



**Monitoring report form for CDM project activity**  
**(Version 06.0)**

*Complete this form in accordance with the instructions attached at the end of this form.*

**MONITORING REPORT**

<b>Title of the project activity</b>	15 MW grid-connected wind power project by MMTC in Karnataka	
<b>UNFCCC reference number of the project activity</b>	1797	
<b>Version number of the PDD applicable to this monitoring report</b>	04	
<b>Version number of this monitoring report</b>	1	
<b>Completion date of this monitoring report</b>	15/06/2018	
<b>Monitoring period number</b>	Second Monitoring Period	
<b>Duration of this monitoring period</b>	01/04/2010 to 31/12/2015	
<b>Monitoring report number for this monitoring report</b>	1	
<b>Project participants</b>	MMTC Limited	
<b>Host Party</b>	India	
<b>Sectoral scopes</b>	Energy industries (renewable/ non-renewable sources)	
<b>Applied methodologies and standardized baselines</b>	Applied Methodologies: AMS-I.D. Grid connected renewable electricity generation version 11. Standardized baseline: Not applicable	
<b>Amount of GHG emission reductions or net anthropogenic GHG removals achieved by the project activity in this monitoring period</b>	Amount achieved before 1 January 2013	Amount achieved from 1 January 2013
	71,384	69,254
<b>Amount of GHG emission reductions or net anthropogenic GHG removals estimated ex ante for this monitoring period in the PDD</b>	135,485 (21927 per annum)	

## SECTION A. Description of project activity

### A.1. General description of project activity

The project activity wind based power generation is a small-scale project activity with an installed capacity of 15 MW (0.6 MW X 25) at Gajendragad site, Gadag district, Karnataka, India. The technology envisaged for this project is 0.6 MW Wind Energy Generators (WEG) developed by Vestas RRB India Ltd. The project promoter is MMTC Limited. MMTC is a major trading company in Asia. Not only does it trade in minerals, metals, fertilizers, and precious metals but also is a major operator in Agro, Coal and hydrocarbon sectors.

The purpose of the project activity is to generate energy electricity by the utilization of wind energy and further selling the generated energy to the southern regional grid of India. In this process, there is no consumption of any fossil fuel and hence it does not lead to any greenhouse gas emissions. Thus, electricity would be generated through sustainable means without causing any negative impact on the environment.

Further, details of the project activity can be obtained from the UNFCCC registered PDD and other associated documents as listed in the UNFCCC website from the following link: <https://cdm.unfccc.int/Projects/DB/RWTUV1207728922.94/view> .

The project activity commissioned on 24/03/2007. The present monitoring report is for the period of 01/04/2010 to 31/12/2015 (both days inclusive). Total emission reductions achieved in this monitoring period, as calculated in Section E of this report is 140,638 tCO<sub>2</sub>.

### A.2. Location of project activity

The location for the project activity is:

State: Karnataka  
District: Gadag  
Taluka: Rona  
Site: Gajendragarh

WTG NO.	LATITUDE	LONGITUDE
6	15°45'28.854"	75°58'14.809"
9	15°44'36.670"	75°58'11'418"
10	15°45'16.523"	75°58'21'165"
13	15°44'40.872"	75°58'18'541"
14	15°44'45.737"	75°58'24.117"
15	15°44'43.085"	75°58'52.276"
16	15°45'16.503"	75°58'30.815"
20	15°45'47.037"	75°58'52.735"
23	15°44'51.830"	75°58'42.825"
24	15°45'02.667"	75°58'36.685"
27	15°45'32.924"	75°58'58.161"
28	15°45'38.967"	75°59'03.344"
29	15°44'45.005"	75°59'05.965"
30	15°44'58.377"	75°59'00.447"
40	15°45'07.561"	75°59'36.592"
41	15°45'17.542"	75°59'38.939"

42	15°45'21.146"	75°59'47.512"
45	15°44'42.271"	75°59'32.618"
34	15°44'34.673"	75°58'06.140"
49	15°44'43.085"	75°58'52.276"
21	15°44'34.530"	75°58'34.719"
22	15°44'48.384"	75°58'34.326"
37	15°45'25.005"	75°59'11.456"
48	15°45'28.854"	75°00'13.036"
44	15°45'28.854"	75°58'24.362"

**A.3. Parties and project participants**

Parties involved	Project participants	Indicate if the Party involved wishes to be considered as project participant (Yes/No)
India (host Party)	MMTC Limited	No

**A.4. Reference to applied methodologies and standardized baselines**

&gt;&gt;

Applied Methodologies: AMS-I.D. Grid connected renewable electricity generation version 11.  
Standardized baseline: Not applicable

**A.5. Crediting period type and duration**

&gt;&gt;

Crediting Period Start Date: 20/02/2009  
Crediting Period: Fixed, 10 years 0 Months

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

&gt;&gt;

The total installed capacity of the project is 15 MW; which involves operation of 25 Wind Turbine Generators (WTGs) with total capacity of 0.6 MW, Karnataka in India.

