Monitoring report form for CDM project activity
(Version 09.0)

MONITORING REPORT			
Title of the project activity	Wind power project in Maharashtra by TVS Energy Limited		
UNFCCC reference number of the project activity	8551[1]		
Version number of the PDD applicable to this monitoring report	05		
Version number of this monitoring report	1.0		
Completion date of this monitoring report	04/04/2022		
Monitoring period number	01		
Duration of this monitoring period	20/12/2012 - 19/12/2019 (first and last dates included)		
Monitoring report number for this monitoring period	NA		
Project participants	Green Infra BTV Limited		
Host Party	India		
Applied methodologies and standardized baselines	**Applied methodology:** ACM0002 Version 12.3.0- Consolidated baseline methodology for grid-connected electricity generation from renewable sources **Standardized baseline:** Not Applicable		
Sectoral scopes	1: 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
	1,765	374,274 tCO_2	0
Amount of GHG emission reductions or net anthropogenic GHG removals estimated ex ante for this monitoring period in the PDD	338,666 tCO_2		

[1] https://cdm.unfccc.int/Projects/DB/DNV-CUK1354626555.71/view?cp=1

SECTION A. Description of project activity

A.1. General description of project activity

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TVS Energy Limited (TVS Energy) has developed 25.5 MW wind farm in the state of Maharashtra in India. The project consists of 17 WEGs (Wind El ectric Generators) of capacity1500kW each. The project are generate clean electricity which is supplied to UNIFIED INDIAN (Northern, Eastern, Western and North- Eastern) grid of India.

The Project with total capacity of 25.5 MW are utilize Vensys 82 Wind Energy Generators (WEGs) of ReGen Powertech Private Limited (RPPL). The project harnesses renewable resources (wind) in the region, thereby displacing non- renewable fossil resources resulting to sustainable economic and environmental development.

The installations in this project are carried out with a motive of generation of electricity from environmentally benign source of energy. The WEGs are connected to the transformer (33 kV / 690 V) at yard, and this is in turn fed to the pooling substation (220 kV / 33 kV).

A.2. Location of project activity

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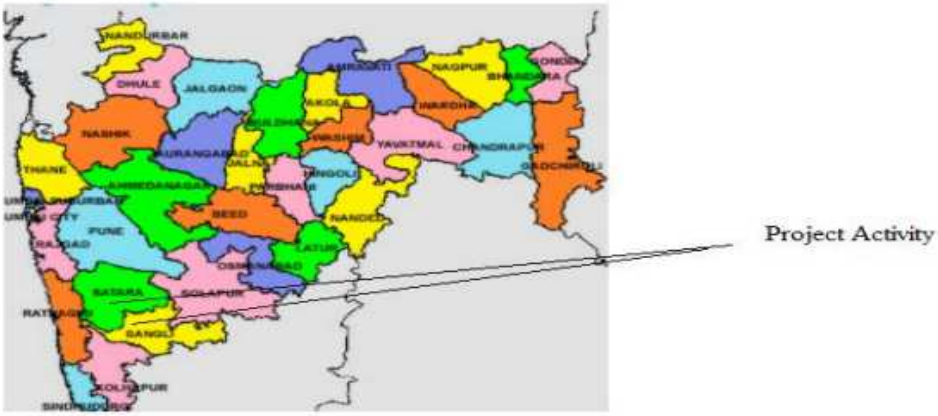
Host Party **:** India
Region/state/province **:** Western Region, Maharashtra, Districts: Satara and Sangli
City/town/community **:** Villages: Vibhutwadi, Kurundwadi, Kaledhon, Mulikwadi and Panchwad

The project activity is located across villages Kaledhon, Mulikwadi and Panchwad in district Satara and villages Vibhutwadi and Kurundwadi in district Sangli, Maharashtra India. The railway station nearest to the site is Karad (50 KMs from site) and the nearest airport is Pune (200 KMs)

