



**Monitoring report form**  
**(Version 05.1)**

**MONITORING REPORT**

<b>Title of the project activity</b>	20 MW Enercon Wind farms (SAI) Pvt. Limited in Maharashtra	
<b>UNFCCC reference number of the project activity</b>	3854	
<b>Version number of the monitoring report</b>	1	
<b>Completion date of the monitoring report</b>	03/05/2017	
<b>Monitoring period number and duration of this monitoring period</b>	04 01/01/2013 to 28/02/2017 (Including first and last day of monitoring period)	
<b>Project participant(s)</b>	Wind World (India) Ltd.	
<b>Host Party</b>	India	
<b>Sectoral scope(s)</b>	Sectoral Scope 01	
<b>Selected methodology(ies)</b>	ACM0002, Version 11	
<b>Selected standardized baseline(s)</b>	Not Applicable	
<b>Estimated amount of GHG emission reductions or net GHG removals by sinks for this monitoring period in the registered PDD</b>	138,874	
<b>Total amount of GHG emission reductions or net GHG removals by sinks achieved in this monitoring period</b>	GHG emission reductions or net GHG removals by sinks reported up to 31 December 2012	GHG emission reductions or net GHG removals by sinks reported from 1 January 2013 onwards
	NA	102,778

## SECTION A. Description of project activity

### A.1. Purpose and general description of project activity

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*(a) Purpose of the project activity and the measures taken for GHG emission reductions or net anthropogenic GHG removals by sinks;*

The objective is development, design, engineering, procurement, finance, construction, operation and maintenance of 20 MW Wind Electricity Generation Project in the state of Maharashtra to provide reliable, renewable power to the NEWNE electricity grid of India. The purpose of the project activity is to utilize renewable wind energy for generation of electricity. The Project will lead to reduction of GHG emissions as it will displace electricity from fossil fuel based electricity generation plants.

*(b) Brief description of the installed technology and equipment;*

The project is owned by Enercon wind farms (SAI) Pvt. Limited. Wind World (India) Limited (will be referred WWIL here onwards) is the operation and maintenance contractor for the Project. The generated electricity is supplied to Maharashtra State Electricity Distribution Company Limited ("MSEDCL") under a long-term power purchase agreement (PPA). The project activity involves installation of 25 number of E - 48 machines (each having capacity of 800 kW) in AhmedNagar in the state of Maharashtra, with internal electrical lines connecting the Project with local evacuation facility. The WECs generates 3-phase power at 400V, which is stepped up to 33 KV. The Project can operate in the frequency range of 47.5–51.5 Hz and in the voltage range of 400 V  $\pm$  12.5%.

*(c) Relevant dates for the project activity (e.g. construction, commissioning, continued operation periods, etc.);*

The first machine under the project activity was commissioned on 28 February, 2007 and last machine was commissioned on 17 March, 2009. The expected operational lifetime of the project is for 20 years.

*(d) Total GHG emission reductions or net anthropogenic GHG removals by sinks achieved in this monitoring period.*

The total emission reductions achieved under this monitoring period (01/01/2013 to 28/02/2017) is 102,778 tCO<sub>2</sub>.

### A.2. Location of project activity

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The project is located in Ahmednagar district of Maharashtra.

The details of the geo-coordinates of individual machines have been given below:

S. No	WEG Loc. No.	Latitude (North)	Longitude (East)
1.	523	19.6264	73.7842
2.	524	19.6275	73.7838
3.	525	19.6286	73.7834
4.	526	19.6296	73.7830
5.	527	19.6307	73.7829
6.	79	19.7480	73.8370
7.	529	19.6328	73.7829

8.	530	19.6341	73.7836
9.	504	19.6076	73.7888
10.	506	19.6087	73.7888
11.	507	19.6104	73.7887
12.	521	19.6244	73.7849
13.	510	19.6133	73.7888
14.	512	19.6155	73.7889
15.	513	19.6166	73.7887
16.	514	19.6176	73.7884
17.	35	19.6604	73.8144
18.	36	19.6617	73.8145
19.	37	19.6630	73.8146
20.	38	19.6642	73.8144
21.	39	19.6655	73.8141
22.	516	19.6196	73.7877
23.	517	19.6205	73.7871
24.	518	19.6216	73.7866
25.	519	19.6224	73.7859

**A.3. Parties and project participant(s)**

Party involved (host) indicates a host Party)	Private and/or public entity(ies) project participants (as applicable)	Indicate whether the Party involved wishes to be considered as project participant (yes/no)
Government of India (Host Country)	Wind World (India) Ltd. (Private)	No

**A.4. Reference of applied methodology and standardized baseline**

&gt;&gt;

**Title:** “Consolidated baseline methodology for grid-connected electricity generation from renewable sources”

**Reference:** Approved consolidated baseline and monitoring methodology ACM0002 (Version 11, EB 52)

Tool: “Tool to calculate the emission factor for an electricity system” – version 2

“Tool for the demonstration and assessment of additionality” – version 5.2

References:

<http://cdm.unfccc.int/methodologies/DB/UB3431UT9I5KN2MUL2FGZXZ6CV71LT>

**A.5. Crediting period of project activity**

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The length of the Crediting period of the project activity as per registered PDD is 10 years (Fixed). The crediting period start date is 14/12/2010 and length of crediting period is 10 years (from 14/12/2010 – 13/12/2020). The monitoring period for the project activity has been considered as 01 January, 2013 to 28<sup>th</sup> February, 2017.

