



## Monitoring report form (Version 03.2)

### Monitoring report

<b>Title of the project activity</b>	Bundled wind energy power projects (2003 policy) in Rajasthan
<b>Reference number of the project activity</b>	1167
<b>Version number of the monitoring report</b>	1.0
<b>Completion date of the monitoring report</b>	18/06/2014
<b>Registration date of the project activity</b>	17/05/2011
<b>Monitoring period number and duration of this monitoring period</b>	Monitoring period number: Third Monitoring period duration: 01/10/2012 to 31/03/2014 (Inclusive of both days)
<b>Project participant(s)</b>	Wind World (India) Limited
<b>Host Party(ies)</b>	India
<b>Sectoral scope(s) and applied methodology(ies)</b>	Sectoral Scope: 1, Energy industries (renewable / non-renewable sources)  Methodology: ACM0002 / Version 06  Title: Approved baseline and monitoring methodology title "Consolidated monitoring methodology for zero-emissions grid-connected electricity generation from renewable sources"
<b>Estimated amount of GHG emission reductions or net anthropogenic GHG removals by sinks for this monitoring period in the registered PDD</b>	75,110 tonnes of CO <sub>2</sub> e
<b>Actual GHG emission reductions or net anthropogenic GHG removals by sinks achieved in this monitoring period</b>	42,388 tonnes of CO <sub>2</sub> e.
<b>Actual GHG emission reductions or net anthropogenic GHG removals by sinks achieved during the period up to 31 December 2012(if applicable)</b>	3,718 tonnes of CO <sub>2</sub> e.
<b>Actual GHG emission reductions or net anthropogenic GHG removals by sinks achieved during the period from 1 January 2013 onwards (if applicable).</b>	38,670 tonnes of CO <sub>2</sub> e.

**SECTION A. Description of project activity****A.1. Purpose and general description of project activity**

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**Purpose of the project activity and the measures taken to reduce greenhouse gas emissions:**

Bundled wind energy power projects of 29.76 MW ("Project") is installed in the state of Rajasthan and provides reliable, renewable power to the Rajasthan state electricity grid. The Project leads to reduction of greenhouse gas emissions because it displaces electricity from fossil fuel based electricity generation plants. The Project harnesses renewable resources in the region, and thereby displacing non-renewable natural resources thereby ultimately leading to sustainable economic and environmental development. Wind World (India) Ltd<sup>1</sup> is the equipment supplier and the operations and maintenance contractor for the Project. The generated electricity is supplied to the utility (Discom) under a long-term power purchase agreement (PPA). The details of the sub-projects comprising the Project are as under:

SN	Name of the Customer	M/C Model	Capacity of M/C	No. of M/C	Capacity (MW)
1	Enercon Wind Farm (Rajasthan) Pvt. Ltd.	E-48	0.8	30	24
2	Modular Power	E-30	0.23	1	0.23
3	Vijay Traders	E-30	0.23	1	0.23
4	Vijay Developers	E-30	0.23	1	0.23
5	Vikas Agencies	E-30	0.23	1	0.23
6	G. C. Chemie Pharmie Ltd.	E-30	0.23	1	0.23
7	Cooper Metals Pvt. Ltd.	E-30	0.23	2	0.46
8	Kataria Infrastructure Corporation	E-40	0.6	1	0.6
9	D.P.Power	E-30	0.23	1	0.23
10	Kataria Infrastructure Corporation	E-30	0.23	1	0.23
11	Kataria Wires	E-30	0.23	1	0.23
12	Ratlam Wires	E-30	0.23	1	0.23
13	Kwality Tobacco Products	E-30	0.23	1	0.23
14	D P Power	E-40	0.6	1	0.6
15	Unique Power Corporation	E-40	0.6	1	0.6
16	P.V.Chandran	E-40	0.6	1	0.6
17	Srinivaas Sirigeri	E-40	0.6	1	0.6
		<b>Total Capacity (MW)</b>		<b>47</b>	<b>29.76</b>

**Brief description of the installed technology and equipments:**

The Project involves 30 wind energy converters (WECs) of Wind World make 800 kW E-48, 4 WECs of Wind World make 600 kW E-40 and 13 WECs of Wind World make 230 kW E-30 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 ± 12.5%. The other salient features of the state-of-art-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 drawal (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%.

<sup>1</sup> With effect from 01/01/2013 name of Enercon (India) Limited has been changed to 'Wind World (India) Limited'

- 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 System.
- 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.

Wind World (India) Ltd has secured and facilitated the technology transfer for wind based renewable energy generation from Enercon GmbH, has established a manufacturing plant at Daman in India, where along with other components the "Synchronous Generators" using "Vacuum Impregnation" technology are manufactured.



**Technology Diagram**

#### **Relevant dates for the project activity:**

The date of placement of purchase order for the first project in the bundle is 30 April, 2003. The first machine under the project activity was commissioned on 29/07/2003 and the last machine under the project activity was commissioned on 29/05/2005. The expected operational lifetime of the project is for 20 years. The crediting period of the project activity commenced on 17/05/2011. This is the third monitoring report. The details of issuance of CERs for the previous monitoring periods are as follows:

Monitoring Period No.	Monitoring Period	CER Issued
First Issuance	17/05/2011 – 31/10/2011 (Inclusive of both days)	17,809
Second issuance	1/11/2011 to 30/09/2012 (Inclusive of both days)	35,260

#### **Total emission reductions achieved in this monitoring period**

This is the third monitoring report for the project activity. The total emission reductions achieved under the monitoring period 1/10/2012 to 31/03/2014 (Inclusive of both days) is 42,388 tCO<sub>2</sub>e.

