

TEMPLATE

MONITORING REPORT

PUBLICATION DATE **14.10.2020**

VERSION **v. 1.1**

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

This document contains the following Sections

Key Project Information

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KEY PROJECT INFORMATION

Key Project Information

GS ID (s) of Project (s)	GS11401
Title of the project (s) covered by monitoring report	Bhesada Wind Power Project in Rajasthan
Version number of the PDD/VPA-DD (s) applicable to this monitoring report	05
Version number of the monitoring report	06
Completion date of the monitoring report	31/10/2023
Date of project design certification	
Date of Last Annual Report	Not Applicable
Monitoring period number	01
Duration of this monitoring period	01/10/2019 to 30/06/2022(both days are included)
Project Representative	EKI Energy Services Limited
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 20.0
Product Requirements applied	☒ GHG Emissions Reduction & Sequestration ☐ Renewable Energy Label ☐ N/A

Table 1 - Sustainable Development Contributions Achieved

Sustainable Development Goals Targeted	SDG Impact	Amount Achieved	Units/ Products
SDG 13- Take urgent action to combat climate change and its impact	Emission reductions	493,381	GSVER
SDG 7- Ensure access to affordable, reliable and modern energy for all	MWh of renewable energy generated	524,188.754	MWh

SDG 8 – Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all	Number of trainings and hiring through project	Total number of trainings imparted to employees during the entire monitoring period: 14 Total number of employment opportunities ¹ created during the entire monitoring period: 42	Number of trainings and Employment generated through project
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Table 2 – Product Vintages

		Amount Achieved		
Start Dates	End Dates	SDG 7	SDG 8	SDG 13
01/10/2019	31/12/2019	37,917.763 MWh	10 people were employed and 1 trainings were conducted	36,126 tCO ₂ e(GSVER)
01/01/2020	31/12/2020	181,156.04 MWh	11 people were employed and 2 trainings were conducted	172,599 tCO ₂ e(GSVER)
01/01/2021	31/12/2021	194,827.746 MWh	10 people were employed and 2 trainings were conducted	182,036 tCO ₂ e(GSVER)

¹ It is to be noted that the employment numbers are not cumulative (unlike ERs) and the year-wise bifurcation is given in Table 2 for both employment & training.

01/01/2022	30/06/2022	110,287.204 MWh	11 people were employed and 9 trainings were conducted	102,620 tCO ₂ e(GSVER)
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SECTION A. DESCRIPTION OF PROJECT

A.1. General description of project

The project activity generates power using renewable energy source (wind energy) and sell the power generated to the National grid. The project activity generates electricity using wind energy. The generated electricity is exported to the Indian grid system which is under the purview of the INDIAN electricity grid of India.

The project activity replaces anthropogenic emissions of greenhouse gases of 493,381 tCO₂e, thereon displacing 524,188.754 MWh amount of electricity in current Monitoring Period from the generation-mix of power plants connected to the INDIAN GRID, which is mainly dominated by thermal/ fossil fuel based power plant.

The total installed capacity of the current project activity is 100.8 MW; which involves operation of 48 WTGs of 2.1 MW capacity each, in the state of Rajasthan in India.

Project Investor	Project Type	Total Project Capacity	State	Usage
ReNew Wind Energy (Rajasthan 3) Private Limited	Wind	100.8 MW	Rajasthan	Sale to Grid

The project activity start date is 21/08/2014, which is date of signing of supply contract with Suzlon Energy Limited.

The project activity is a new facility (Greenfield) and the project activity generates electricity by the utilization of renewable wind energy and further selling the generated energy to the Indian Grid. In this process there is no consumption of any fossil fuel and hence the project does not lead to any greenhouse gas emissions. Thus, electricity is generated through sustainable means without causing any negative impact on the environment.

The proposed monitoring period² (01/10/2019 to 30/06/2022) of this monitoring report is covered in First & Second Crediting Periods as mentioned below:

Sl. No.	Crediting Period	CP Duration		MP Duration	
		From	To	From	To
1	First	31/03/2016	30/03/2021	01/10/2019	30/03/2021
2	Second	31/03/2021	30/03/2026	31/03/2021	30/06/2022

² Deviation request was submitted to consider remote audit as per Covid-19 interim guidelines for first verification for Monitoring Period from 01/10/2019 to 30/06/2022(both dates are included). VVB conducted the remote audit as per paragraph 4.2 of COVID Interim Measures and provided opinion on verification report. GS approved the deviation request on 27/10/2023. One FAR has been raised by VVB to conduct a mandatory physical site visit for subsequent verification.

A.2. Location of project

Host Country: India

State: Rajasthan

District: Jaisalmer

Village: Bheeksar, Karada & Surrounding area

The location of the project activity has been highlighted in the map shown below:



The WTG location details is shown below:

Model: S97X, HBT_120Mtr			
Sr. No	WTG Name	Longitude(N)	Latitude(E)
1	BSD-001	71.38866	26.6132
2	BSD-004	71.39865	26.59866
3	BSD-005	71.40195	26.5938
4	BSD-006	71.40533	26.58895
5	BSD-058	71.40438	26.6061
6	BSD-061	71.40525	26.62209
7	VJI-067	71.31178	26.59331
8	VJI-068	71.31698	26.58629
9	VJI-073	71.33412	26.57749
10	VJI-074	71.32871	26.58481
11	VJI-075	71.32664	26.58877
12	VJI-077	71.31767	26.5976
13	VJI-078	71.31436	26.60744
14	VJI-104	71.32333	26.61446

