



Monitoring report form for CDM project activity
(Version 06.0)

MONITORING REPORT

Title of the project activity	Bundled Wind Power Project by Peethambra Granites Pvt Ltd (EKIESL-CDM. November -11-01)	
UNFCCC reference number of the project activity	8890 ¹	
Version number of the PDD applicable to this monitoring report	03	
Version number of this monitoring report	01	
Completion date of this monitoring report	12/09/2017	
Monitoring period number	01	
Duration of this monitoring period	19/12/2012 to 14/08/2017 (inclusive of both days)	
Monitoring report number for this monitoring report	01	
Project participants	Peethambra Granites Pvt. Ltd.	
Host Party	India	
Sectoral scopes	Sectoral Scope: 1 - Energy industries (renewable / non-renewable sources)	
Applied methodologies and standardized baselines	Methodology: AMS-I.D "Grid connected renewable electricity generation" (EB 61, Version 17)	
Amount of GHG emission reductions or net anthropogenic GHG removals achieved by the project activity in this monitoring period	Amount achieved before 1 January 2013	Amount achieved from 1 January 2013
	78	21,618
Amount of GHG emission reductions or net anthropogenic GHG removals estimated ex ante for this monitoring period in the PDD	36,484	

¹ <https://cdm.unfccc.int/Projects/DB/TUEV-RHEIN1355888511.27/view>

SECTION A. Description of project activity

A.1. General description of project activity

The project activity uses renewable energy (wind) as a clean fuel to generate electrical energy. The total installed capacity of the project is 4 MW, which comprises 5 no. Wind Turbine Generator (WTG), of 800 kW each of make Enercon India Limited.

The wind power produced being GHG neutral which reduce the emissions associated with power generation through fossil fuels based power plant in the regional grids of India. The project activity is a green field project activity & activity is generating electricity using Wind energy thus reducing approximately 7,833 tonnes of CO₂ equivalent at the regional Southern grid of India, as respective WTGs are selling the power generated to the Southern grid.

The further information of the project WTGs are:

Sr. No.	Project Participants' Name	Capacity (kW)	Date of Commissioning	Connected Grid	Generated Power use
WEG1	Peethambra Granites Pvt Ltd	800kW	31/03/2012	Southern	Sale to TNEB
WEG2	Neha Sharma	800kW	27/03/2012	Southern	Sale to TNEB
WEG3		800kW	31/03/2012	Southern	Sale to TNEB
WEG4	Atul Sharma	800kW	30/09/2011	Southern	Sale to TNEB
WEG5		800kW	31/03/2012	Southern	Sale to TNEB

Purpose of the project activity:

The project activity involves supply, erection, commissioning and operation of 5 Wind Electric Generators (WTGs) of 800 kW each, 3 at District Tuticorin and 2 at District Tirunelveli in Tamil Nadu; all WTGs was supplied and manufactured by Enercon India Ltd.

The main purpose of the project activity is to generate electrical energy through sustainable means using wind power resources, to utilize the generated output for selling it to the State Electricity Board and to contribute to climate change mitigation efforts. The WTGs convert wind energy into electrical energy and do not use any other fuel for generating the electricity, therefore, the project emissions are considered as zero.

Pre-project Scenario:

The Project participant was not involved in generation of wind based power and supplying to grid at the same site under the pre-project scenario therefore, in the absence of the project activity, the equivalent amount of electricity would have been generated from the connected / new power plants in the Southern grid. The installed capacity is predominantly coal based and therefore is a major source of carbon dioxide emissions in India². The main emission source in the pre-project scenario is the power plants connected to the Southern grid and main GHG involved is CO₂.

Baseline scenario:

As the project activity is the installation of a new grid-connected renewable power plant/unit, the baseline scenario is the following as per applied methodology:

"Electricity delivered to the grid by the project activity would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources, into the

² http://www.cea.nic.in/reports/planning/cdm_co2/cdm_co2.htm

grid.”

Hence, pre-project scenario and baseline scenario are the same.