**A.6. Contact information of responsible persons/entities**

&gt;&gt;

Mr. Yogeshh Mehra  
Wind World (India) Ltd.  
Managing Director

Email Id: [yogeshh.mehra@windworldindia.com](mailto:yogeshh.mehra@windworldindia.com)

Contact No: +91-22-6692 4848

Wind World Tower, A-9, Veera Industrial Estate, Veera Desai Road, Andheri (W),  
Mumbai - 400053

The responsible person is also a project participant; refer Appendix 1 for further details.

**SECTION B. Implementation of project activity****B.1. Description of implemented registered project activity**

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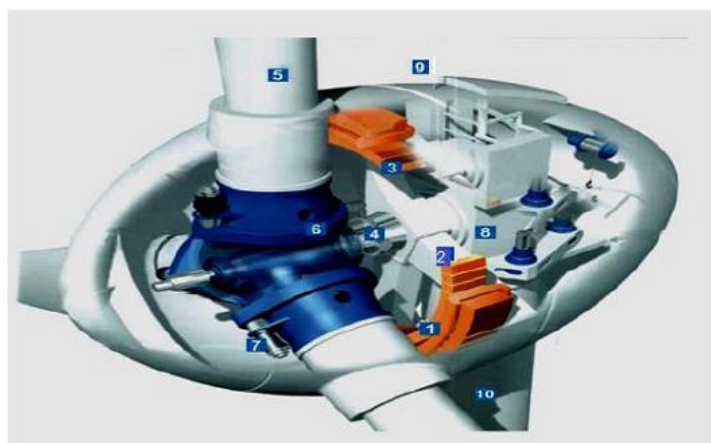
The first machine under the project activity was commissioned on 28 February, 2007 and last machine was commissioned on 17 March, 2009. The project activity consists of 25 WEGs (800 kW) of Enercon make E-48 models. The commissioning date for all the machines included in the project activity is given in the table below:

S. NO.	WEG Location no.	Unique Identification No.	Date of Commissioning
1	523	EWFSPL -01	17 March, 2009
2	524	EWFSPL -02	26 February, 2009
3	525	EWFSPL -03	26 February, 2009
4	526	EWFSPL -04	11 February, 2009
5	527	EWFSPL -05	11 February, 2009
6	79	EWFSPL -06	22 May, 2008
7	529	EWFSPL -07	26 February, 2009
8	530	EWFSPL -08	17 March, 2009
9	504	EWFSPL -09	17 March, 2009
10	506	EWFSPL -10	26 February, 2009
11	507	EWFSPL -11	11 February, 2009
12	521	EWFSPL -12	4 December, 2008
13	510	EWFSPL -13	4 December, 2008
14	512	EWFSPL -14	4 December, 2008
15	513	EWFSPL -15	13 September, 2008
16	514	EWFSPL -16	13 September, 2008
17	35	EWFSPL -17	28 February, 2007
18	36	EWFSPL -18	28 February, 2007
19	37	EWFSPL -19	28 February, 2007
20	38	EWFSPL -20	28 February, 2007
21	39	EWFSPL -21	28 February, 2007
22	516	EWFSPL -22	13 September, 2008
23	517	EWFSPL -23	24 September, 2008
24	518	EWFSPL -24	4 December, 2008
25	519	EWFSPL -25	4 December, 2008

WWIL's operation and maintenance activities are ISO 9001:2008 certified and all the events are recorded at the project site. Referring to the data available, it can be inferred that there have not been any major special event for any machines that are included in the project activity. As a part of regular maintenance, the machines are stopped for mechanical and electrical maintenance for 16 to 18 hours annually and for visual inspection for 6 to 7 hours quarterly.

The project involves 25 wind energy converters (WECs) of Enercon make (800 kW E-48) with internal electrical lines connecting the project with local evacuation facility. The Project can operate in the frequency range of 47.5–51.5 Hz and in the voltage range of 400 V  $\pm$  12.5%. The salient features of the technology are:

- Gearless Construction - Rotor & Generator Mounted on same shaft eliminating the Gearbox.
- Variable speed function – has the speed range of 18 to 33 RPM thereby ensuring optimum efficiency at all times.
- Variable Pitch functions ensuring maximum energy capture.
- Near Unity Power Factor at all times.
- Minimum drawl (less than 1% of kWh generated) of Reactive Power from the grid.
- No voltage peaks at any time.
- Operating range of the WEC with voltage fluctuation of -20 to +20%.
- Less Wear & Tear since the system eliminates mechanical brake, which are not needed due to low speed generator which runs at maximum speed of 33 rpm and uses Air Brakes.
- Three Independent Braking Systems.
- Generator achieving rated output at only 33 rpm.
- Incorporates lightning protection system, which includes blades.
- Starts Generation of power at wind speed of 3 m/s.



- |                     |                 |
|---------------------|-----------------|
| 1. Generator        | 6. Blade Flange |
| 2. Generator Stator | 7. Pitch Drive  |
| 3. Generator Rotor  | 8. Main Carrier |
| 4. Main Pin         | 9. Wind Sensor  |
| 5. Rotor Blade      | 10. Tower       |

## B.2. Post-registration changes

### B.2.1. Temporary deviations from registered monitoring plan, applied methodology or applied standardized baseline

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Not Applicable

### B.2.2. Corrections

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The PP has revised the PDD to incorporate the change and the same has been approved on 02 January, 2013, as post registration changes during the second verification of the project (Source: <https://cdm.unfccc.int/Projects/DB/DNV-UK1279516994.31/view>).

