



Monitoring report form for CDM project activity
(Version 08.0)

MONITORING REPORT

Title of the project activity	Renewable Energy Wind Power Project in Karnataka		
UNFCCC reference number of the project activity	4956		
Version number of the PDD applicable to this monitoring report	04		
Version number of this monitoring report	01		
Completion date of this monitoring report	28/09/2021		
Monitoring period number	5 th Monitoring Period		
Duration of this monitoring period	01//01/2021 to 19/08/2021 (including both the dates)		
Monitoring report number for this monitoring period	NA		
Project participants	Vish Wind Infrastruktur LLP (India) WeAct Pty Ltd (Australia)		
Host Party	India		
Applied methodologies and standardized baselines	Grid connected renewable electricity generation AMS-I.D., Version 16		
Sectoral scopes	Sectoral Scope 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
	0 tCO ₂ e	0 tCO ₂ e	9,049 tCO ₂ e
Amount of GHG emission reductions or net anthropogenic GHG removals estimated ex ante for this monitoring period in the PDD	7,774 tCO ₂ e		

SECTION A. Description of project activity

A.1. General description of project activity

Purpose of the project activity and the measures taken for GHG emission reductions or net anthropogenic GHG removals by sinks:

The project activity is of capacity 6.4 MW wind energy project comprising eight Wind Energy Converters (WECs) of capacity 800 kW each, commissioned in Karnataka state of India. The electricity produced from renewable source is being supplied to Karnataka state electricity grid which is part of the unified Indian Grid system¹. Thus the project activity has been displacing equivalent amount of electricity at the grid which would have otherwise been produced at grid from fossil fuels based power plants. Thus, the project activity accounts reduction in carbon emissions that helps in mitigating the climate change impact. The project participant (PP) is Vish Wind Infrastruktüre LLP (VWLLP). PP has entered into agreement with Wind World (India) Ltd. (previously known as Enercon India Ltd.) for development, operation and maintenance of the project activity.

Brief description of the installed technology and equipment:

The project consists of 8 (eight) machines of Enercon make E-53 type WEGs of 800KW capacity each totaling to the capacity of 6.4 MW. The WEGs generates 3-phase power at 400V, which is stepped up to 33 kV and further transmitted to WWIL Sub-station (previously known as Enercon Substation). From WWIL substation electricity is further evacuated to the Karnataka State Electricity Grid. Wind World (India) Ltd (WWIL) is the turbine supplier and is the operations and maintenance contractor. The clean and green electricity supplied by the project will aide in sustainable growth in the region.

Relevant dates for the project activity (e.g. construction, commissioning, continued operation periods, etc.):

The eight WECs under project activity were commissioned on 30/09/2010. The project activity was registered as CDM project on 04/07/2011. The first monitoring period was for the period from 20/08/2011 to 30/09/2012, the second monitoring period considered the period from 01/10/2012 to 30/06/2017, and the third is 01/07/2017 to 30/06/2020. The 4th monitoring period is currently under verification covering till the period 31/12/2020; the current monitoring is the 5th monitoring period of the project that covers the period from 01/01/2021 to 19/08/2021 (included both the dates).

Total GHG emission reductions or net anthropogenic GHG removals by sinks achieved in this monitoring period:

The total emission reductions achieved under this monitoring period (i.e. 01/01/2021 to 19/08/2021) is 9,049 tCO₂e.

¹ Currently integrated under Indian Grid.

As per CEA database version 11 (released in April 2016), in previous years the Indian electricity system was divided into two grids, the NEWNE and Southern Grid (SR), which are now integrated as a single 'Indian Grid' covering all the states. Thus, the project activity at the time of registration was part of Southern Grid which is now referred as Indian Grid.

