
7	VIPCPL	ER spread sheet (final)	Dated 10/07/2017	VIPCPL
8	UNFCCC	CDM VVS	Version 09	Other
9	UNFCCC	CDM PS	Version 09	Other
10	GETCO	Monthly JMRs issued by state utility( at 33 kV)	For the period from 01/01/2015 to 31/03/2017	VIPCPL
11	GETCO	Monthly “Share Certificates” issued by state utility	For the period from 01/01/2015 to 31/03/2017	VIPCPL
12	VIPCPL	Monthly invoices raised by the PP to state utility	For the period from 01/01/2015 to 31/03/2017	VIPCPL
13	GETCO	Calibration certificates of main meters and check meters	-	VIPCPL
14	GEDA	Commissioning certificates (for all 64 WTGs)	-	VIPCPL
15	GETCO	Power Purchase Agreement between GETCO and Vaayu (India) Power Corporation Private Limited	-	VIPCPL
16	CEA	CO <sub>2</sub> Baseline Database for Indian Power Sector	Version 05	Others
17	UNFCCC	UNFCCC webpage for the project activity	<a href="https://cdm.unfccc.int/Projects/DB/DNV-CUK1303122887.18/view">https://cdm.unfccc.int/Projects/DB/DNV-CUK1303122887.18/view</a>	Others
18	Ministry of corporate Affairs, GOI	Name change consent issued by Government of India	dated 01/01/2013	VIPCPL
19	CEA	CEA Notification No. 502/70/CEA/DP&D	dated 17/03/2006	Others
20	ESPL	Site visit observation and photographs	Dated 16/06/2017 and 17/06/2017	-
21	VIPCPL	Letter requesting state utility to conduct calibration of cluster meters	Dated 26/07/2016	VIPCPL
22	UNFCCC	Sampling and survey for CDM project activities and programmes of activities	Version 06	Others

## Appendix 4. Clarification requests, corrective action requests and forward action requests

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

FAR ID	Section no.	Date :DD/MM/YYYY
<b>Description of FAR</b>		
N/A		
<b>Project participant response</b>		<b>Date :DD/MM/YYYY</b>
<b>Documentation provided by project participant</b>		
<b>DOE assessment</b>		<b>Date: DD/MM/YYYY</b>

**Table 2. CL from this verification**

CL ID	Section no.	Date :
<b>Description of CL</b>		
NA		
<b>Project participant response</b>		<b>Date :</b>
<b>Documentation provided by project participant</b>		
<b>DOE assessment</b>		<b>Date:</b>

**Table 3. CAR from this verification**

CAR ID	Section no.	Date :
01	E.8	16/06/2017
<b>Description of CAR</b>		
<ol style="list-style-type: none"> <li>Monitoring parameters <math>EG_{GETCO, Export}</math> and <math>EG_{GETCO, Import}</math> are reported in section D.2 of the MR, however monthly values of both parameters are not reported in ER calculation sheet in line with the requirements of registered monitoring plan.</li> <li>Comparison of estimated and actual ERs achieved during the current monitoring period is not provided in the ER sheet.</li> <li>Current monitoring period ends on 31/03/2017; however ER calculation is reported till 28/02/2017 in ER calculation spreadsheet.</li> </ol>		
<b>Project participant response</b>		<b>Date : 10/07/2017</b>
<ol style="list-style-type: none"> <li>Monitoring parameters <math>EG_{GETCO, Export}</math> and <math>EG_{GETCO, Import}</math> are reported in section D.2 of the MR, the monthly values of both parameters are reported in the revised ER calculation sheet</li> <li>Comparison of estimated and actual ERs achieved during the current monitoring period is provided in the revised ER Calculation sheet.</li> <li>The Monitoring Period has been corrected in the revised ER Sheet.</li> </ol>		
<b>Documentation provided by project participant</b>		
<i>ER Calculation Sheet</i>		
<b>DOE assessment</b>		<b>Date: 15/07/2017</b>

Monthly values of the parameter  $EG_{GETCO, Export}$  and  $EG_{GETCO, Import}$  are now reported in the ER calculation sheet, verified with the JMRs issued by state utility and found consistent. Comparison of estimated and actual ERs achieved during the current monitoring period is provided in the revised ER calculation sheet, found satisfactory. End date of current monitoring period is corrected in the ER calculation sheet, consistent with published MR, hence accepted. CAR #1 is closed.

<b>CAR ID</b>	02	<b>Section no.</b>	E.1	<b>Date : 16/06/2017</b>
<b>Description of CAR</b>				
Section A.6 MR: It is not indicated indicate if the person(s)/ entity (ies) is also a project participant(s) in Appendix 1. Section B.2: It is not clear why the reference number of PRC is not provided as per instructions for filling out MR form.				
<b>Project participant response</b>				<b>Date : 10/07/2017</b>
In Section A.6 of revised MR: It is indicated that the person(s)/ entity (ies) is also a project participant(s) in Appendix 1. In Section B.2 of revised MR the reference number of PRC has been provided as per instructions for filling out MR form.				
<b>Documentation provided by project participant</b>				
MR version 02,dated 10/07/2017				
<b>DOE assessment</b>				<b>Date: 15/07/2017</b>
The PP has provided the required information under section A.6 of the MR, found satisfactory. Reference number of PRC is provided in section B.2 of the MR as per instructions for filling out MR form.				
CAR #2 is closed.				