**B.2.3. Changes to start date of crediting period**

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Not Applicable

**B.2.4. Inclusion of a monitoring plan to the registered PDD that was not included at registration**

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Not Applicable

**B.2.5. Permanent changes from registered monitoring plan, applied methodology or applied standardized baseline**

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The PP has revised the PDD to incorporate the change and the same has been approved on 02 January, 2013, as post registration changes (PRC-3854-001) during the second verification of the project (Source: <https://cdm.unfccc.int/Projects/DB/DNV-UK1279516994.31/view>).

**B.2.6. Changes to project design of registered project activity**

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Not Applicable

**B.2.7. Types of changes specific to afforestation or reforestation project activity**

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Not Applicable

**SECTION C. Description of monitoring system**

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Approved monitoring methodology ACM0002 / Version 11 Sectoral Scope: 1, "Consolidated monitoring methodology for zero-emissions grid-connected electricity generation from renewable sources", by CDM - Meth Panel is proposed to be used to monitor the emission reductions.

This approved monitoring methodology requires monitoring of the following:

- Electricity generation from the project activity; and
- Operating margin emission factor and build margin emission factor of the grid, where *ex post* determination of grid emission factor has been chosen

Since the baseline methodology is based on *ex ante* determination of the baseline, the monitoring of operating margin emission factor and build margin emission factor is not required.

The generated electricity is measured through a two step procedure wherein the first metering is carried out at the controller of the machine with on-board meter. The monitoring of all these wind turbines is done from a common monitoring station as a part of central monitoring system.  $EG_{gross,y}$  is the electricity generated from an individual wind turbine measured through its panel. The summation of total Electricity generated from wind turbine of the project proponent from individual meters (panel meter) in MWh is presented as:

$$\sum_{y=0}^n EG_{gross,y}$$

where  $n$  = number of WEGs of SAI connected at common MSEDCL meter

and the summation of total Electricity generated (panel data) from the other wind turbines ( total number of WEGs = m) attached to the common MSEDCL meter at the sub-station in MWh is presented as

$$\sum_{y=0}^m EG_{gross,y}$$

where m = number of WEGs of other customer connected at common MSEDCL meter

The second metering is carried out at grid interconnection point (sub-station) wherein the Joint Meter Reading (JMR) is carried out on first day of every month in presence of the representatives of the project proponent & the state electricity utility (MSEDCL). This JMR is used for calculation of the amount of electricity supplied to the grid against which the utility makes the payment to the project proponent. The JMR gives both the “export” ( $EG_{JMR,export}$ ) and “import” ( $EG_{JMR,import}$ ) of the electricity to/ from the NEWNE grid based on common MSEDCL meter readings.

The apportioning of electricity generated from the various wind turbines is done by DISCOM (Maha Vitran), based on the power generation from the individual wind turbines connected to this MSEDCL meter. This report contains details of power exported/imported to/from the grid by each of the wind turbines connected. This apportioned value (calculated by DISCOM) is then used by the project proponent to raise invoice to MSEDCL.

The break-up sheet reflecting net electricity supplied by the project activity to the grid is prepared by DISCOM based on the allocation procedure explained below.

$EG_{export}$  the electricity supplied to the grid by the project activity is calculated as follows:

$$EG_{export} = \frac{EG_{JMR, export} \times \sum_{y=0}^n EG_{gross, y}}{(\sum_{y=0}^n EG_{gross, y} + \sum_{y=0}^m EG_{gross, y})}$$

$EG_{import}$  the electricity drawn from the grid by the project activity is calculated as follows:

$$EG_{import} = \frac{EG_{JMR, import} \times \sum_{y=0}^n EG_{gross, y}}{(\sum_{y=0}^n EG_{gross, y} + \sum_{y=0}^m EG_{gross, y})}$$

$EG_y$ , the net electricity supplied to the grid by the project activity, is calculated as follows:

$$EG_y = EG_{export} - EG_{import}$$

The apportioning of electricity generated by the all WEGs (project activity and non-project activity) is entirely under the jurisdiction of the DISCOM. The project participant has no role in computing and furnishing the apportioned electricity generated for them or any other project developer. The above apportioning procedure for deriving the apportioned electricity generated by the project activity has been included only to bring clarity to the apportioning and overall monitoring procedure.

#### **Details of the monitoring equipment, QC/ QA procedures followed:**

- **Metering Equipment:** The metering equipment (main and check) are capable of recording and storing half hourly readings of all the electrical parameters with digital output.
- **Meter Readings:** The monthly meter readings (both main and check meters) are taken jointly by the parties each month. At the conclusion of each meter reading an appointed representative of MSETCL and WWIL sign a document indicating the number of Kilowatt-hours indicated by the main meter.

