

TEMPLATE

MONITORING REPORT

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VERSION **v. 1.1**

RELATED SUPPORT - **TEMPLATE GUIDE Monitoring Report v. 1.1**

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Key Project Information

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KEY PROJECT INFORMATION

Key Project Information

GS ID (s) of Project (s)	GS4962
Title of the project (s) covered by monitoring report	Wind Power Project in Madhya Pradesh by OBWPPL
Version number of the PDD/VPA-DD (s) applicable to this monitoring report	05
Version number of the monitoring report	05
Completion date of the monitoring report	17/05/2024
Date of project design certification	04/06/2018
Date of Last Annual Report	29/08/2023
Monitoring period number	04 th (For 1 st CP)
Duration of this monitoring period	01/01/2021 to 04/05/2023 (Both days included)
Project Representative	Infinite Solutions
Host Country	India
Activity Requirements applied	☐ Community Services Activities ☒ Renewable Energy Activities ☐ Land Use and Forestry Activities/Risks & Capacities ☐ N/A
Methodology (ies) applied and version number	ACM0002: Grid-connected electricity generation from renewable sources - Version 17.0 ¹
Product Requirements applied	☒ GHG Emissions Reduction & Sequestration ☐ Renewable Energy Label ☐ N/A

¹ <https://cdm.unfccc.int/UserManagement/FileStorage/D5YFS9I3VKBT18MQNGX0LPZ6U7AWCO>

Table 1 - Sustainable Development Contributions Achieved

Sustainable Development Goals Targeted	SDG Impact	Amount Achieved	Units/ Products
SDG 7: Affordable and Clean Energy	MWh of renewable energy generated	249,556.05	MWh
SDG 8: Decent Work and Economic Growth	Trainings Employees Income generation (INR)	13 Training 41 employees INR 172,271,000	No of Training No of Employees INR
SDG 13: Climate Action (mandatory)	Emission Reduction	243,990	VERs

Table 2 – Product Vintages

		Amount Achieved		
Start Dates	End Dates	SDG 7: Affordable and Clean Energy (MWh)	SDG 8: Decent Work and Economic Growth	SDG 13: Climate Action (VERs) tCO ₂
01/01/2021	31/12/2021	117,419.50	5 Training 41 employees INR 71,233,000	114,801
01/01/2022	31/12/2022	105,305.90	5 Training 41 employees INR 74,782,000	102,957
01/01/2023	04/05/2023	26,830.64	3 Training 41 employees INR 26,256,000	26,232

SECTION A. DESCRIPTION OF PROJECT

A.1. General description of project

M/s Orange Bercha Wind Power Pvt. Ltd has setup wind power project at villages around Bercha village, Ratlam District of Madhya Pradesh state, India with capacity of 50 MW (25 X 2 MW).

The purpose of the project activity is to generate electrical power using wind energy through operation of Wind Electric Generators (WEG's). The project consists of 25 Wind Turbine Generators (WTGs) of Gamesa G-97 turbines of 2 MW each. The electricity generated by the project is exported to the Indian national grid. The project activity will therefore displace an equivalent amount of carbon intense electricity which would have otherwise been generated by fossil fuel dominant electricity grid.

The project activity has been fully commissioned on 05/05/2016 and is operational.

The project proponent has chosen the 1st crediting period from 05/05/2016 to 04/05/2023.

The present monitoring period is from 01/01/2021 to 04/05/2023 through which emission reduction claimed is 243,990 tCO₂e.

The Emission Reductions as per the vintage break-up (2021,2022 and 2023) in the monitoring in the following format:

01/01/2021 to 31/12/2021: 114,801 tCO₂e.

01/01/2022 to 31/12/2022: 102,957 tCO₂e.

01/01/2023 to 04/05/2023: 26,232 tCO₂e.

A.2. Location of project

The project activity is located in the villages of Jhar, Sandala, Dhanesra, Kamed villages of Ratlam district, in the state of Madhya Pradesh, India. Details of co-ordinates of each WTGs are given below:

Sl.NO	WTG No	Latitude(N)	Longitude(E)	Tehsil/District	Village	State
1	B 16	52.1672	25.7515	Ratlam	Jhar	Madhya Pradesh
2	B 4	52.3946	25.7375	Ratlam	Sandala	Madhya

						Pradesh
3	B 1	52.2298	25.7294	Ratlam	Jhar	Madhya Pradesh
4	B 72	52.3437	25.7426	Ratlam	Jhar	Madhya Pradesh
5	B 90	52.3086	25.7305	Ratlam	Jhar	Madhya Pradesh
6	B 92	52.2800	25.7224	Ratlam	Jhar	Madhya Pradesh
7	B 89	52.4506	25.7245	Ratlam	Sandala	Madhya Pradesh
8	B 86	52.5160	25.7492	Ratlam	Sandala	Madhya Pradesh
9	B 73	52.5259	25.7524	Ratlam	Sandala	Madhya Pradesh
10	B 79	52.5573	25.7324	Ratlam	Sandala	Madhya Pradesh
11	B 38	52.5902	25.7508	Ratlam	Dhanesra	Madhya Pradesh
12	B 87	52.5999	25.7551	Ratlam	Dhanesra	Madhya Pradesh
13	B 80	52.6188	25.7452	Ratlam	Dhanesra	Madhya Pradesh
14	B 82	52.5976	25.7415	Ratlam	Dhanesra	Madhya Pradesh
15	B 91	52.608	25.737	Ratlam	Dhanesra	Madhya Pradesh
16	B 33	52.6708	25.7399	Ratlam	Dhanesra	Madhya Pradesh
17	B 71	52.8647	25.7629	Ratlam	Kamed	Madhya Pradesh
18	T1	52.7818	25.7614	Ratlam	Kamed	Madhya Pradesh
19	T2	52.7876	25.7563	Ratlam	Kamed	Madhya Pradesh
20	B 77	52.8648	25.7588	Ratlam	Kamed	Madhya Pradesh
21	B 83	52.8737	25.7434	Ratlam	Kamed	Madhya Pradesh
22	B 78	52.8747	25.7401	Ratlam	Kamed	Madhya Pradesh
23	B 85	52.8032	25.7356	Ratlam	Kamed	Madhya Pradesh
24	B 75	52.7864	25.7393	Ratlam	Kamed	Madhya Pradesh
25	B 84	52.735	25.7416	Ratlam	Kamed	Madhya Pradesh



A.3. Reference of applied methodology

Title: Grid-connected electricity generation from renewable sources

References: Approved Large-Scale Consolidated Methodology: ACM0002 "Grid-connected electricity generation from renewable sources" (Version 17.0)².