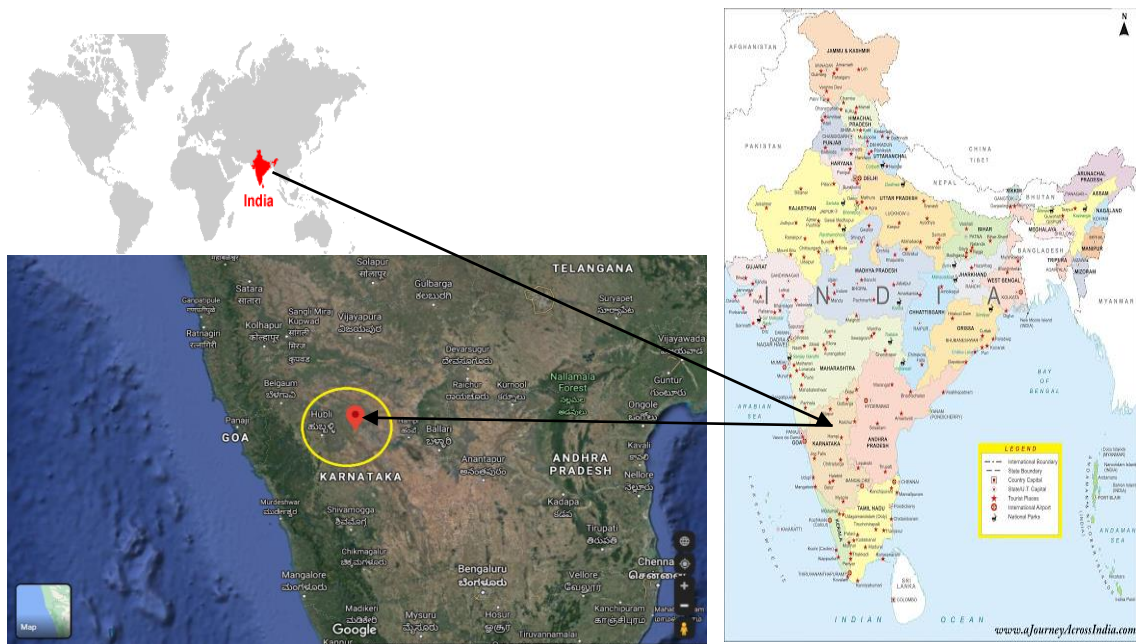
A.2. Location of project activity

Host Party(ies): India

Region/State/Province, etc.: Southern Region, in the state of Karnataka.

City/Town/Community, etc.: The project is located in Village: Kalasapur, District: Gadag, State: Karnataka.

Physical/Geographical location: The project activity is situated between latitude 15° 21' & 15° 22' North and longitude 75° 37' & 75° 38' East. The Project activity has eight WEC of type E-53 of Enercon make. Capacity of each WEC is 800 kW. The Substation, which is maintained by WWIL, is located at Harthi village.



Individual WEG location numbers and coordinates are detailed out in the table below: -

Details of Latitude & Longitude are given below:-

Sr. No.	WEG Capacity (MW)	Village	District	State	Latitude (N)			Longitude (E)		
					Hr	Min	Sec	Hr	Min	Sec
1	0.8	Kalasapur	Gadag	Karnataka	15	22	22.2	75	38	21.2
2					15	21	50.8	75	37	52.1
3					15	21	59.8	75	37	52.4
4					15	21	43.6	75	38	31.0
5					15	21	50.3	75	38	27.3
6					15	21	42.6	75	37	54.4
7					15	21	59.2	75	38	31.3
8					15	21	32.9	75	37	57.8

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)	Vish Wind Infrastruktüre LLP (Private entity)	No
Australia	WeAct Pty Ltd (Private entity)	No

A.4. References to applied methodologies and standardized baselines

Title: “Grid connected renewable electricity generation”

Reference: Approved small scale baseline methodology AMS-I.D
(Version 16, SC 01, EB 54)

UNFCCC web reference of methodology:

<http://cdm.unfccc.int/UserManagement/FileStorage/SJI52M6QXGKFNOZABTHDYP789EV3C>

Tools referenced in this methodology:

- ✓ “Tool to calculate project or leakage CO₂ emissions from fossil fuel combustion”
(Version 02²)
- ✓ “Tool to calculate the emission factor for an electricity system” (version 02.1.0³)

A.5. Crediting period type and duration

Type of crediting period : Fixed
Length of crediting period : 10 years
Start date of crediting period : 20/08/2011
End date of crediting period : 19/08/2021

² <https://cdm.unfccc.int/methodologies/PAMethodologies/tools/am-tool-03-v2.pdf>

³ <https://cdm.unfccc.int/methodologies/PAMethodologies/tools/am-tool-07-v2.1.0.pdf>

SECTION B. Implementation of project activity

B.1. Description of implemented project activity

The project activity comprises of eight WECs of Enercon's model E-53. The project uses technology that is environmentally clean and safe since there are no GHG emissions associated with the electricity generation from the windmills.

The project activity can operate in the frequency range of 47.5–51.5 Hz and in the voltage range of 400 V \pm 12.5%. The average lifetime of the WEC is around 20 years as per the industry standards.