- **Inspection of Energy Meters:** the entire main and check energy meters (export and import) and all associated instruments, transformers installed at the Project are of 0.2% accuracy class. Each meter is jointly inspected and sealed on behalf of the Parties and is not to be interfered with by either Party except in the presence of the other Party or its accredited representatives.
- **Meter Test Checking:** the entire meter Test Checking: main and check meters are tested for accuracy with reference to a portable standard meter. The portable standard meter is owned by MSETCL. If during testing, both the Main and Check Meter are found within the permissible limit of error i.e. 0.2%, the energy computation will be as per the Main Meter. The consumption registered by the main meters alone will hold good for the purpose of metering electricity supplied to the grid as long as the error in the main meters is within the permissible limits.
- The main meter readings are apportioned based upon the LCS meter readings from the individual WTGs to compute net electricity supplied from individual WTGs. The LCS meter readings are archived electronically on continuous basis. Joint meter reading at the EB substation is noted each month. Therefore cumulative LCS meter reading for each month is used for purpose of allocation of net electricity supplied to the grid from the project activity.
- The LCS meters do not require calibration as the energy readings of electricity generated at the LCS meter is cross verified by the energy calculated by inverting system installed in the WEGs. In case there is any mismatch in the energy values recorded by the LCS meter and the energy values calculated by the inverting system; the machine will stop working and generate the error report. The operations and maintenance staff will attend to the problem immediately in order to identify the error and correction factor will be determined.

If during the meter test checking,

- The main meter is found to be within the permissible limit of error and the corresponding check meter is beyond the permissible limits, then the meter reading will be as per the main meter as usual. The check meter shall, however, be calibrated immediately.
- The main meter is found to be beyond permissible limits of error, but the corresponding check meter is found to be within permissible of error, then the meter reading for the month up to the date and time of such test shall be as per the check meter. There will be a revision in the meter reading for the period from the previous calibration test up to the current test based on the readings of the check meter. The main meter shall be calibrated immediately and meter reading for the period thereafter till the next monthly meter reading shall be as per the calibrated main meter.
- Both the main meters and the corresponding check meters are found to be beyond the permissible limits of error, both the main meters shall be immediately calibrated and the correction applied to the reading registered by the main meter to arrive the correct reading of energy supplied for metering electricity supplied to the grid for the period from the last month's meter reading up to the current test. Meter reading for the period thereafter till the next monthly reading shall be as per the calibrated main meter.
- If during any of the monthly meter readings, the variation between the main meter and the check meter is more than the permissible limit for meters of 0.2% accuracy class, all the meters shall be re-tested and calibrated immediately.

**Meter Details**

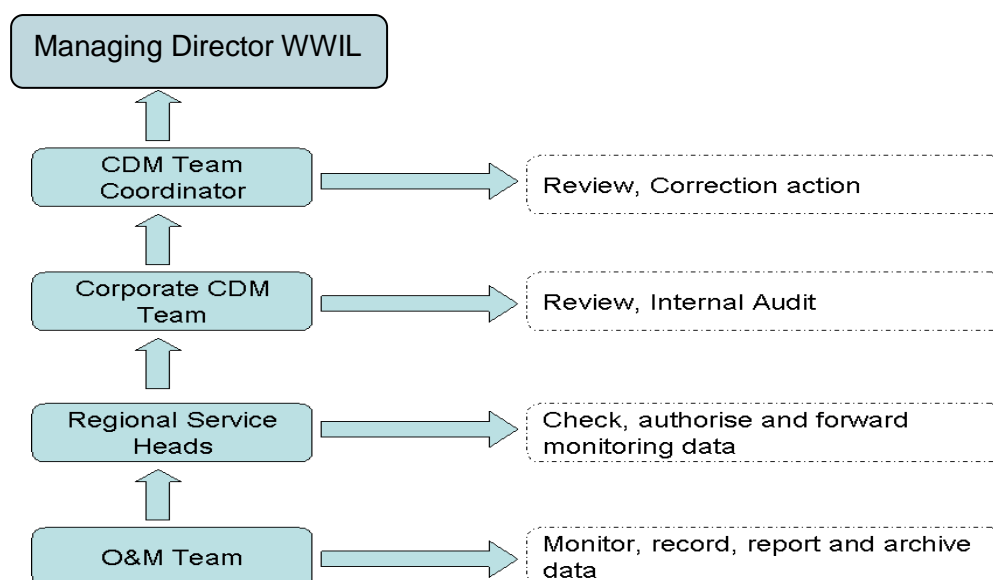
<i>Loc No</i>	<i>Total Capacity (MW)</i>	<i>Feeder</i>	<i>Meter Serial Number</i>	<i>Accuracy Class</i>	<i>Make</i>
526, 527	1.6	2	14831534 <sup>1</sup>	0.2	Elster
524, 525, 529	2.4				
523, 530	1.6				
513, 514, 516	2.4	3	14831529 <sup>2</sup>	0.2	Elster
517	0.8				
510, 512, 518, 519, 521	4.0				
507	0.8				
506	0.8				
504	0.8				
35 to 39	4.0	4	14831520 <sup>3</sup>	0.2	Elster
79	0.8	6	14831533 <sup>4</sup>	0.2	Elster

**Calibration Details**

The metering equipment are inspected & calibrated by state utility. Calibration details for the all the main and backup meters are provided below (the calibration of Main meter and back up meters is done on annual basis). The detail of meter calibration has been provided in Annex 1.

The line diagram showing all relevant monitoring points are in Annex 2.

The operational and management structure implemented by WWIL is as follows:

**STRUCTURE****RESPONSIBILITY**

<sup>1</sup> Old Meter Serial no. 4862979 was replaced with new ABT Meter bearing serial no. 14931527 on 01/08/2012 and the new meter was replaced with current meter bearing serial number 14831534 on 29/10/12

<sup>2</sup> Old Meter Serial no. 4862986 was replaced with new ABT Meter bearing serial no. 14931529 on 01/08/2012.