Location	Villages	Taluks	Districts	GPS Coordinates	
				Latitude (Deg Min Secs)	Longitude (Deg Min Secs)
RP67_P	Vibhutwadi	Aatpadi	Sangli	17° 29' 5.6868"	74° 43' 2.827"
RP68_P				17° 29' 2.2776"	74° 43' 9.887"
RP69_P				17° 28' 56.8848"	74° 43' 15.287"
RP70_P				17° 28' 51.3912"	74° 43' 20.687"
RP71_P				17° 28' 45.4764"	74° 43' 25.406"
RP72_F	Vibhutwadi and Kurundwadi	Aatpadi & Khanapur		17° 28' 40.998"	74° 43' 33.686"
RP73_F				17° 28' 33.6756"	74° 43' 32.344"
RP74_F				17° 28' 26.3172"	74° 43' 30.76"
RP75_F				17° 28' 18.8328"	74° 43' 30.4"
RP76_F				17° 28' 12"	74° 43' 30.544"
G3	Kaledhon	Khatav	Satara	17° 25' 30.9828"	74° 40' 13.127"
G5				17° 25' 21.2124"	74° 40' 28.06"
G6				17° 25' 17.778"	74° 40' 18.268"
N3	Mulikwadi	Khatav	Satara	17° 27' 36"	74° 40' 10.564"
N2	Mulikwadi			17° 27' 39.9924"	74° 40' 5.268"
RP_11P	Panchwad	Khatav	Satara	17° 29' 34.5372"	74° 38' 14.784"
RP_11Pb				17° 29' 29.1912"	74° 38' 9.37"

Map of India



Map of Maharashtra state

Location of Project Activity

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 Green Infra BTV Limited (Private entity)[2]	No

A.4. References to applied methodologies and standardized baselines

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Title: Consolidated baseline and monitoring methodology for "Grid-connected electricity generation from renewable sources" Version 12.3.0[3], EB 66

The Approved consolidated baseline methodology ACM0002 (draws upon the following tools which have been used in the PDD:

- Tool to calculate the emission factor for an electricity system – Version 2.2.1[4], EB 63

[2] The name of project proponent has been changed from M/S TVS Energy Limited to GREEN INFRA BTV LIMITED from 22.11.2012

[3] https://cdm.unfccc.int/UserManagement/FileStorage/4W1SCKX3EMPO6AYGRJUTD7BQ8IVN0H

[4] https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-07-v2.2.1.pdf

- Tool for the demonstration and assessment of additionality – Version 6.1.0[5], EB 69

A.5. Crediting period type and duration

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Type of crediting period : Renewable
Crediting period : 20/12/2012 – 19/12/2019

SECTION B. Implementation of project activity

B.1. Description of implemented project activity

>>
The Project involves 17 WEGs of ReGen Powertech make Vensys 82. Each WEG has a rated capacity of 1,500 kW with internal electrical lines connecting the Project with a local evacuation facility. The project uses technology that is environmentally clean and safe since there are no GHG emissions associated with the electricity generation from WEGs. The technical specifications of the 1,500 kW WEG is given below:

General	
Wind Turbine Class	GL III A
Hub Height	85 m
Type	Direct Drive Horizontal Axis Wind Turbine with variable Rotor Speed
Power Regulation	Independent electromechanical pitch system for each blade
Rated Power	1500 kW
Rotational Speed	Variable, 9 -17.3 rpm
Design Lifetime	20 years
Wind Conditions	
Air Density	1.225 kg / cu.m
Annual Average Wind Speed	7.5 m/s
Wind shear	0.16
Cut-in wind speed	3 m/s
Cut-out wind speed	22 m/s
Re cut-in wind speed	< 22 m/s (10 min. avg.)
Rated wind speed	approx. 13 m/s
Survival wind speed	52.5 m/s
Maximum in-flow angle	8 Deg
Rotor	
Diameter	82 m
No. of Blades	3
Swept Area	5258 sq. m
Orientation	Up-wind
Direction of Rotation	Clockwise (from up-wind side)
Cone Angle	-3 Deg
Tilt Angle	3 Deg
Blade	
Type	LM 40.3 P2
Material	Glass Fibre Reinforced Plastic
Profile	NACA 64618 and DU
Starting	Self-starting
Lightening Protection	Provided