15	VJI-105	71.32517	26.60927
16	VJI-106	71.32862	26.60561
17	VJI-107	71.3361	26.5978
18	VJI-108	71.33888	26.5909
19	VJI-112	71.35836	26.58953
20	VJI-114	71.34996	26.60213
21	VJI-470	71.3318	26.58132
22	VJI-471	71.33367	26.60363
23	VJI-472	71.35699	26.594
24	VJI-473	71.33719	26.57401

Model: S97x,Tubular_90Mtr			
Sl. No.	WTG Name	Longitude(N)	Latitude(E)
1	BSD-002	71.39061	26.60759
2	BSD-003	71.39532	26.60349
3	BSD-059	71.40199	26.61055
4	BSD-060	71.39864	26.61543
5	BSD-063	71.41186	26.6128
6	BSD-064	71.41499	26.60883
7	BSD-118	71.43018	26.61004
8	BSD-121	71.41767	26.62741
9	BSD-124	71.4306	26.62622
10	BSD-125	71.43605	26.61917
11	BSD-126	71.43986	26.61493
12	VJI-019	71.21193	26.62336
13	VJI-022	71.22678	26.61785
14	VJI-028	71.24541	26.61831
15	VJI-029	71.2423	26.62229
16	VJI-030	71.23867	26.62902
17	VJI-036	71.23923	26.64592
18	VJI-037	71.24236	26.64233
19	VJI-045	71.27376	26.59475
20	VJI-052	71.25334	26.64588
21	VJI-061	71.27402	26.64395
22	VJI-062	71.27649	26.63885
23	VJI-063	71.28321	26.6328
24	VJI-111	71.36176	26.58498

A.3. Reference of applied methodology

Title: Grid-connected electricity generation from renewable sources

Reference: The project activity meets the eligibility criteria of large scale project as it is more than 15 MW

Methodology: ACM0002: Grid-connected electricity generation from renewable sources - Version 20.0³

Type I: Energy industries (renewable / non-renewable sources)

Category: Approved Consolidated Methodology (ACM0002)

Tools referred with above methodology and applicable for project activity are:

- Tool to calculate the emission factor for an electricity system⁴- Version 07.0 (EB 100, Annex 04)
- Tool for the demonstration and assessment of additionality⁵- Version 07.0.0 (EB 70, Annex 08).
- Assessment of the validity of the original/current baseline and update of the baseline at the renewal of the crediting period, Version 03.0.1⁶

A.4. Crediting period of project

The Crediting Period of this project activity is from 31/03/2016 to 30/03/2021(both days are included) for First Crediting Period and 31/03/2021 to 30/03/2026(both days are included) for Second Crediting Period.

SECTION B. IMPLEMENTATION OF PROJECT

B.1. Description of implemented project

Technical specifications of WTG model: Suzlon Energy Limited make S97/2.1 MW⁷

³ <https://cdm.unfccc.int/methodologies/DB/XP2LKUSA61DKUQC0PIWPGWDN8ED5PG>

⁴ <http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-07-v7.0.pdf>

⁵ <http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-01-v7.0.0.pdf>

⁶ <https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-11-v3.0.1.pdf>

⁷ <https://en.wind-turbine-models.com/turbines/1430-wind-world-india-ww-53>

S.N.	Parameter	Specification/ Value with unit
1	Rated power	2100 kW
2	Rotor diameter	97 m
3	Hub height	90 m and 120 m
4	Turbine type	Asynchronous 3 phase induction generator with slip rings operated with rotor circuit inverter system
5	Power regulation	Electric blade pitch control
6	Cut in wind speed	3.5 m/s
7	Rated wind speed	11 m/s
8	Cut out wind speed	20 m/s
9	Operational range of rot. speed	11.8-17.7
10	Orientation	Up-wind
11	No. of blades	3
12	Blade material	E-glass reinforced Epoxy, Vacuum-injected
13	Gear box type	1 planetary stage, 2 helical stages
14	Generator type	Asynchronous 3-phase induction generator with slip rings operated with rotor circuit inverter system
15	Braking	Hydraulic disc brake, activated by hydraulic pressure (active brake)
16	Output voltage	690 V
17	Tower	Welded steel plate and hybrid tower (partially)
18	Useful life	20 years

Since commissioning, the power plant is in running condition and there is no major breakdown occurred in current monitoring period.

There is no change in project design which is envisaged in PDD.

The commissioning date of WTGs of this project activity is given below:

Sr. No	WTG Name	Commissioning Date
1	BSD-001	18/12/2015
2	BSD-004	07/11/2015
3	BSD-005	07/11/2015
4	BSD-006	18/12/2015
5	BSD-058	18/12/2015
6	BSD-061	18/12/2015
7	VJI-067	11/09/2015
8	VJI-068	07/11/2015
9	VJI-073	30/09/2015
10	VJI-074	30/09/2015
11	VJI-075	30/09/2015
12	VJI-077	11/09/2015
13	VJI-078	11/09/2015
14	VJI-104	11/09/2015
15	VJI-105	11/09/2015
16	VJI-106	11/09/2015
17	VJI-107	30/09/2015
18	VJI-108	07/11/2015
19	VJI-112	30/09/2015