Tools:

Tool for the demonstration and assessment of additionality (Tool 1)- Version 7.0³.

Tool to calculate the emission factor for an electricity system (Tool 7)- Version 6.0⁴.

A.4. Crediting period of project

Type of crediting period: Renewable

Start date of crediting period: 05/05/2016

End date of crediting period: 04/05/2023

Length of crediting period: 7 years

²<https://cdm.unfccc.int/UserManagement/FileStorage/D5YFS9I3VKBT18MQNGX0LPZ6U7AWCO>

³<https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-01-v7.0.0.pdf>

⁴<https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-07-v6.pdf>

SECTION B. IMPLEMENTATION OF PROJECT

B.1. Description of implemented project

The total installed capacity of the project activity is 50 MW comprising of 25 Nos of 2 MW WTGs. The project has been commissioned as of 05/05/2016 and all the WTGs are currently operational. A total of all the 25 WTGs under the project activity were commissioned on the same day. There are no changes to the technical details of the project activity as mentioned in the registered PDD. Project Proponent installed Gamesa make G-97 model WTGs. Technical specification of the installed WTGs are same as mentioned during the commissioning of the project. The technical details of the WTGs are given below:

POWER	
Rated power	2000 kW
Average Annual Wind speed	7.5 m/s
Reference Turbulence Intensity	18 m/s
Reference 10-minute wind speed	37.5 m/s
Survival wind speed	52.5 m/s
GENERATOR	
Type	Doubly-fed with coil rotors and slip rings
Rated power	2 MW
Voltage	690 V AC
Frequency	50Hz/60 Hz
Protection class	IP 54 (slip ring IP 23)
Power Factor	0.95 CAP - 0.95 IND
ROTOR	
Diameter	97 m
Swept area	7390 sq.m
Speed range	9:19 rpm
TOWER AND FOUNDATION	
Hub height	104 m
Type	Tubular, Four sections
Foundation type	Floating foundation
GEARBOX	
Type	1 Planetary stage & 2 helical stages
Gear Ratio	1:106.8 (50 Hz), 1:127.2 (60 Hz)

The details of WTGs and the feeders connected are mentioned below

Feeder	WTGs
Feeder 1	B-01, B-04, B-16, B-72, B-73, B-79, B-82, B-86, B-89, B-90, B-91, B-92
Feeder 2	B-33, B-38, B-71, B-75, B-77, B-78, B-80, B-83, B-84, B-85, B-87, T-01, T-02

B.1.1 Forward Action Requests

FAR#1 The VVB shall conduct site visit and confirm physical implementation of the project activity and technical features of the WTGs and monitoring system and meters.

Rectification: The VVB has conducted a physical site visit dated 20/07/2023 and has confirmed the physical implementation of the project activity and also the technical features of the WTGs and the monitoring system and meters.

FAR#2 The VVB shall conduct interviews with plant staff and local stakeholders to confirm the grievances, Safeguarding Principles, trainings and CSR activities.

Rectification: The VVB has interviewed with plant staff and local stakeholders to confirm the grievances, Safeguarding Principles, trainings and CSR activities.

B.2. Post-Design Certification changes

B.2.1. Temporary deviations from the approved Monitoring & Reporting Plan, methodology or standardized baseline

There are no temporary deviations from the approved Monitoring & Reporting Plan, methodology or standardized baseline, hence Not Applicable.

B.2.2. Corrections

Correction: In registered PDD, there was a typographical error related to the geo coordinates of the WTGs. The geo coordinates of the mentioned WTGs B 16, B 1, B 90, B 92, B 89, B 86, B 73, B 79, B 38, B 87, B 80 and B 82 are corrected as per actual project scenario and for WTG No. B 1 the village is corrected from Sandala to Jhar whereas the district and state are same.

Above changes do not impact the project's Additionality, Baseline, design, crediting period and applicability of methodology in any way.

B.2.3. Changes to start date of crediting period

No changes to start date of the crediting period, hence, Not Applicable.

B.2.4. Permanent changes from the Design Certified monitoring plan, applied methodology or applied standardized baseline

There are no Permanent changes from the Design Certified monitoring plan, applied methodology or applied standardized baseline, hence Not Applicable.

B.2.5. Changes to project design of approved project

Not Applicable as there is no project design change within the monitoring period.

SECTION C. DESCRIPTION OF MONITORING SYSTEM APPLIED BY THE PROJECT

The project proponent has entered into agreement between Orange Bercha Wind Power Private Limited and Gamesa Renewable Private Limited for the operation and maintenance of WTGs. The WTG supplier has dedicated and technically well-equipped O&M team for day-to-day Operation and maintenance of each WTG. O&M contractor provides a monthly report, which includes generation data, major breakdown events and machine availability.

The project activity has entered a power purchase agreement for a period of 25 years with the M/s. Madhya Pradesh Power Management Company Limited MPPMCL. The electricity is fed in the Integrated Indian grid. Monitoring consists of metering the net electricity supplied to the grid ($EG_{\text{facility},y}$). This parameter is based on the monthly JMRs (share certificates) undertaken by DISCOM and Gamesa which is continuously through energy meter. The PP then raises monthly electricity sales invoices to MPPMCL based on the JMR reading. All the meters used in the project activity are calibrated in once in a five year.

The monitored data reported by the PP to the GS consultant on a monthly basis for the calculation and estimation of emission reductions. This data is checked against invoices raised.

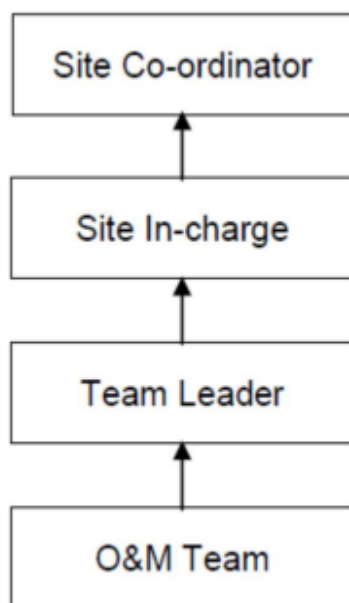
Data storage and Archiving

In accordance with the methodology all the data collected during the crediting period are archived electronically and kept for at least two years after the end of crediting period. 100% of the data is monitored and the meters owned by DISCOM/PP are calibrated at regular intervals to ensure low uncertainty in the monitored data.

O&M contractor (Gamesa) provides a monthly report, which includes generation data, major breakdown events and machine availability. Project manager is responsible for

recording of monthly meter readings of export and import. Monthly power export and import data is sent regularly to site in charge.