[5] https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-01-v6.1.0.pdf

Hub	
Hub Type	Rigid – Star
Material	EN-GJS-400-18U-LT
Pitch System	
Blade Bearing	Ball Slew Bearing (without gearing)
Mechanism	Toothed Belt Drive
Drive	Planetary geared AC motor
Backup power	Ultra-capacitor
Braking System	
Primary Brake System	Aerodynamic Brake, Individual full 90 deg. blade pitch and control for each blade
Maintenance	Hydraulic Brake Caliper at Generator Rotor
Generator	
Type	Synchronous, Variable Speed
Cooling	Passive Air Cooled
Excitation	Permanent Magnet
Rated Power	1500 kW
No. of poles	88
Winding	Medium Voltage, Fractional Slot
Rated Voltage	690 V
Frequency	Variable /
No. of phases	6
Insulation Class	F
Protection Class	IP 23
Generator Protection	2 x Circuit Breaker Switches at Nacelle
Main Shaft and Bearing	
Main Shaft Type	Hollow Shaft and Main Axle
Material	EN-GJS-400-18U-LT
Bearing Type	Cylindrical Roller / Taper Roller
Location	Inside the generator
Lubrication	Manual
Nacelle	
Material	EN-GJS-400-18U-LT
Maintenance Hoist	1 x 250kg SWL
Wind Measuring Devices	1 x Anemometer + 1 x Wind Vane
Top Box	Provided
Yaw System	
Yaw Bearing	Ball Slew Bearing with external gearing
Yaw Motor	3 kW, planetary geared motor with brake
No. of Yaw Drive	3
Yaw Brake	Hydraulic Calipers
No. of Yaw Brake Calipers	8/10
Tower	
Type	Tubular Steel Tower with Embedded Steel Can in Foundation - Cylindrical+Conical
Material	S 355
No. of Sections	4
Assembly	Bolted Connection
No. of Platforms and Type	5, Chequered Plates
Ascent	Ladder inside Tower with safety harness
Ventilation	Air Inlet at Tower Top and Exhaust Fan at Tower Bottom
Corrosion Protection	
Corrosion class (outside)	DIN EN ISO 12944-C5
Colour	RAL 7035
Foundation	

Type	Floating Foundation
Power Converter and Controller	
Type	AC-DC-AC Full Power Converter
Design	Modular
Cooling	Forced Air Cooled
System Power Factor	Full Reactive Power Control 0.95 cap……..0.95 ind
Rated Output Voltage	620 V
Voltage Variation	+/-10%
Frequency	50 Hz
Frequency Variation	-5% / 3%
Cut-in-system	Active IGBT
Low Voltage Ride Through (LVRT)	3 seconds
Safety System	PLC Based Control System
SCADA	Remote Monitoring & Control

Relevant dates for the project activity:

Location	Date of commissioning
RP67_P	17/09/2012
RP68_P	17/09/2012
RP69_P	17/09/2012
RP70_P	17/09/2012
RP71_P	17/09/2012
RP72_F	17/09/2012
RP73_F	17/09/2012
RP74_F	17/09/2012
RP75_F	17/09/2012
RP76_F	17/09/2012
G3	30/05/2012
G5	30/05/2012
G6	30/05/2012
N3	31/03/2012
N2	17/09/2012
RP_11P	31/03/2012
RP_11Pb	30/05/2012

The project has been under operation since commissioning, without any major breakdowns. The plant is running smoothly since commissioning with scheduled maintenance. No events or situations happened expect the normal breakdowns for the reported monitoring period that 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, standardized baselines or other methodological regulatory documents

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There are no temporary deviations from the registered monitoring plan, the applied methodologies, the applied standardized baselines or the other applied methodological regulatory documents during this monitoring period. Hence, Not Applicable

B.2.2. Corrections

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There is no corrections to project information or parameters fixed at the registration or renewal of crediting period of the project activity. Hence, Not Applicable

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

>>
There is no request for the change the start of the crediting period. Hence, Not Applicable

B.2.4. Inclusion of monitoring plan

>>
There is no post-registration change to include a monitoring plan into the PDD. Hence, 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

>>
There are no permanent changes to the registered monitoring plan, or permanent deviation of monitoring from applied methodologies, applied standardized baseline, or other methodological regulatory documents. Hence, Not Applicable.

B.2.6. Changes to project design

>>
There is no any changes to the project design of the project activity. Hence, Not Applicable.

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

>>
As the project activity is not an afforestation or reforestation project activity. Hence, Not Applicable.