The other salient features of the state-of-art-technology are:

Turbine model	Enercon E- 53
Rated power	800 KW
Rotor diameter	53 m
Hub height	75 m
Turbine Type	Gearless horizontal axis wind turbine with variable rotor speed
Power regulation	Independent electromechanical pitch system for each blade.
Cut in wind speed	2.5 m/s
Rated wind speed	12 m/s
Cut out Wind speed	28-34 m/s
Extreme Wind Speed	59.5 m/s
Rated rotational speed	32 rpm
Operating range rot. speed	12-29 rpm
Orientation	Upwind
No of Blades	3
Blade Material	Fibre Glass Epoxy reinforced with integral lightning protection
Gear box type	Gear less
Generator type	Synchronous generator
Braking	Aerodynamic
Output Voltage	400 V
Yaw System	Active yawing with 4 electric yaw drives with brake motor and friction bearing
Tower	74 m concrete

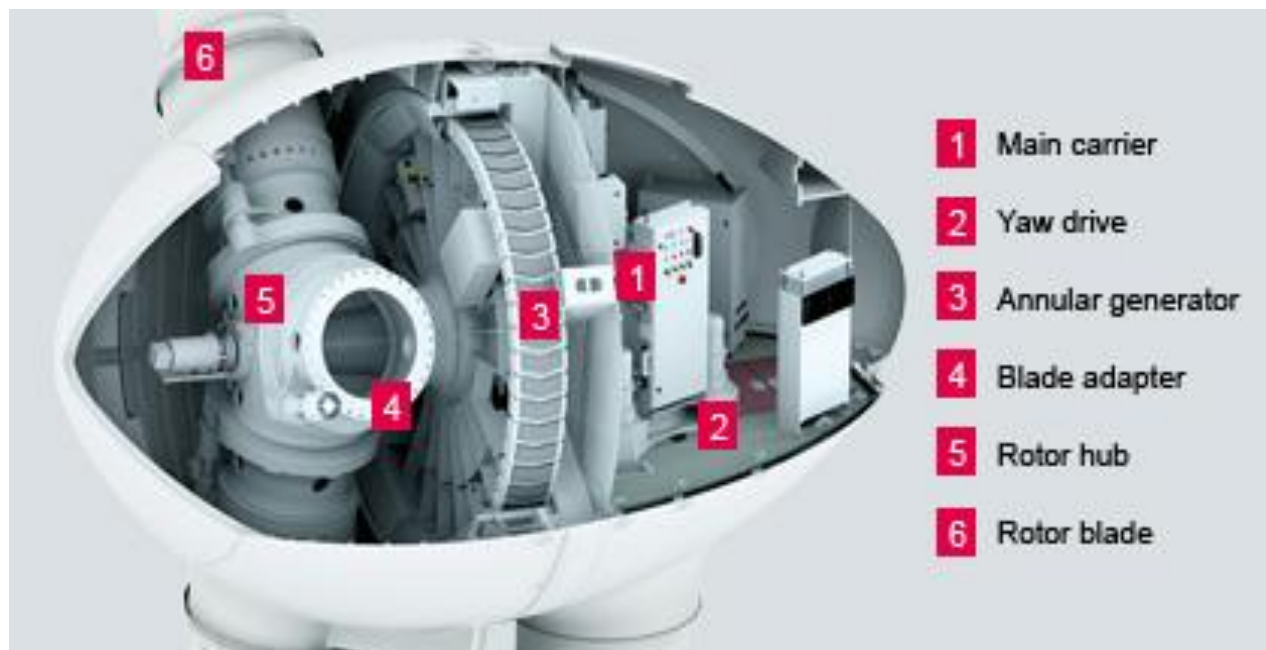
The eight WECs under project activity were commissioned on 30/09/2010.

Wind World (India) Ltd (erstwhile known as Enercon (India) Ltd., herein after also referred as WWIL) conducts operation and maintenance activities, which are ISO 9001:2008 certified. Referring to the available data give in the ER sheet, it can be inferred that there have not been any major special events for any of the machines that are included in the project activity. As a part of regular maintenance the machines are stopped for mechanical and electrical maintenance for 16 to 18 hours annually and for visual inspection for 6 to 7 hours quarterly. Further the consolidated performance report of project WEGs during the monitoring period including the down time, machine availability, grid availability, etc. has

been submitted to DOE. During the monitoring period there were no events or situations occurred, which may impact the applicability of the methodology.

WWIL has secured and facilitated the technology transfer for wind based renewable energy generation from Enercon GmbH, has established a manufacturing plant at Daman in India, where along with other components the "Synchronous Generators" using "Vacuum Impregnation" technology are manufactured. Diagram of main component of Enercon make E-53 is shown in below picture:-

Figure: E-53 Diagram (Cross sectional drawing of nacelle E-53 / 800 kW).



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

Not Applicable

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

Not Applicable to the project activity.

SECTION C. Description of monitoring system

Metering:

Electricity supplied to the grid is metered continuously at the metering point connecting 8 machines of the project activity. The meter reading is taken in the presence of representatives of WWIL (O&M Contractor for the project activity) and KPTCL.