20	VJI-114	07/11/2015
21	VJI-470	30/09/2015
22	VJI-471	30/09/2015
23	VJI-472	30/09/2015
24	VJI-473	07/11/2015

Sl. No.	WTG Name	Commissioning Date
1	BSD-002	22/03/2016
2	BSD-003	22/03/2016
3	BSD-059	22/03/2016
4	BSD-060	22/03/2016
5	BSD-063	22/03/2016
6	BSD-064	22/03/2016
7	BSD-118	22/03/2016
8	BSD-121	22/03/2016
9	BSD-124	22/03/2016
10	BSD-125	22/03/2016
11	BSD-126	22/03/2016
12	VJI-019	22/03/2016
13	VJI-022	22/03/2016
14	VJI-028	22/03/2016
15	VJI-029	22/03/2016
16	VJI-030	22/03/2016
17	VJI-036	22/03/2016
18	VJI-037	22/03/2016
19	VJI-045	22/03/2016
20	VJI-052	22/03/2016
21	VJI-061	22/03/2016
22	VJI-062	22/03/2016
23	VJI-063	22/03/2016
24	VJI-111	22/03/2016

B.1.1 Forward Action Requests

No Forward Action Requests from Design Certification or previous Performance Certification is applicable. One Forward Action Request has been raised by VVB regarding mandatory site visit which will be responded in subsequent verification(second verification). GS approved the same in Deviation Request.

B.2. Post-Design Certification changes

Not Applicable during the current monitoring period. There are no post-design certification changes for this project.

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

Not Applicable during the current monitoring period. There are no temporary deviations in the monitoring & reporting plan, methodology or standardized baseline of the project.

B.2.2. Corrections

Not Applicable during the current monitoring period. There are no corrections.

B.2.3. Changes to start date of crediting period

Not Applicable during the current monitoring period. There is no change in start date of crediting period.

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

Not Applicable during the current monitoring period. There are no permanent changes from the design certified monitoring plan, applied methodology or applied standardized baseline of this project.

B.2.5. Changes to project design of approved project

Not Applicable during the current monitoring period. There are no changes to project design of the approved project.

SECTION C. DESCRIPTION OF MONITORING SYSTEM APPLIED BY THE PROJECT

The monitoring team includes PP's employees and O&M contractor's representatives.

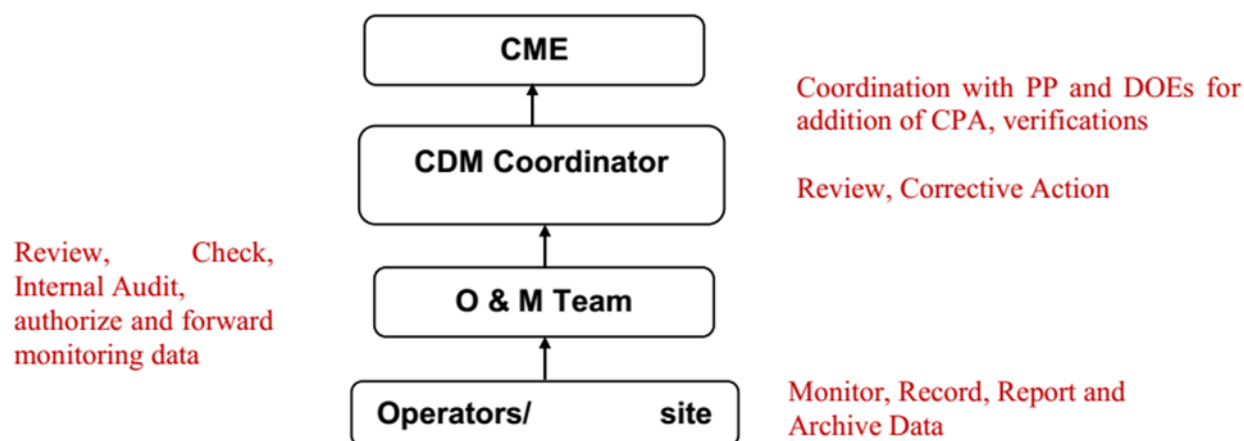
Meter readings is taken jointly at the appointed date by PP's representative, Suzlon Energy Ltd. official and State Discom official. The same is reported as Joint Meter Reports (JMR). The same is reported to the O&M team and the complied reports are generated in the form of monthly report on generation and consumption.

Net electricity supplied by the project activity to the grid is cross-checked with records for sold electricity by invoices raised for the payment purpose.

One metering system is there at the substation/yard and another at the WTG site. If the variation between the two meter readings is significant for the monthly recording of data, the meters would be reset and calibrated. The measurement is taken from the energy meter located in the substation/yard. Meter reading is carried out in every calendar month.

The accuracy of monitoring parameter is ensured by adhering to the calibration and testing procedure as set in the power purchase agreement. The project adheres to all mandatory regulatory and statutory requirements at the state as well as national level. The energy meters installed are tri-vector meters of 0.2% accuracy class.

The operational and management structure implemented by PP and O&M contractor is as follows:



In some cases, if a particular feeder/ substation has other WTGs not part of this project activity connected through same electricity meter, apportioning is used. Even otherwise, to get WTG/ project owner wise electricity supplied to grid, apportioning is required and is carried out as below.