SECTION C. Description of monitoring system

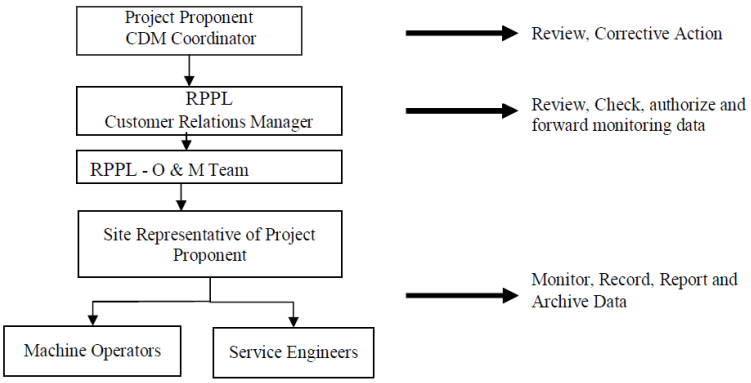
>>
Wind based electricity generation is not associated with any kind of leakages. Hence, the sole parameter for monitoring is the net electricity supplied to the grid. The Project is operated and managed by RPPL. They follow the documentation practices to ensure the reliability and availability of the data for all the activities as required from the identification of the site, wind resource assessment, logistics, finance, construction, commissioning and operation of the wind power project.

The output from the WEGs is connected to the transformer (33 kV / 690 V) at yard. The output from the yard transformer is connected to a 33 kV feeder, which feeds the electricity to the pooling sub-station, which is a part of the UNIFIED INDIAN Grid of India. From there it goes to the utility. Throughout the CDM crediting period and beyond, the electricity generated from the project are monitored.

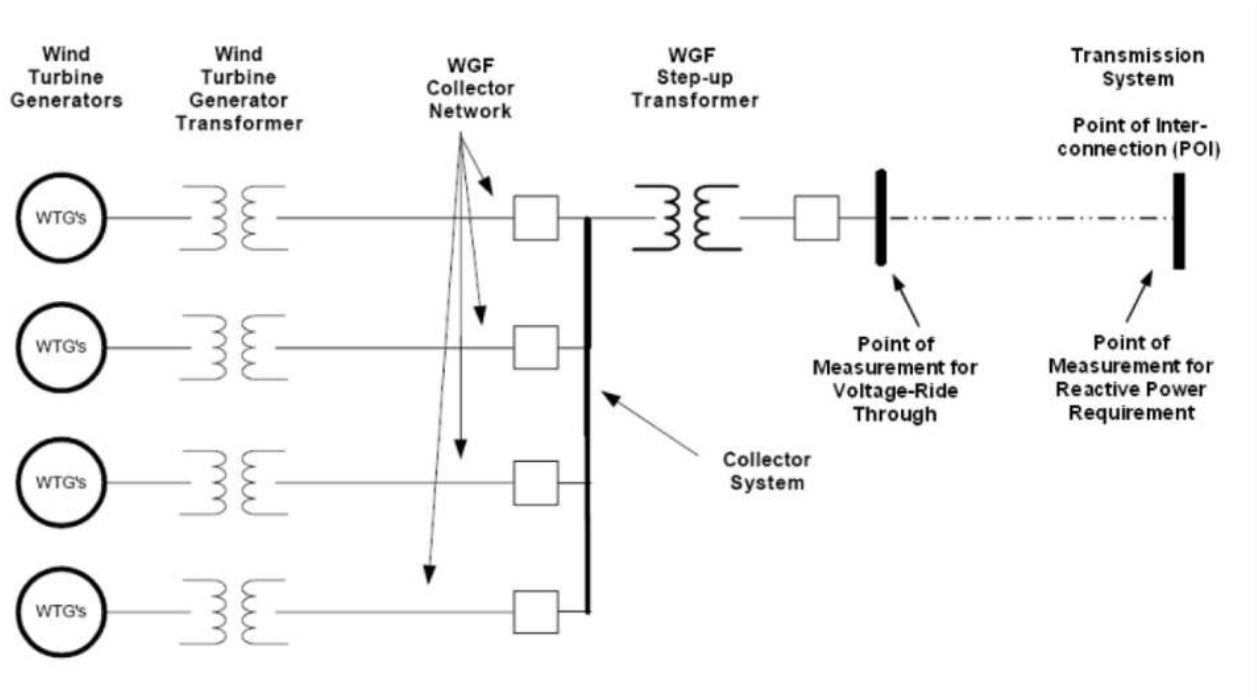
The project promoter has hired the services of RPPL for the Operation and Maintenance of the wind farm under a contract.