Metering Equipment:

Metering system for the project activity consists of main and check meter. Both the meters are two-way trivector meters (accuracy class of 0.2%) capable of recording import and export of electricity. The metering equipment is calibrated annually.

Meter Readings:

The electricity exported to the grid is recorded monthly by taking a Joint Meter Reading (JMR) in the presence of Officials from the Utility and WWIL, O&M contractor, on behalf of project owner. The Joint meter reading contains the value of energy imported and exported. These readings become the basis of making Form B. These certified readings are then used by the DISCOM officials to prepare the tariff invoices. Thus the monitoring parameters for the project activity are the electricity import and electricity export to the grid as mentioned in the JMR. The readings are then adjusted for the transmission loss in the Form B, which can be crosschecked with the value mentioned in the invoices.

Inspection of Energy Meters:

All main and check energy meters (export and import) and all associated instruments, transformers installed at the project are of 0.2% accuracy class. Each meter is jointly inspected and sealed on behalf of the parties and is not to be interfered with by either party except in the presence of the other party or its accredited representatives.

Meter Test Checking:

There is a separate check and main meter. The Main and Check Meters are close to each other and will be tested for accuracy, with a standard meter, by the KPTCL's testing Division. The KPTCL will carry out the calibration, periodical testing, sealing and maintenance of meters. The KPTCL will provide a copy of the test reports.

If during the meter test checking,

- the main meter is found to be within the permissible limit of error and the corresponding check meter is beyond the permissible limits, then the meter reading will be as per the main meter as usual. The check meter shall, however, be calibrated immediately.
- the main meter is found to be beyond permissible limits of error, but the corresponding check meter is found to be within permissible limit of error, then the meter reading for the month up to the date and time of such test shall be as per the check meter.
- If both the main meters and the corresponding check meters are found to be beyond the permissible limits of error, both the meters shall be immediately calibrated and the correction will be applied to the reading registered by the main meter to arrive the correct reading of energy supplied to the grid for the period up to last test.
- If during any of the monthly meter readings, the variation between the main meter and the check meter is more than the permissible limit for meters of 0.2% accuracy class, all the meters shall be re-tested and calibrated immediately and the correction will be applied to the reading registered by the main meter to arrive the correct reading of energy supplied to the grid for the period up to last test.

- In case of the failures such as burning of the meter and the erratic display of the metered parameters and when the error found in testing the meters is beyond the permissible limit of error, the meter shall be calibrated immediately and the correction will be applied to the reading registered by the main meter to arrive the correct reading of energy supplied to the grid for the period up to last test.

CALCULATION OF DATA:

$$EGy = Gpe - 115\% * Gpi - Li$$

EGy : Net Electricity supplied to grid by the project activity

Gpe : Electricity Export is recorded at the meter(s) connecting 08 machines of the project activity

Gpi : Electricity Import is recorded at the meter(s) connecting 08 machines of the project activity

Li : Transmission loss

Transmission loss is certified by the state utility in JMR:

$$L = \sum_j Gj - N$$

$\sum_j Gj$: Summation of electricity generation data measured at all the feeders connected to substation at Harthi Village (export – Import)

N : Electricity generation data measured at Substation at Harthi Village from the feeders emanating from the pooling station

L : Total transmission loss

$$Li = Gpe * (L / \sum_j Gj)$$

The meter reading will be taken by the representatives of WWIL and the State utility at the meter(s) for the project activity connecting 08 turbines at the project site at 33kV and at the substation located at Harthi Village where bulk metering is done at 220kV. These readings become the basis of making Form B, which is signed by the representatives of WWIL and State Utility.

Transmission loss between metering point for the project activity and the metering point at the Substation at Harthi Village is applied to the meter reading taken at the feeder connecting 08 turbines of the project activity. Transmission losses are applied to the meter readings taken at the metering point of the project activity. Net Electricity exported to the grid is calculated by applying transmission loss to the meter reading taken at the metering point of the project activity connecting 8 turbines.