<sup>3</sup> Old Meter Serial no. 4862984 was replaced with new ABT Meter bearing serial no. 14931526 on 01/08/2012 and the new meter was replaced with current meter bearing serial number 14831520 on 29/10/12

<sup>4</sup> Old Meter Serial no. 4862987 was replaced with new ABT Meter bearing serial no. 14931524 on 31/07/2012 and the new meter was replaced with current meter bearing serial number 14831533 on 29/10/12

**Training procedure:** Training on the machine is an essential pre-requisite, to ensure necessary safety of man and machine. Further, in order to maximize the output from the Wind Energy Converters (WECs), it is extremely essential, that the engineers and technicians understand the machines and keep them in good health. In order to ensure, that WWIL's service staff is deft at handling technical snags on top of the turbine, the necessity of ensuring that they are capable of climbing the tower with absolute ease and comfort has been established. **The WWIL Training Academy** provides need-based training to meet the training requirements of WWIL projects. This includes emergency preparedness and handling of routine and non routine tasks so as to ensure 100% satisfactory service to the customers. The training is contemporary, which results in imparting focused knowledge leading to value addition to the attitude and skills of all trainees. This ultimately leads to creativity in problem solving.

Approved consolidated baseline and monitoring methodology ACM0002/ Version 11, Sectoral Scope: 1, "Consolidated baseline methodology for grid-connected electricity generation from renewable sources", by CDM - Meth Panel is proposed to be used to monitor the emission reductions.

## SECTION D. Data and parameters

### D.1. Data and parameters fixed ex ante or at renewal of crediting period

<b>Data/parameter:</b>	<b><math>EF_{OM,y}</math></b>
Unit	tCO <sub>2</sub> e/MWh
Description	Operating Margin Emission Factor of Western Regional Electricity Grid
Source of data	"CO <sub>2</sub> Baseline Database for Indian Power Sector", version 2 published by the Central Electricity Authority, Ministry of Power, Government of India.
Value(s) applied)	0.9985
Choice of data or measurement methods and procedures	"CO <sub>2</sub> Baseline Database for Indian Power Sector", version 2 published by the Central Electricity Authority, Ministry of Power, Government of India
Purpose of data	Baseline Emission Calculations
Additional comments	None

<b>Data/parameter:</b>	<b><math>EF_{BM,y}</math></b>
Unit	tCO <sub>2</sub> e/MWh
Description	Build Margin Emission Factor of Western Regional Electricity Grid
Source of data	"CO <sub>2</sub> Baseline Database for Indian Power Sector", version 2 published by the Central Electricity Authority, Ministry of Power, Government of India.
Value(s) applied)	<b>0.6300</b>
Choice of data or measurement methods and procedures	"CO <sub>2</sub> Baseline Database for Indian Power Sector", version 2 published by the Central Electricity Authority, Ministry of Power, Government of India
Purpose of data	Baseline Emission Calculations
Additional comments	None

<b>Data/parameter:</b>	<b><math>EF_{CM,y}</math></b>
Unit	tCO <sub>2</sub> e/MWh
Description	Combined Margin Emission Factor of Western Regional Electricity Grid
Source of data	"CO <sub>2</sub> Baseline Database for Indian Power Sector", version 2 published by the Central Electricity Authority, Ministry of Power, Government of India.
Value(s) applied)	0.90641
Choice of data or measurement methods and procedures	"CO <sub>2</sub> Baseline Database for Indian Power Sector", version 2 published by the Central Electricity Authority, Ministry of Power, Government of India

Purpose of data	Baseline Emission Calculations
Additional comments	None

## D.2. Data and parameters monitored

<b>Data/parameter:</b>	<b>EG<sub>y</sub></b>
Unit	MWh (Mega-Watt hour)
Description	Net electricity supplied to the grid by the machines of the Project
Measured/calculated/default	Calculated as the difference of EG <sub>Export</sub> and EG <sub>Import</sub>
Source of data	The break-up sheet based on Joint Meter Reading (JMR) prepared & signed by DISCOM. The net electricity supplied to the grid can be cross checked from the invoices raised on the state utility.
Value(s) of monitored parameter	113392.76 MWh
Monitoring equipment	The details have been provided in the tabular form in section C.
Measuring/reading/recording frequency:	Calculated on Monthly basis
Calculation method (if applicable):	Please refer to Section C for the procedure.
QA/QC procedures:	QA/QC procedures will be as implemented by MSETCL pursuant to the provisions of the power purchase agreement. Refer Section C for an illustration of the provisions for QA/QC procedures.
Purpose of data:	Baseline Emission Calculations
Additional comments:	The data will be archived for crediting period + 2 years.