The data for the project is compiled by the O&M Contractor and subsequently stored by the PP, the reporting and data flows as per the below mentioned flow chart starting from Site O&M team which monitors day to day operational data and monthly recording. The roles and responsibilities for the project are described as below;



The monitored data is reported by the PP to the GS consultant on a monthly basis for the calculation and estimation of emission reductions. This data is checked against invoices raised.

Personal Training:

The training for operating and maintaining the plant are provided to the O&M team whenever there is necessity or any technological upgradation.

Monitoring Process at project site:

Joint monthly meter reading has been taken from substation meter by representative of DISCOM and O&M team/service provider (on behalf of the project proponent). It must be noted here that the meter readings as mentioned above shall be calculated as the product of meter multiplication factor and the difference of the current and previous meter readings.

Based on the above procedure, the Monthly Wind Energy Certificates has been provided to the project proponent. This is to be noted that the detail procedure of monitoring is illustrated here for the sake of understanding; for the preparation of monitoring report during periodic verifications, only the net electricity generation value calculated from energy certificates shall be used for emission reduction calculation. No other parameters as explained above shall be used and presented in the monitoring report.

Data Adjustment in case of monitoring period different from billing period:

The net electricity supplied to the grid is reported as the difference between the net export and import from the plant. The electricity export and import data are monitored via main and check meters connected to the sub-station.

Data Adjustment in case of monitoring period different from billing period:

In case the dates of a particular monitoring period do not match with the dates of the billing period, the net electricity exported to the grid is calculated as follows:

$$D = (A*B)/C$$

Where:

A = Net Electricity supplied to the grid for that given billing period/ month

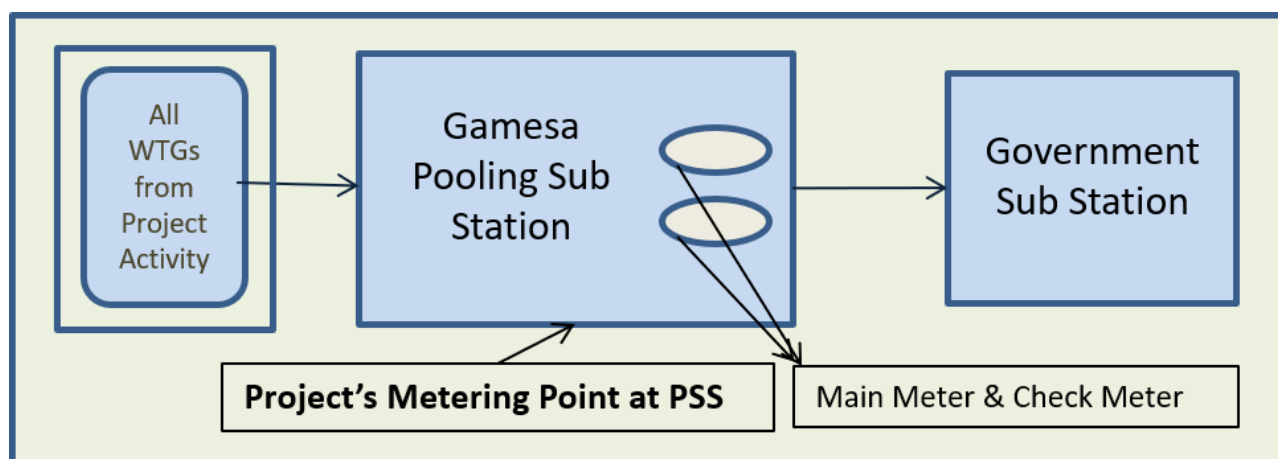
B = Difference of number of days which are not matching of billing period and monitoring period.

C = Number of days of the billing period/ month which was not matched with the monitoring period.

The calculated value after apportioning is used for calculation of emission reductions during the current monitoring period.

Emergency preparedness:

In case Main meter or Check meter is found to be outside the acceptable limits of accuracy or faulty or not functioning properly, it is repaired, recalibrated or replaced as soon as possible. In the event that the Main meter is not in service as a result of maintenance, repairs or testing, the Check meter will be used for readings the project's metering arrangement representation.



SECTION D. DATA AND PARAMETERS

D.1. Data and parameters fixed ex ante or at renewal of crediting period

Relevant SDG Indicator 13: Take urgent action to combat climate change and its impacts

Data/parameter	$EF_{gridOM,y}$
Unit	tCO ₂ /MWh
Description	Operating Margin CO ₂ emission factor for the Indian Grid in year y
Source of data	Calculated from CEA database, Version 11 ⁵ published by Central Electricity Authority (CEA), Ministry of Power, Government of India.
Value(s) applied	0.9941
Choice of data or Measurement methods and procedures	Calculated in line with "Tool to calculate the emission factor for an electricity system (Version 07.0.0)" using data from Central Electricity Authority of India's (CEA) "Baseline Carbon Dioxide Emission Database Version 11.0". The value used is calculated ex-ante as generation based weighted average of last three years of the operating margin provided in the CEA database.

⁵https://cea.nic.in/wp-content/uploads/baseline/2020/07/user_guide_ver11.pdf

	Weighted average = $\sum_{i=1 \text{ to } n} (\text{Net generation in operating margin in year } i * \text{Simple operating margin in year } i) / \sum_{i=1 \text{ to } n} (\text{Net generation in operating margin of year } i)$
Purpose of data	For the calculation of the Baseline Emission
Additional comment	This parameter is fixed ex-ante for the entire crediting period.

Data/parameter	EF _{gridBM,y}
Unit	tCO ₂ /MWh
Description	Build Margin CO ₂ emission factor for the Indian Grid in year y
Source of data	Calculated from CEA database, Version 11 ⁶
Value(s) applied	0.9285
Choice of data or Measurement methods and procedures	Calculated in line with "Tool to calculate the emission factor for an electricity system (Version 07.0.0)" using data from Central Electricity Authority of India's (CEA) "Baseline Carbon Dioxide Emission Database Version 11.0". The value is calculated ex-ante as most recent build margin provided by the CEA.
Purpose of data	For the calculation of the Baseline Emission
Additional comment	This parameter is fixed ex-ante for the entire crediting period.