Roles and responsibilities

The operational and management structure implemented by project proponent and RPPL is as follows: The meters located at the grid sub-station are sealed and maintained by the state electricity utility. The meters are calibrated annually for accuracy.



Single Line Diagram –



Monitoring are done as:

Meter reading:

There is group metering arrangement at the pooling substation. Meter reading of both main and check meter of each feeder i are undertaken jointly by representatives of the state utility and RPPL on an appointed day of every month for the preceding month. At the conclusion of each meter reading, the meter readings are jointly certified by the representatives of state utility and RPPL.

Such meter readings are treated as the accurate and final measurement of the electricity supplied to the state utility by power producers connected to feeder i for preceding month. Reading from the check meter reading is taken by the representatives of state utility and the PP in case the main meter is faulty. The main meter reading recorded indicates total net electricity exported by all the WEGs connected to the feeder ($EG_{feeder\ i}$).

Along with the monthly main meter reading of the feeder, the PP's representative, RPPL also provides the electricity generated by each WEG connected to feeder i ($EG_{CM,WEG\ PP,\ feeder\ i}$ and $EG_{CM,\ other\ WEG,\ feeder\ i}$) based on the monthly WEG controller meter reading of each WEG connected to the feeder i to the state utility. Based on the monthly main meter reading of feeder i at the substation and the monthly WEG controller meter reading of all WEGs connected to feeder i

provided by RPPL, the state electricity utility prepares and submits the credit notes for electricity generated by each group of WEGs belonging to the individual investor.

Based on this credit note authorized by the state electricity utility, the PP raises an invoice on the state utility for the energy exported. Payments are made by the state utility to the PP through either the cheque or online transfer.

Meter Test Checking

The main and check meter is calibrated for accuracy annually with reference to a portable standard meter which is of an accuracy class of 0.2%. The portable standard meter is owned by the state utility and tested and certified by an accepted laboratory in accordance with electricity standards. The meters are deemed to be working satisfactorily if the errors are within specifications i.e. +0 .2%.
The consumption registered by the meter holds good for the purpose of billing as long as the error in the main meter is within the permissible limits.

The calibration frequency for the meters is annual.

Data Collection and Archiving

1. The monthly credit notes are collected from the state utility by representative of RPPL and maintained at the site office by a representative of RPPL.
2. Further, for the purpose of Emission reduction calculations, the PP at its head office are maintain copies of the monthly credit report and are record the monthly electricity generation in an excel sheet. The data are available at both site level and in the project proponent's head office at Chennai.
3. The monthly credit report are archived, and the data kept electronically for a minimum of two years after the end of the crediting period or the last issuance of CERs for this project activity, whichever occurs later.

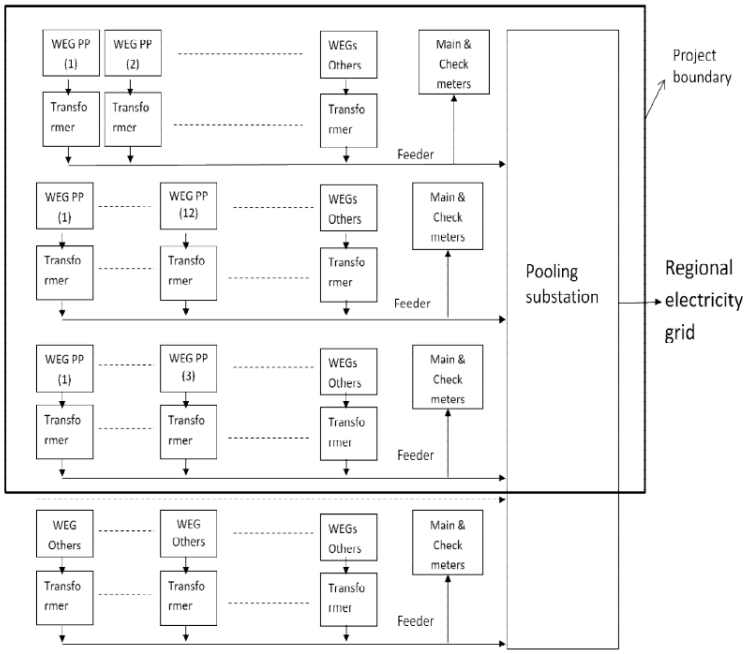
Procedures for handling data uncertainty:

a- In case main meter is faulty- check meter are used to calculate the electricity exported to the grid by the feeder. Main meter is immediately rectified or replaced by a new meter and meter reading from the rectified/replaced meter are used thereafter.
b- In case the check meter is faulty- The check meter is immediately replaced. The emission reduction calculation are not affected as reading from main meter is used to calculate the net electricity exported to the grid.
c- In case error is identified during annual calibration- If during the annual calibration, the meter is found to be beyond the permissible limits of error, the meter are immediately rectified or replaced, if necessary. The error that is identified in the annual calibration are applied to all the readings of electricity exported as indicated in the credit note from the date of previous. Billing for the period thereafter are as per the calibrated meter.