A.2. Location of project activity

Sr. No.	Project Participants' Name	Capacity (kW)	Village	District	State	Country
WEG1	Peethambra Granites Pvt Ltd	800kW	Subramaniyapuram	Tuticorin	Tamil Nadu	India
WEG2	Neha Sharma	800kW	Pallankottai	Tirunelveli	Tamil Nadu	India
WEG3		800kW	Pallankottai	Tirunelveli	Tamil Nadu	India
WEG4	Atul Sharma	800kW	Karadikulam	Tuticorin	Tamil Nadu	India
WEG5		800kW	Karadikulam	Tuticorin	Tamil Nadu	India

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)	Peethambra Granites Pvt. Ltd.	No

A.4. Reference to applied methodologies and standardized baselines

Title: Grid Connected Renewable Electricity Generation

Reference: AMS I.D. (Version 17, EB 61)

The methodology also refers to approved versions of “**Tool to calculate the emission factor for an electricity system, version 02.2.1**”

A.5. Crediting period type and duration

Type of crediting period	Renewable
Crediting period from	19 Dec 12 - 18 Dec 19
Length of the Crediting Period	07 Years
Current Monitoring period from	19 Dec 2012 to 14 August 2017 (inclusive of both days)
Length of the Monitoring Period	1700 Days

SECTION B. Implementation of project activity

B.1. Description of implemented project activity

The technology employed by the Proposed Project Activity includes the generation of renewable electrical energy by harnessing wind power. Thus, this project actually displaces the electricity in the grid which is essentially fossil-fuel based to supply the generated electricity to the Southern Grid. The generation and consumption of the Project Activity is monitored continuously through the energy meters at project site & substations. The data is used for the calculation of exports to the grid and imports from the grid. The commissioning dates are as follows:

Sr. No.	Project Participants' Name	Capacity (kW)	District	State
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WEG1	Peethambra Granites Pvt Ltd	800kW	31/03/2012	Southern
WEG2	Neha Sharma	800kW	27/03/2012	Southern
WEG3		800kW	31/03/2012	Southern
WEG4	Atul Sharma	800kW	30/09/2011	Southern
WEG5		800kW	31/03/2012	Southern

The net electricity exported to grid is calculated as the difference in the electricity exported to the grid and imported from the grid. The electricity export and import values are calculated as the product of difference of current and previous TNEB meter readings multiplied with the multiplying factor of the meter. Additionally, all the WTGs at the site are connected to a central monitoring system located at that site only. This system captures daily generation figures which are later made available to PP on the customized website of EIL.

No events or situations happened during the reported monitoring period which can alter the applicability of the applied methodology.

B.2. Post-registration changes

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

There is no request for deviation applied during this monitoring period.

B.2.2. Corrections

There have not been any corrections to project information or parameters fixed at validation during the current monitoring period.

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

The start date crediting period was changed from 31st Dec 2012 to 19th Dec 2012. Thus revised crediting period is 19th Dec 2012 to 18th Dec 2019. Please refer UN web page for the change in start date of crediting period³.

B.2.4. Inclusion of monitoring plan

There has not been any change in the monitoring plan during the current monitoring period.

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

Not Applicable.

B.2.6. Changes to project design

There has not been any change in the PDD during the current monitoring period.

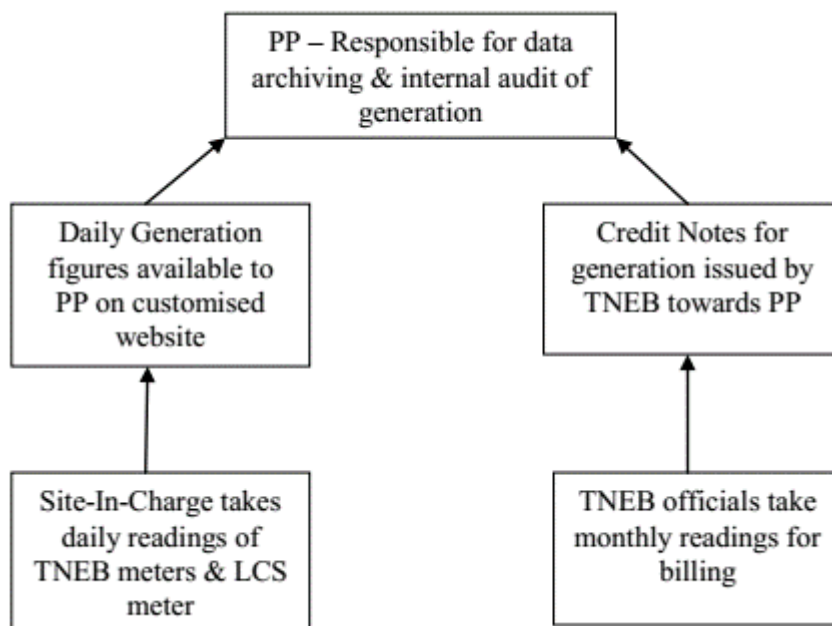
³ <https://cdm.unfccc.int/Projects/DB/TUEV-RHEIN1355888511.27/view>

SECTION C. Description of monitoring system

The project activity is in accordance with approved small scale methodology AMS I.D, and therefore, can use the monitoring methodology for type I.D of 'Appendix B of the simplified M&P for small-scale CDM project activities-Version 17, - Grid connected renewable electricity generation.