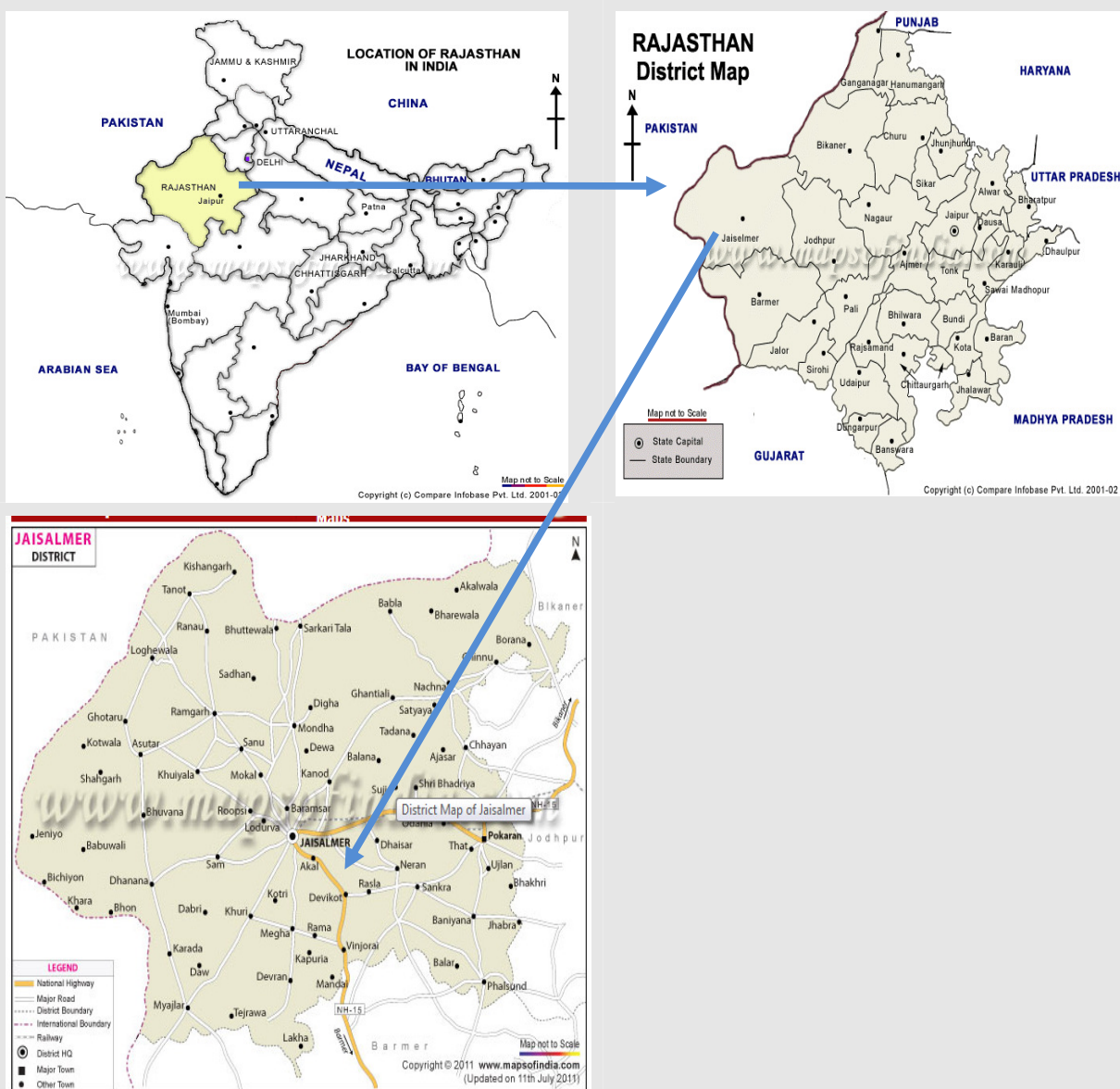
#### **A.2. Location of project activity**

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- Host Party(ies);*  
India
- Region/State/Province, etc.;*  
Rajasthan State
- City/Town/Community, etc.;*  
Kita. Bhu, Sodabhandhan and Temdarai villages in Jaisalmer district of Rajasthan of India.
- Physical/ Geographical location.*

The detailed individual WECs location numbers and coordinates of project activity are provided in Appendix 1.

A location map is provided below:



### 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 if the Party involved wishes to be considered as project participant (Yes/No)
Government of India (host)	Wind World (India) Limited (Private Entity)	No

### A.4. Reference of applied methodology

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The approved consolidated baseline and monitoring methodology ACM0002, Version 6.0 (19 May, 2006) has been used. The title of the baseline and monitoring methodologies are "Consolidated baseline methodology for grid – connected electricity generation from renewable sources" and "Consolidated monitoring methodology for grid – connected electricity generation from renewable sources".

