MONITORING REPORT FORM (CDM-MR) *
Version 01 - in effect as of: 28/09/2010

CONTENTS

* as contained within the document entitled "Guidelines for completing the monitoring report form (CDM-MR)" (EB 54 meeting report, annex 34).

MONITORING REPORT
Version: 3.1 Date: 02/07/2011

"5.5 MW Bundled Wind Power Project by WMI Cranes Ltd"
Reference number: 2682[1]
1st Monitoring Period from 21/10/2007 to 14/06/2010 (first and last days included)

SECTION A. General description of the project activity

A.1. Brief description of the project activity: >>

1. **Purpose of the project activity:**

The main purpose of the project activity is to generate electrical energy through sustainable means using wind power resources, to sell the generated electricity to the respective regional electricity grid namely Maharashtra, Gujarat and Tamil Nadu which falls under western region grid[2] (now part of integrated NEWNE grid) and Southern region grid of India and thus leads to CO_2 emission reduction due to the displacement of equivalent amount of electricity.

The present bundled project activity deals with generation of electricity using wind energy by Wind Turbine Generator (WTG). The project utilizes wind energy for generating electricity which otherwise would have been generated through operation of or new addition of alternate fuels (fossil fuel) based power plants in regional grid, which would leads to GHG emissions. The project contributing to reduction in specific emissions (pollutants generated from energy generation) including GHG emissions. Apart from generation of renewable electricity, the project has also conceived for the following:

- To enhance the propagation of commercialisation of wind turbines in the region
- To contribute to the sustainable development of the region, socially, environmentally and economically
- To reduce the prevalent regulatory risk for this project through revenues from emission trade

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

The implemented project activity by WMI Power Private Limited[3] Consist of Seven WTGs spread across three states of India. The total installed capacity is 5.50 MW having two WTGs of 1.25 MW and five WTGs of 0.6 MW individual capacities.

The project activity consists of seven Wind Turbine Generators (WTGs) having two WTGs of 1.25 MW (Suzlon make S-70) and five WTGs of 0.6 MW (Vestas Type-PS-600) The project activity does not involve any technology transfer.

3. **Relevant dates for the project activity**

Project start date: 30/09/2006 (Commissioning date of first WTG in bundled project activity)

VCS Crediting period start date: 21/10/2007[4]

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[1] http://cdm.unfccc.int/Projects/DB/SGS-UKL1244624606.95/view

[2] As per the new delineation of electricity system in India, western region grid is part of integrated NEWNE grid.

[3] The Project proponent has change the company name from 'WMI cranes Ltd.' to 'WMI Power Private Limited' the supportive document has been submitted for the verification.

[4] As per the Policy Announcement from the VCS Association dated 19/03/2008

CDM Crediting period start date: 15/06/2010

Project registration date: 15/06/2010

First verification period: 21/10/2007 to 14/06/2010

Total emission reductions achieved in this monitoring period: 15,645 tCO_2

A.2. Project Participants

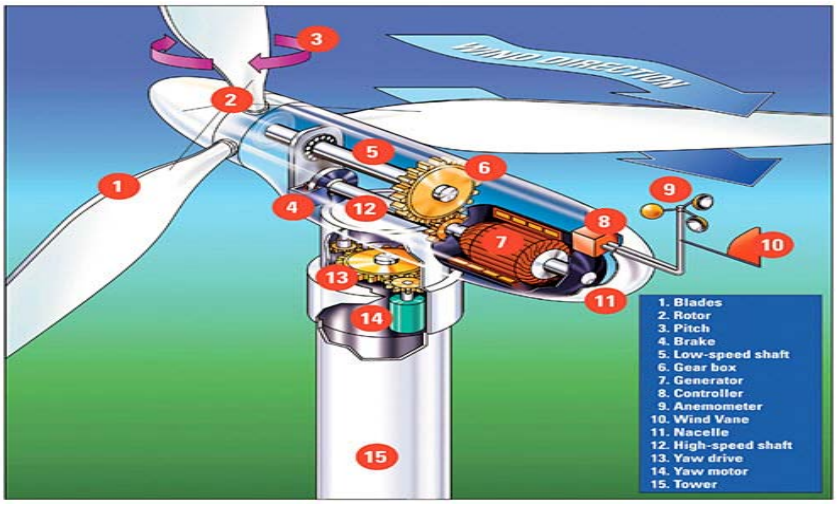
Name of Party involved ((host) indicates a host Party)	Private and/or public entity (ies) project participants (as applicable)	Kindly indicate if the Party involved wishes to be considered as project participant (Yes/No)
India	WMI Power Private Limited	No

A.3. Location of the project activity:

Sr. No.	Name of Project Promoter	WTG Location No.	GPS coordinates	WTG location-Village	District
Bundle I	M/s.WMI Power Private Limited	K 233	21°16'N 74°19'E	Kaltek,Sakri	Dhule
		K 231	21°16'N 74°19'E	Kaltek,Sakri	Dhule
Bundle II		VRRB-600/07-08 733	23°13'N 70°42'E	Khumbariya, Surajbari	Kutch
		VRRB-600/07-08 734	23°13'N 70°42'E	Khumbariya, Surajbari	Kutch
		VRRB-600/07-08 735	23°13'N 70°42'E	Khumbariya, Surajbari	Kutch
Bundle III		WEG HT SC. No. 2277	09°01'N 77°26' E	Vellalankulam, Sankarankoil	Tirunelveli
		WEG HT SC. No. 2281	09°01'N 77°26' E	Vellalankulam, Sankarankoil	Tirunelveli

A.4. Technical description of the project

In wind energy generation, kinetic energy of wind is converted into mechanical energy and subsequently into electrical energy. Wind has considerable amount of kinetic energy when blowing at high speeds. The wind (Kinetic Energy) when it passes through the blades of the wind turbines, it is converted into mechanical energy and rotates the wind blades. When the wind blades rotate, the connected generator also rotates, thereby produce electricity.



Detail technical process diagram of WTG

The project activity consists of total 7 numbers of WTGs, Provide by two technology suppliers as below:

Sr. No	Technology Supplier	WTG Capacity (MW)	WTG Model	No. of WTGs	Total installed Capacity (MW)
1	Suzlon	1.25	S-70	2	2.5
2	RRB energy	0.6	PS-600	5	3.0
		Total		**7**	**5.5**

All the above WTGs in the project have been developed indigenously and no transfer of technology is involved.

A.5. Title, reference and version of the baseline and monitoring methodology applied to the project activity:

Title: AMS-I.D. "Grid connected renewable electricity generation" (Version 13)[5]
Sectoral Scope: 1, Energy industries (Renewable / non-renewable sources)
Type: Renewable Energy Project (Small Scale)
Reference: Appendix B of the simplified M & P for small scale CDM project activities

A.6. Registration date of the project activity:

15/06/2010[6]

A.7.Crediting period of the project activity and related information (start date and choice of crediting period):

The start date of the VCS crediting period of the project activity is 21/10/2007.

The start date of the CDM crediting period of the project activity is 15/06/2010.
Project activity has fixed crediting period of 10 years 0 month (15 /06/2010 to 14 /06/ 2020)

[5]http://cdm.unfccc.int/UserManagement/FileStorage/CDMWF_AM_PHPV5WESACMBTJ2YY54GAJYSIEI3HD

[6] http://cdm.unfccc.int/Projects/DB/SGS-UKL1244624606.95/view

A.8. Name of responsible person(s)/entity(ies):

Contact information of the person responsible for completing the monitoring report form.

Organization:	WMI Power Private Limited
Street/P.O.Box:	Village Road
Building:	--
City:	Bhandup (West), Mumbai
State/Region:	Maharashtra
Postfix/ZIP:	400078
Country:	India
Telephone:	91-22 - 25661661
FAX:	91-22 - 25664932
E-Mail:	n.narasimhan@wmicranes.com
URL:	http://www.wmicranes.com
Represented by:	
Title:	Vice President (Finance)
Salutation:	Mr.
Last Name:	Narsimhan
Middle Name:	L.
First Name:	N.
Department:	Finance
Mobile:	91 - 9833866854
Direct FAX:	91-22 - 24301211
Direct tel:	91-22 - 24301211
Personal E-Mail:	n.narasimhan@wmicranes.com

And

Mr. Dipak S. Shirsath
Project Consultant
MITCON Consultancy & Engineering Services Ltd.
Kubera Chambers, Shivajinagar, Pune - 411 005
Email: dipak@mitconconsultancy.in

SECTION B. Implementation of the project activity

B.1. Implementation status of the project activity

Sr. No.	Name of Project Promoter	Installed Capacity (MW)	WTG Location No.	Commissioning Date	Village, District
1	WMI Power Private Limited	1.25	K-231	30/09/2006	Kaltek, Dhule
2		1.25	K-233	13/11/2006	Kaltek, Dhule
3		0.6	VRRB-600/07-08 733	28/12/2007	Khumbariya, Kutch/Kachchh
4		0.6	VRRB-600/07-08 734	07/02/2008	Khumbariya, Kutch/Kachchh
5		0.6	VRRB-600/07-08 735	03/10/2007	Khumbariya, Kutch/Kachchh
6		0.6	WEG HT SC. No. 2277	29/03/2007	Vellalankulam, Tirunelveli
7		0.6	WEG HT SC. No. 2281	29/03/2007	Vellalankulam, Tirunelveli

B.2. Revision of the monitoring plan

The section is left blank on purpose.