Apportioning of net electricity supplied is done with reference to the electricity generated from individual WTGs. Apportioning of net electricity supplied, as per the Joint Energy Meter Readings sheet, by each project owner is done based on the individual meter readings of each wind turbine. The apportioning is done by electricity purchaser jointly with the PP. The Monthly report on generation and consumption with electricity buyer is used to calculate actual net electricity supplied to the grid and on the basis of that GHG emission reductions by this project activity is calculated.

The net electricity exported to the grid by project activity is referred from Monthly report on generation and consumption readings. The main billing meter at substation/yard records total export, and total import by all the connected WTGs to the sub-station through a feeder. The electricity export and import by a WTG of the PP is then calculated by using the following formulae as given below. This is the billable reading against which the PP raises invoice to the state electricity board.

Formula:

Net Generation of a WTG @ for credit:

$$\frac{(\text{kWh individual generation at WTG controller} \times \text{Total (Export kWh} - \text{Import kWh)} @ \text{EB at cumulative meter at feeder})}{(\text{Total Controller Generation of all projects connected on a feeder})}$$

Procedures for handling data uncertainty:

- a. In case main meter is faulty: In the event that the main metering system is not in the service as result of maintenance, repairs or testing, then the backup metering system shall be used during the period the main metering system is not in service and the provisions above shall apply to the reading of the backup metering system.
- b. In case both the meters are faulty: When the Main Metering System and/or Backup Metering System and/or any component thereof is found to be outside the acceptable limit of accuracy or otherwise not functioning properly, it shall be repaired, recalibrated or replaced as soon as possible by the state agency. The error observed during this calibration will be applied to all readings from last correct JMR / last meter calibration. State agency ensures that metering system

is tested for accuracy at least once in year and report furnished along with joint meter reading.

Any meter seal(s) shall be broken only by the authorised officer of state agency in the presence of representative of Power Producers/ Developers, whenever the Main Metering System or the backup metering system is to be inspected, tested, adjusted, repaired or replaced.

In case, the monitoring period starts mid- month, the reading for that month will be apportioned based on the daily electricity export data give by the O&M contractor. This will be also checked with the average daily export arrived from that month's JMR and the conservative of the two will be used for the emission reduction calculation.

Apportioning Procedure

Procedure for apportioning of electricity:

1. In case the start/end dates of monitoring period do not match with the start/end dates of Joint Meter Reading Sheets / Generation reports, following apportioning procedure will be applied for the first and the last monitoring period within a particular crediting period:

Apportioning will be carried out based on ratio of generation data recorded using LCS installed at the each WTG. The emission reductions of that particular period (between the start/end date of monitoring period and the end/start of the billing period) will be calculated based on percentage generation of that particular period at WTG using LCS data multiplied with the total units generated in the month as per the Joint Meter Reading Sheets / Generation report issued. The calculation formula has been furnished below:

Generation from all project WTGs for the period $y1 = EG_{WTGcontroller,i,y1}$

Generation from all project WTGs for the period $y2 = EG_{WTGcontroller,i,y2}$

Net energy supplied used for calculation of emission reduction for the monitoring period $y1$, i.e $EG_{facility,y1} =$

$$N \sum_{i=1} ((EG_{export,i,y2} - EG_{import,i,y2}) * (EG_{WTGcontroller,i,y1} / EG_{WTGcontroller,i,y2}))$$

Where:

$y1$ = No. of days within a billing period up to which generation is considered for emission reduction calculation

$y2$ = No. of days in the billing period

N = No. of feeders to which project WTGs are connected to.

2. In case if there are project and non-project WTGs connected to a particular feeder i , the quantity of net electricity supplied by the project to the grid connected to that particular feeder will be calculated based on the formula specified below:

Total generation from the project connected to the feeder i in period $y = EG_{WTGcontroller,i,y}$

Total generation from all project and non-project plants connected to the feeder i in period y = $EG_{All_controller,i,y}$

Quantity of net electricity exported by all (project and non-project) projects connected to feeder i to the grid in period y = $EG_{export,i,y}$

Quantity of net electricity imported by all (project and non-project) projects connected to feeder i to the grid in period y = $EG_{import,i,y}$

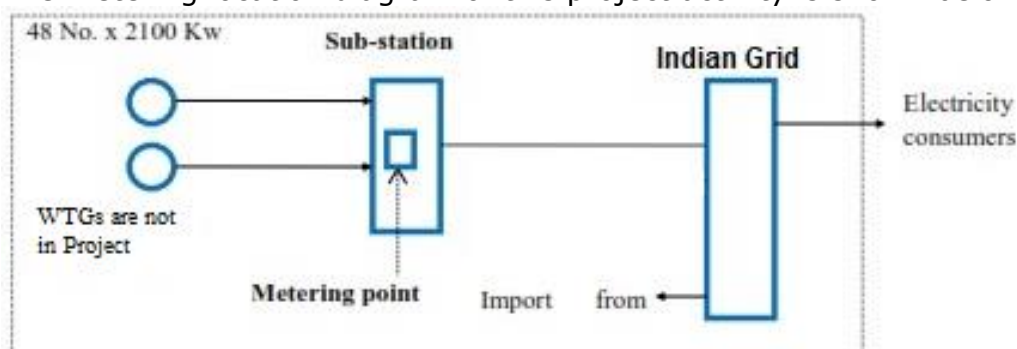
Net electricity supplied by the project connected to feeder i to the grid in period y = $EG_{facility,y} =$

$$\sum_{i=1}^N ((EG_{export,i,y} - EG_{import,i,y}) * (EG_{WTGcontroller,i,y} / EG_{All_controller,i,y}))$$

Where: N = No. of feeders to which project activity is connected to.