The tool used for the project is as follows:

“Tool for the demonstration and assessment of additionality” version 3.0

References:

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

<http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-01-v3.pdf>

#### 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 17/05/2011 and length of crediting period is from 17/05/2011 to 16/05/2021 (first and last days included).

### SECTION B. Implementation of project activity

#### B.1. Description of implemented registered project activity

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The start date of the project activity is 30 April, 2003, which is the date of placement of purchase order for the first project in the bundle. The first machine under the project activity was commissioned on 29/07/2003 and last machine under the project activity was commissioned on 29/05/2005. The commissioning dates for all the machines included in the project activity are given in the table below:

S. No.	Name of customers	Unique Identification no.	Type of M/C	No. of M/C	Capacity (MW)	Date of Commissioning
1	Enercon Wind Farm Rajasthan	EW RPL 01	0.80	30	24	29/05/2005
		EW RPL 02				
		EW RPL 03				
		EW RPL 04				
		EW RPL 05				
		EW RPL 06				
		EW RPL 07				
		EW RPL 08				
		EW RPL 09				
		EW RPL 10				
		EW RPL 11				
		EW RPL 12				
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		EW RPL 23				
		EW RPL 24				
		EW RPL 25				
		EW RPL 26				
		EW RPL 27				
		EW RPL 28				
		EW RPL 29				
		EW RPL 30				

2	Jitendra K. Newaskar (formerly Prerna Pharma Intermediates Pvt. Ltd.)	PPIPL-01	0.23	1	0.23	29/03/2004
3	Modular Power	MPPL -01	0.23	1	0.23	29/03/2004
4	Vijay Traders	VT -01	0.23	1	0.23	29/03/2004
5	Vijay Developers	VD-01	0.23	1	0.23	29/03/2004
6	Vikas Agencies	VA-01	0.23	1	0.23	29/03/2004
7	G. C. Chemie Pharmie Ltd.	GCCPL -01	0.23	1	0.23	29/03/2004
8	Cooper Metals Pvt. Ltd.	CMPL-01	0.23	2	0.46	29/03/2004 & 12/06/2004
		CMPL-02				
9	Kataria Infrastructure Corporation	KIC -01	0.60	1	0.60	29/07/2003
10	Dempo Industries Pvt. Ltd. (has been de- commissioned)	DIPLG-01	0.60	1	0.60	10/03/2004
11	D.P. Power	DPP -01	0.23	1	0.23	29/07/2003
12	Kataria Infrastructure Corporation	KIC -02	0.23	1	0.23	29/07/2003
13	Kataria Wires	KWPL -02	0.23	1	0.23	29/07/2003
14	Ratlam Wires	RWPL -02	0.23	1	0.23	29/07/2003
15	Kwality Tobacco Products	KTP -01	0.23	1	0.23	29/07/2003
16	D P Power	DPP-02	0.60	1	0.60	30/06/2004
17	Unique Power Corporation	UPC-01	0.60	1	0.60	30/06/2004
18	P.V. Chandran	PVC -01	0.60	1	0.60	30/11/2003
19	Srinivaas Sirigeri	SS -01	0.60	1	0.60	03/03/2004

There are no changes that have happened in project activity which may impact the applicability of the methodology. The operation and maintenance activities of Wind World are ISO certified and all the events are recorded in the log book available at the project site. Referring to the data available it can be inferred that there have not been any major special events of breakdown for any of the 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. During the monitoring period there were no events or situation occurred, which may impact the applicability of the methodology.

## **B.2. Post registration changes**

### **B.2.1. Temporary deviations from registered monitoring plan or applied methodology**

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There is no deviation from registered monitoring plan or applied methodology during this monitoring period.

### **B.2.2. Corrections**

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There are no corrections from the registered PDD during this monitoring period.

#### **B.2.3. Permanent changes from registered monitoring plan or applied methodology**

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The registered monitoring plan is in line with the monitoring plan implemented for the project activity. However, to bring more clarity on the monitoring plan according to the real scenario, the other parameters as monitored along with EGy (as referred in the registered monitoring plan) have also been described in details along with the apportionment procedure followed for the project activity. The details of the apportionment procedure have been described in the section C & D.

#### **B.2.4. Changes to project design of registered project activity**

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The original capacity of the project was 30.59 MW at the time of project commissioning. Afterwards, from this bundle, the sub-project comprising of one WEC of 0.6 MW by Dempo Industries Pvt. Ltd. has been decommissioned and the ownership of the sub – project comprising of one WEC of 0.23 MW by Perna Pharma Intermediates Pvt. Ltd. has been changed to Jitendra K. Newaskar. Dempo Industries Pvt. Ltd. decided to decommission this sub – project (one WEC) due to shortfall in generation of power during the project operational period. The change in ownership of this sub – project (one WEC) from M/s. Perna Pharma Intermediates Pvt. Ltd. to M/s. Jitendra K. Newaskar was a normal business decision. These changes in project design of registered project activity was approved by UNFCCC on 02/11/2012 ( Link: <http://cdm.unfccc.int/Projects/DB/SGS-UKL1181738388.43/view> ).

#### **B.2.5. Changes to start date of crediting period**

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There are no changes to the start date of the crediting period.

#### **B.2.6. Types of changes specific to afforestation or reforestation project activity**

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Not applicable to the project activity.