The monitoring methodology specified in the methodology requires that the project-monitoring plan to consist of monitoring of quantity of net electricity supplied to the grid in the year y. In order to monitor the mitigation of GHG due to the project activity, the total energy exported needs to be measured. The net energy supplied to grid by the project activity multiplied by emission factor for regional grid, would form the baseline for the project activity.

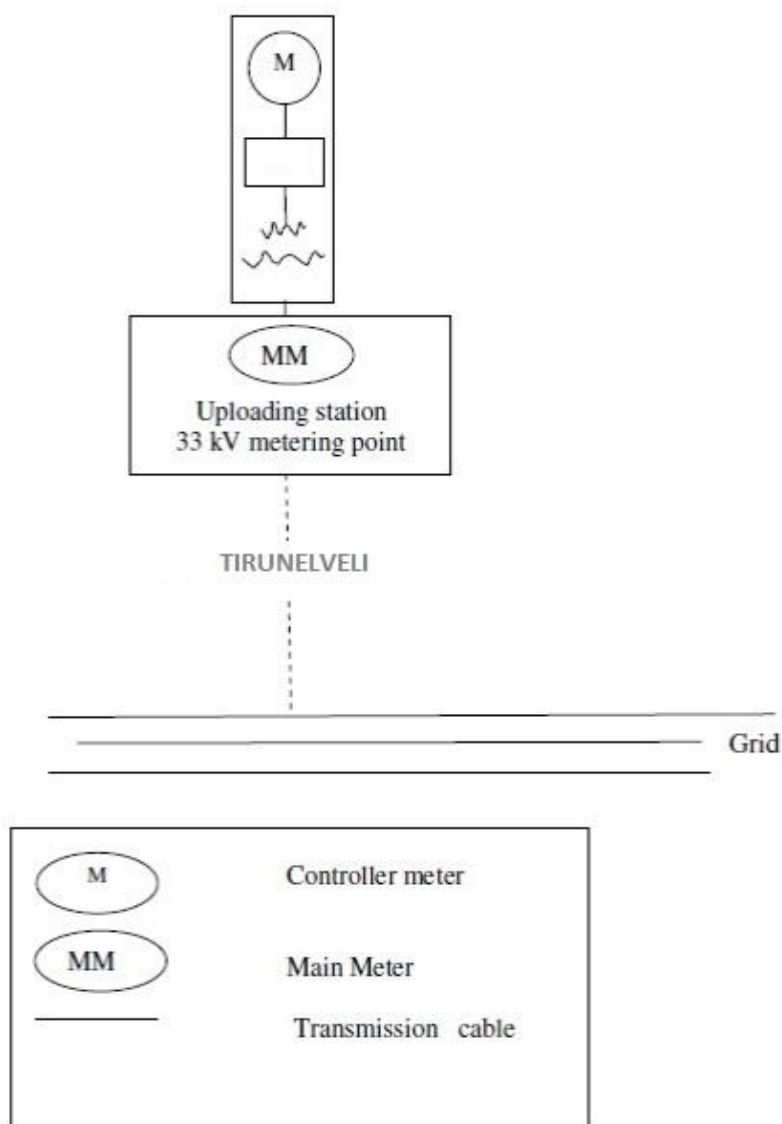
Since the baseline emission factor is based on an ex-ante determination, monitoring of this parameter is not required. The sole parameter for monitoring is the net electricity exported to the grid. The Project is operated and managed by Enercon India Limited (EIL). Enercon India Limited (EIL) will have a designated Site-In-Charge (O&M) on site, who will be responsible for monitoring the electricity exported from the project activity. The overall flow of information has been depicted using the following hierarchical structure:



As per the project boundary diagram provided in Section B.3 of this document, the monitoring is done at the WTG electrical yard substation using a TNEB owned electronic tri-vector meters (Main & Check Meters).

The net electricity exported to grid is calculated as a difference in the electricity exported to the grid and imported from the grid. The electricity export and import values are calculated as the product of difference of current and previous TNEB meter readings multiplied with the multiplying factor of the meter. Additionally, all the WTGs at the site are connected to a central monitoring system located at that site only. This system captures daily generation figures which are later made available to PP on the customized website of EIL.