B.3. Request for deviation applied to this monitoring period

The section is left blank on purpose.

B.4. Notification or request of approval of changes

The section is left blank on purpose.

SECTION C. Description of the monitoring system

I. Monitoring Plan

The project activity essentially involves generation of electricity from wind, the employed WTG can only convert wind energy into electrical energy and cannot use any other input fuel for electricity generation. Thus no special ways and means are required to monitor leakage from the project activity.

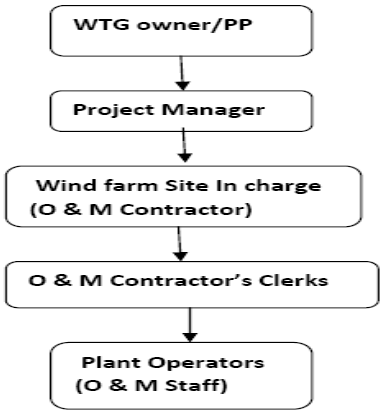
a. The proposed project activity requires evacuation facilities for sale to grid and the evacuation facility is essentially maintained by the state power utility.
b. The electricity generation measurements are required by the respective state utility and the investors to assess electricity sales revenue and / or wheeling charges.
c. The project activity has therefore envisaged two independent measurements of generated electricity from the wind turbines.
d. The primary recording of the electricity fed to the state utility grid was carried out jointly at the incoming feeder of the state power utility. Machines for sale to utility are connected to the feeder.
e. The joint measurement was carried out once in a month in presence of both parties (the developer's representative and officials of the state power utility). Both parties has signed the recorded reading.

    - Metering equipment - Metering was carried out through electronic tri-vector meters of accuracy class 0.2% required for the project. The main meter was installed and owned by State utility of respective state of the different sub bundles, whereas the project participant owns the check meters. The metering equipments was maintained in accordance with electricity standards.

    - Meter readings - The monthly meter readings at the project site and the receiving station was taken simultaneously and jointly by the parties on a pre-determined day of the following month. At the conclusion of each meter reading, an appointed representative of the state utility and the company signs a document indicating the number of kWh exported to the grid.

f. The secondary monitoring, which would be done at the individual WTGs. Each WTG is equipped with an integrated electronic meter. These meters are connected to the Central Monitoring Station (CMS) of the entire wind farm through a wireless Radio Frequency (RF) network (PLC). The generation data of individual turbine can be monitored as a real-time entity at CMS.

II. Organizational structure*:*



Organizational Structure for WTG Monitoring System

III. Responsibilities and competencies

Roles	Responsibilities
PP (Director)	Review the overall performance of project & give directions for improvements.
PP (Project Manager)	Review the performance of project. preparing & submitting the annual reports, supporting documents for validation & verification of VERs
EPC contractor – Site In charge	Judge the performance of project through reports from clerks & plant operators on site. Visits to plant site & instruct to plant operators for improvement in performance. Compile data & reports to available for audit, review the performance of the project
EPC contractor - Clerks	Day to day monitoring, record, report & archive data as received contains overall conditions on wind farm.
EPC contractor - Plant Operators (O & M Staff)	Daily monitoring, checking routine Operation & Maintenance activities, reporting for any major O &M and Preventive Maintenance.

IV. Methods for generating, recording, storing, aggregating, collating and reporting data on monitored parameters:

Monitoring of electricity generation was carried out continuously with tri-vector electronic meter. This helps to avoid manual data handling error, material misstatement and gives accurate measurement. The calibration of monitoring equipments was carried out following set calibration standards and at frequencies schedule by respective state electricity utility.

All monitoring parameters was recorded and verified by the responsible authorities of project participants. For metering & monitoring of the electricity generation from Wind Turbine Generator, the specific method applied was as per the Power Purchase Agreement as outlined below.

a) The recording of the electricity exported to the state utility grid is done jointly at the incoming feeder of the state utility.
b) The joint meter readings is carried out once in a month in presence of both parties (the developer's representative and officials of the state electricity utility). Meter reading of exported power is signed by both parties. This forms the basis of invoicing.
c) Using the signed joint measurement/meter reading, each respective state electricity utility entity, issues electricity generation/credit report to corresponding PP. the credit report shows the amount of electricity exported to the grid and this value in this report is used for calculations emission reductions.