### **SECTION C. Description of monitoring system**

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Approved monitoring methodology ACM0002/ Version 06, 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.

*In order to determine the net electricity supplied to the grid by the project, the following procedure is followed:*

All the WECs of the Project along with the other wind firms are connected to the backup/check meter at Temderai sub-station, which is further connected to the Sub-station at Amarsagar at 220 kV. The generation readings of all WECs of all the customers are collectively displayed at this Main Billing meter at 220 kV Amarsagar substation. Therefore, the main meter reading reflects the aggregate electricity supplied by all these wind farms, including the project activity. Representatives of Discom and Wind World will jointly take the main meter reading at Amarsagar and sign the meter reading on the first day of every month. Simultaneously, the joint meter reading of the backup metering system at Temderai substation will also be taken by representatives of the Discom and Wind World.



To calculate the net amount of electricity generation from each wind turbine, apportionment of this collective meter reading of the main billing meter (recorded at Main meter 1 & Main meter 2) is done on the basis of the controller panel reading at the individual wind turbine end. This controller panel reading is recorded and maintained by Wind World.

The apportionment procedure has been explained as follows:

$EG_{JMR, Export}$	= Electricity exported, as recorded by the main meter at the substation
$EG_{JMR, Import}$	= Electricity imported, as recorded by the main meter at the substation
$EG_{Controller, Export}$	= Electricity exported by a WEC, as measured at the controller
$\Sigma EG_{Controller, Export}$	= Electricity exported by all the WECs connected to the main meter at the substation, measured at the controller of each WEC
$EG_{WEC, Export}$	= Electricity exported by a WEC to the grid, calculated
$EG_{WEC, Import}$	= Electricity imported by a WEC from the grid, calculated

Electricity exported by each WEC is apportioned on the basis of electricity export recorded at the controller of each WEC and the electricity export at the main meter as mentioned in the JMR. The export multiplication factor is calculated as follows:

$$\text{Export Multiplication factor} = EG_{JMR, Export} / \Sigma EG_{Controller, Export} \dots\dots\dots(1)$$

Therefore, the energy exported by a WEC to the grid is calculated as:

$$EG_{WEC, Export} = \text{Export Multiplication factor} \times EG_{Controller, Export} \dots\dots\dots(2)$$

As the controller meter doesn't record import, the apportioning of energy import by each WEC is also done on the basis of electricity exported recorded at the controller of each WEC and the electricity import at the main meter as mentioned in the JMR. The import multiplication factor is calculated as follows:

$$\text{Import Multiplication factor} = EG_{JMR, Import} / \Sigma EG_{Controller, Export} \dots\dots\dots(3)$$

Therefore, the energy imported by a WEC to the grid is calculated as:

$$EG_{WEC, Import} = \text{Import Multiplication factor} \times EG_{Controller, Export} \dots\dots\dots(4)$$

Hence, the net electricity exported by a WEC of the project is calculated as:

$$EG_{WEC, Export} - EG_{WEC, Import}$$

The net electricity exported by all the WECs of the project activity is calculated as:

$$\begin{aligned} EG_y &= \Sigma EG_{WEC, Export} - \Sigma EG_{WEC, Import} \\ &= EG_{Export} - EG_{Import} \end{aligned}$$

Where,

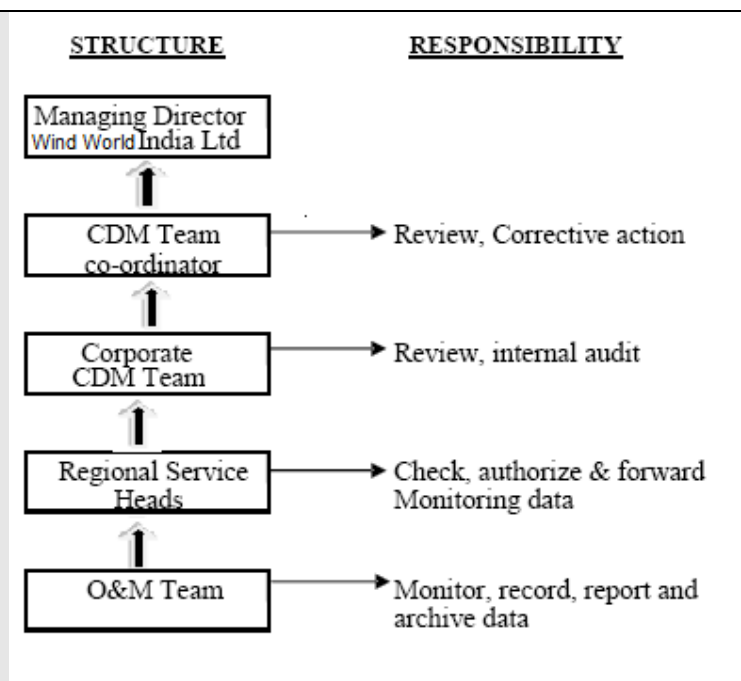
$\Sigma EG_{WEC, Export}$  = Export from all the WECs under the project activity

$\Sigma EG_{WEC, Import}$  = Import from all the WECs under the project activity

The summation is done considering the WECs which belong to the project activity.