The Form B contains the following data:-

1. Electricity Export

2. Electricity Import

3. Transmission Loss

(Between the metering point for project activity and at the substation where bulk metering is done)

4. Net Electricity exported to the Grid [Electricity Export-115%*Electricity Import-Transmission Loss]

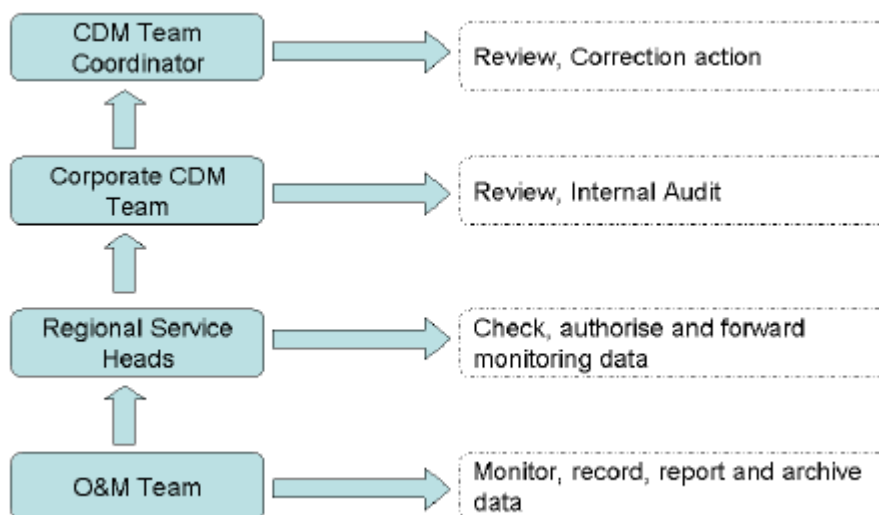
Joint Meter reading is signed by the representatives of WWIL and the state utility. The meter readings (both export and import), transmission loss and net electricity exported to the grid are noted in the Form B. Hence all these values will be reproduced from the JMR at the time of verification. Please refer Appendix 3 for details on calibration and QA/QC procedures.

The Project is operated and managed by Vish Wind Infrastruktüre LLP. The operational and maintenance contract for the project is with WWIL. WWIL is an ISO 9001:2008 certified organization (with Quality Management system certified from Germanischer Lloyd). WWIL follows 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 accuracy of monitoring parameter is ensured by adhering to the calibration and testing procedure. The project will adhere to all the mandatory regulatory and statutory requirements at the state as well as national level. WWIL is Operation and Maintenance contractor for the project activity and provides the daily generation report to the project proponent. The project proponent also maintains the records of daily generation report and joint meter report.

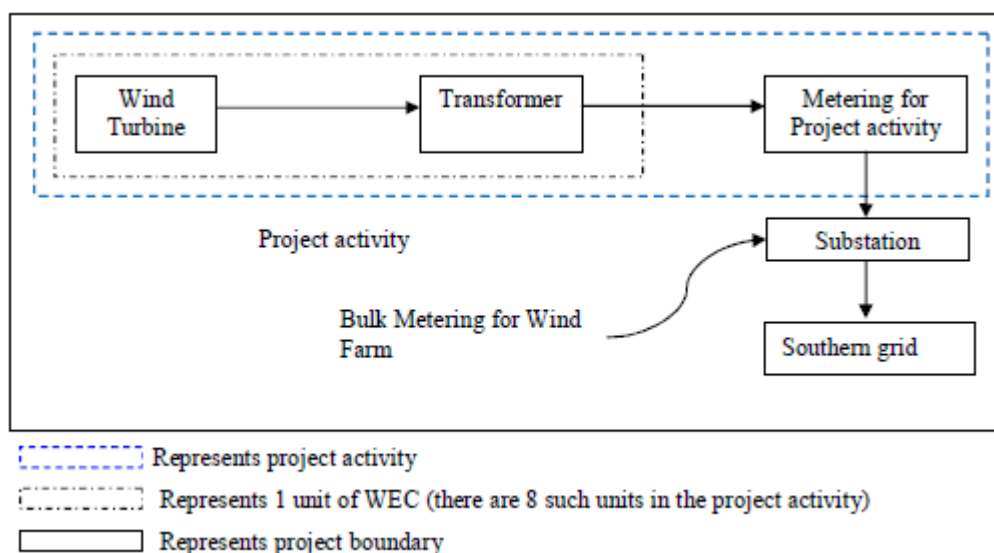
The operational and management structure implemented is as follows:



Metering system details:

The metering arrangement for the project activity is given in the diagram below:

Line diagram of the monitoring system is provided below:



The details of meters installed at the site for measuring export and import by project activity are mentioned below:

Meter details:

Meter Location	RR Number	Meter Details
VWLLP pooling station/MAIN meter	GDG/DN/WF/HESCOM VWIL/138	Sr. No: 09142236 Accuracy Class: 0.2 Make: L&T
VWLLP pooling station/CHECK meter	GDG/DN/WF/HESCOM VWIL/138	Sr. No: 09142599 Accuracy Class: 0.2 Make: L&T

The details of the meter calibration for the meters at receiving station at Harthi are provided below:

Meter Details	Meter Serial Number	New Meter S.No
Receiving station (Main Meter)	06760786 Accuracy Class: 0.2 Make: L&T	20005981 Accuracy Class: 0.2 Make: L&T
Metering Point-3		
Receiving station (Check Meter)	06767587 Accuracy Class: 0.2 Make: L&T	20005994 Accuracy Class: 0.2 Make: L&T
Metering Point-3		

The dates of calibration for the respective meters are included under the Appendix 1.