Data/parameter	EF _{gridCM,y}
Unit	tCO ₂ /MWh
Description	Combined Margin CO ₂ emission factor in year y
Source of data	Calculated from CEA database, Version 11 ⁷
Value(s) applied	0.9777

⁶https://cea.nic.in/wp-content/uploads/baseline/2020/07/user_guide_ver11.pdf

⁷https://cea.nic.in/wp-content/uploads/baseline/2020/07/user_guide_ver11.pdf

Choice of data or Measurement methods and procedures	The combined margin emissions factor is calculated as follows: $EF_{grid,CM,y} = EF_{grid,OM,y} * W_{OM} + EF_{grid,BM,y} * W_{BM}$ Where: $EF_{grid,BM,y}$ = Build margin CO₂ emission factor in year y (tCO₂/MWh) $EF_{grid,OM,y}$ = Operating margin CO₂ emission factor in year y (tCO₂/MWh) W_{OM} = Weighting of operating margin emissions factor (%) = 75% W_{BM} = Weighting of build margin emissions factor (%) = 25%
Purpose of data	For the calculation of the Baseline Emission
Additional comment	This parameter is fixed ex-ante for the entire crediting period.

D.2 Data and parameters monitored

Relevant SDG Indicator: SDG 7.2.1: Renewable energy share in the total final energy consumption

Data / Parameter	$EG_{facility,y}$										
Unit	MWh/year										
Description	Quantity of net electricity supplied by the project plant/unit to the grid in year y (MWh)										
Source of data	Monthly energy generation statement issued by State Electricity Board. These are called JMR (Joint Meter Reading)										
Value(s) applied	249,556.05 MWh <table border="1"> <thead> <tr> <th>Vintage</th><th>Net Generation (MWh)</th></tr> </thead> <tbody> <tr> <td>01/01/2021 to 31/12/2021</td><td>117,419.50</td></tr> <tr> <td>01/01/2022 to 31/12/2022</td><td>105,305.90</td></tr> <tr> <td>01/01/2023 to 04/05/2023</td><td>26,830.64</td></tr> <tr> <td>Total</td><td>249,556.05</td></tr> </tbody> </table>	Vintage	Net Generation (MWh)	01/01/2021 to 31/12/2021	117,419.50	01/01/2022 to 31/12/2022	105,305.90	01/01/2023 to 04/05/2023	26,830.64	Total	249,556.05
Vintage	Net Generation (MWh)										
01/01/2021 to 31/12/2021	117,419.50										
01/01/2022 to 31/12/2022	105,305.90										
01/01/2023 to 04/05/2023	26,830.64										
Total	249,556.05										

Measurement methods and procedures	Monitoring equipment: Electrical Energy Meters which are electronic tri-vector meters of accuracy class 0.2s and located at 33 kV side of GSS Substation (Main & Check meters) (Please refer to the Annex-1 for meter serial number) Data type: Measured & Calculated Archiving: Paper & Electronic Recording Frequency: Continuous monitoring and monthly recording from energy meters, summarised annually. Calibration frequency: Once in 5 years as per CEA Guidelines.⁸ The net electricity will be calculated by MPPKVVCL and provided in the monthly generation statement. Hence, the net electricity reading will be directly sourced from the monthly generation statement. The net electricity will be calculated by State electricity board and provided in the monthly generation statement/JMR/B-form. The net electricity supplied to the grid by the project activity is calculated as a difference of electricity exported to the grid and electricity imported from the grid obtained from monthly meter reports provided as per below equation: Net Electricity = Export – Import
Monitoring frequency:	Continuous measurement and monthly recording Monitoring Method: recording in JMR (Join Meter Reading)
QA/QC procedures	Net electricity supplied to the grid by the project activity is cross checked with invoices submitted to MP Electricity Board (EB). The meter(s) shall be calibrated and maintained by the state utility as per their schedule, and this frequency of meter calibration

⁸ https://cea.nic.in/wp-content/uploads/2020/04/review_regulation.pdf

	is not within the control of the Project Proponent. However, the project proponent shall ensure that calibration of electricity meters is carried out in-line with the National standard which recommends at least once in 5-year calibration ⁹ or whenever abnormal difference/inconsistency is observed between main meter and check meter. The calibration details have been provided in the appendix 1.
Purpose of data	Baseline emission calculation ($EG_{\text{facility},y}$)
Additional comment	Data will be archived electronically for a period of 2 years beyond the end of crediting period.

Relevant SDG Indicator: SDG 8.5.2: Unemployment rate, by sex, age and persons with disabilities

Data / Parameter	Quality of employment										
Unit	Number of Trainings provided to employees & O&M staffs										
Description	Trainings provided to employees & O&M staffs										
Source of data	Training Records (HSE & HR)										
Value(s) applied	13 trainings are carried out annually covering the whole monitoring period and details of the training has been provided in the appendix 2. <table border="1"> <thead> <tr> <th>Period</th><th>Training</th></tr> </thead> <tbody> <tr> <td>01/01/2021 to 31/12/2021</td><td>5</td></tr> <tr> <td>01/01/2022 to 31/12/2022</td><td>5</td></tr> <tr> <td>01/01/2023 to 04/05/2023</td><td>3</td></tr> <tr> <td>Total</td><td>13</td></tr> </tbody> </table> The training programmes help in making the workforce efficient and skilled at their job. This not only helps the company but adds to growth of individual employees. Thus, the project has a positive impact on the parameter.	Period	Training	01/01/2021 to 31/12/2021	5	01/01/2022 to 31/12/2022	5	01/01/2023 to 04/05/2023	3	Total	13
Period	Training										
01/01/2021 to 31/12/2021	5										
01/01/2022 to 31/12/2022	5										
01/01/2023 to 04/05/2023	3										
Total	13										
Measurement methods and procedures	List of training programmes conducted and the number of beneficiaries										

⁹ https://cea.nic.in/wp-content/uploads/2020/04/review_regulation.pdf

Monitoring frequency:	Yearly once
QA/QC procedures	-
Purpose of data	To monitor the contribution to SDG 8 (Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all)
Additional comment	-

Relevant SDG Indicator: SDG 8.5.1: Average hourly earnings of female and male employees, by occupation, age and persons with disabilities

Data / Parameter	- Quantitative employment - Income generation
Unit	- Number of O&M staffs involved in the project - Cost spent for O&M
Description	Total employment generated due to the implementation of project activity and the amount spent for O&M activities due to the project.
Source of data	Plant employment records
Value(s) applied	The total number of employments 41. Bifurcation based on gender: Male:41 Female: 0¹⁰ This includes 5 numbers of third-party contractor Gamesa (skilled),1 personnel of Orange Bercha (skilled),10 number of WTG and BOP technician(skilled),1 Office boy and 24 number of PSS and site security staffs (unskilled) employed at the project site with no persons with disabilities. Total 16 are skilled and 25 are unskilled employees. The O&M cost can be verified from the O&M contract signed with Gamesa for all the 25 WTGs. The income