3. In cases where both scenarios mentioned above exist at the same time (i.e. both project and non-project plants connected to the same feeder(s) and the start/end date of the monitoring periods do not match with those of the JMR readings), firstly the apportioning as per point # 2 above will be applied for the billing period y2 to estimate the Net electricity supplied by the project WTGs connected to feeder Z to the grid in period y2. Then this value would replace $(EG_{export,y2} - EG_{import,y2})$ in the formula specified under point # 1 above to arrive at the Net energy export used for calculation of emission reduction for the monitoring period y1.

The metering location diagram of this project activity is shown below:



Impact of CP1 & CP2 on the Monitored Values:

As the monitoring period is covered in CP1 & CP2 of the project activity, the Emission Factor of 0.9528 & the Emission Factor of 0.9305 is used for CP1 & CP2 respectively.

Hence,

The number of Emission Reductions in CP1 comes out to be – 240,965 tCO₂e

The number of Emission Reductions in CP2 comes out to be – 252,416 tCO₂e

SECTION D. DATA AND PARAMETERS

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

SDG 13 (Indicators 13.2.1)

For the First Crediting Period

Data/parameter	EF_{grid,OM,y}
Unit	tCO ₂ /MWh
Description	Operating Margin CO ₂ emission factor in year y
Source of data	Calculated from CEA database, Version 7, January 2012 ⁸
Value(s) applied	0.9842
Choice of data or Measurement methods and procedures	Calculated as per "Tool to calculate the emission factor for an electricity system, version 07" as per the latest data available for the most three recent years 2008-09, 2009-10 and 2010-11 of NEWNE Grid. The data is obtained from "CO ₂ Baseline Database for Indian Power Sector" version 7, published by the Central Electricity Authority, Ministry of Power, Government of India.
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_{grid,BM,y}
Unit	tCO ₂ /MWh
Description	Build Margin CO ₂ emission factor in year y
Source of data	Calculated from CEA database, Version 7, January 2012 ⁹
Value(s) applied	0.8588
Choice of data or Measurement methods and procedures	Calculated as per "Tool to calculate the emission factor for an electricity system, version 07" as per the latest data available for the most recent year 2010-11 of NEWNE Grid. The data is obtained from "CO ₂ Baseline Database for Indian Power Sector" version 7, published by the Central

⁸ <https://cea.nic.in/cdm-co2-baseline-database/?lang=en>

⁹ <https://cea.nic.in/cdm-co2-baseline-database/?lang=en>

	Electricity Authority, Ministry of Power, Government of India.
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_{grid,CM,y}
Unit	tCO ₂ /MWh
Description	Combined Margin CO ₂ emission factor in year y
Source of data	Calculated from CEA database, Version 7, October 2012 ¹⁰
Value(s) applied	0.9528
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.

For the Second Crediting Period

Data/parameter	EF_{grid,OM,y}
Unit	tCO ₂ /MWh

¹⁰ <https://cea.nic.in/cdm-co2-baseline-database/?lang=en>

Description	Operating Margin CO ₂ emission factor in year y
Source of data	Calculated from CEA database, Version 17, October 2021 ¹¹
Value(s) applied	0.9522
Choice of data or Measurement methods and procedures	Calculated as per "Tool to calculate the emission factor for an electricity system, version 07" as per the latest data available for the most three recent years 2018-19, 2019-20 and 2020-21. The data is obtained from "CO ₂ Baseline Database for Indian Power Sector" version 17, published by the Central Electricity Authority, Ministry of Power, Government of India.
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_{grid,BM,y}
Unit	tCO ₂ /MWh
Description	Build Margin CO ₂ emission factor in year y
Source of data	Calculated from CEA database, Version 17, October 2021 ¹²
Value(s) applied	0.8653
Choice of data or Measurement methods and procedures	Calculated as per "Tool to calculate the emission factor for an electricity system, version 07" as per the latest data available for the most recent year 2020-21. The data is obtained from "CO ₂ Baseline Database for Indian Power Sector" version 17, published by the Central Electricity Authority, Ministry of Power, Government of India.
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_{grid,CM,y}
Unit	tCO ₂ /MWh
Description	Combined Margin CO ₂ emission factor in year y

¹¹ https://cea.nic.in/wp-content/uploads/tpe_cc/2022/02/User_Guide_ver_17_2021.pdf

¹² https://cea.nic.in/wp-content/uploads/tpe_cc/2022/02/User_Guide_ver_17_2021.pdf

Source of data	Calculated from CEA database, Version 17, October 2021 ¹³
Value(s) applied	0.9305
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.

Since the project activity is applying for combined transition and renewal of the second crediting period, the latest emission factor calculated from the latest CEA database has been considered for the second crediting period and emission factor used in UNFCCC CDM mechanism for the same project has been used for First Crediting Period.