V. Procedures for handling internal auditing and non-conformities.

An internal audit of the project activity would be done on a half yearly basis by a special audit team. The audit team would comprise competitive persons. The team would audit the project for the following aspects among other things:

- Are the monitoring of CDM parameters done in line with the CDM PDD Is the documentation of monitored CDM parameters done properly
- Are equipments calibrated and maintained as scheduled
- Is the quantity of CERs generated in line with that projected in the CDM PDD, if not, what are the reasons for deviation?
- Are necessary corrective actions being taken to address deviations?
- Check the authenticity of data monitored and recorded by random cross-checking with other sources.

The audit team would submit their observations to Head- Wind Power Projects for his review and necessary action.

VI. Data uncertainties and adjustments

For this parameter, data uncertainties are likely during the following scenarios:

- During error in meter
- When meter is dismantled for O&M or calibration
- When records are lost

Error in main meter will be usually identified during cross-checking with check meter. If an error is found in the MSEDCL main-meter, the PP will request MSEDCL for recalibrating the main meter. Data recorded by check meter & the PP's meter minus average transmission losses would be used for emission reduction determination for the error period.

When main-meter is dismantled for O&M or calibration, the same procedure as listed above will be used for emission reduction calculation. In case of Tamilnadu, there is no need to dismantle the meter, as it is being calibrated by the state utility on site.

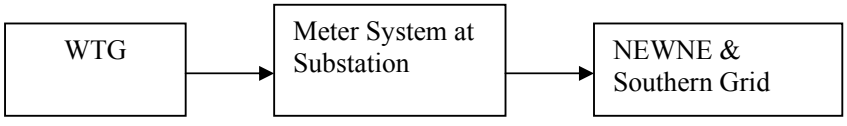
VII. GHG collection and management system:

Since the project participant have signed an O&M contract with the suppliers of the wind turbines, internal audits regarding GHG compliance will be carried out by the suppliers.

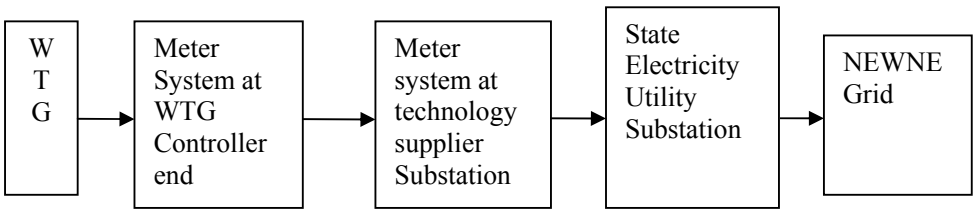
VIII. The electricity apportioning procedure followed by state electricity utility in Maharashtra and Gujarat:

Each substation is connected to a number wind turbine. The generation reading is collectively displayed by the substation meter. The net generation of each of the wind turbines is then calculated in the following manner:

The Metering system of project activity for Maharashtra State is illustrated in below figure.



The Metering system of project activity for the state of Gujarat is illustrated in below figure.



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. The system consists of a state- of- the- art controlling and monitoring and well trained staff personnel of O&M contractor are always present on site to monitor various parameters of power generation and deal with any problems related to generation, transmission or maintenance. EGn,y is the electricity generated from an individual wind turbine measured through its controller meter. The summation of total Electricity Generated (MWh) from all the wind turbines of the project proponent at a particular site is presented as

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

And the summation of total Electricity Generated (MWh) from all the wind turbines connected to the particular feeder as measured at the individual controllers is presented as

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

A ratio based on these two set of measured values is used for apportioning the net electricity supplied to the NEWNE grid by the project activity. The second metering is carried out at grid interconnection point (sub station) wherein the Joint Meter Reading (JMR) is carried out, usually in the first week of every month, in presence of the representatives of the project proponent & the state electricity utility. 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 grid. From these two values, $\mathbf{EG_{(Main\ Meter\ reading)}}$ is calculated by deducting $EG_{JMR,import}$ from $EG_{JMR,export}$. This $EG_{(Main\ Meter\ reading)}$ value is then used for calculating net export from individual windmills. There is a single meter which gives both the export and import values, this metered reading gives the net value of line losses and auxiliary consumption. Further, as there is a common joint meter for multiple project proponents, the joint meter reading (JMR) taken every month by state utility personnel, reflects the cumulative monthly generation for all wind turbines connected to this main meter. The apportioning of electricity generated from the various wind turbines is done by the EPC contractor based on the power generation from the individual wind turbines connected to the main meter. A monthly report on generation and consumption is prepared by the O&M contractor. This report contains details of power exported/imported to/from the grid by each of the wind turbines connected. This apportioned value is then used by the project proponent to raise invoice from state utility.