¹⁰ The project activity is located in the remote area and women employment is not possible due to safety concerns but they are encouraging to apply in the head office.

	generation for the current monitoring period is INR 172,271,000.
Measurement methods and procedures	• Training Attendance sheets. • Employee Records • Salary slips of the employees
Monitoring frequency:	Yearly once
QA/QC procedures	-
Purpose of data	To monitor the contribution to SDG 8 (Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all)
Additional comment	-

Relevant SDG Indicator SDG 13: Climate Action

Data / Parameter	Air Quality
Unit	CO ₂ emission reduction and reduction in dust generation
Description	In order to reduce dust emissions during the construction phase, the following dust suppression measures stipulated and implemented: • Spraying water and covering material trucks' body to minimize dust; • Reuse of water for sprinkling of unpaved roads. • Imposition of speed controls for vehicles and unpaved site roads; • Well-maintained diesel-powered mechanical equipment to avoid black smoke emissions; • Shut-down of diesel-powered mechanical equipment or trucks inside the worksites when they are not in operation.
Source of data	Calculated as per "Tool to calculate the emission factor for an electricity system,". The data are obtained from "CO ₂ Baseline Database for Indian Power Sector" version 11.0, published by the Central Electricity Authority, Ministry of Power, Government of India.
Value(s) applied	243,990 tCO ₂ emission reductions for the current monitoring period

	Vintage	Emission Reduction (tCO ₂ e)
	01/01/2021 to 31/12/2021	114,801
	01/01/2022 to 31/12/2022	102,957
	01/01/2023 to 04/05/2023	26,232
	Total	243,990
Measurement methods and procedures	Project logbook, or interview with maintenance staff. Amount of annual net electricity generation will be used to calculate estimated CO ₂ emission reductions by project activity	
Monitoring frequency:	Once every monitoring period	
QA/QC procedures	In order to reduce dust emissions during the operation phase, the following dust suppression measures are stipulated and implemented: • Imposition of speed controls for vehicles and unpaved site roads; • Well-maintained diesel-powered mechanical equipment to avoid black smoke emissions;	
Purpose of data	To monitor compliance to Safeguarding Principle 4.3.4 (Release of pollutants)	
Additional comment	-	

Relevant Safeguarding principle 4.3.11: Endangered Species

Data / Parameter	Birds and bat deaths
Unit	Bird Carcass Count
Description	• During the siting activity, it was ensured that there are no water bodies beside WTGs. • Water pits are not allowed around the WTGs. • None of the area of WTGs erection or transmission lines are under sensitive or under areas of conservation importance • The transmission lines wherever required has reflectors • Storm water control around within 100m of every WTG
Source of data	Bird Strike register, or interview with local villagers.
Value(s) applied	The O&M team maintains a Bird strike register. As per the record, there are no observed carcasses in vicinity

	of the WTGs. The dead of birds by other reasons including prey and accidents has been observed however as this is not caused by the project's WTGs and its ancillary; it is not recorded. The impact of parameter is neutral as there is no impact observed during the current monitoring period. The DOE has been provided with details of observations
Measurement methods and procedures	-
Measuring/reading / recording frequency:	Once in a year
QA/QC procedures	-
Purpose of data	To monitor compliance to Safeguarding Principle 4.3.11 (Endangered Species)
Additional comment	-

Relevant Safeguarding Principle 4.2.2: Erosion and/or Water Body Instability

Data / Parameter	Soil Erosion
Unit	-
Description	General soil erosion and sediment control measures would include: • Keep open areas of excavation to a minimum and construction activities restricted to dry months to avoid heavy rainfalls; • Using existing roads and lanes used by land owner. • Stockpiles of materials placed away from drainage lines and formed with sediment control structures placed immediately down slope; • Construction debris and excavated material were cleared up at regular intervals • Excavated material stock piled and used for backfilling of foundations, platforms etc. • Minimization of traffic in construction zones and use of a dedicated parking area, i.e. site compound; • Re-vegetation taken up as necessary after construction, in order to reduce the risk of soil erosion. Specific mitigation measures followed in the operational phase of the project:

	• Proper drainage controls such as culverts, cut-off trenches shall be used to ensure proper management of surface water runoff to prevent erosion. • Waste oil generated shall be stored separately in containers in a secured location in the maintenance room. The storage location and the containers are properly marked. • The waste / used waste oil from the WTGs to be disposed of to a CPCB/SPCB authorized vendor. A hazardous waste inventory is maintained as per the provisions of the Hazardous Waste (Management, Handling and Trans-boundary Movement) Rules, 2008. The possibility of soil erosion due to the project operation is negligible to none. Hence, does not involve many mitigation measures.
Source of data	Project O&M HSE logbook, or interview with maintenance staff.
Value(s) applied	The O&M log book records all the parameters as listed: • Hazardous waste generated, disposed, any spillages • Waste oil generated, disposed, any spillages • Leakage of any diesel or waste oil The same O&M HSE log book is submitted to DOE. This parameter has a neutral (0) impact as there has been no incidence of oil leakage or inappropriate disposal of hazardous or waste oil during the monitoring period.
Measurement methods and procedures	-
Measuring/reading / recording frequency:	Once in a year
QA/QC procedures	-
Purpose of data	To monitor compliance to Safeguarding Principle 4.2.2 (Erosion and/or Water Body Instability, 4.3.4 (Release of pollutants), and 4.3.5 (Hazardous and Non-hazardous Waste)
Additional comment	-

Relevant Safeguarding Principle 4.3.1: Landscape modification and soil

Data / Parameter	Maintenance of Landscape visual impact
Unit	Aesthetics

Description	Detailed ESIA study conducted to understand if any of the location needs to be altered. Locals were consulted wherever a WTG location or access road was in vicinity to a settlement. The WTGs are painted with non-reflect paints and are not glary. Re-vegetation taken up as necessary after construction, in order to reduce the risk of soil erosion.
Source of data	Project Grievance register, or interview with local villagers
Value(s) applied	No significant visual impact observed and no grievances received. Vegetation has been grown wherever possible in the project's land. Apart from this, the project proponent has planted a number of trees to improve the landscape visual impact. The parameter has a neutral (0) impact as there are no grievances received or registered. The WTGs are spread across the terrain and hence have minimalistic presence.
Measurement methods and procedures	-
Measuring/reading / recording frequency:	Once in a year
QA/QC procedures	-
Purpose of data	To monitor compliance to Safeguarding Principle 4.3.1 (Landscape Modification and Soil)
Additional comment	-

Relevant Safeguarding Principle 3.4.2: Forced Eviction and displacement

Data / Parameter	Involuntary Resettlement & expropriation
Unit	Resettlement or Grievance
Description	The project activity does not involve in any involuntary resettlement. Further all the land purchased is private land purchased from on mutual consent. The project proponent ensured the following during land purchase: • No land with existing structures was purchased • No land from any marginalized farmers was purchased • No WTG land was within vicinity of settlements • All the purchase process followed national and state laws for land purchase.