<b>Data/parameter:</b>	<b>N</b> <b><math>\sum_{y=0} EG_{gross,y}</math></b>
Unit	MWh (Mega-watt hour)
Description	Summation of EG <sub>gross, y</sub> is the electricity generated from wind turbines of the project activity measured through its panel located in WTG tower.
Measured/calculated/default	Measured
Source of data	Monthly operating logs recorded in electronic format by EPC contractor
Value(s) of monitored parameter	118392.67 MWh
Monitoring equipment	The value is recorded continuously by the online monitoring station. This reading can also be seen in the electronic panel installed inside the WEG tower. The LCS meters do not require calibration as the energy readings of electricity generated at the LCS meter is cross verified by the energy calculated by inverting system installed in the WEGs. In case there is any mismatch in the energy values recorded by the Panel meter and the energy values calculated by the inverting system; the machine will stop working and generate the error report. The operations and maintenance staff will attend to the problem immediately in order to identify and correct the error.
Measuring/reading/recording frequency:	Monthly Recording
Calculation method (if applicable):	NA

QA/QC procedures:	This data parameter will be logged electronically on a monthly basis by EPC contractor on its online portal. The value of this parameter shall be compared with the value of EG <sub>y</sub> and the conservative approach would be taken by the PP for estimating the net electricity supplied value for the calculation of emission reduction.
Purpose of data:	Calculation of baseline emissions
Additional comments:	The data will be archived for crediting period + 2 years.

<b>Data/parameter:</b>	<b>EG<sub>Export</sub></b>
Unit	MWh (Mega-Watt hour)
Description	Electricity exported by the project activity to the grid
Measured/calculated/default	Calculated as per empirical formula given in section C
Source of data	The break-up sheet based on Joint Meter Reading (JMR) prepared & signed by DISCOM.
Value(s) of monitored parameter	113603.79 MWh
Monitoring equipment	Calculated as per empirical formula given in section C
Measuring/reading/recording frequency:	Monthly Recording
Calculation method (if applicable):	Detailed calculation has been explained in section C
QA/QC procedures:	Refer Section C for an illustration of the provisions for QA/QC procedures.
Purpose of data:	Calculation of baseline emissions
Additional comments:	The data will be archived for crediting period + 2 years.

<b>Data/parameter:</b>	<b>EG<sub>Import</sub></b>
Unit	MWh (Mega-Watt hour)
Description	Electricity Import by the project activity from the grid
Measured/calculated/default	Calculated as per empirical formula given in section C
Source of data	The break-up sheet based on Joint Meter Reading (JMR) prepared & signed by DISCOM.
Value(s) of monitored parameter	211.03 MWh
Monitoring equipment	Calculated as per empirical formula given in section C
Measuring/reading/recording frequency:	Monthly Recording
Calculation method (if applicable):	Detailed calculation has been explained in section C
QA/QC procedures:	Refer Section C for an illustration of the provisions for QA/QC procedures.
Purpose of data:	Calculation of baseline emissions
Additional comments:	The data will be archived for crediting period + 2 years.

### D.3. Implementation of sampling plan

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Not Applicable

## SECTION E. Calculation of emission reductions or GHG removals by sinks

**E.1. Calculation of baseline emissions or baseline net GHG removals by sinks**

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As described in the registered PDD, the baseline emission ( $BE_y$ ) =  $EG_y \cdot EF_y$

Where,

**BE** is baseline emissions in year y, tCO<sub>2</sub>e

**EG<sub>y</sub>** is the net electricity supplied to the grid in year y and is applied directly from the month credit notes and can be cross-checked by the invoices raised to the State Utility.

**EF<sub>y</sub>** is the CO<sub>2</sub> emission factor of the grid (0.90641 tCO<sub>2</sub>e/ MWh; fixed ex-ante).

Therefore, Baseline Emission calculation for the period of 01/04/2012 to 31/12/2012:

$$\text{Baseline Emission (BE}_y\text{)} = EG_y \cdot EF_y$$

$$\text{Where, } EG_y = EG_{\text{Export}} - EG_{\text{Import}} = 113392.76 \text{ MWh}$$

Therefore,

$$\begin{aligned} \text{Baseline Emission (BE}_y\text{)} &= 113392.76 \text{ (MWh)}^5 \cdot 0.90641 \text{ (tCO}_2\text{/MWh)} \\ &= 102,778 \text{ tCO}_2 \end{aligned}$$

**E.2. Calculation of project emissions or actual net GHG removals by sinks**

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The project activity uses wind power to generate electricity and hence the emissions from the project activity have been taken as zero.

$$PE_y = 0$$

**E.3. Calculation of leakage**

&gt;&gt;

No leakage has been considered from the project activity as per the approved methodology ACM0002.

$$L_y = 0$$

**E.4. Summary of calculation of emission reductions or net GHG removals by sinks**

Item	Baseline emissions or baseline net GHG removals by sinks (t CO <sub>2</sub> e)	Project emissions or actual net GHG removals by sinks (t CO <sub>2</sub> e)	Leakage (t CO <sub>2</sub> e)	GHG emission reductions or net GHG removals by sinks (t CO <sub>2</sub> e) achieved in the monitoring period		
				Up to 31/12/2012	From 01/01/2013	Total amount
01/01/2013-31/12/2013	34,652	0	0	NA	34,652	34,652
01/01/2014-31/12/2014	26,144	0	0	NA	26,144	26,144

<sup>5</sup>Net electricity supplied to the grid as discussed in the section C.