The Project is operated and managed by Wind World (India) Ltd. According to the above mentioned procedure, the monthly credit notes are issued and the invoices are raised to the respective DISCOM and the copies are archived electronically as well as on paper. These documents are used for calculation of the emission reduction and cross checking of data. The operational and management structure implemented by Wind World is as follows:





The details of the metering arrangement have been described below:

#### **Metering:**

- The project along with the other wind firms are connected to grid through common metering point (backup meter) at Temderai substation and further connected to Amarsagar sub-station (EB main meter), where metering is done for billing purpose. The line diagram of the relevant metering points has been shown below as Appendix 2.

#### **Meter Reading:**

- Representatives of Discom and Wind World India will jointly take the main reading and sign the meter reading on the first day of every month at Temderai and Amarsagar substation.
- The export, import and net electricity supplied to the grid by individual customer will be sourced from the credit notes and can be cross-checked with the invoices raised to the DISCOM and will be used for calculation of emission reduction.

#### **Metering Equipment:**

- The meters used are Tri-vector of accuracy class 0.2 and the manufacturer is the Secure Meters Ltd. The meters are two-way meters and measure the electricity import and export.

#### **Meter Test Checking:**

- The main and backup/ check meters will jointly inspected/tested once in a year as per the terms of the PPA.
- The LCS meters (for panel reading) 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 WECs. 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.

**Inspection of Energy Meters:**

- In case the meters are found to operate outside the permissible limits, the meters will be either replaced immediately or calibrated. Whenever a main meter goes defective, the consumption recorded by the backup meter will be referred.
- The main and the backup metering systems will be sealed in presence of representatives of Wind World India and RRVPNL/Jodhpur Discom.

**Calibration Details**

The metering equipments were inspected & calibrated by state utility. Meter details for the all the main and backup meters are as follows:-

Meter description	Serial No.	Make	Accuracy class	Metering point	2012	2013-14	
					Calibration Dates	Calibration Dates	Validity Dates
Main meter (Line I)	TNU0094 6	Secure	0.2	Amarsagar Substation	26-12-2012	26-12-2013	25-12-2014
Backup meter (Line I)	RJB00052	Secure	0.2	Temdarai Substation	28-12-2012	28-12-2013	27-12-2014
Main meter (Line II)	TNU0094 5	Secure	0.2	Amarsagar Substation	26-12-2012	26-12-2013	25-12-2014
Backup meter (Line II)	ABB00691	Secure	0.2	Temdarai Substation	28-12-2012	28-12-2013	27-12-2014

The main and the backup meters are calibrated once each year. The LCS meters are 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 WECs. 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. Therefore there is no data uncertainty.

**Training and maintenance:**

In order to ensure that Wind World's staffs who are positioned to take care all the activities starting from project construction to operation and maintenance, Wind World Training Academy provides need based periodical training to meet the requirements of the project. The training is contemporary, which results in imparting focused knowledge leading to value addition to the attitude and skills of all the trainees. The training facility is located at Daman and is fully functional and equipped with qualified trainers, training equipments, classrooms and hostel facilities.

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

Data/Parameter	$EF_{OM, y}$
Unit	tCO <sub>2</sub> e/MWh
Description	Operating Margin Emission Factor of Northern Regional Electricity Grid

<b>Source of data</b>	<p>“CO<sub>2</sub> Baseline Database for Indian Power Sector”, version 01.1 published by the Central Electricity Authority, Ministry of Power, Government of India.</p> <p>The “CO<sub>2</sub> Baseline Database for Indian Power Sector”, version 01.1 is available at <a href="http://www.cea.nic.in">www.cea.nic.in</a>.</p>						
<b>Value(s) applied</b>	<table border="1"> <tr> <td>2002 – 03</td><td>0.9993</td></tr> <tr> <td>2003 – 04</td><td>0.9869</td></tr> <tr> <td>2004 – 05</td><td>0.9756</td></tr> </table>	2002 – 03	0.9993	2003 – 04	0.9869	2004 – 05	0.9756
2002 – 03	0.9993						
2003 – 04	0.9869						
2004 – 05	0.9756						
<b>Purpose of data</b>	Calculation of Baseline Emissions						
<b>Additional comment</b>	None						

<b>Data/Parameter</b>	<b><math>EF_{BM,y}</math></b>		
<b>Unit</b>	tCO <sub>2</sub> e/MWh		
<b>Description</b>	Build Margin Emission Factor of Northern Regional Electricity Grid		
<b>Source of data</b>	<p>“CO<sub>2</sub> Baseline Database for Indian Power Sector”, version 01.1 published by the Central Electricity Authority, Ministry of Power, Government of India.</p> <p>The “CO<sub>2</sub> Baseline Database for Indian Power Sector”, version 01.1 is available at <a href="http://www.cea.nic.in">www.cea.nic.in</a>.</p>		
<b>Value(s) applied</b>	<table border="1"> <tr> <td>2004 – 05</td><td>0.5335</td></tr> </table>	2004 – 05	0.5335
2004 – 05	0.5335		
<b>Purpose of data</b>	Calculation of Baseline Emissions		
<b>Additional comment</b>	None		