WEG NO.	LOCATION	DATE OF COMMISSIONING
40	Kuntaji	24/03/2007
41	Kuntaji	24/03/2007
42	Kuntaji	24/03/2007
48	Kuntaji	24/03/2007
21	Unachagere	30/03/2007
44	Unachagere	30/03/2007
29	Unachagere	30/03/2007
37	Unachagere	30/03/2007
9	Unachagere	24/03/2007
13	Unachagere	24/03/2007
14	Unachagere	24/03/2007
34	Unachagere	24/03/2007
22	Unachagere	24/03/2007
49	Unachagere	24/03/2007
23	Unachagere	24/03/2007

20	Vadegola	24/03/2007
27	Vadegola	24/03/2007
28	Vadegola	24/03/2007
10	Vadegola	24/03/2007
16	Vadegola	24/03/2007
6	Rajur	24/03/2007
15	Rajur	24/03/2007
24	Rajur	24/03/2007
30	Rajur	24/03/2007
45	Gowdagere	30/03/2007

The project has been under operation for this monitoring period without any major breakdowns. However, a dedicated O&M contractor for the projects' WTGs is continuously working upon normal breakdowns due to O&M measures. There has been no event that may have an impact on the GHG emissions or removals during the current monitoring period.

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

### **B.2.1. Temporary deviations from the registered monitoring plan, applied methodologies or standardized baselines**

None

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

None

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

None

### **B.2.4. Inclusion of monitoring plan**

None

### **B.2.5. Permanent changes to the registered monitoring plan, or permanent deviation of monitoring from the applied methodologies, standardized baselines, or other applied standards or tools**

None

### **B.2.6. Changes to project design**

None

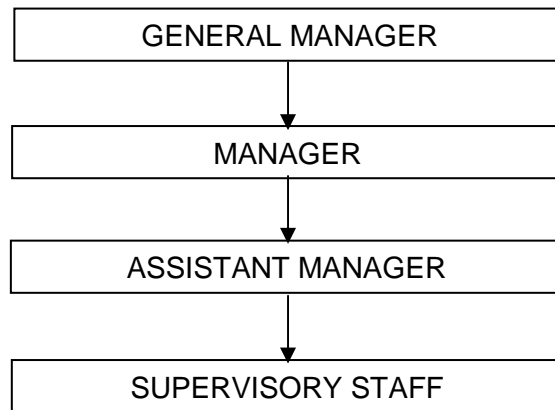
## **SECTION C. Description of monitoring system**

For monitoring, the project participant has entered into an operation and maintenance agreement with the supplier of the machines Vestas RRB India Ltd. for a period of twenty years from the date of commissioning. The Vestas RRB India Ltd. (the Contractor) has done training of engineers of MMTC at site and two engineers at works where assembly and testing of complete WEG are carried out; the training course is carried out at site.

RRB Vestas has a separate service department headed by Vice President supported by General Managers, Managers, and Assistant Managers and Supervisory Staff. Assistant Managers are posted at the project site along with requisite numbers of supervisory staff for carrying out

operation and maintenance. The supervisory staff and maintenance are provided in adequate number for maintaining adequate strength at all the time. The operation and maintenance structure with respect to the implementation of the project has been given below. The operators also record monthly energy output of each WEG and prepare reports on the performance of wind farm indicating turbine wise production. The contractor shall draw the preventive maintenance schedules and attend to the breakdowns keeping in view that machine availability would be minimum 95%.

**Operational & Maintenance Structure**



**Line Diagram**



**Monitoring System**

There are three metering points for each WEG in the project activity. The first being at the Controller end, completely controlled and maintained by the RRB Vestas. The WEGs are then connected to the Main Receiving Stations (MRS) managed by HESCOM. All the WEGs for the project have been specifically identified at Local Control System (LCS) to avoid any confusion regarding the generation by each WEG. The MRS is then connected to the Main meter at the Bulk meter station handled by HESCOM and KPTCL. In case, other than the project WEGs are jointly metered at the Main meters (MRS), the electricity generated is apportioned on the basis of the readings at the MRS and individual generation of WEGs at the controller end. A check meter is also provided at the Main Receiving Station (MRS) as a backup for any fault in the Main meters. The meters both at Bulk meter station and MRS would be calibrated regularly and in case of faulty meters, corrective action would be taken immediately.