Item	Baseline emissions or baseline net GHG removals by sinks (t CO <sub>2</sub> e)	Project emissions or actual net GHG removals by sinks (t CO <sub>2</sub> e)	Leakage (t CO <sub>2</sub> e)	GHG emission reductions or net GHG removals by sinks (t CO <sub>2</sub> e) achieved in the monitoring period		
				Up to 31/12/2012	From 01/01/2013	Total amount
01/01/2015-31/12/2015	23,923	0	0	NA	23,923	23,923
01/01/2016-31/12/2016	17,518	0	0	NA	17,518	17,518
01/01/2017-28/02/2017	541	0	0	NA	541	541
<b>Total</b>	102,778	0	0	NA	102,778	102,778

**E.5. Comparison of actual emission reductions or net GHG removals by sinks with estimates in registered PDD**

Item	Values estimated in ex ante calculation of registered PDD	Actual values achieved during this monitoring period
Emission reductions or GHG removals by sinks (t CO <sub>2</sub> e)	138,874	102,778

**E.6. Remarks on difference from estimated value in registered PDD**

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The CERs for the current monitoring period is 26% lower than the estimated volume in the PDD. This is primarily due to seasonal nature of wind power projects. During the monitoring period CERs are low due to considerably low monsoon availability and low wind availability leading to low PLF. As calculated, PLF of project activity during the monitoring period (01/01/2013 – 28/02/2017) comes out 15.54%, which is well below than the annual PLF of 21% as mentioned under the registered PDD, which clearly shows the low wind availability of wind and less generation and correspondingly less CERs as compared to estimated value in registered PDD.

## Appendix 1. Contact information of project participants and responsible persons/entities

<b>Project participant and/or responsible person/ entity</b>	<input checked="" type="checkbox"/> Project participant <input checked="" type="checkbox"/> Person/entity responsible for completing the CDM-MR-FORM
<b>Organization name</b>	Wind World (India) Limited
<b>Street/P.O. Box</b>	A-9, Veera Industrial Estate, Veera Desai Road, Andheri (W)
<b>Building</b>	Wind World Tower
<b>City</b>	Mumbai
<b>State/region</b>	Maharashtra
<b>Postcode</b>	400 053
<b>Country</b>	India
<b>Telephone</b>	+91-22-6692 4848
<b>Fax</b>	+91-22 - 67040473 / 66921175
<b>E-mail</b>	<a href="mailto:yogeshh.mehra@windworldindia.com">yogeshh.mehra@windworldindia.com</a>
<b>Website</b>	<a href="http://www.windworldindia.com">www.windworldindia.com</a>
<b>Contact person</b>	
<b>Title</b>	Managing Director
<b>Salutation</b>	Mr.
<b>Last name</b>	Mehra
<b>Middle name</b>	
<b>First name</b>	Yogeshh
<b>Department</b>	Corporate
<b>Mobile</b>	+91-98200 40301
<b>Direct fax</b>	+91-22-6692 1177
<b>Direct tel.</b>	+91-22-6702 2832
<b>Personal e-mail</b>	<a href="mailto:yogeshh.mehra@windworldindia.com">yogeshh.mehra@windworldindia.com</a>