TVS Energy are undertake an annual review process of the actual CERs accrued and the price transacted. On the basis of the actual price and exchange rate, TVS Energy are commit 2% of the revenue for sustainable development activities in the local areas.

As part of the annual review, TVS Energy are undertake informal discussions with the locals at the project site and commit the revenue towards society / community developmental activities in areas that are of most concern to the local population. These areas has include health, education, sanitation, skill development, infrastructure development, etc. The annual review process are detail the exact activities that are undertaken using the 2% revenue and the detailed mode of implementation of the proposed activity.

Line diagram of the project is provided below



SECTION D. Data and parameters

D.1. Data and parameters fixed ex ante

Data/Parameter	$EF_{grid,OMsimple,y}$
Unit	tCO_2e/MWh
Description	Operating Margin Emission Factor of Unified Indian Grid
Source of data	"CO_2 Baseline Database for Indian Power Sector", version 7 published by the Central Electricity Authority, Ministry of Power, Government of India. The "CO_2 Baseline Database for Indian Power Sector" is available at www.cea.nic.in
Value(s) applied	0.9842
Choice of data or measurement methods and procedures	Operating Margin Emission Factor has been calculated by the Central Electricity Authority using the simple OM approach in accordance with ACM0002.
Purpose of data/parameter	For the calculation of baseline emission
Additional comments	Detailed information available at https://www.cea.in

Data/Parameter	$EF_{grid,BM,y}$
Unit	tCO_2e/MWh
Description	Build Margin Emission Factor of Unified Indian Grid
Source of data	"CO_2 Baseline Database for Indian Power Sector", version 7 published by the Central Electricity Authority, Ministry of Power, Government of India. The "CO_2 Baseline Database for Indian Power Sector" is available at www.cea.nic.in
Value(s) applied	0.8587
Choice of data or measurement methods and procedures	Build Margin Emission Factor has been calculated by the Central Electricity Authority in accordance with ACM0002.
Purpose of data/parameter	For the calculation of baseline emission
Additional comments	Detailed information available at https://www.cea.in

Data/Parameter	$EF_{grid, CM, y}$
Unit	tCO_2e/MWh
Description	Combined Margin Emission Factor of Unified Indian Grid
Source of data	Combined Margin Emission Factor ($EF_{CM,y}$) is calculated as the weighted average of Operating Margin Emission Factor ($EF_{OM,y}$) and Build Margin Emission Factor ($EF_{BM,y}$). The "CO_2 Baseline Database for Indian Power Sector" published by the Central Electricity Authority, Ministry of Power, Government of India. The "CO_2 Baseline Database for Indian Power Sector" is available at www.cea.nic.in
Value(s) applied	"CO2 Baseline Database for Indian Power Sector", version 7 published by the Central Electricity Authority, Ministry of Power, Government of India. Combined Margin Emission Factor (EF_y or $EF_{CM,y}$) is 0.9528 Refer Annex – 3 of registered PDD for comprehensive calculation of Combined Margin Emission Factor.
Choice of data or measurement methods and procedures	Combined Margin Emission Factor has been calculated by the Central Electricity Authority in accordance with CDM methodologies: ACM0002, and Tool to Calculate the emission Factor for an Electricity System.
Purpose of data/parameter	For the calculation of baseline emission
Additional comments	Detailed information available at https://www.cea.in

D.2. Data and parameters monitored

Data/Parameter	$EG_{Facility, y}$
Unit	MWh (Mega-watt hour)
Description	Net electricity supplied to the grid by the Project in the year y
Measured/calculated/ default	Measured
Source of data	Monthly credit notes issued by state utility for net electricity generation by WEGs of the Project
Value(s) of monitored parameter	394,667.3
Monitoring equipment	Energy Meter
Measuring/reading/recording frequency	Monthly Basis