	As the purchase of land is a voluntary process it does not involve "The National Rehabilitation and Resettlement Policy, 2007"
Source of data	Interview with local villagers & Grievance register
Value(s) applied	There is no change in the status, as no land has been purchased after construction nor any associated resettlement.
Measurement methods and procedures	-
Measuring/reading / recording frequency:	Once in a year
QA/QC procedures	-
Purpose of data	To monitor compliance to Safeguarding Principle 3.4.2 (Forced Eviction and displacement)
Additional comment	-

Relevant Safeguarding Principle 3.3 Community Health, Safety and Working Conditions

Data / Parameter	Safety of workers
Unit	Safety procedures followed: - Operating staffs are provided with helmet, shoes & gloves - Conduct safety training to the O&M staffs yearly
Description	The EHS team is responsible for ascertaining the safety procedures are followed, some being: - Proper training to all the workers at site - Safety gear mandatory while working at heights and inside the site location - Job card in conformity with safety protocol released before taking up any task by O&M team - Implementation of Loading & Unloading protocols - Use of vehicles with PUC & proper maintenance of vehicles - Control speed of vehicles
Source of data	Site Records of helmet, shoes & gloves distributed to staffs & Records of safety training
Value(s) applied	Total 45 helmets, 45 safety shoes and 45 gloves were distributed to the O&M staffs during the current monitoring period.

	Total 13 trainings have been provided out of that 10 trainings are safety trainings during the current monitoring period.
Measurement methods and procedures	-
Measuring/reading / recording frequency:	Once in a year
QA/QC procedures	-
Purpose of data	To monitor compliance to Safeguarding Principle 3.3 (Community Health, Safety and Working Conditions)
Additional comment	-

D.3. Comparison of monitored parameters with last monitoring period

Data/Parameter	Value obtained in this monitoring period	Value obtained last monitoring period
NA		
NA		

As per monitoring template guidelines, this section is not applicable for non- Community Service Activities, hence not applicable.

D.4. Implementation of sampling plan

No sampling process is involved, hence not applicable.

SECTION E. CALCULATION OF SDG IMPACTS

E.1. Calculation of baseline value or estimation of baseline situation of each SDG Impact

SDG 7:

The monitoring parameter for the SDG 7 is Quantity of net electricity supplied to the grid during the year y. Since baseline and pre-project scenario are same, in the baseline condition no renewable electricity will be supplied to grid from the project location. Hence, the baseline value is zero.

Vintage	Baseline value
	Net Electricity supplied to grid (MWh)
01/01/2021 to 31/12/2021	0
01/01/2022 to 31/12/2022	0
01/01/2023 to 04/05/2023	0

SDG 8:

The monitoring parameter for the SDG 8 are Number of trainings provided to employees & O&M staff, income generation & Number of O&M staffs involved in the project. Since baseline and pre-project scenario are same, in the baseline condition these values are zero.

Vintage	Baseline value		
	Number of training(Nos)	Income generation (INR)	Number of employees (Nos)
01/01/2021 to 31/12/2021	0	0	0
01/01/2022 to 31/12/2022	0	0	0
01/01/2023 to 04/05/2023	0	0	0

SDG 13: -

Baseline emissions include only CO₂ emissions from electricity generation in fossil fuel fired power plants that are displaced due to the project activity. The methodology assumes that all project electricity generation above baseline levels would have been generated by existing grid- connected power plants and the addition of new grid-connected power plants. The baseline emissions are to be calculated as follows:

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

Where,

BE_y - Baseline emissions in year y, (tCO₂e/yr)

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

EF_{grid,CM,y} - Combined margin CO₂ emission factor for grid connected power generation in year y

Calculation of EG_{PJ,y}

The calculation of EG_{PJ,y} is different for

- Greenfield plants,
- Retrofits and replacements, and
- Capacity additions

The project activity is the installation of wind projects, and it is a green field project. So the formula in option (a) i.e., greenfield plants is used to calculate the value of $EG_{PJ,y}$. In accordance with para 41 of the applied methodology:

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

Where:

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

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

$$BE_y = EG_{facility,y} * EF_{grid,CM,y}$$

$$BE_y = 249,556.05 * 0.9777$$

$$BE_y = 243,990 \text{ tCO}_2\text{e (Rounded down)}$$

E.2. Calculation of project value or estimation of project situation of each SDG Impact

SDG 7: Affordable and Clean Energy

The monitoring parameter for the SDG 7 is Quantity of net electricity supplied to the grid during the year y. In the project situation, the project supplied 249,556.05 MWh electricity during the monitoring period. This can be crosschecked from JMR & Invoices.

During Monitoring period - 01/01/2021 to 04/05/2023

Quantity of net electricity supplied to the grid (MWh) = 249,556.05 MWh

Vintage	Project Value
	Quantity of net electricity supplied to the grid (MWh)
01/01/2021 to 31/12/2021	117,419.50
01/01/2022 to 31/12/2022	105,305.90
01/01/2023 to 04/05/2023	26,830.64
Total	249,556.05

SDG 8: Decent Work and Economic Growth

The monitoring parameter for the SDG 8 are Number of trainings provided to employees & O&M staff, income generation & Number of employees involved in the project. During the project scenario, the following is achieved:

During Monitoring period - 01/01/2021 to 04/05/2023

Quality of Employment – 13 training

Quantitative employment and income generation - 41 employees

Income generation (INR) – 172,271,000

These can be crosschecked from the training records, O&M contract & employment records.

Vintage	Project Value		
	Number of trainings (Nos)	Income generation (Lakh INR)	Number of employees (Nos)
01/01/2021 to 31/12/2021	5	71,233,000	41
01/01/2022 to 31/12/2022	5	74,782,000	
01/01/2023 to 04/05/2023	3	26,256,000	
Total	13	172,271,000	41

SDG 13: Climate Action

The monitoring parameter for the SDG 13 is Quantity of emission reduction during the year y. In the project situation, the project reduced 243,990 tCO₂e during the current monitoring period. This parameter is calculated, and no such QA/ QC is required.