Single Line diagram for the WTGs in Tamil Nadu

Line Diagram for WTGs in Tamilnadu**Training**

Training of staff operating and maintaining the WEGs will be carried out by the WEG manufacturer or O&M Service Provider or Investors contract agency. Special emphasis will be given to the training of the employees to enable them to develop their skills to meet changing WEG technology and to provide efficient and effective O&M services. There is an initial learning program as well as continuous learning programs for all employees.

The training program focuses mainly on the management, monitoring and maintenance, and safety & reliability aspects of wind power. The objectives include:

1. Understanding the various stages and aspects in the management of wind power systems.
2. Understanding the importance of monitoring and maintenance of wind power systems and hence the various tasks involved in this.
3. Understanding the importance of safety and reliability aspects involved with wind power and the measures taken.
4. Managing generation and other data for future reference.

Internal audits & Performance review

The records are regularly audited and checked by the senior officials from project proponent on an annual basis. The officials will monitor the actual emission reduction. The personnel responsible for taking readings at site are adequately trained.

Emergency Preparedness

In the context of the project activity, the main & check meters will be kept in sealed by TNEB and all maintenance will be taken up by TNEB only. In case of failure of the main meter, generation value would be arrived at as per standard clause (8) and (9) of Article 4 of the Energy Purchase agreement as provided below:

"(8) Check meter readings shall be considered when Main Meters are found to be defective or stopped. Provided that, if difference between the readings of main and check meters vis-à-vis main meter reading exceeds twice the Percentage error applicable to the relevant class, both meters shall be tested and the one found defective shall be immediately replaced and reading of other will be considered.

(9) If during test or calibration, both the main meter and check meter are found to have errors beyond permissible limits, the bill shall be revised for the previous 3 (Three) months or the exact period if known and agreed upon by the parties, by applying correction as determined by the meter testing Wing of the STU/Distribution Licensee to the consumption registered by the meter with lesser error.

The project promoters have contracted the technology supplier for providing O&M services for the power project. The service provider would be responsible for maintenance of the necessary spare parts and consumables for the maintenance of the WTGs such as anemometers, wind vanes and sensors, oil filters, batteries, auxiliary motors and pumps, WTG controllers, slip rings, limit switches and sensors, detergents & solvents etc. The service provider would also be responsible for supply of necessary main components of the WTG such as main gearboxes, blades, generators, towers, hubs, main shafts & bearings, ground and top controller and hydraulic systems. The service provider would also ensure that occupational health and safety procedures are adhered to during the operation & maintenance activities. Additionally, spare meters would also be kept available at the site for replacement in case of failure of any of the monitoring equipments.

SECTION D. Data and parameters

D.1. Data and parameters fixed ex ante

Data/Parameter	EF _{grid,CM,y}
Unit	tCO ₂ /MWh
Description	Combined Margin Grid Emission factor
Source of data	Calculated from operating and built margin, using 75%-25% weights used
Value(s) applied	0.8971
Choice of data or measurement methods and procedures	The value applied is taken from the CEA reviews of three years. The detailed calculation is shown in the baseline section above.
Purpose of data/parameter	Calculation of Baseline Emission
Additional comments	This value is fixed <i>ex-ante</i>

Data/Parameter	EF _{OM,y}
Unit	tCO ₂ /MWh
Description	Operating Margin Grid Emission factor
Source of data	Calculated from CEA database, Version 07, January 2012
Value(s) applied	0.9515
Choice of data	The value applied is taken from the CEA reviews of three years. The detailed

or measurement methods and procedures	calculation is shown in the baseline section above.
Purpose of data/parameter	Calculation of Baseline Emission
Additional comments	This value is fixed <i>ex-ante</i>

Data/Parameter	EF_{BM,y}
Unit	tCO ₂ /MWh
Description	Build Margin Grid Emission factor
Source of data	Calculated from CEA database, Version 07, January 2012
Value(s) applied	0.7339
Choice of data or measurement methods and procedures	The value applied is taken from the CEA reviews of three years. The detailed calculation is shown in the baseline section above.
Purpose of data/parameter	Calculation of Baseline Emission
Additional comments	This value is fixed <i>ex-ante</i>