Quality Control and Quality Assurance:

The main meter and check meter both have accuracy class of 0.2s.

The accuracy of monitoring parameter is ensured by adhering to the calibration and testing procedure. The metering equipment is calibrated annually.

Application of Error factor in reading due to meter calibration delay:

As per Monitoring plan, the meters shall be tested for accuracy **once annually**. As can be seen in the calibration/tests status of meters tabulated under Appendix 1, the meters' calibration were conducted periodically, without any delay observed for the meters in pooling station.

SECTION D. Data and parameters

D.1. Data and parameters fixed ex ante

Data/Parameter	EF _{OM,y}
Unit	tCO ₂ e/MWh
Description	Operating Margin Emission Factor of Southern Regional Electricity Grid
Source of data	“CO2 Baseline Database for Indian Power Sector” published by the Central Electricity Authority, Ministry of Power, Government of India. The “CO2 Baseline Database for Indian Power Sector” (Version 5) is available at www.cea.nic.in
Value(s) applied	0.98755
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.
Purpose of data/parameter	To calculate Baseline Emission.
Additional comments	The value is calculated on ex-ante basis and it will remain same throughout the crediting period.

Data/parameter:	EF _{BM,y}
Unit	tCO ₂ e/MWh
Description	Build Margin Emission Factor of Southern Electricity Grid
Source of data	“CO2 Baseline Database for Indian Power Sector” published by the Central Electricity Authority, Ministry of Power, Government of India. The “CO2 Baseline Database for Indian Power Sector” (Version 5) is available at www.cea.nic.in
Value(s) applied	0.81792
Choice of data or measurement methods and procedures	Build Margin Emission Factor has been calculated by the Central Electricity Authority.
Purpose of data	To calculate Baseline Emission.
Additional comments	The value is calculated on ex-ante basis and it will remain same throughout the crediting period.

Data/parameter:	EF _{CO2,grid,y}
Unit	tCO ₂ e/MWh
Description	Combined Margin Emission Factor of Southern Electricity Grid
Source of data	Calculated
Value(s) applied	In case of wind power projects default weights of 0.75 for EF _{OM,y} and 0.25 for EF _{BM,y} are applicable as per ACM0002 Version 12.1.0. Combined Margin Emission Factor (EF _{CO2,grid,y}) = 0.94515
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 and Tool to Calculate the emission Factor for an Electricity System.
Purpose of data	To calculate Baseline Emission.
Additional comments	The value is calculated on ex-ante basis and it will remain same throughout the crediting period.

D.2. Data and parameters monitored

Data/Parameter	EG _y
Unit	MWh (Mega-watt hour)
Description	Net electricity supplied to the grid by the Project during the period y
Measured/calculated/Default	Calculated. Electricity supplied to the grid as per the Form B. This is a calculated parameter derived from Energy exported, imported and transmission losses mentioned in Form B.
Source of data	Form B issued by state Utility.
Value(s) of monitored parameter	9,575.032 ⁴
Monitoring equipment	<p>The meter readings will be taken by the representatives of WWIL and the State utility at the meter(s) for the project activity connecting 08 turbines at the project site at 33kV and at the substation located at Harthi Village where bulk metering is done at 220kV. These readings become the basis of making Form B, which is signed by the representatives of WWIL and State Utility. Transmission loss between metering point for the project activity and the metering point at the Substation at Harthi Village is applied to the meter reading taken at the feeder connecting 08 turbines of the project activity.</p> <p>Transmission losses are applied to the meter readings taken at the metering point of the project activity. Net Electricity exported to the grid is calculated by applying transmission loss to the meter reading taken at the metering point of the project activity connecting 08 turbines.</p> <p>The Form B contains the following data:-</p> <ol style="list-style-type: none"> 1. Electricity Export 2. Electricity Import 3. Transmission Loss (Between the metering point for project activity and at the substation where bulk metering is done) 4. Net Electricity exported to the Grid [Electricity Export-115%*Electricity Import-Transmission Loss] <p>Joint Meter reading is signed by the representatives of WWIL and the state utility. The meter readings (both export and import), transmission loss and net electricity exported to the grid are noted in the Form B.</p>
Measuring/reading/recording frequency	<p>Monthly.</p> <p>The reading is jointly noted by the representatives of state utility and WWIL. The value of EG_y for the project activity is also provided in the JMR (Form B) and is applied directly for calculation of emission reductions.</p>
Calculation method (if applicable)	$EG_y = G_{pe} - 115\% * G_{pi} - L_i$ <p>Refer section C for details.</p>
QA/QC procedures	QA/QC procedures are implemented by state utility pursuant to the provisions of the power purchase agreement. Refer section C of QA/QC procedures
Purpose of data/parameter	Calculation of Baseline Emissions
Additional comments	The data will be archived for crediting period + 2 years.

