



Monitoring report form for CDM project activity
(Version 08.0)

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

MONITORING REPORT

Title of the project activity	13.25 MW Wind Power Generation by RMTL, In Kutch, Gujarat		
UNFCCC reference number of the project activity	2247		
Version number of the PDD applicable to this monitoring report	1.3		
Version number of this monitoring report	01		
Completion date of this monitoring report	10/08/2021		
Monitoring period number	-		
Duration of this monitoring period	01/04/2012 to 30/03/2016 (including both dates)		
Monitoring report number for this monitoring period	01		
Project participants	M/s Ratnamani Metals and Tubes Ltd Emergent Ventures India Pvt. Ltd.		
Host Party	India		
Applied methodologies and standardized baselines	AMS I.D. ver 13- Grid connected renewable electricity generation Standardized Baseline: NA		
Sectoral scopes	01: Energy Industries (renewable -/ non-renewable sources)		
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 until 31 December 2020	Amount achieved from 1 January 2021
	18,723 tCO _{2e}	62,288 tCO _{2e}	0 tCO _{2e}
Amount of GHG emission reductions or net anthropogenic GHG removals estimated ex ante for this monitoring period in the PDD	95,840 tCO _{2e}		

SECTION A. Description of project activity

A.1. General description of project activity

The purpose of the project activity is to generate clean and green energy to help combat greenhouse gas emissions from conventional sources of energy. The project activity entails installation of wind turbines having a total capacity of 13.25 MW. Eight wind turbines of 1.5MW each and one wind turbine of 1.25 MW are installed in this project activity. The electricity produced from the wind turbines is exported to the connected state grid barring the entire power generated by the 1.25 MW WTG and 70% of one of the 1.5MW WTG would be wheeled to the project proponent's unit. The project activity is a part of the Western Region (WR) grid (Now INDIAN Grid). WR grid is predominantly fossil fuel dependent and has a grid emission of 0.898 tCO₂e/ MWh. The project activity reduces greenhouse gas (GHG) emission in power generation in the grid, which predominantly has fossil fuel based power stations. All the nine wind turbines have been installed in Kutch district in Gujarat state as shown in the table below:

WTG ID Number	Capacity (MW)
SEL/1500/06-07/0358	1.50
SEL/1500/06-07/0359	1.50
SEL/1500/06-07/0360	1.50
SEL/1500/06-07/0361	1.50
SEL/1500/06-07/0382	1.50
SEL/1500/06-07/0383	1.50
SEL/1500/06-07/0384	1.50
SEL/1500/06-07/0362	1.50
SEL/1250/05-06/0139	1.25
Total	13.25

The project proponent, Ratnamani Metals and Tubes Ltd (RM TL), is a well known manufacturer of carbon steel and stainless steel tubes. It employs state-of-the-art technology and caters to the niche markets of almost all the emerging sectors like oil and gas, refineries, petrochemicals, process industries, power plants and water distribution.

The project meets the sustainable development aspects and also contributes its mite to the Government of India's target of meeting its 10% power requirements through renewable energy sources by 2012.

A.2. Location of project activity

Village: Arikhana, Kamand, Suthri

District: Kutch

State:Gujarat

Country: India

WTG Number	Capacity (MW)	Village Location	Latitude (N) (Deg min sec)	Longitude (E) (Deg min sec)
SEL/1250/05-06/0139	1.25	Vanku	N23 07 30.2	E68 49 42.2
SEL/1500/06-07/0361	1.5	Kamand	N23 03 10.0	E68 52 10.5
SEL/1500/06-07/0360	1.5	Arikhana	N23 03 28.0	E68 52 03.1
SEL/1500/06-07/0383	1.5	Suthri	N23 02 35.3	E68 52 19.6
SEL/1500/06-07/0384	1.5	Suthri-old	N23 02 56.6	E68 52 32.1
SEL/1500/06-07/0359	1.5	Arikhana	N23 02 40.5	E68 53 41.5

SEL/1500/06-07/0358	1.5	Suthri	N23 03 05.9	E68 52 56.6
SEL/1500/06-07/0382	1.5	Suthri-old	N23 00 02.6	E68 55 34.7
SEL/1500/06-07/0362	1.5	Suthri	N23 02 55.0	E68 54 19.6
Total	13.25			