D.2 Data and parameters monitored

SDG 13 (Indicators 13.2.1)

Data / Parameter	ER _y		
Unit	tCO ₂ e/year		
Description	Emission reductions achieved per year		
Source of data	ER Sheet		
Value(s) applied	Period		Emission Reduction (tCO ₂ e)
	CP1(01/10/2019 to 30/03/2021)		240,965
	CP2(31/03/2021 to 30/06/2022)		252,416
	Total		493,381

¹³ https://cea.nic.in/wp-content/uploads/tpe_cc/2022/02/User_Guide_ver_17_2021.pdf

Measurement methods and procedures	The baseline emissions are the product of electrical energy baseline $EG_{\text{facility},y}$ expressed in MWh of electricity produced by the renewable generating unit multiplied by an emission factor.
Monitoring frequency	As per monitoring period
QA/QC procedures	Not Applicable
Purpose of data	To Monitor the SDG 13 Indicator
Additional comment	Data will be archived in paper & electronic form for two years after the end of crediting period or of the last issuance of VERs for this project activity, whichever occurs later.

SDG 7 (Indicators 7.2.1)

Data / Parameter	EG _{facility,y}		
Unit	MWh/year		
Description	Quantity of net electricity generation supplied by the project plant/unit to the grid in year y in MWh		
Source of data	Monthly report on generation provided by Suzlon Energy Ltd.		
Value(s) applied	Period		Net Generation(MWh)
	CP1(01/10/2019 to 30/03/2021)		252,912.585
	CP2(31/03/2021 to 30/06/2022)		271,276.169
	Total		524,188.754
Measurement methods and procedures	The JMR is usually taken once in month for the bulk/revenue meter at the common substation/yard. Based on the JMR a monthly report on generation and consumption is prepared by the Suzlon Energy Ltd. By using these data, net export by the WTGs in the project will be calculated (as in some case net export is not explicitly reported in JMR).		
	Measurement by: electricity meters (bulk, WTG controller/ CMS)		
	Recording: Electronic and paper		
	Recording Frequency: Continuous monitoring and monthly recording		
	Responsibility: The operators/ O&M team is responsible for measurement		
	Calibration Testing Frequency: Annually		
	Accuracy class of meters: 0.2s/ 0.5s (as per state regulation)		
	Archiving: Crediting Period + 2 years		
	The meter details are provided below:		
	Meter No.	Meter Type	Make
RJB90214	Main Meter	Secure	

				0.2
	RJB90215	Check meter	Secure	0.2
	Meter calibration details are provided in Appendix 1 of Monitoring Report.			
Monitoring frequency	Continuous monitoring and monthly recording			
QA/QC procedures	Cross check measurement results with records for sold electricity – where electricity sale is applicable			
Purpose of data	To Monitor the SDG 7 Indicator			
Additional comment	Data will be archived in paper & electronic form for two years after the end of crediting period or of the last issuance of VERs for this project activity, whichever occurs later.			

SDG 8 (Indicators 8.5.1)

Data / Parameter	Number of employment generation																							
Unit	Number																							
Description	Number of people employed directly due to the project activity																							
Source of data	Plant records or The training records for all the employees/Letter from O&M contractor for employment generation/ VVB interview with employees, local stakeholders etc																							
Value(s) applied	Total employment opportunities generated during the current monitoring period is 42.																							
	Further, below is the breakup of employment generated during the monitoring period.																							
	<table><tr><th>Year</th><th>Skilled</th><th>Unskilled</th><th>Total</th></tr><tr><td>2019</td><td>6</td><td>4</td><td>10</td></tr><tr><td>2020</td><td>9</td><td>2</td><td>11</td></tr><tr><td>2021</td><td>5</td><td>5</td><td>10</td></tr><tr><td>2022</td><td>5</td><td>6</td><td>11</td></tr></table>				Year	Skilled	Unskilled	Total	2019	6	4	10	2020	9	2	11	2021	5	5	10	2022	5	6	11
	Year	Skilled	Unskilled	Total																				
	2019	6	4	10																				
	2020	9	2	11																				
	2021	5	5	10																				
	2022	5	6	11																				
Four unskilled female staffs were employed during the current monitoring period.																								
Crediting Period wise break up is show below:																								
<table><tr><th>Period</th><th>Employment Generated</th></tr><tr><td>CP1(01/10/2019 to 30/03/2021)</td><td>22</td></tr><tr><td>CP2(31/03/2021 to 30/06/2022)</td><td>20</td></tr><tr><td>Total</td><td></td></tr></table>				Period	Employment Generated	CP1(01/10/2019 to 30/03/2021)	22	CP2(31/03/2021 to 30/06/2022)	20	Total														
Period	Employment Generated																							
CP1(01/10/2019 to 30/03/2021)	22																							
CP2(31/03/2021 to 30/06/2022)	20																							
Total																								

		42
Measurement methods and procedures	The total number of persons working in the plant can be checked from the daily attendance sheet available at site. This parameter also monitors number of men/women employed by the project activity. The project activity ensures that "equal pay for work of equal value" for both men and women and there is no any discrimination against women. "The employment covers number of men and number of women employed by the project activity. The job is of type temporary/permanent or skilled/unskilled, etc. Also it is ensured that peoples gets equal payment for equal work. The payment is based on work and no any gender inequality for payment for work of equal value". The average hourly earnings of a person is calculated by considering 8 hours per day working as per Indian standards and is depicted below. For e.g, a person is getting a monthly salary of INR 20,116; then his hourly earnings will be calculated as follows: Hourly Income = $20,116 / (30 * 8) = \text{INR } 83.82$. The hourly wages can be checked from the notification from the order published by the Chief Labour Commissioner (Central)¹⁴. As per the notification from Chief Labour Commissioner, for semi-skilled workers working in B Category of cities, the daily wage is 625, and accordingly the average hourly earnings come out to be INR 78.12. Thus, it can be justified that, PP is providing the employees/workers with salary/wages higher than the minimum wages as determined by the minimum wages order published by Chief Labour Commissioner (Central). The same can be checked from the salary slips provided.	
Monitoring frequency	Monthly monitoring and annual compilation	
QA/QC procedures	The number of persons employed is mentioned in the plant register, which can be crossed checked with attendance register.	