⁴ The detail calculation and month wise values are provided in the ER sheet.

Data/Parameter	Gpe
Unit	MWh (Mega-watt hour)
Description	Electricity Export is recorded at the meter(s) connecting 8 machines of the project activity.
Measured/Calculated /Default	This is a measured parameter.
Source of data	Electricity exported to the grid as per the Form B.
Value(s) of monitored parameter	9,664.650
Monitoring equipment	<p>Main meter details: Sr. No: 09142236 Accuracy Class: 0.2 Make: L&T</p> <p>Check meter details: Sr. No: 09142599 Accuracy Class: 0.2 Make: L&T</p> <p>Details of Meter calibration have been provided under Appendix 1.</p>
Measuring/Reading/ Recording frequency	Electricity exported to the grid will be recorded by the meter(s) connecting the 08 machines of the project activity feeding the substation of WWIL. Metering will be continuous and recording will be done monthly as Form B.
Calculation method (if applicable)	Not applicable
QA/QC procedures	QA/QC procedures are implemented by state utility pursuant to the provisions of the power purchase agreement. Refer section C of QA/QC procedures.
Purpose of data	To calculate emission reduction.
Additional comment	The data will be archived for crediting period + 2 years.

Data/Parameter	Gpi
Unit	MWh (Mega-watt hour)
Description	Electricity Imported recorded at the meter(s) connecting 8 machines of the project activity.
Measured/Calculated /Default	This is a measured parameter.
Source of data	Electricity imported to the grid as per the Form B.
Value(s) of monitored parameter	7.763
Monitoring equipment	<p>Main meter details: Sr. No: 09142236 Accuracy Class: 0.2 Make: L&T</p> <p>Check meter details: Sr. No: 09142599 Accuracy Class: 0.2 Make: L&T</p> <p>Details of Meter calibration have been provided under Appendix 1.</p>
Measuring/Reading/ Recording frequency	Electricity imported to the grid will be recorded by the meter(s) connecting the 8 machines of the project activity feeding the substation of WWIL. Metering will be continuous and recording will be done monthly as Form B.
Calculation method (if applicable)	Not applicable
QA/QC procedures	QA/QC procedures are implemented by state utility pursuant to the provisions of the power purchase agreement. Refer section C of QA/QC procedures.
Purpose of data	To calculate emission reduction.
Additional comment	The data will be archived for crediting period + 2 years.

Data/Parameter	Li
Unit	MWh (Mega-watt hour)
Description	Transmission loss between the metering point for the project activity and the metering point at Substation where bulk metering is done.
Measured/Calculated /Default	This is a measured parameter.
Source of data	Transmission Loss will directly applied from the Form B for the project activity.
Value(s) of monitored parameter	81.855
Monitoring equipment	<p>Main meter details: Sr. No: 06760786 Accuracy Class: 0.2 Make: L&T</p> <p>Check meter details: Sr. No: 06767587 Accuracy Class: 0.2 Make: L&T</p> <p>Details of Meter calibration have been provided under Appendix 1.</p>
Measuring/Reading/ Recording frequency	<p>Transmission loss between metering point (feeder connecting 8 turbines of the project activity) and the metering point at the Substation is applied to the meter reading taken at the feeder connecting 08 turbines of the project activity. Substation is connected to the machines of the project activity and the machines commissioned by the other project developers. The project proponent does not have control over the data of the other project developers.</p> <p>Therefore, the project developer has to rely upon the transmission loss applied to the project activity by the state utility as reflected in the JMR (Form B). The JMR is signed by the representatives of WWIL and the state utility. Metering will be continuous and recording will be done monthly as Form B.</p>
Calculation method (if applicable)	Not applicable
QA/QC procedures	QA/QC procedures are implemented by state utility pursuant to the provisions of the power purchase agreement. Refer section C of QA/QC procedures.
Purpose of data	To calculate emission reduction.
Additional comment	The data will be archived for crediting period + 2 years.

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**

The baseline emissions are calculated as:

$$BE_y = EG_y * EF_{CO_2, grid, y}$$

Where:

BE_y = Baseline emissions in year y tCO₂.