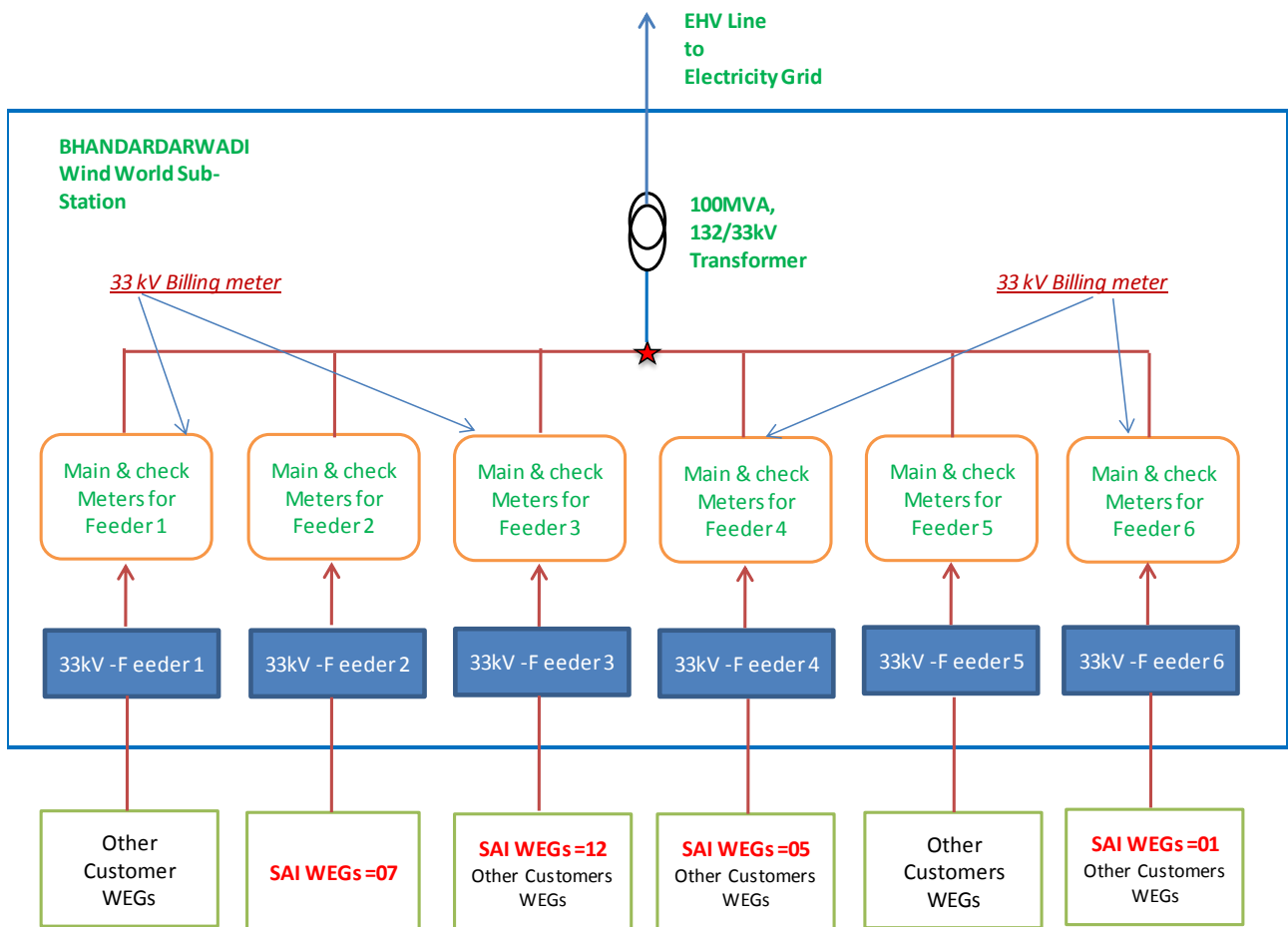
**Annex 1 Meter Calibration Detail**

<i>Loc No</i>	<i>Total Capacity (MW)</i>	<i>Feeder</i>	<i>Meter Serial Number</i>	<i>Accuracy Class</i>	<i>Make</i>	<i>Calibration Date</i>					
526, 527	1.6	2	14831534	0.2	Elster	01-Aug-12	29-Oct-12	16-Jan-14	07-Mar-15		14-Dec-16
524, 525, 529	2.4										
523, 530	1.6										
513, 514, 516	2.4	3	14831529	0.2	Elster	01-Aug-12		16-Jan-14	21-May-15		14-Dec-16
517	0.8										
510, 512, 518, 519, 521	4.0										
507	0.8										
506	0.8										
504	0.8										
35 to 39	4.0	4	14831520	0.2	Elster	01-Aug-12	29-Oct-12	19-Nov-13	07-Mar-15	05-Sep-15	14-Dec-16
79	0.8	6	14831533	0.2	Elster	20-Jun-12	29-Oct-12	19-Nov-13	02-Feb-15	28-Aug-15	14-Dec-16

Note: As per Guidelines for assessing compliance with the calibration frequency requirements, (VVS Version 09.0 para 395 (a)) states that: “Applying the maximum permissible error of the instrument to the measured values taken during the period between the scheduled date of calibration and the actual date of calibration, if the results of the delayed calibration do not show any errors in the measuring equipment, or if the error is smaller than the maximum permissible error;

Feeder	Calibration Due Date	Calibration Date	Correction Factor Applied( for Months)	Calibration Due Date	Calibration Date	Correction Factor Applied( for Months)	Calibration Due Date	Calibration Date	Correction Factor Applied( for Months)
2	28-Oct-12	16-Jan-14	Oct-13 to Jan-14	15-Jan-15	07-Mar-15	Jan-15 to Mar-15	06-Mar-16	14-Dec-16	Mar-16 to Dec-16
3	28-Oct-12	16-Jan-14	Aug-13 to Jan-14	15-Jan-15	21-May-15	Jan-15 to May-15	20-May-16	14-Dec-16	May-16 to Dec-16
4	28-Oct-12	19-Nov-13	Oct-13 to Nov-13	18-Nov-14	07-Mar-15	Nov-14 to Mar-15	04-Sep-16	14-Dec-16	Sep-16 to Dec-16
6	28-Oct-12	19-Nov-13	Oct-13 to Nov-13	18-Nov-14	02-Feb-15	Nov-14 to Feb-15	27-Aug-16	14-Dec-16	Aug-16 to Dec-16

## Annex 2 Line diagram showing relevant metering points



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**Document information**

<i>Version</i>	<i>Date</i>	<i>Description</i>
05.1	4 May 2015	Editorial revision to correct version numbering.
05.0	1 April 2015	Revisions to: <ul style="list-style-type: none"> <li>• Include provisions related to delayed submission of a monitoring plan;</li> <li>• Provisions related to the Host Party;</li> <li>• Remove reference to programme of activities;</li> <li>• Overall editorial improvement.</li> </ul>
04.0	25 June 2014	Revisions to: <ul style="list-style-type: none"> <li>• Include the Attachment: Instructions for filling out the monitoring report form (these instructions supersede the "Guideline: Completing the monitoring report form" (Version 04.0));</li> <li>• Include provisions related to standardized baselines;</li> <li>• Add contact information on a responsible person(s)/ entity(ies) for completing the CDM-MR-FORM in A.6 and Appendix 1;</li> <li>• Change the reference number from <i>F-CDM-MR</i> to <i>CDM-MR-FORM</i>;</li> <li>• Editorial improvement.</li> </ul>
03.2	5 November 2013	Editorial revision to correct table in page 1.
03.1	2 January 2013	Editorial revision to correct table in section E.5.
03.0	3 December 2012	Revision required to introduce a provision on reporting actual emission reductions or net GHG removals by sinks for the period up to 31 December 2012 and the period from 1 January 2013 onwards (EB70, Annex 11).
02.0	13 March 2012	Revision required to ensure consistency with the "Guidelines for completing the monitoring report form" (EB 66, Annex 20).
01	28 May 2010	EB 54, Annex 34. Initial adoption.
Decision Class: Regulatory Document Type: Form Business Function: Issuance Keywords: monitoring report		