<b>Data/Parameter</b>	<b><math>EF_{CM,y}</math></b>
<b>Unit</b>	tCO <sub>2</sub> e/MWh
<b>Description</b>	Combined Margin Emission Factor of Northern Regional Electricity Grid
<b>Source of data</b>	<p>“CO<sub>2</sub> Baseline Database for Indian Power Sector”, version 01.1 published by the Central Electricity Authority, Ministry of Power, Government of India.</p> <p>The “CO<sub>2</sub> Baseline Database for Indian Power Sector” is available at <a href="http://www.cea.nic.in">www.cea.nic.in</a>.</p>
<b>Value(s) applied</b>	0.87387
<b>Purpose of data</b>	Calculation of Baseline Emissions
<b>Additional comment</b>	None

## D.2. Data and parameters monitored

<b>Data/Parameter</b>	<b>EG<sub>y</sub></b>
<b>Unit</b>	MWh (Mega-Watt hour)
<b>Description</b>	Net electricity supplied to the grid by the Project
<b>Measured/Calculated /Default</b>	Calculated
<b>Source of data</b>	Calculated as the difference of EG <sub>Export</sub> and EG <sub>Import</sub> and sourced from the monthly credit notes. This value can be cross-checked from the invoices raised to the DISCOM.
<b>Value(s) of monitored parameter</b>	48,505.907 MWh
<b>Monitoring equipment</b>	Calculated as per the procedures shown in section C.
<b>Measuring/Reading/ Recording frequency</b>	Monthly basis

<b>Calculation method (if applicable)</b>	<p>The net electricity supply is calculated as follows:</p> $= (EG_{\text{Export}} - EG_{\text{Import}})$ <p>This value is directly used for calculation of emission reduction. Detailed procedures have been described in section C.</p>
<b>QA/QC procedures</b>	<p>Details of the QA/QC procedures have been described in section C.</p> <p>The data will be archived electronically as well as on paper. The data will be kept for the period up to two years after the completion of the crediting period.</p>
<b>Purpose of data</b>	Calculation of Baseline Emissions
<b>Additional comment</b>	None

<b>Data/Parameter</b>	<b>EG<sub>JMR, Export</sub></b>
<b>Unit</b>	MWh (Mega-Watt hour)
<b>Description</b>	Electricity exported as recorded by the main meter at EB substation.
<b>Measured/Calculated /Default</b>	Measured
<b>Source of data</b>	Export value from the Joint Meter reading taken at the substation in the presence of Wind World India representatives and the State Utility representatives.
<b>Value(s) of monitored parameter</b>	222,242.750 MWh
<b>Monitoring equipment</b>	<p>Line I Type- Tri-vector Meter Accuracy Class-0.2 Serial Number of Main Meter: TNU00946 Serial Number of Backup Meter: RJB00052</p> <p>Line II Type- Tri-vector Meter Accuracy Class-0.2 Serial Number of Main Meter: TNU00945 Serial Number of Backup Meter: ABB00691</p> <p>Line I and Line II Main Meter Last date of Test-26 December 2013 Validity of Test-25 December 2014</p> <p>Line I and Line II Check Meter Last date of Test-28 December 2013 Validity of Test-27 December 2013</p> <p>Frequency of Calibration- Annual</p>
<b>Measuring/Reading/ Recording frequency</b>	Measured in continuous basis and recorded on Monthly basis
<b>Calculation method (if applicable)</b>	Not Applicable
<b>QA/QC procedures</b>	<p>The meters will be calibrated once in a year. Details of the QA/QC procedures have been described in section C.</p> <p>The data will be archived electronically as well as on paper. The data will be kept for the period up to two years after the completion of the crediting period.</p>
<b>Purpose of data</b>	Calculation of Baseline emissions
<b>Additional comment</b>	None

<b>Data/Parameter</b>	<b>EG<sub>JMR, Import</sub></b>
<b>Unit</b>	MWh (Mega-Watt hour)
<b>Description</b>	Electricity import as recorded by the main meter at EB substation.
<b>Measured/Calculated /Default</b>	Measured
<b>Source of data</b>	Import value from the Joint Meter reading taken at the substation in the presence of Wind World India representatives and the State Utility representatives.
<b>Value(s) of monitored parameter</b>	11,188.000 MWh
<b>Monitoring equipment</b>	<p>Line I Type- Tri-vector Meter Accuracy Class-0.2 Serial Number of Main Meter: TNU00946 Serial Number of Backup Meter: RJB00052</p> <p>Line II Type- Tri-vector Meter Accuracy Class-0.2 Serial Number of Main Meter: TNU00945 Serial Number of Backup Meter: ABB00691</p> <p>Line I and Line II Main Meter Last date of Test-26 December 2013 Validity of Test-25 December 2014</p> <p>Line I and Line II Check Meter Last date of Test-28 December 2013 Validity of Test-27 December 2013</p> <p>Frequency of Calibration- Annual</p>
<b>Measuring/Reading/ Recording frequency</b>	Measured in continuous basis and recorded on Monthly basis
<b>Calculation method (if applicable)</b>	Not Applicable
<b>QA/QC procedures</b>	<p>The meters will be calibrated once in a year. Details of the QA/QC procedures have been described in section C.</p> <p>The data will be archived electronically as well as on paper. The data will be kept for the period up to two years after the completion of the crediting period.</p>
<b>Purpose of data</b>	Calculation of Baseline emissions
<b>Additional comment</b>	None