EG_y = Energy baseline in year y MWh.

$EF_{CO_2, grid, y}$ = CO₂ emission factor in year y, tCO₂/MWh.

$$BE_y = 9,575.032 * 0.94515 \text{ tCO}_2\text{e/MWh}$$

$$= 9,049 \text{ tCO}_2\text{e}$$

Baseline Emission Reductions calculation for project activity:-

Duration	Quantity of net electricity generation supplied by the project activity to the grid in year y [MWh]	Baseline Emission Factor (tCO ₂ e/MWh)	Baseline Emissions (tCO ₂ e)
	[EG _y]	[EF _{CO₂, grid, y}]	[BE _y] = [EG _y] * [EF _{CO₂, grid, y}]
01 Jan 2021 to 19 Aug 2021	9,575.032	0.94515	9,049

In the emission reduction excel spreadsheet, the baseline emissions for the current monitoring period have been calculated as the sum of the monthly baseline emissions. To be conservative, the final value has been rounded down, hence the final value arrived is conservative (i.e. reported value is less than the manually calculated value). Please refer the spreadsheet for the calculations of baseline emission and emission reductions for the current monitoring period.

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

Since the project activity is a renewable energy project which generates electricity using wind power and hence as per methodological provision the project does not result in project emissions.

E.3. Calculation of leakage emissions

No leakage is considered from the project activity as per approved methodology AMS ID.

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	9,049	0	0	0	0	9,049	9,049

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)
9,049	7,774

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

As per registered CDM-PDD (PDD Version 04, Dated: 26/05/2011), the annual estimated volume of CERs is 12,284 tCO₂e. The total nos. of days included in this mentoring period (i.e. 01/01/2021 to 19/08/2021, inclusive of both the days) = 231. Thus, to calculate the ex-ante estimated value of ER corresponding to this monitoring period, the annual estimated ER value (as per registered PDD) has been extrapolated for the equivalent period, i.e. 231 days, which results in 7,774 tCO₂e. Whereas actual ER achieved is 9,049 tCO₂e. The detailed calculation has been provided in ER calculation sheet.

E.6. Remarks on increase in achieved emission reductions

As shown in the section E.5.1 that the actual emission reduction achieved during the current monitoring period is 16.40% higher than the expected estimation as per PDD for the equivalent period. This increase in emission reduction is mainly due to the reason that the particular monitoring period is part of a full year season and it includes mostly the peak wind seasons. The availability of wind and seasonal variation is a natural phenomenon and beyond the control of PP.

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

The project activity is a wind power project having a total installed capacity of 6.4 MW. Therefore, project is within the small-scale project type I, remained under the limit of 15 MW of type-1 every year during the crediting period.

Appendix 1. Meter details

Detailed metering information has been provided in the section C.

The details of energy meters and the dates of periodic calibration are tabulated below:

Meter Location	RR Number	Meter Details	Calibration Dates	Validity Dates	Delay
			(dd-mm-yyyy)	(dd-mm-yyyy)	Months
VWLLP pooling station/MAIN meter	GDG/DN/WF/H ESCOM VWIL/138	Sr. No: 09142236 Accuracy Class: 0.2 Make: L&T	14-05-2019	13-05-2020	The delay has been considered in the previous monitoring period.
			23-09-2020	22-09-2021	No Delay
VWLLP pooling station/CHECK meter	GDG/DN/WF/H ESCOM VWIL/138	Sr. No: 09142599 Accuracy Class: 0.2 Make: L&T	14-05-2019	12-05-2020	The delay has been considered in the previous monitoring period.
			23-09-2020	22-09-2021	No delay

The details of the meter calibration for the meters at receiving station at Harthi are provided below:

Meter Location	Meter Details	Calibration Dates	Validity Dates	Delay
		(dd-mm-yyyy)	(dd-mm-yyyy)	Months
Receiving station -Harthi (Main Meter) Metering Point-3	Sr. No: 6760786			
	Accuracy Class: 0.2			
	Make: L&T			
	Meter Replaced	Replacement Date		No delay
	New/Current Meter Sr. No : 20005981	23-11-2020	22-11-2021	
	Accuracy Class: 0.2			
	Make: L&T			
	Type: DLMS/ABT			
Receiving station -Harthi (Check Meter) Metering Point-3	Sr. No: 6767587			
	Accuracy Class: 0.2			
	Make: L&T			
	Meter Replaced	Replacement Date		No Delay
	New /Current Meter Sr. No : 20005994	23-11-2020	22-11-2021	
	Accuracy Class: 0.2			
	Make: L&T			
	Type: DLMS/ABT			

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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.
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