$EG_{(MAIN\ METER)}$, the electricity supplied to the grid by the project activity is calculated as follows:

$$EG_{\text{(Net export by project activity)}} = \frac{\sum_{0}^{n} EG_{n,y} * EG_{\text{(Main Meter reading)}}}{\sum_{0}^{m} EG_{m,y}}$$

Where

$EG_{(Net\ export\ by\ project\ activity)}$	Net generation from all the WTGs of the promoter at a particular site.
$\sum_{0}^{n} EG_{n,y}$	Total electricity generated by the WTGs of the promoter as measured at the controller
$EG_{(Main\ Meter\ reading)}$	Total net generation from all wind turbines at the common metering point as calculated by $EG_{JMR,export}$ - $EG_{JMR,import}$ at the substation feeder.
$\sum_{0}^{m} EG_{m,y}$	Total generation of all the WTGs connected to the feeder as measured at controller.

The responsibility of calibration, periodical testing, sealing and maintenance of meters is with the respective state utilities. This is done in the presence of representatives of the promoter. The frequency of meter testing is annual or as decided by the state utility. All meters are tested only at the Metering Point. Additionally, each wind turbine is equipped with an integrated electronic meter. The electricity generated is recorded by the O & M staff of the EPC contractor on 24 hour basis.

The Accounts department of WMI receives the data from both the sources and keeps track of project activity which reduces the carbon emission reductions. The project performance is communicated to the higher management by the accounts department.

SECTION D. Data and parameters

D.1. Data and parameters determined at registration and not monitored during the monitoring period, including default values and factors	
(Copy this table for each data and parameter. To report multiple values, a table may be used)	
Data / Parameter:	**Plant Load Factor**
Data unit:	%
Description:	Plant Load Factor considered for the estimation of electricity generation from WTGs in each sub-bundle of the project activity. This has been used for the estimation of CERs from the project.
Source of data used:	As per tariff orders of the respective sub-bundles.
Value(s) :	Maharashtra Sub-bundle-I : 20 Gujarat Sub-bundle-II : 23 Tamil Nadu Sub-bundle-III : 26.7
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Data are used for Baseline calculation
Additional comment:	--

Data / Parameter:	**Installed Capacity**
Data unit:	MW
Description:	Total installed capacity of the project
Source of data used:	Purchase order & Commissioning certificate of the WTGs in different sub-bundles
Value(s) :	5.5
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	-
Additional comment:	-

Data & Parameters monitored for WTG in Maharashtra & Gujarat State

D.2. Data and parameters monitored	
(Copy this table for each data and parameter. To report multiple values, a table may be used)	
Data / Parameter:	$\sum_{0}^{n} EG_{n,y}$
Data unit:	MWh
Description:	The summation of total Electricity Generated (MWh) at the controller from all the wind turbines of the project proponent at a particular site
Measured /Calculated /Default:	Measured
Source of data:	Monitored through meters Source-Joint meter reading report
Value(s) of monitored parameter:	Maharashtra: 9,471 (Period 1/11/2007 to 31/05/2010)[7] Gujarat: Not available[8]
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Used for the calculation of $EG_{(Net\ export\ by\ project\ activity)}$ (Baseline Calculation)
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)	Monitored through inbuilt WTG Controller meter.
Measuring/ Reading/ Recording frequency:	Continuous measurement and monthly recording
Calculation method (if applicable):	--
QA/QC procedures applied:	--

Data / Parameter:	$\sum_{0}^{m} EG_{m,y}$
Data unit:	MWh
Description:	The summation of total Electricity Generated (MWh) from all the wind turbines at the site and connected to a particular feeder as measured at the individual controllers.
Measured /Calculated /Default:	Measured
Source of data:	Monitored through meters Source-Joint meter reading report
Value(s) of monitored parameter:	Maharashtra: 230,155 (Period 1/11/2007 to 31/05/2010)[9] Gujarat: Not available[10]
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Used for the calculation of $EG_{(Net\ export\ by\ project\ activity)}$(Baseline Calculation)
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)	Monitored through inbuilt WTG Controller meter.

[7] The daily generation data at controller end for all the WTG (except the WTGs of PP) connected to the same feeder for month Oct-2007 and June-2010 was not readily available with PP, hence The values for the period 1/11/ 2007 to 31/05/ 2010 (excluding the month Oct-2007 and June-2010) has considered for parameter.

[8] The controller end data for the WTGs of PP for the overall crediting period was not available with the PP, hence there is a deviation has occur in the monitoring plan as per registered PDD.