A.3. Parties and project participant(s)

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)	M/s Ratnamani Metals & Tubes Ltd	No
Switzerland (other Party)	Emergent Ventures India Pvt. Ltd.	No

A.4. References to applied methodologies and standardized baselines

Methodology: AMS ID 'Grid connected renewable electricity generation' Scope 1 Version 13, EB 36¹

"Tool to calculate the emission factor for an electricity system"
Version 01, EB 35²

A.5. Crediting period type and duration

Type: Fixed crediting period
Duration: 25/03/2009 to 24/03/2019

¹ <https://cdm.unfccc.int/methodologies/DB/W3TINZ7KKWCK7L8WTFQOQFQQH4SBK>

² <https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-07-v7.0.pdf>

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

The project activity entails installations of wind turbines having a total capacity of 13.25 MW. Eight wind turbines of 1.5 MW each and one turbine of 1.25 MW are installed in this project activity.

The commissioning details of the WTGs are provided in the table below:

Sl. No.	WTG ID	Commissioning Date
1	SEL/1500/06-07/0358	30/03/2007
2	SEL/1500/06-07/0359	29/03/2007
3	SEL/1500/06-07/0360	22/03/2007
4	SEL/1500/06-07/0361	21/03/2007
5	SEL/1500/06-07/0382	31/03/2007
6	SEL/1500/06-07/0383	22/03/2007
7	SEL/1500/06-07/0384	22/03/2007
8	SEL/1500/06-07/0362	30/06/2007
9	SEL/1250/05-06/0139	31/03/2006

These WTGs are connected to Line1 and Line2 of Suthri and Vanku Substations.

The project is a small scale CDM project activity and is based on Appendix B of the simplified modalities and procedures for small-scale CDM project activities. The project activity conforms to the following category -

Technology:

Technical specifications of Suzlon 1500 kW WTG is given below:

Wind Turbine Generator Type	1.5 MW
Make	Suzlon
Rotor	
Rotor Diameter	82.0 m
Cut-in wind speed	4m/s
Rated wind speed	14m/s
Rotor swept area	5281 m ²
Rotational Speed	16.30 rpm
Rotor material	GRP
Regulation	Pitch
Gear Box	
Type	3 Stage gear box, 1 planetary & 2 helical
Manufacturer	Winergy
Nominal load	1650 kW
Type of cooling	Oil cooling system
Gear ratio	95.09
Generator	
Type	Asynchronous generator 4 pole
Rotational Speed	1511 rpm
Rated output	1500 kW
Operational Voltage	690 V
Frequency	50 Hz

Insulation class	Class "H"
Protection	IP 54
Cooling system	Air cooled
Safety system	
Aerodynamic brake	3 times Independent systems pitch regulation
Mechanical brake	Spring powered disc brakes, hydraulically released, fail safe
Control unit	Microprocessor controlled, indicating actual operating conditions, UPS back up system
Yaw Drive System	4 active electrical yaw motors
Yaw bearing	Polyamide slide bearing

Technical specifications of Suzlon 1250 kW WTG is given below.

Wind Turbine Generator Type	1.25 MW
Make	Suzlon, S.64
Rotor	
Rotor Diameter	64 m
Cut-in wind speed	3 m/s
Rated wind speed	14 m/s
Rotor blades	3 no.
Rotor swept area	3217 m ²
Rotational Speed	13.9 rpm
Rotor material	GRP
Regulation	Pitch regulated
Gear Box	
Type	3 Stage gear box, 1 planetary & 2 helical
Manufacturer	Winergy
Nominal load	1390 kW
Type of cooling	Oil cooling system
Gear ratio	74.917:1
Generator	
Type	Asynchronous generator 4 pole
Rotational Speed	1006/ 1506 rpm
Rated output	250/1250 kW
Rated Voltage	690 V
Frequency	50 Hz
Insulation class	Class "H"
Protection	IP 56
Cooling system	Air cooled
Safety system	
Aerodynamic brake	3 Independent systems with blade pitch
Mechanical brake	Spring powered disc brakes, hydraulically released, fail safe

Control unit	Microprocessor controlled, indicating actual operating conditions, UPS back up system
Yaw Drive System	4 active electrical yaw motors
Yaw bearing	Polyamide slide bearing

The technology used in the project activity is environmentally safe and sound.