During Monitoring period - 01/01/2021 to 04/05/2023

Quantity of emission reduction – 243,990 tCO₂e

Vintage	Project Value		
	Net generation (MWh)	Grid Emission Factor (tCO ₂ /MWh)	Emission Reduction (tCO ₂ e)
01/01/2021 to 31/12/2021	117,419.50	0.9777	114,801
01/01/2022 to 31/12/2022	105,305.90	0.9777	102,957
01/01/2023 to 04/05/2023	26,830.64	0.9777	26,232
Total	249,556.05	0.9777	243,990

As per the approved consolidated Methodology ACM0002 (Version 17.0):

“For most renewable energy power generation project activities, PE_y = 0. However, some project activities may involve project emissions that can be significant. These emissions shall be accounted as project emissions by using the following equation:

$$PE_y = PE_{FF,y} + PE_{GP,y} + PE_{HP,y}$$

Where:

PE_y - Project emissions in year y (tCO_2e/yr)

$PE_{FF,y}$ - Project emissions from fossil fuel consumption in year y (tCO_2/yr)

$PE_{GP,y}$ - Project emissions from the operation of dry, flash steam or binary geothermal power plants in year y (tCO_2e/yr)

$PE_{HP,y}$ - Project emissions from water reservoirs of hydro power plants in year y (tCO_2e/yr)”

As the project activity is the installation of a new grid-connected wind power plant/unit and does not involve any project emissions from fossil fuel, operation of dry, flash steam or binary geothermal power plants, and from water reservoirs of hydro power plants. Therefore $PE_{FF,y}$, $PE_{GP,y}$, $PE_{HP,y}$ is equal to zero and thus, $PE_y = 0$.

E.3. Calculation of leakage

As per applied methodology ACM0002, version 17 and in accordance with para-B.6.3 of the registered PDD, the leakage emissions are not considered for the project activity. Hence, $LE_y = 0$.

E.4. Calculation of net benefits or direct calculation for each SDG Impact

SDG	SDG Impact	Baseline estimate	Project estimate	Net benefit
7	Affordable and Clean Energy (MWh)	0	249,556.05 MWh	249,556.05 MWh
8	Decent Work and Economic Growth	0	13 Trainings 41 employees INR 172,271,000	13 Trainings 41 employees INR 172,271,000
13	Climate Action (mandatory) (tCO_2)	243,990 VERs	0	243,990 VERs

E.5. Comparison of actual SDG Impacts with estimates in approved PDD

SDG	Values estimated in ex ante calculation of approved PDD for this monitoring period	Actual values ¹¹ achieved during this monitoring period
7	109,500 MWh/year 256,200.00 MWh for the monitoring period (854 days)	249,556.05 MWh
8	3 Trainings 50 employees INR 53,750,000 (365 days) 7 trainings 50 employees and INR 125,760,273.97 (854 days)	13 Trainings 41 employees INR 172,271,000
13	107,058 tCO ₂ /year 250,486 tCO ₂ for the monitoring period (854 days)	243,990 tCO ₂ e

E.5.1. Explanation of calculation of value estimated ex ante calculation of approved PDD for this monitoring period

SDG 7: Affordable and Clean Energy

The annual estimated power generation for the project activity is 109,500 MWh, thus considering number of days covered during current monitoring period to be 854, the estimated power generation is 256,200.00 MWh.

$$= 109,500 * 854 \text{ (days)} / 365$$

$$= 256,200.00 \text{ MWh}$$

SDG 8: Decent Work and Economic Growth

The project leads to employment opportunities which were not possible in the baseline scenario. The annual estimated employment generation, trainings and income generation for the project activity as per PDD are 50 no's, 3 no's and 53,750,000 INR,

¹¹ Whenever emission reductions are capped, both the original and capped values used for calculations must be transparently reported. Use brackets to denote original values.

thus considering number of days covered during current monitoring period to be 854, the estimated employment generation, trainings and income generation are 50 no's, 7 no's and 125,760,273.97 INR.

SDG 13: Climate Action

The annual estimated emission reduction for the project activity is 107,058 tCO₂e, thus considering number of days covered during current monitoring period to be 854, the estimated emission reduction contributing towards SDG 13 is 250,486 tCO₂e.

$$= 107,058 * 854 (\text{days}) / 365$$

$$= 250,486 \text{ tCO}_2\text{e}$$

The below comparison of SDG 7, SDG 8 and SDG 13 for the monitoring period of 01/01/2021 to 04/05/2023 is as per follows:

SDG	Parameter	Annual Average Estimation as per PDD	Estimation for the monitoring period	Actual Achieved during the monitoring period	Difference
7	Renewable electricity generation	109,500	256,200	249,556.05	-2.59%
8	Number of Trainings Conducted	3	7	13	+85.21%
	Income generation (INR)	53,750,000	125,760,273.97	172,271,000	+36.98%
	Number of Employment	50	50	41	-18%
13	Emission Reduction	107,058	250,486	243,990	-2.59%

E.6. Remarks on increase in achieved SDG Impacts from estimated value in approved PDD

The emission reductions as per the registered PDD is estimated to be 107,058 tCO₂e/year whereas during the current monitoring period the emission reductions claimed are 243,990 tCO₂e, which is approximately 2.59% lower than the estimated emission reductions for the same monitoring period. The reductions in actual emission reduction are justified. The generation is subject to climate conditions which are beyond the control of the Project Proponent. The current monitoring period is 01/01/2021 till

04/05/2023. Some of the months involved in this monitoring period are low yield months. The net electricity generated in some month is low due to the changing season which is beyond the control of the project participant. Moreover, the difference is due to the variation in the wind availability during the current monitoring period, which is a natural uncontrolled phenomenon and may vary. Hence the actual emission reductions are 2.59% lower as compared to the estimated emission reductions.