[9] Please refer footnote No.7

[10] Please refer footnote No.8

Measuring/ Reading/ Recording frequency:	Continuous measurement and monthly recording
Calculation method (if applicable):	--
QA/QC procedures applied:	--

Data / Parameter:	$EG_{JMR,export}$
Data unit:	MWh
Description:	Total export as measured at the substation feeder of all wind turbines connected to the same feeder.
Measured /Calculated /Default:	Measured
Source of data:	Monitored through meters. Source-Joint meter reading report
Value(s) of monitored parameter:	Maharashtra: 222,779 Gujarat: Not available[11]
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Used for the calculation of $EG_{(Net\ export\ by\ project\ activity)}$ (Baseline calculation)
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)	Please refer Annexure-I for details
Measuring/ Reading/ Recording frequency:	Continuous measurement and monthly recording
Calculation method (if applicable):	---
QA/QC procedures applied:	The calibration of the meters has been done annually by state utility. Other than periodic calibration of the meters the reading of both meters has been matched every month.

Data / Parameter:	$EG_{JMR,import}$
Data unit:	MWh
Description:	Total import as measured at the substation feeder of all wind turbines connected to the same feeder.
Measured /Calculated /Default:	Measured
Source of data:	Monitored through meters. Source-Joint meter reading report
Value(s) of monitored parameter:	Maharashtra: 870 Gujarat: Not available[12]
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Used for the calculation of $EG_{(Net\ export\ by\ project\ activity)}$(Baseline Calculation)
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)	Please refer Annexure-I for details
Measuring/ Reading/ Recording frequency:	Continuous measurement and monthly recording
Calculation method (if applicable):	--
QA/QC procedures applied:	The calibration of the meters has been done annually by state utility. Other than periodic calibration of the meters the reading of both meters has been matched every month.

[11] Please refer footnote No. 8

[12] Please refer footnote No. 8

Data / Parameter:	**$EG_{(Net\ export\ by\ project\ activity)}$**
Data unit:	MWh
Description:	Net generation from all the WTGs of the promoter at a particular site connected to same feeder.
Measured /Calculated /Default:	Calculated
Source of data:	Joint meter reading & credit report
Value(s) of monitored parameter:	Maharashtra: 9,433 Gujarat: 4,998
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Data are used for baseline emission calculation.
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)	Calculated value
Measuring/ Reading/ Recording frequency:	Recorded monthly
Calculation method (if applicable):	Please refer section C .VII of this document
QA/QC procedures applied:	Value has been cross verified by Apportioning procedure for deriving net electricity generated by the project activity at Maharashtra.

Data / Parameter:	EF_{Grid}
Data unit:	t CO_2/MWh
Description:	Weighted average Grid Emission Factor
Measured /Calculated /Default:	Monitored
Source of data:	Centre Electricity Authority (CEA) CO_2 Baseline Database for the Indian Power Sector, Version 6
Value(s) of monitored parameter:	**Crediting period** / **Year** / **Emission Factor** **From** / **to** 21/10/2007 – 31/03/2007 – 2006-07 – 0.82 1/4/2007 – 31/03/2008 – 2007-08 – 0.81 1/4/2008 – 31/03/2009 – 2008-09 – 0.83 1/4/2009 – 31/03/2010 – 2009-10 – 0.82 1/4/2010 – 14/06/2010 – - – 0.82 Emission factor for Monitoring period: **0.81** **(Most conservative value)**
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Used for the Baseline emission Calculation
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)	---
Measuring/ Reading/ Recording frequency:	---
Calculation method (if applicable):	--
QA/QC procedures applied:	The archive of data has been maintained for crediting period + 2 years. The archiving will be done both on paper and electronically.

Data & parameters monitored for the WTG in Tamil Nadu State

Data / Parameter:	$EG_{JMR,export}$
Data unit:	MWh
Description:	Total export from the WTG at TNEB meter
Measured /Calculated /Default:	Measured
Source of data:	Monitored through meters. Source-Statement Showing the energy generated through wind mill
Value(s) of monitored parameter:	5,529
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Used for the calculation of $EG_{(Net\ export\ by\ project\ activity)}$ (Baseline calculation)
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)	Please refer annexure-I for details
Measuring/ Reading/ Recording frequency:	Continuous measurement and monthly recording
Calculation method (if applicable):	--
QA/QC procedures applied:	The calibration of the meters has been done annually by state utility. Other than periodic calibration of the meters the reading of both meters has been matched every month.