Calculation method (if applicable)	1. Each project activity WEG has a controller meter which continuously records the electricity generated and records in hourly. 2. The project activity WEGs are connected to 33 kV feeders for transmitting the electricity generated by WEGs to pooling sub-station; the 17 WEGs of PP are connected to 3 feeders; 2 WEGs on one feeder, WEGs on another feeder and 12 WEGs on another feeder. 3. A main and check meter is installed at the pooling sub-station end of each feeder. These meters are of 0.2 accuracy class and owned by the state utility. These meters are bidirectional meters that measure and record electricity export and import continuously. 4. Readings from the main meter of each feeder is taken on a monthly basis by representatives of state utility, RPPL and PP on a designated day to determine the net electricity generated (export minus import) ($EG_{feeder, i}$) by all WEGs connected to feeder i. 5. Reading from controller meter of each WEG connected to feeder i is also taken on the same designated day by representatives of RPPL and PP. The total value of electricity exported by the WEGs belonging to the PP and connected the feeder i is represented by $EG_{CM,WEG\ PP,feeder\ i}$ and by other WEGs by $EG_{CM,\ other\ WEG,\ feeder\ i}$ 6. The net energy generated and exported by WEGs belonging to the PP and connected to feeder i is determined by the state utility on the following basis: $EG_{WEG,\ PP,\ feeder\ i} = EG_{feeder\ i} \times EG_{CM,WEG\ PP,\ feeder\ i} / (EG_{CM,WEG\ PP,\ feeder\ i} + EG_{CM,\ other\ WEG,\ feeder\ i})$ On the basis of above determination of net energy generation by WEG belonging to the PP, the state utility issues credit note for the net electricity generated. 7. The sum of net electricity generated by all WEGs of PP in any month gives the net electricity exported by the facility of PP in that month and summation of this monthly generation for 12 successive months of year y gives the net electricity exported by the facility of PP in year y ($EG_{facility, y}$). $EG_{facility, y} = \sum_{m=1}^{12} \sum_{i=1}^{3} EG_{WEG,PP,feeder\ i}$ Where 'm' represents month and 'i' represents feeder
QA/QC procedures	Invoices raised by PP on the state utility are used to verify the electricity generation units as shown in the credit note.
Purpose of data/parameter	The data is used to calculate baseline emissions
Additional comments	Archiving policy: State utility credit notes are archived for a period of crediting period + 2 years in paper form. The data therein are stored electronically.

Data/Parameter	$EG_{feeder\ i}$
Unit	MWh (Mega-watt hour)
Description	Net Electricity (Export minus Import) exported to the grid as recorded by the main or check meter installed on feeder i at the pooling sub-station end
Measured/calculated/ default	Measured
Source of data	Joint Meter Reading by representatives of state utility, RPPL and PP
Value(s) of monitored parameter	1,572,104.03
Monitoring equipment	Energy Meter
Measuring/reading/recording frequency	Monthly Basis

Calculation method (if applicable)	N.A.
QA/QC procedures	1. In case the main meter is found to be malfunctioning, the check meter are used to record net electricity generation. 2. The main and check meters are calibrated on an annual basis. PP holds responsibility of calibration of the meters by the state utility. 3. The result of calibration and correction, if any, are binding on PP and state utility
Purpose of data/parameter	The data is used to calculate baseline emissions
Additional comments	Archiving policy: JMRs are archived for a period of crediting period + 2 years in paper form. The data therein are stored electronically.

Data/Parameter	$EG_{CM,WEG\ PP,\ feeder\ i}$
Unit	MWh (Mega-watt hour)
Description	Electricity generation from WEG belonging to the PP and connected to feeder i as recorded by its controller meter.
Measured/calculated/ default	Measured
Source of data	Monthly generation report
Value(s) of monitored parameter	Please refer ER sheet
Monitoring equipment	Energy Meter
Measuring/reading/recording frequency	Monthly Basis
Calculation method (if applicable)	N.A.
QA/QC procedures	Calibration of the meters are undertaken by RPPL annually. The meters have an error margin of +2% to -3%.
Purpose of data/parameter	The data is used to calculate baseline emissions
Additional comments	Archiving policy: JMRs are archived for a period of crediting period + 2 years in paper form. The data therein are stored electronically.