### Meter Reading Procedure

On the first day of every month, readings are taken from the Main meters (JMR) at the Main Receiving Station (MRS) on the basis of which invoices are raised to the HESCOM. The annual emission reductions would also be calculated on the basis of the same readings. A double check of the measurements can be done with the help of the sale receipts from the HESCOM. The data would be collected regularly by project proponent and archived in both electronic and paper for minimum of two years after the end of the crediting period or the last issuance of CERs for this project activity, whichever occurs later. In case of meter failure, the faulty meters shall be replaced immediately by the relevant authority.

## SECTION D. Data and parameters

### D.1. Data and parameters fixed ex ante

(Copy this table for each data or parameter.)

Data/Parameter	NA
Unit	
Description	
Source of data	
Value(s) applied	
Choice of data or measurement methods and procedures	
Purpose of data/parameter	
Additional comments	

### D.2. Data and parameters monitored

Data/Parameter	EGy
Unit	MWh
Description	Net Electricity supplied to the grid by the WEG project in year y
Measured/calculated/default	<ul style="list-style-type: none"> <li>Calculated from the measured readings of electricity exported and imported by energy meters of accuracy class 0.2.</li> <li>The net electricity that is delivered is calculated after deduction of transmission line losses.</li> </ul>
Source of data	B-form generated using the Joint Meter Readings (JMRs)
Value(s) of monitored parameter	145,694 MWh

Monitoring equipment	RR. No.	Main Meter	Check Meter
	62	06767614	06760800
	63	06767630	06606812
	64	06606810	06767623
	75	07002560	06760792
	Accuracy class of meters: 0.2s Calibration Frequency: Annually		
Measuring/reading/recording frequency	The data is measured continuously and recorded monthly.		
Calculation method (if applicable)	The net electricity value is calculated based on monthly export and import values.		
QA/QC procedures	<p>The electricity meters record both export and import of electricity from the WEGs and the net electricity generated will be used for calculation of Emission reductions. The two meters (main and check) would be checked for accuracy and calibrated annually.</p> <p>The data is monitored continuously, measured hourly considering the LCS data for each WEG and recorded monthly on 1st of each month in presence of representative of MMTC and HESCOM at the Main Receiving Station. Since there are no common meters for WEGs from any other owner, there is no apportioning or related calculation. The net electricity that is delivered is calculated after deduction of transmission line losses. The transmission loss is calculated from the monthly readings of the bulk meter</p>		
Purpose of data/parameter	Baseline Emission calculation		
Additional comments	-		

Data/Parameter	EGy(import)		
Unit	MWh		
Description	Electricity imported by the project in year y (MWh).		
Measured/calculated/default	Measured		
Source of data	B-form generated using the Joint Meter Readings (JMRs)		
Value(s) of monitored parameter	233.88 MWh		
Monitoring equipment	RR. No.	Main Meter	Check Meter
	62	06767614	06760800
	63	06767630	06606812
	64	06606810	06767623
	75	07002560	06760792
	Accuracy class of meters: 0.2s Calibration Frequency: Annually		
Measuring/reading/recording frequency	The data is measured continuously and recorded monthly.		
Calculation method (if applicable)	The data is monitored monthly from the B-Form directly		
QA/QC procedures	The data is recorded monthly on 1st of each month in presence of representative of MMTC and HESCOM at the Main Receiving Station where all the 25 WEGs are connected.		
Purpose of data/parameter	Baseline Emission calculation		
Additional comments	-		

Data/Parameter	$EG_{y(\text{export})}$		
Unit	MWh		
Description	Electricity exported by the project in year y		
Measured/calculated/default	Measured		
Source of data	B-form generated using the Joint Meter Readings (JMRs)		
Value(s) of monitored parameter	145,694 MWh		
Monitoring equipment	RR. No.	Main Meter	Check Meter
	62	06767614	06760800
	63	06767630	06606812
	64	06606810	06767623
	75	07002560	06760792
	Accuracy class of meters: 0.2s Calibration Frequency: Annually		
Measuring/reading/recording frequency	The data is measured continuously and recorded monthly.		
Calculation method (if applicable)	The data is monitored monthly from the B-Form directly		
QA/QC procedures	The two meters (main and check) would be checked for accuracy and calibrated annually.		
Purpose of data/parameter	Baseline Emission calculation		
Additional comments	-		

Data/Parameter	$EF_y$
Unit	tCO <sub>2</sub> /MWh
Description	Combined margin CO <sub>2</sub> emission factor of Indian grid
Measured/calculated/default	Calculated
Source of data	Calculated based on the data from the CEA database, v12
Value(s) of monitored parameter	0.9653
Monitoring equipment	The methods for measuring $EF_y$ can be found in the User Guide for The CO <sub>2</sub> Baseline Database for the Indian Power Sector by CEA.
Measuring/reading/recording frequency	Annually during the time of calculation of the emission reduction units.
Calculation method (if applicable)	The data for the emission factor is calculated by the Central Electricity Authority of India every year
QA/QC procedures	The data for the $EF_y$ would be calculated by the Central Electricity Authority of India every year. Thus, the data would reflect the updated existing generation mix for the southern grid and used ex-post. The conservative of the weighted average and the combined margin would be taken as emission factor.
Purpose of data/parameter	Baseline Emission calculation
Additional comments	-