¹⁴ <https://clc.gov.in/clc/min-wages>

	Average hourly earnings of the employees/workers can be checked and calculated from the salary slips.
Purpose of data	To Monitor the SDG 8 Indicator
Additional comment	-

SDG 8 (Indicators 8.6.1)

Data / Parameter	Quality of Employment																		
Unit	-																		
Description	Number of trainings provided per year																		
Source of data	Plant records or the training records for all the employees / VVB interview with employees, etc.																		
Value(s) applied	During the current monitoring period, a total of 14 trainings were conducted. The training details are given below: <table> <tr> <th>Year</th><th>Training</th></tr> <tr> <td>2019</td><td>Electrical Safety -1 No.</td></tr> <tr> <td>2020</td><td>Fire Fighting – 1 No. Hot Work Precaution & PPE – 1 No.</td></tr> <tr> <td>2021</td><td>Hazardous Waste Management – 1 No. Work at Height – 1 No.</td></tr> <tr> <td>2022</td><td>Incident Sharing -1 No. Electricity Safety – 2Nos. Emergency Response Plan – 2 No. HSE – 1 No. Bird/Bat Monitoring & Noise Monitoring – 1 No. Work at Height – 1No. Maintenance – 1 No.</td></tr> </table> Crediting Period wise break up is show below: <table> <tr> <th>Period</th><th>Training Conducted</th></tr> <tr> <td>CP1(01/10/2019 to 30/03/2021)</td><td>3</td></tr> <tr> <td>CP2(31/03/2021 to 30/06/2022)</td><td>11</td></tr> <tr> <td>Total</td><td>14</td></tr> </table>	Year	Training	2019	Electrical Safety -1 No.	2020	Fire Fighting – 1 No. Hot Work Precaution & PPE – 1 No.	2021	Hazardous Waste Management – 1 No. Work at Height – 1 No.	2022	Incident Sharing -1 No. Electricity Safety – 2Nos. Emergency Response Plan – 2 No. HSE – 1 No. Bird/Bat Monitoring & Noise Monitoring – 1 No. Work at Height – 1No. Maintenance – 1 No.	Period	Training Conducted	CP1(01/10/2019 to 30/03/2021)	3	CP2(31/03/2021 to 30/06/2022)	11	Total	14
Year	Training																		
2019	Electrical Safety -1 No.																		
2020	Fire Fighting – 1 No. Hot Work Precaution & PPE – 1 No.																		
2021	Hazardous Waste Management – 1 No. Work at Height – 1 No.																		
2022	Incident Sharing -1 No. Electricity Safety – 2Nos. Emergency Response Plan – 2 No. HSE – 1 No. Bird/Bat Monitoring & Noise Monitoring – 1 No. Work at Height – 1No. Maintenance – 1 No.																		
Period	Training Conducted																		
CP1(01/10/2019 to 30/03/2021)	3																		
CP2(31/03/2021 to 30/06/2022)	11																		
Total	14																		
Measurement methods and procedures	Together with the technology supplier, the Project organize training for the staff on the technology and the monitoring of the plant operation, and the emergency and safety procedures.																		
Monitoring frequency	Annual																		
QA/QC procedures	The training records for all the employees																		
Purpose of data	To Monitor the SDG 8 Indicator																		

Additional comment	-
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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	NA

This section is Not Applicable since no community service activities are involved in this project activity.

D.4. Implementation of sampling plan

There is no sampling plan used for this project activity.

SECTION E. CALCULATION OF SDG IMPACTS

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

1– SDG 7– Affordable and Clean Energy (Contribution to Climate Security & Sustainable Development)– As there is no affordable and clean energy generation in baseline scenario, SDG 7 value is zero.

2– SDG 8– Decent Work and Economic Growth– As there is no employment in baseline scenario, SDG 8 value is zero.

3– SDG 13– Climate Action– For the current monitoring period, the emission reductions contributed by the project activity (ER_y) is calculated as follows:

For the period covered in CP1:

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

Where:

BE_y	=	Baseline emissions in year y (t CO ₂)
$EG_{\text{facility},y}$	=	Quantity of net electricity generation supplied by the project plant/unit to the grid in year y in MWh
$EF_{\text{grid,CM},y}$	=	Combined margin CO ₂ emission factor for grid connected power generation in year y

$$BE_y = 252912.585 \text{ MWh} \times 0.9528 \text{ tCO}_2/\text{MWh}$$

$$= 240,965 \text{ tCO}_2\text{e (Round down value)}$$

For the period covered in CP2:

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

Where:

BE_y	=	Baseline emissions in year y (t CO ₂)
$EG_{\text{facility},y}$	=	Quantity of net electricity generation supplied by the project plant/unit to the grid in year y in MWh
$EF_{\text{grid,CM},y}$	=	Combined margin CO ₂ emission factor for grid connected power generation in year y

$$BE_y = 271,276.169 \text{ MWh} \times 0.9305 \text{ tCO}_2/\text{MWh}$$

$$= 252,416 \text{ tCO}_2\text{e (Round down value)}$$

Hence, the total baseline emission in current monitoring period is
 $= 240,965 \text{ tCO}_2\text{e} + 252,416 \text{ tCO}_2\text{e} = 493,381 \text{ tCO}_2\text{e}$

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

SDG 7: Affordable and Clean Energy

For the current monitoring period, the clean energy generation contributed by the project activity is 524,188.754 MWh.