Data / Parameter:	$EG_{JMR,import}$
Data unit:	MWh
Description:	Total import from the WTG at TNEB meter
Measured /Calculated /Default:	Measured
Source of data:	Monitored through meters. Source- Statement Showing the energy generated through wind mill
Value(s) of monitored parameter:	55
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Used for the calculation of $EG_{(Net\ export\ by\ project\ activity)}$(Baseline Calculation)
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)	Please refer annexure-I for details
Measuring/ Reading/ Recording frequency:	Continuous measurement and monthly recording
Calculation method (if applicable):	--
QA/QC procedures applied:	The calibration of the meters has been done annually by state utility. Other than periodic calibration of the meters the reading of both meters has been matched every month.

Data / Parameter:	**$EG_{(Net\ export\ by\ project\ activity)}$**
Data unit:	MWh/yr
Description:	Net generation from the individual WTG.
Measured /Calculated /Default:	calculated
Source of data:	Joint meter reading and TNERC electricity bills
Value(s) of monitored parameter:	5,494

Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Used for baseline calculation
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)	--
Measuring/ Reading/ Recording frequency:	The used data is from an official source.
Calculation method (if applicable):	Calculated by using total export from the WTG at TNEB meter minus total import from the WTGat TNEB meter. $\mathbf{EG_{(Net\ export\ by\ project\ activity)}} = (EG_{JMR,export} - EG_{JMR,import})$
QA/QC procedures applied:	The archive of data will be maintained for crediting period + 2 years. The archiving has been done both on paper and electronically.

Data / Parameter:	EF_{Grid}
Data unit:	t CO_2/MWh
Description:	Weighted average Grid Emission Factor
Measured /Calculated /Default:	Monitored
Source of data:	Centre Electricity Authority (CEA) CO_2 Baseline Database for the Indian Power Sector Version 6
Value(s) of monitored parameter:	**Crediting period** / **year** / **Emission Factor**

From	**to**		
21/10/2007	31/03/2007	2006-07	0.72
1/4/2007	31/03/2008	2007-08	0.72
1/4/2008	31/03/2009	2008-09	0.76
1/4/2009	31/03/2010	2009-10	0.75
1/4/2010	14/06/2010	-	0.75

Emission factor for Monitoring period: **0.72**
(Most conservative Value)

Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Used for the Baseline emission Calculation
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)	---
Measuring/ Reading/ Recording frequency:	---
Calculation method (if applicable):	--
QA/QC procedures applied:	The archive of data will be maintained for crediting period + 2 years. The archiving has been done both on paper and electronically.

SECTION E. Emission reductions calculation

E.1. Baseline emissions calculation

Proposed project activity is situated in three different states of India, namely, Maharashtra, Gujarat & Tamil Nadu. The grid emission factor for Maharashtra, Gujarat (which comes under NEWNE region Grid) is 0.81 tCO_2/ MWh & 0.72 tCO_2/ MWh for Tamil Nadu (which comes under Southern Grid).

Calculation for ex-post emission factor for Maharashtra and Gujarat state:

Crediting period		**year**	**Emission Factor**
From	**to**		**NEWNE grid**
21/10/2007	31/03/2007	2006-07	0.82
1/4/2007	31/03/2008	2007-08	0.81
1/4/2008	31/03/2009	2008-09	0.83
1/4/2009	31/03/2010	2009-10	0.82
1/4/2010	14/06/2010	-	0.82

Emission factor = 0.81 (Most Conservative Value)

Calculation for ex-post emission factor for Tamil Nadu state:

Crediting period		**year**	**Emission Factor**
From	**to**		**Southern grid**
21/10/2007	31/03/2007	2006-07	0.72
1/4/2007	31/03/2008	2007-08	0.72
1/4/2008	31/03/2009	2008-09	0.76
1/4/2009	31/03/2010	2009-10	0.75
1/4/2010	14/06/2010	-	0.75

Emission factor = 0.72 (Most Conservative Value)

The emission reduction ER_y by the project activity during a given year y is the difference between the baseline emissions through substitution of electricity generation with fossil fuels (BE_y) and project emissions (PE_y)

Baseline emissions or VERs generated by the project are estimated to be:

Baseline emissions $_{(project)}$ **= Grid emission factor * Power generated from the project**
(tons of CO_2) *(tons of CO_2/MWh)* *(MWh/year)*

$$\mathbf{ER_y = BE_y - PE_y - LE_y}$$

Where:

ER_y = Emission reductions in year *y* (t CO_2/y)
BE_y = Baseline Emissions in year *y* (t CO_2/y)
PE_y = Project emissions in year *y* (t CO_2/y)
LE_y = Leakage emissions in year *y* (t CO_2/y)

Being wind power project the project activity does not involve any project emission and any leakage

Emission reduction = Baseline project emission

$$\mathbf{BE_y = EG_y * EF_y}$$

E.2. Project emissions calculation

The emission reduction ER_y by the project activity during a given year y is the difference between the baseline emissions through substitution of electricity generation with fossil fuels (BE_y) and project emissions (PE_y)

Hence, PE_y= 0

E.3. Leakage calculation

As wind energy projects fall under clean energy sources for electricity generation, the emission from the project is taken as zero.