**D.3. Implementation of sampling plan**

&gt;&gt; Not applicable

**SECTION E. Calculation of emission reductions or net anthropogenic removals****E.1. Calculation of baseline emissions or baseline net removals**

>> Baseline emissions include only CO<sub>2</sub> emissions from electricity generation in fossil fuel fired power plants that are displaced due to the project activity. The methodology assumes that all project electricity generation above baseline levels would have been generated by existing grid connected power plants and the addition of new grid-connected power plants. The baseline emissions are to be calculated as follows:

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

$BE_y$  = Baseline emissions in year  $y$  (t CO<sub>2</sub>/yr)

$EG_{PJ,y}$  = Quantity of net electricity generation that is produced and fed into the grid as a result of the implementation of the CDM project activity in year  $y$  (MWh/yr)

**Calculation of  $EG_{PJ,y}$**

If the project activity is the installation of a Greenfield power plant, then:

$$EG_{PJ,y} = EG_{facility,y}$$

Where:

$EG_{PJ,y}$  = Quantity of net electricity generation that is produced and fed into the grid as a result of the implementation of the CDM project activity in year  $y$  (MWh/yr)

$EG_{facility,y}$  = Quantity of net electricity generation supplied by the project plant/unit to the grid in year  $y$  (MWh/yr)

Therefore,  $EG_{PJ,y} = 145,694$  MWh

**Calculation of Baseline Emission Factor ( $EF_{grid,CM,y}$ )**

The baseline emission factor  $EF_{grid,CM,y}$  is calculated as the weighted average of the Operating Margin emission factor ( $EF_{grid,OM,y}$ ) and the Build Margin emission factor ( $EF_{grid,BM,y}$ ):

$$EF_{grid,CM,y} = w_{OM} * EF_{grid,OM,y} + w_{BM} * EF_{grid,BM,y}$$

Where,

$W_{OM}$	75% weight of operating margin emissions factor (%)
$W_{BM}$	25% weight of build margin emissions factor (%)
$EF_{grid,OM,y}$	Build margin CO <sub>2</sub> emission factor of a particular grid in year y; calculated as described in Steps 3&4 above (tCO <sub>2</sub> /MWh)
$EF_{grid,BM,y}$	Build margin CO <sub>2</sub> emission factor of a particular grid in year y; calculated as described in Steps 5 above (tCO <sub>2</sub> /MWh)

#### Baseline Emission factor

$$EF_{grid,CM,y} = 0.75 \times 0.9843 + 0.25 \times 0.9083$$

$$= 0.9475 \text{ tCO}_2/\text{MW}$$

Therefore, Baseline Emissions:

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

$$BE_y = 145,694 \times 0.9475 = 40,751 \text{ tCO}_2$$

#### E.2. Calculation of project emissions or actual net removals

>>

The project activity involves in harnessing wind power. Therefore, the emissions from the project are zero.

#### E.3. Calculation of leakage emissions

>>

No leakage emissions have been considered and hence the leakage emission is zero.

#### E.4. Calculation of emission reductions or net anthropogenic removals

	Baseline GHG emissions or baseline net GHG removals (t CO <sub>2</sub> e)	Project GHG emissions or actual net GHG removals (t CO <sub>2</sub> e)	Leakage GHG emissions (t CO <sub>2</sub> e)	GHG emission reductions or net anthropogenic GHG removals (t CO <sub>2</sub> e)		
				Before 01/01/2013	From 01/01/2013	Total amount
<b>Total</b>	140,638	0	0	71,384	69,254	140,638

#### E.5. Comparison of emission reductions or net anthropogenic removals achieved with estimates in the registered PDD

Amount achieved during this monitoring period (t CO <sub>2</sub> e)	Amount estimated ex ante (t CO <sub>2</sub> e)
140,638	135,485

#### E.6. Remarks on increase in achieved emission reductions

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The emission reductions for the current monitoring period is marginally higher than the estimated values. No impact on additionality as it is within the sensitivity analysis.

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**Document information**

<i>Version</i>	<i>Date</i>	<i>Description</i>
06.0	7 June 2017	Revision to: <ul style="list-style-type: none"> <li>• Ensure consistency with version 01.0 of the "CDM project standard for project activities" (CDM-EB93-A04-STAN);</li> <li>• Make editorial improvements.</li> </ul>
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 (EB 70, 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).
01.0	28 May 2010	EB 54, Annex 34. Initial adoption.
Decision Class: Regulatory Document Type: Form Business Function: Issuance Keywords: monitoring report		