<b>Data/Parameter</b>	<b>ΣEG<sub>Controller, Export</sub></b>
<b>Unit</b>	MWh (Mega-Watt hour)
<b>Description</b>	Electricity exported by all the WECs connected to the main meter at the substation, as measured at the controller panel.
<b>Measured/Calculated /Default</b>	50,837.918 MWh
<b>Source of data</b>	This value is monitored on continuous basis by online monitoring system at the site and can also be seen at the electronic panel inside the WTG tower.
<b>Value(s) of monitored parameter</b>	As measured

<b>Monitoring equipment</b>	The LCS meters (for panel reading) 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 WECs. 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.
<b>Measuring/Reading/Recording frequency</b>	Monthly basis; This value is monitored on continuous basis by online monitoring system at the site.
<b>Calculation method (if applicable)</b>	Not Applicable
<b>QA/QC procedures</b>	<p>The LCS meters (for panel reading) 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 WECs. 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.</p> <p>The data will be archived electronically as well as on paper. The data will be kept for the period up to two years after the completion of the crediting period.</p>
<b>Purpose of data</b>	Calculation of Baseline emissions
<b>Additional comment</b>	None

<b>Data/Parameter</b>	<b>EG<sub>Export</sub></b>
<b>Unit</b>	MWh (Mega-Watt hour)
<b>Description</b>	Electricity exported to the grid by the project activity
<b>Measured/Calculated/Default</b>	Calculated
<b>Source of data</b>	The calculation procedure has been shown in the section C.
<b>Value(s) of monitored parameter</b>	48,633.907 MWh
<b>Monitoring equipment</b>	Calculated as per the procedures shown in section C.
<b>Measuring/Reading/Recording frequency</b>	Monthly basis
<b>Calculation method (if applicable)</b>	Calculated as per the procedures shown in section C.
<b>QA/QC procedures</b>	<p>No separate QA/QC procedures will be followed.</p> <p>The data will be archived electronically as well as on paper. The data will be kept for the period up to two years after the completion of the crediting period.</p>
<b>Purpose of data</b>	Calculation of Baseline emissions
<b>Additional comment</b>	None

<b>Data/Parameter</b>	<b>EG<sub>Import</sub></b>
<b>Unit</b>	MWh (Mega-Watt hour)
<b>Description</b>	Electricity Import from the grid by the project activity
<b>Measured/Calculated/Default</b>	Calculated

<b>Source of data</b>	The calculation procedure has been shown in the section C.
<b>Value(s) of monitored parameter</b>	128.000 MWh
<b>Monitoring equipment</b>	Calculated as per the procedures shown in section C.
<b>Measuring/Reading/Recording frequency</b>	Monthly basis
<b>Calculation method (if applicable)</b>	Calculated as per the procedures shown in section C.
<b>QA/QC procedures</b>	No separate QA/QC procedures will be followed.  The data will be archived electronically as well as on paper. The data will be kept for the period up to two years after the completion of the crediting period.
<b>Purpose of data</b>	Calculation of Baseline emissions
<b>Additional comment</b>	None

### D.3. Implementation of sampling plan

>>

Not applicable to the project activity.

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

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

>>

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

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 sourced from the credit notes and can be cross-checked with the invoices raised to the DISCOM.

**EF<sub>y</sub>** is the CO<sub>2</sub> emission factor of the grid (0.87387 tCO<sub>2</sub>e/ MWh; fixed ex-ante).

Baseline Emission reduction calculation for the period 01/10/2012 to 31/03/2014 (Inclusive of both days):

$$\begin{aligned}
 \text{Baseline Emission Reductions (BE}_y\text{)} &= 48,505.907 \text{ (MWh)} * 0.87387 \text{ (tCO}_2\text{e/ MWh)} \\
 &= \mathbf{42,388 \text{ tCO}_2\text{e}}
 \end{aligned}$$

Therefore, total baseline emissions are **42,388 tCO<sub>2</sub>**.

Total project emissions: Zero

Total leakages: Zero

$$\begin{aligned}
 \text{Total Emission reductions, ER} &= \text{Baseline Emissions} - \text{Project Emissions} - \text{Leakages} \\
 &= \mathbf{42,388} - 0 - 0 \\
 &= \mathbf{42,388 \text{ tCO}_2}
 \end{aligned}$$

The details of net electricity generation that is produced and fed into the grid as a result of the implementation of the CDM project activity is provided in ER spreadsheet.



**Baseline Emission Reductions calculations for project activity:-**

Duration	Net electricity supplied to the grid by the Project [MWh]	Baseline Emission Factor (tCO <sub>2</sub> e/MWh)	Baseline Emissions (tCO <sub>2</sub> e)
01/10/2012 – 31/12/2012	4,255.068 <sup>2</sup>	0.87387	3,718
01/01/2013 – 31/03/2014	44,250.839	0.87387	38,670
<b>Total</b>	<b>48,505.907</b>		<b>42,388</b>

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

&gt;&gt;

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

PEy = 0

**E.3. Calculation of leakage**

&gt;&gt;

No leakage has been considered from the project activity as per approved methodology ACM0002. Hence, L<sub>y</sub> = 0

**E.4. Summary of calculation of emission reductions or net anthropogenic 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)	Emission reductions or net anthropogenic GHG removals by sinks (t CO <sub>2</sub> e)
1/10/2012 to 31/03/2014 (Inclusive of both days)	42,388	0	0	42,388
<b>Total</b>	<b>42,388</b>	<b>0</b>	<b>0</b>	<b>42,388</b>

**E.5. Comparison of actual emission reductions or net anthropogenic 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
<b>Emission reductions or GHG removals by sinks (t CO<sub>2</sub>e)</b>	75,110	42,388

<sup>2</sup> Detailed calculations has been provided in ER spreadsheet.