D.2. Data and parameters monitored

Data/Parameter	EG_y
Unit	MWh/year
Description	Quantity of net electricity supplied to the grid in Year y
Measured/calculated/default	Measured
Source of data	Joint Metering Report.
Value(s) of monitored parameter	24,187
Monitoring equipment	Monitoring: Electrical Energy Meters which are electronic tri-vector meters of accuracy class 0.5 (Main & Check meters) Data type: Measured & Calculated Archiving: Paper & Electronic Responsibility: The O&M site-in-charge shall be responsible for the regular recording of data. Calibration Frequency: The meters shall be calibrated once every two years.
Measuring/reading/recording frequency	Continuous Monitoring, Continuous Measurement and at least monthly recording.
Calculation method (if applicable)	The net electricity exported to grid is calculated as a difference in the electricity exported to the grid and imported from the grid.
QA/QC procedures	The amount of electricity exported to grid is cross-checked with the invoices for sale of power. Meter calibration shall be conducted once every two years and internal audit system is in place as mentioned in PDD Section B.7.2
Purpose of data/parameter	Calculate baseline emission
Additional comments	The data will be kept for two years after the end of the crediting period or the last issuance of CERs for this project activity, whichever occurs later. In the case of the crediting period start & end dates of the project activity falls in between the billing cycles, then for emission reduction calculations, the daily generation reports measured at TNEB provided by the O&M service provider, shall be considered.

D.3. Implementation of sampling plan

Sampling is not required for the given project activity.

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

The baseline emission calculation for the project activity is attributable to the CO₂ Emission that could have been produced at grid from fossil fuel based power plants in absence of the proposed project activity with wind mill. Therefore the amount electricity supplied to the baseline grid will be multiplied by the Grid emission factor to calculate the baseline emission reduced by the Project.

As per para 11 of AMS ID

$$BE_y = EG_{BL,y} \times EF_{CO_2,grid,y}$$

Where,

BE_y = Baseline Emissions in year y (t CO₂)

EG_{BL,y} = Quantity of net electricity supplied to the grid as a result of the implementation of the CDM project activity in year y (MWh)

EF_{CO₂, grid, y} = CO₂ emission factor of the grid in year y (t CO₂/MWh)

E.2. Calculation of project emissions or actual net removals**Project Emissions:**

As per para 20 to AMS I.D, version 17 **for renewable project activities Project Emission (PE_y)** in tCO₂/year = 0 except geothermal and hydro power plants. Since project activity is a wind power plant.

Therefore,

$$PE_y = 0 \dots\dots\dots(1)$$

E.3. Calculation of leakage emissions**Leakage Emissions:**

Since project does not involve transfer of an energy generating equipment from another activity, as per para 22 of AMS I.D, Version 17:

$$LE_y = 0 \dots\dots\dots(2)$$

Emission Reduction:

As per para 23 of AMS I.D, version 17,

$$ER_y = BE_y - PE_y - LE_y$$

Where,

ER_y = Emission reductions in year y (t CO₂/y)

BE_y = Baseline Emissions in year y (t CO₂/y)

PE_y = Project emissions in year y (t CO₂/y)

LE_y = Leakage emissions in year y (t CO₂/y)

Using equation 1 & 2 we get,

$$ER_y = BE_y - 0 - 0$$

or

$$ER_y = BE_y$$

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

	Baseline GHG emissions or baseline net GHG removals (t CO ₂ e)	Project GHG emissions or actual net GHG removals (t CO ₂ e)	Leakage GHG emissions (t CO ₂ e)	GHG emission reductions or net anthropogenic GHG removals (t CO ₂ e)		
				Before 01/01/2013	From 01/01/2013	Total amount
Total	21,696	0	0	78	21,618	21,696

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 ₂ e)	Amount estimated ex ante (t CO ₂ e)
21,696	36,484

E.6. Remarks on increase in achieved emission reductions

During the current monitoring period, the plant suffered scheduled maintenance as well as there were certain uncontrolled variations in wind speed due to which actual CER generation is around 40% below the ex-ante values, which is not under the control of PP.

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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"> • Ensure consistency with version 01.0 of the “CDM project standard for project activities” (CDM-EB93-A04-STAN); • Make editorial improvements.
05.1	4 May 2015	Editorial revision to correct version numbering.
05.0	1 April 2015	Revisions to: <ul style="list-style-type: none"> • Include provisions related to delayed submission of a monitoring plan; • Provisions related to the Host Party; • Remove reference to programme of activities; • Overall editorial improvement.
04.0	25 June 2014	Revisions to: <ul style="list-style-type: none"> • Include the Attachment: Instructions for filling out the monitoring report form (these instructions supersede the "Guideline: Completing the monitoring report form" (Version 04.0)); • Include provisions related to standardized baselines; • Add contact information on a responsible person(s)/ entity(ies) for completing the CDM-MR-FORM in A.6 and Appendix 1; • Change the reference number from <i>F-CDM-MR</i> to <i>CDM-MR-FORM</i>; • Editorial improvement.
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		