<b>CAR ID</b>	03	<b>Section no.</b>	E.7	<b>Date : 16/06/2017</b>
<b>Description of CAR</b>				
<ol style="list-style-type: none"> <li>1. Due date of calibration for GETCO meters mentioned in section C of the MR is not in line with the calibration frequency of meters as indicated in the registered monitoring plan.</li> <li>2. It is not clear why calibration details of GETCO meters covering the current monitoring period are not reported.</li> <li>3. Monthly share certificates issued by the state utility only provides the value of "Quantity of net electricity generation supplied by the project activity to the grid" (<math>EG_{PJ,y}</math>) and not the export and import values by the project. In view of this information please clarify how the error factor (0.2%) applied to the parameter <math>EG_{PJ,y}</math> to address the delay in calibration is conservative.</li> </ol>				
<b>Project participant response</b>				<b>Date : 10/07/2017</b>
<ol style="list-style-type: none"> <li>1. The due date was date of calibration for GETCO Meters, typo error has been corrected in the revised version of MR.</li> <li>2. The details of Calibration for GETCO Meters has been given in Section C of revised MR. The Calibration of meter is not under the purview of PP, the same is done by GEDA. PP has intimated GEDA about due calibration of Cluster Meter, but the same has not been calibrated yet. The request letter sent by PP to GEDA regarding due Calibration has been submitted along with revised MR. PP has no control over delay in calibration, however an error factor (-0.4%) is applied to the values of <math>EG_{PJ,y}</math> for entire monitoring period.</li> <li>3. As per VVS requirement: error factor of "0.2%" should be applicable for both export &amp; import i.e. the measured vales. However, GEDA share certificate provides only net electricity generation, the separate export and import values are not available. Hence being conservative and to account for the error for both export &amp; import, a cumulative error of "-0.4%" on net electricity generation has been applied.</li> </ol>				
<b>Documentation provided by project participant</b>				
MR version 02,dated 10/07/2017 ER Calculation Sheet.				
<b>DOE assessment</b>				<b>Date: 15/07/2017</b>

1. Typo error in due date of calibration for GETCO meters is rectified in section C of the MR, hence accepted.
2. Calibration details for GETCO Meters covering the current monitoring period is provided in section C of the MR. However calibration of cluster meters are not done after September 2013 regardless of PPs request to state utility. As state under section 7.2 of the PPA, GETCO is sole entity responsible for calibration and PP don't have any intervention with reference to the calibration and maintenance of energy meters. Official of state utility (GETCO) and representative of PP jointly read the metering system on first day of every month (section 7.1(i) PPA).  
It is revealed under section 7.2(ii) that if the metering system and/or any component thereof are found to be outside the acceptable limits of accuracy or not functioning properly, it shall be repaired, re-calibrated or replaced by GETCO as soon as possible.  
Since state utility (GETCO is a Government Organization and a 3rd party with respect to this CDM project) is also the purchaser of electricity supplied to the grid by project, hence, the state utility ensures that the energy meters are in proper working condition, because all monetary transactions done based on these meter readings.  
The PP has applied the error factor (-0.4%) to the parameter  $EG_{PJ,Y}$  for the entire monitoring period considering the delay in calibration of all the meters( GETCO and cluster meters),this approach is found to be appropriate, hence accepted.
3. Accordance with the guidelines outlined under paragraph 395(a) of VVS version 09, an error factor 0.2% had to be applied for both export & import i.e. the measured values in the delayed calibration period. However, the monthly share certificates issued by the state utility only provides the value of "Quantity of net electricity generation supplied by the project activity to the grid" ( $EG_{PJ,Y}$ ) and not the export and import values by the project. Hence the error for both export & import has been taken into account and a cumulative error factor of -0.4% on the parameter  $EG_{PJ,Y}$  is applied. The approach followed by the PP was found to be conservative and appropriate, hence accepted.

CAR #3 is closed.

**Table 4. FAR from this verification**

FAR ID	NA	Section No.	NA	Date :DD/MM/YYYY
<b>Description of FAR</b>				
No FAR raised during the verification.				
<b>Project participant response</b>				<b>Date :DD/MM/YYYY</b>
NA				
<b>Documentation provided by project participant</b>				
NA				
<b>DOE assessment</b>				<b>Date: DD/MM/YYYY</b>
NA				

- - - - -

### Document information

Version	Date	Description
01.0	23 March 2015	Initial publication.
Decision Class: Regulatory		
Document Type: Form		
Business Function: Issuance		
Keywords: project activities, verifying and certifying		