B.2. Post-registration changes

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

Not Applicable.

B.2.2. Corrections

Not Applicable.

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

Not Applicable.

B.2.4. Inclusion of monitoring plan

Not Applicable.

B.2.5. Permanent changes to the registered monitoring plan, or permanent deviation of monitoring from the applied methodologies, standardized baselines, or other methodological regulatory documents

Not Applicable.

B.2.6. Changes to project design

The revised project design document was approved by the UNFCCC on 27/07/2011.

B.2.7. Changes specific to afforestation or reforestation project activity

Not Applicable.

SECTION C. Description of monitoring system

The project proponents have proposed a detailed procedure to ensure proper monitoring for the purpose of CDM activity.

The methodology requires monitoring of the electricity generation from the project activity. Analysis of daily power generation reports, performance report and monthly meter reading is handled by project proponent on a regular basis. The metering system includes a main meter and a back up meter, sealed in the presence of the representatives of the power producer and GETCO. The State Electricity Board personnel take readings of power generation every month; this data is used for the billing purposes.

The meter reading taken jointly at the appointed date and time is signed by the representatives of the GUVNL/ GETCO and the O&M service provider every month. The backup meter is used in the

period the main metering system is not in service. The project proponent ensures that the meters are repaired, recalibrated or replaced immediately in case they are found to be outside the acceptable limits of accuracy or not functioning properly. The meters are calibrated at least once in three years as per the registered PDD.

The proponent keeps complete and accurate records and all other data required for the purpose of proper administration and operation of the windmills. The proponent also maintains an accurate and up-to-date operating log at the wind mill sites. The data will be kept for at least 2 years after the end of the crediting period or the last issuance of CERs for the project activity, whichever occurs later.

Data collection procedures

The data that bears relevance to the energy generation from the project- the meter readings, are taken monthly by the representative of GEDA and the PP (currently Suzlon personnel- the O&M service provider) for calculating (as represented in the registered PDD) and reporting the Wind energy share certificate. This is then forwarded to the owner of each WTG linked to the substation to credit their share. The service provider maintains all records as required and can forward the same to the PP if requested.

The web linked central monitoring system (CMS) of Suzlon downloads daily data of all the WTGs and this information is made available to the PP through their website. PP may request all other supporting documentation about their project to be presented to them in case of any aberrations.

The operation and maintenance team manages the farm, repairs in case of breakdown and ensures security on site. They have established emergency procedures. They also update the PP if any problems arise on site.

Emergency preparedness:

To ensure trouble free operations and efficient generations through all the wind turbines, PP has entered into a comprehensive long term Operation and Maintenance agreement with the manufactures of the turbines. The contractor Suzlon Infrastructure Services Limited, under the O&M contract with Ratnamani Metals and Tubes Ltd (RMTL) is responsible for the operation and maintenance of the project activity. The metering system also includes a back up meter apart from main meter. In case of any failure or error in the main meter, the reading from back up meter will be considered for monitoring.

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 for WR grid
Source of data	Central Electricity Authority ,India
Value(s) applied	0.898
Choice of data or measurement methods and procedures	-
Purpose of data/parameter	For the calculation of baseline emission, project emission (if any), leakage emission (if any) .Central Electricity Authority (India) is a government body and data published is in line with the methodological requirement. http://www.cea.nic.in/planning/c%20and%20e/user_guide_ver3.pdf
Additional comments	Fixed ex ante in the registered PDD

Data/Parameter	EF _{grid, OM,y}
Unit	tCO ₂ / MWh
Description	Operating Margin for WR grid
Source of data	Central Electricity Authority ,India
Value(s) applied	1.00
Choice of data or measurement methods and procedures	-
Purpose of data/parameter	Central Electricity Authority (India) is a government body and data published is in line with the methodological requirement. http://www.cea.nic.in/planning/c%20and%20e/user_guide_ver3.pdf
Additional comments	Fixed ex ante in the registered PDD