Data/Parameter	$EG_{CM,other\ WEG\ ,\ feeder\ i}$
Unit	MWh (Mega-watt hour)
Description	Electricity generation from other WEGs (not belonging to the PP) and connected to feeder i as recorded by its controller meter.
Measured/calculated/ default	Measured
Source of data	Monthly generation report given by RPPL
Value(s) of monitored parameter	Please refer ER sheet
Monitoring equipment	Energy Meters
Measuring/reading/recording frequency	Monthly Basis
Calculation method (if applicable)	N.A.
QA/QC procedures	The meter is not within the control of the PP as it belongs to the owner of other WEGs. Therefore, no QA/QC procedures are applied to this meter by the PP.
Purpose of data/parameter	The Data is used to calculate baseline emissions
Additional comments	Archiving policy: JMRs are archived for a period of crediting period + 2 years in paper form. The data therein are stored electronically.

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

>>
The baseline emissions (BE_y) for the project activity is calculated as follows:

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

Where,

$\mathbf{BE_y}$: Baseline emissions in year y (tCO_2/yr)
$\mathbf{EG_{PJ,\,y}}$: 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)
$\mathbf{EF_{grid,CM,y}}$: Combined margin CO_2 emission factor for grid connected power generation in year y tCO_2/MWh

BE_y = 394,667.3 MWh * 0.9528 tCO_2/MWh
BE_y = 376,039 tCO_2 (round down)

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

>>
As per ACM0002 Version 12.3.0, for most renewable power generation project activities, PEy = 0. The project activity is a wind power project does not involve fossil fuel consumption or operation of geothermal power plants or hydro power plants. Therefore, there is no project emissions in the project activity. $PE_y = 0$

E.3. Calculation of leakage emissions

>>
As per ACM0002 Version 12.3.0, no leakage has been considered for the calculation of emission factor. $LE_y = 0$

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

	Baseline GHG emissions or baseline net GHG removals (t CO_2e)	Project GHG emissions or actual net GHG removals (t CO_2e)	Leakage GHG emissions (t CO_2e)	GHG emission reductions or net anthropogenic GHG removals (t CO_2e)			
				Before 01/01/ 2013	From 01/01/ 2013 until 31/12/ 2020	From 01/01/ 2021	Total amount
Total	376,039	0	0	1,765	374,274	0	376,039

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_2e)	Amount estimated ex ante for this monitoring period in the PDD (t CO_2e)

Amount achieved during this monitoring period (t CO_2e)	Amount estimated ex ante for this monitoring period in the PDD (t CO_2e)
376,039	338,666

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

>>
Estimated Emission Reduction according to PDD = 48,590 tCO_2e per annum
Total number of days in this monitoring period = 2544 days

The ex-ante estimated ER for the current monitoring period has been calculated by factorizing the annualized projected ER value for the equivalent days of the current monitoring period.

= (48,590 * 2544) / 365 = 338,666 tCO_2e

E.6. Remarks on increase in achieved emission reductions

>>
During the present monitoring period, actual emission reductions achieved are 376,039 tCO_2e whereas estimated emission reductions was 338,666 tCO_2e.

The actual emission reduction achieved is 11.04% higher than the estimated in the registered PDD. This is due to higher PLF achieved during the current monitoring period as compared to the estimated PLF in the registered PDD. As per the registered PDD (page 23 section B.5), sensitivity analysis, an increase in 10% in PLF result in 11.59% of project IRR as compared to the benchmark of 13.06%. The project IRR crosses the benchmark if the plant load factor of the project activity increases by 21.2%. Thus, the increase in PLF during the current monitoring period does not impact the additionality.

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

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The installed capacity of the plant is 25.5 MW which is higher than 15 MW. Hence, the project activity is not a small-scale project activity.

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Document information

Version	*Date*	*Description*
09.0	8 October 2021	Revision to: • Ensure consistency with version 03.0 of the "CDM project standard for project activities" (CDM-EB93-A04-STAN).
08.0	6 April 2021	Revision to: • Reflect the "Clarification: Regulatory requirements under temporary measures for post-2020 cases" (CDM-EB109-A01-CLAR).
07.0	31 May 2019	Revision to: • 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: • 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: • 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: • 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 *F-CDM-MR* to *CDM-MR-FORM*; • Editorial improvement.
03.2	5 November 2013	Editorial revision to correct table in page 1.

Version	*Date*	*Description*
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.

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