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

&gt;&gt;

There is change of 43.57 % (downside) in the expected and actual emission reductions. The difference in the total CERs is due to low wind availability leading to low plant load factor.

**E.7. Actual emission reductions or net anthropogenic GHG removals by sinks during the first commitment period and the period from 1 January 2013 onwards**

Item	Actual values achieved up to 31 December 2012	Actual values achieved from 1 January 2013 onwards
Emission reductions or GHG removals by sinks (t CO <sub>2</sub> e)	3,718 tonnes of CO <sub>2</sub> e.	38,670 tonnes of CO <sub>2</sub> e.

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**Document information**

<i>Version</i>	<i>Date</i>	<i>Description</i>
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 anthropogenic 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, performance monitoring		

**Appendix 1: Details of Physical Location (Latitude and Longitude)**

Sl. No.	Name of customers	Unique Identification No.	Latitude (N)			Longitude (E)		
			Deg.	Min.	Sec.	Deg.	Min.	Sec.
1.	Enercon Wind Farm Rajasthan	EWRPL 01	26	38	44.5	70	51	23.4
		EWRPL 02	26	38	50.4	70	51	19.7
		EWRPL 03	26	38	54.2	70	51	12.3
		EWRPL 04	26	38	56.5	70	51	37.4
		EWRPL 05	26	38	48.3	70	51	44.0
		EWRPL 06	26	38	32.3	70	51	54.0
		EWRPL 07	26	38	27.2	70	51	43.1
		EWRPL 08	26	38	19.0	70	51	52.5
		EWRPL 09	26	38	16.9	70	52	4.3
		EWRPL 10	26	38	10.6	70	52	8.7
		EWRPL 11	26	38	14.6	70	52	27.8
		EWRPL 12	26	38	18.1	70	52	21.8
		EWRPL 13	26	38	26.2	70	52	15.0
		EWRPL 14	26	38	35.1	70	52	9.2
		EWRPL 15	26	38	51.5	70	51	58.5
		EWRPL 16	26	38	55.1	70	51	52.9
		EWRPL 17	26	39	0.9	70	52	9.2
		EWRPL 18	26	38	56.4	70	52	15.0
		EWRPL 19	26	38	49.6	70	52	19.7
		EWRPL 20	26	38	47.0	70	52	26.4
		EWRPL 21	26	38	42.9	70	52	32.2
		EWRPL 22	26	38	36.7	70	52	36.8
		EWRPL 23	26	38	30.5	70	52	41.6
		EWRPL 24	26	38	36.6	70	52	56.9
		EWRPL 25	26	38	42.7	70	52	51.9
		EWRPL 26	26	38	47.3	70	52	46.5
		EWRPL 27	26	38	56.3	70	52	43.3
		EWRPL 28	26	39	2.6	70	52	39.3
		EWRPL 29	26	39	8.7	70	52	35.3
		EWRPL 30	26	39	23.2	70	52	45.2
2.	D.P. Power	DPP-02	26	44	43.5	70	54	0.3
3.	Unique Power Corporation	UPC-01	26	44	46.8	70	53	58.9
4.	Cooper Metals Pvt. Ltd.	CMPL-01	26	37	45.4	70	52	55.1
5.	Srinivaas Sirigeri	SS -01	26	43	29.1	70	53	5.5
6.	Cooper Metals Pvt. Ltd.	CMPL-02	26	37	28.0	70	52	54.7
7.	G. C. Chemie Pharmie Ltd.	GCCPL -01	26	37	15.9	70	53	20.9
8.	Modular Power	MPPL -01	26	37	24.9	70	52	56.2
9.	Jitendra K. Newaskar (formerly Prerna Pharma Intermediates Pvt. Ltd.)	PPIPL-01	26	37	19.2	70	53	20.5

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10.	Vijay Developers	VD-01	26	37	23.0	70	52	59.0
11.	Vijay Traders	VT -01	26	37	13.6	70	52	58.1
12.	Vikas Agencies	VA-01	26	37	22.1	70	53	4.8
13.	P.V. Chandran	PVC -01	26	42	53.6	70	53	14.3
14.	Kataria Infrastructure Corporation	KIC -01	26	45	1.3	70	53	57.3
15.	D.P. Power	DPP -01	26	45	38.6	70	53	22.4
16.	Kataria Infrastructure Corporation	KIC -02	26	45	42.7	70	53	21.2
17.	Kataria Wires	KWPL -02	26	45	45.3	70	53	19.0
18.	Kwality Tobacco Products	KTP -01	26	45	57.0	70	53	13.4
19.	Ratlam Wires	RWPL -02	26	45	51.1	70	53	15.8

## Appendix 2: Line Diagram Showing Relevant Metering Points