Data/Parameter	EF _{grid, BM,y}
Unit	tCO ₂ / MWh
Description	Build Margin for WR grid
Source of data	Central Electricity Authority ,India
Value(s) applied	0.59
Choice of data or measurement methods and procedures	-
Purpose of data/parameter	Central Electricity Authority (India) is a government body and data published is in line with the methodological requirement. http://www.cea.nic.in/planning/c%20and%20e/user_guide_ver3.pdf
Additional comments	Fixed ex ante in the registered PDD

D.2. Data and parameters monitored

Data/Parameter	GEN
Unit	kWh per annum
Description	Net electricity supplied by WTGs per annum in the project activity
Measured/calculated/default	Measured Refer annex 2 for the metering arrangement
Source of data	Monthly certificates issued by GEDA/ Electricity meter installed by State Electricity Board at uploading station connected to WTGs
Value(s) of monitored parameter	90,214,768.32
Monitoring equipment	Energy meter Please refer annex 1 for energy meter details
Measuring/reading/recording frequency	Meter readings for measuring this parameter are taken monthly.
Calculation method (if applicable)	-
QA/QC procedures	These meters are the property of state electricity boards and calibration of the meters is carried out by them as per UNFCCC requirements.
Purpose of data/parameter	Baseline emission calculation
Additional comments	-

D.3. Implementation of sampling plan

Not Applicable.

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

Calculations have been done as per the methodology and formula presented in the registered PDD.

Baseline emission:

$$BE = GEN * CM / 1000$$

Where;

BE = Baseline emission in tCO₂/MWh

GEN = Net electricity supplied by WTGs per annum in the project activity in kWh

CM = Combined margin of WR grid in tCO₂/MWh

$$\begin{aligned} BE_y &= 90,214,768.32 \text{ (kWh)} * 0.898 \text{ (tCO}_2\text{/MWh)} / 1000 \\ &= 81,011 \text{ (tCO}_2\text{e)} \end{aligned}$$

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

There is no emission due to the project activity and hence,

$$\text{Emission reduction, } ER = BE - PE = BE - 0 = BE$$

E.3. Calculation of leakage emissions

As the energy generating equipment is not transferred from another activity or the existing equipment is transferred to another activity, hence leakage is not to be considered.

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 until 31/12/2020	From 01/01/2021	Total amount
Total	81,011	0	0	18,723	62,288	0	81,011

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 for this monitoring period in the PDD (t CO ₂ e)
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Amount achieved during this monitoring period (t CO _{2e})	Amount estimated ex ante for this monitoring period in the PDD (t CO _{2e})
81,011	95,840

E.5.1. Explanation of calculation of “amount estimated ex ante for this monitoring period in the PDD”

Considering the annual average emission reductions as per the registered PDD which is 23,960 tCO_{2e} per year, the number of days covered during the current monitoring period comes out to be 1,460 days, based upon which the estimated emission reductions attributed to this monitoring period comes out to be 95,840 tCO_{2e}.

E.6. Remarks on increase in achieved emission reductions

It is to be noted here that as per the estimated emission reduction to be achieved from the project activity for the current monitoring period is 95,840 tCO_{2e}, whereas actual emission reductions achieved are 81,011 tCO_{2e}, which is approximately 15.1% lower than the estimated emission reductions. The generation of electricity depends upon many other climatic conditions, which are not within the control of the project participant. The higher generation during the current verification period is due to certain natural conditions. Hence, it is acceptable.

E.7. Remarks on scale of small-scale project activity

This project activity remain a small scale project.

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Document information

<i>Version</i>	<i>Date</i>	<i>Description</i>
08.0	6 April 2021	Revision to: <ul style="list-style-type: none"> • Reflect the “Clarification: Regulatory requirements under temporary measures for post-2020 cases” (CDM-EB109-A01-CLAR).
07.0	31 May 2019	Revision to: <ul style="list-style-type: none"> • Ensure consistency with version 02.0 of the “CDM project standard for project activities” (CDM-EB93-A04-STAN); • Add a section on remarks on the observance of the scale limit of small-scale project activity during the crediting period; • Add "changes specific to afforestation or reforestation project activity" as a possible post-registration changes; • Clarify the reporting of net anthropogenic GHG removals for A/R project activities between two commitment periods; • Make editorial improvements.
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.

<i>Version</i>	<i>Date</i>	<i>Description</i>
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		