Hence, LE_Y= 0

E.4. Emission reductions calculation / table

Baseline emissions or VERs generated by the project are estimated to be:

Baseline emissions	=	**Grid emission factor**	*	**Power generated from the project**
(tons of CO_2)		*(tons of CO_2/MWh)*		*(MWh/year)*

For Maharashtra and Gujarat State (21/10/2007 to 14/06/2010 vintage)
BE_y = 14,431* 0.81
BE_y =11,689 tCO_2 ..... (1)

For Tamil Nadu State (21/10/2007 to 14/06/2010 vintage)

BE_y =5,494 * 0.72
BE_y = 3,956 t CO_2 ..... (2)

Total baseline emission for the project activity (21/10/2007 to 14/06/2010 vintage) is as follows: From above equation (1) and (2)

BE= 11, 689 + 3,956

BE_y = 15,645 t CO_2

Total Baseline Emission for the Monitoring Period of 21/10/2007 to 14/06/2010 (Inclusive Both Days) as follows:

Period	**Net Generation from all the WEGs (MWh)**	**Emission Factor of the grid (tCO_2/ MWh)**	**Baseline Emission (tCO_2)**
	$EG_{(Net\ export\ by\ project\ activity)}$	**EF_{Grid}**	**BE_y**
Maharashtra & Gujarat			
21/10/2007 to 31/12/2007	239	0.81	193
01/01/2008 to 31/12/2008	5,815	0.81	4,710
01/01/2009 to 31/12/2009	5,787	0.81	4,687
01/01/2010 to 14/06/2010	2,591	0.81	2,099

Tamil Nadu			
21/10/2007to 31/12/2007	43	0.72	31
01/01/2008 to 31/12/2008	2,182	0.72	1,571
01/01/2009 to 31/12/2009	2,626	0.72	1,890
01/01/2010 to 14/06/2010	644	0.72	463
Total	**19,926**		**15,645**

The separate excel sheet is provided for details emission reduction calculation for entire crediting period

E.5. Comparison of actual emission reductions with estimates in the CDM-PDD

Item	As per of the registered CDM-PDD	Actual values reached during the monitoring period
Emission reductions (tCO_2e) In the monitoring period (21/10/2007 to 14/06/2010) i.e. 968 days	**23,619**	**15,645**

In the monitoring period i.e. 21/10/2007 to 14/06/2010 (Inclusive Both Days) means for 968 days the actual value of emission reduction is less as compare to estimated amount of emission reduction in registered CDM-PD

E.6. Remarks on difference from estimated value in the PDD

There is no any increase in the actual Emission Reductions achieved during the current monitoring period in comparison with estimated emission reduction in registered PDD.

Annexure-I

Sr. No.	Name of Project Promoter	WTG Location No.	Feeder /SS Name	Main Meter No.	Check Meter No.	Accuracy class	calibration date			
							2007	2008	2009	2010
Bundle -I	M/s.WMI Power Private Limited	K 233	Walve feeder-III	04862765	04862469	0.2	08/10/2007	27/05/2008	08/07/2009	20/08/2010
		K 231	Walve feeder-III	04862765	04862469	0.2	08/10/2007	27/05/2008	08/07/2009	20/08/2010
Bundle -II		VRRB-600/07-08 733	Surajbari S/S	GJB00730 & GJB 00731	-	0.2	07/04/2007	-	21/04/2009	13/05/2010
		VRRB-600/07-08 734	Surajbari S/S	GJB00730 & GJB 00731	-	0.2	07/04/2007	-	21/04/2009	13/05/2010
		VRRB-600/07-08 735	Surajbari S/S	GJB00730 & GJB 00731	-	0.2	07/04/2007	-	21/04/2009	13/05/2010
Bundle -III		WEG HT SC. No. 2277	Shankarkoil S/S	04881074	-	0.5	29/03/2007	11/12/2008	-	25/11/2010
		WEG HT SC. No. 2281	Shankarkoil S/S	04865413	-	0.5	29/03/2007	11/12/2008	-	17/09/2010
				TNU04733 (change on 17/09/2010)	-	0.5	NA	NA	NA	25/11/2010

* as contained within the document entitled "Guidelines for completing the monitoring report form (CDM-MR)" (EB 54 meeting report, annex 34).