SECTION F. SAFEGUARDS REPORTING

Safeguarding Principle 4.3.4: Release of pollutants

Data/parameter:	Air quality
Mitigation measures followed	In order to reduce dust emissions during the construction phase, the following dust suppression measures stipulated and implemented: • Spraying water and covering material trucks' body to minimize dust; • Reuse of water for sprinkling of unpaved roads • Imposition of speed controls for vehicles and unpaved site roads • Well-maintained diesel-powered mechanical equipment to avoid black smoke emissions; • Shut-down of diesel-powered mechanical equipment or trucks inside the worksites when they are not in operation.
Source	Calculation of emission reductions from the power generation of the project by using Central Electricity Authority: "CO ₂ Emission Database CEA CO ₂ Baseline database Version 11" published by Central Electricity Authority (CEA), Ministry of Power, Government of India and Interview with maintenance staff
Additional comments:	-

Safeguarding Principle 4.2.2: Erosion and/or Water Body Instability

Data/parameter:	Soil Erosion
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Mitigation measures followed	General soil erosion and sediment control measures would include: • Keep open areas of excavation to a minimum and construction activities restricted to dry months to avoid heavy rainfalls; • Using existing roads and lanes used by land owner. • Stockpiles of materials placed away from drainage lines and formed with sediment control structures placed immediately down slope; • Construction debris and excavated material were cleared up at regular intervals • Excavated material stock piled and used for backfilling of foundations, platforms etc. • Minimization of traffic in construction zones and use of a dedicated parking area, i.e. site compound; • Re-vegetation taken up as necessary after construction, in order to reduce the risk of soil erosion. Specific mitigation measures followed in the operational phase of the project: • Proper drainage controls such as culverts, cut-off trenches shall be used to ensure proper management of surface water runoff to prevent erosion. • Waste oil generated shall be stored separately in containers in a secured location in the maintenance room. The storage location and the containers are properly marked. • The waste / used waste oil from the WTGs to be disposed of to a CPCB/SPCB authorized vendor. A (Management, Handling and Trans-boundary Movement) Rules, 2008. The possibility of soil erosion due to the project operation is negligible to none. Hence, does not involve many mitigation measures.
Source	Project O&M HSE logbook, or interview with maintenance staff.
Additional comments:	-

Safeguarding Principle 4.3.1: Landscape modification and soil

Data/parameter:	Maintenance of Landscape visual impact
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Mitigation measures followed	• Detailed ESIA study conducted to understand if any of the location needs to be altered. • Locals were consulted wherever a WTG location or access road was in vicinity to a settlement. • The WTGs are painted with non-reflect paints and are not glary. • Re-vegetation taken up as necessary after construction, in order to reduce the risk of soil erosion.
Source	Project Grievance register, or interview with local villagers
Additional comments:	-

Safeguarding Principle 4.3.11: Endangered Species

Data/parameter:	Bird mortality
Mitigation measures followed	• During the siting activity, it was ensured that there are no water bodies beside WTGs. • Water pits are not allowed around the WTGs. • None of the area of WTGs erection or transmission lines are under sensitive or under areas of conservation importance • The transmission lines wherever required has reflectors • Storm water control around within 100m of every WTG
Source	Bird strike register & Interview with O&M team
Additional comments:	-

Safeguarding Principle 3.4.2: Forced Eviction and displacement

Data/parameter:	Involuntary Resettlement & expropriation
Mitigation measures followed	The project activity does not involve in any involuntary resettlement. Further all the land purchased is private land purchased from on mutual consent. The project proponent ensured the following during land purchase: • No land with existing structures was purchased • No land from any marginalized farmers was purchased • No WTG land was within vicinity of settlements • All the purchase process followed national and state laws for land purchase. • As the purchase of land is a voluntary process it does not involve "The National Rehabilitation and

	Resettlement Policy, 2007,
Source	Interview with local villagers & Grievance register
Additional comments:	-

Safeguarding Principle 3.3: Community Health, Safety and Working Conditions

Data/parameter:	Safety of workers
Mitigation measures followed	The EHS team is responsible for ascertaining the safety procedures are followed, some being: • Proper training to all the workers at site • Safety gear mandatory while working at heights and inside the site location • Job card in conformity with safety protocol released before taking up any task by O&M team • Implementation of Loading & Unloading protocols • Use of vehicles with PUC & proper maintenance of vehicles • Control speed of vehicles
Source	Site Records of helmet, shoes & gloves distributed to staffs & Records of safety training.
Additional comments:	-

SECTION G. STAKEHOLDER INPUTS AND LEGAL DISPUTES

G.1. List all Inputs and Grievances which have been received via the Continuous Input and Grievance Mechanism together with their respective responses/mitigations.

The grievance record regarding reported monitoring period has been submitted to the verification body.

G.2. Report on any stakeholder mitigations that were agreed to be monitored.

There has been no stakeholder mitigation that were agreed to be monitored in this verification period.

G.3. Provide details of any legal contest that has arisen with the project during the monitoring period

No, there has been no legal contest that has arisen with the project during the monitoring period.

Appendix I- Details of meters

The total capacity of the project activity is 50 MW (25 X 2 MW) and 25 Wind Turbine Generators (WTGs) of Gamesa G 97 turbines of 2 MW each. Project site has one main meter and one check meter.

Details	Main Meter	Check Meter
Make	SEMS	SEMS
Type	R3E	R3E
Serial Number	XC576471 ¹²	XC576472
Accuracy class	0.2s	0.2s
Calibration frequency as per PDD	Once in 5 years	Once in 5 years
Calibration date	11/10/2019	11/10/2019
Calibration validity	10/10/2024	10/10/2024

Details	Main Meter	Check Meter
Make	SECURE	SECURE
Type	R3E	R3E
Serial Number	Q0594743	Q0594742
Accuracy class	0.2s	0.2s
Calibration frequency as per PDD	Once in 5 years	Once in 5 years
Calibration date	07/06/2022	07/06/2022
Calibration validity	06/06/2027	06/06/2027

¹²The meters XC576471 and XC576472 are been replaced by the meters Q0594742 and Q0594743 on 07/06/2022

Appendix II- Training Records

The training records for the current monitoring period has been given below:

Date	Topics	Total no. of trainings
05/04/2021	Risk Assessment	1
05/07/2021	Personal safety	1
18/08/2021	Basic first aid	1
18/08/2021	Covid 19 and dengue awareness	1
04/10/2021	Basic electrical safety and 5 golden rules	1
07/01/2022	Safe work in HT line/ Permit to work	1
09/02/2022	OET implementation	1
22/06/2022	Lift safe suspended loads	1
04/11/2022	How to operate life	1
15/12/2022	Move safe	1
12/01/2023	Permit to work	1
08/02/2023	Safety guards	1
06/03/2023	Driving safety	1
Total		13

Revision History

Version	Date	Remarks
1.1	14 October 2020	Hyperlinked section summary to enable quick access to key sections Improved clarity on Key Project Information Section for POA monitoring Forward action request section Improved Clarity on SDG contribution/SDG Impact term used throughout Clarity on safeguard reporting Clarity on design changes Leakage section added for VER/CER projects Addition of Comparison of monitored parameters with last monitoring period Provision of an accompanying Guide to help the user understand detailed rules and requirements
1.0	10 July 2017	Initial adoption