Generation in CP1 = 252,912.585 MWh

Generation in CP2 = 271,276.169 MWh

SDG 8: Decent Work and Economic Growth

The project leads to employment opportunities which would not have been possible in the baseline scenario. During the current monitoring period, the project activity provided employment to 42 persons.

Also project activity improves the quality of employment by giving training to employee. During the current monitoring period, 14 trainings has been conducted.

SDG 13: Climate Action

The SDG 13 value of project estimate is zero as it is a renewable energy project.

Emission Reduction:

$$ER_y = BE_y - PE_y$$

Where:

ER_y = Emission reductions in year y (t CO₂e)

BE_y = Baseline emissions in year y (t CO₂e)

PE_y = Project emissions in year y (t CO₂e)

$$\text{Therefore, } ER_y = 493,381 - 0$$

$$= 493,381 \text{ tCO}_2\text{e}$$

E.3. Calculation of leakage

Not Applicable.

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

SDG	SDG Impact	Baseline estimate	Project estimate	Net benefit
13	Climate Action	493,381 tCO ₂ e (GSVER)	-	493,381 tCO ₂ e(GSVER)
7	Affordable and Clean Energy	-	524,188.754 MWh	524,188.754 MWh
8	Decent Work and Economic Growth	-	No. of Employment Opportunities created: 42 No. of trainings conducted: 14	No. of Employment Opportunities created: 42 No. of trainings conducted: 14

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 ¹⁵ achieved during this monitoring period			
13	524,564 tCO ₂ e	493,381 tCO ₂ e			
7	556,480.065 MWh	524,188.754 MWh			
8	3 training and employment to 28 persons	No. of Employment opportunities created: 42			
		Year	Skilled	Unskilled	Total
		2019	6	4	10
		2020	9	2	11

¹⁵ Whenever emission reductions are capped, both the original and capped values used for calculations must be transparently reported. Use brackets to denote original values.

		2021	5	5	10
		2022	5	5	11
		No. of trainings conducted: 14			

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 202,306 MWh, thus considering number of days covered during present monitoring period to be 1004, the estimated power generation will be 556,480.065 MWh.

SDG 8: Decent Work and Economic Growth

The project leads to employment opportunities which would not have been possible in the baseline scenario. The project will provide employment to at least 10 persons per year. Taking the number of days in monitoring period 1004, the estimated number of employment is 28 persons.

Also project activity improves the quality of employment by giving training to employee. Thus, minimum 1 training per year will be conducted by the project activity. Taking the number of days in monitoring period 1004, the estimated number of training is 3.

SDG 13: Climate Action

The annual estimated emission reduction for the project activity is 192,757 tCO₂e for CP1 & 188,245 tCO₂e for CP2, thus considering number of days covered during present monitoring period to be 1004(547 days for CP1 and 457 days for CP2), the estimated emission reduction contributing towards SDG 13 will be 524,564 tCO₂e.

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

SDG 7 and SDG 13:

A total of 5.8% lower generation and 5.94% lower emission reduction achieved with respect to estimated values due to lower wind speed in some days. The generation is nature dependent and it varies based on wind conditions and PP do not have any control on it.

SDG 8:

Number of training and employment figure is slightly higher, which is conservative.

SECTION F. SAFEGUARDS REPORTING

Environmental Safeguard

Data / Parameter	Noise and Shadow Flickering
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Unit	-
Description	The noise and shadow produced due to operation of wind power plant respect to nearest residential spot
Source of data	Grievance Register
Value(s) applied	0
Measurement methods and procedures	Manual
Monitoring frequency	Once in First Monitoring Period
QA/QC procedures	-
Purpose of data	Analysis of safeguarding principle
Additional comment	-

Data / Parameter	Waste Oil Disposal
Unit	m ³
Description	Waste oil due to operation and Construction work of plant
Source of data	Plant Log Book
Value(s) applied	0 ¹⁶
Measurement methods and procedures	Manual
Monitoring frequency	Once in a Monitoring Period
QA/QC procedures	-
Purpose of data	Analysis of safeguarding principle
Additional comment	-

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.

As a part of continuous feedback from stakeholders, the grievances register is placed at site and is being continuously monitored and if any comments are received, they are addressed through the grievance cell.

¹⁶ There is no waste oil disposal in this project activity in current monitoring period as the transformer oil is refined and reused.

During the current monitoring period, there were no comments/feedbacks received in the grievance register.

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

Not Applicable.

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

Not Applicable.

Appendix 1

Meter No.	Meter Type	Make	Accuracy Class	Date of Calibration	Validity of Calibration	Delay in Calibration ¹⁷
RJB90214	Main Meter	Secure	0.2	19/04/2018	18/04/2019	October 2019 to January 2020, January 2021 to February 2021, January 2022
				22/01/2020	21/01/2021	
				18/02/2021	17/02/2022	
				23/01/2022	22/01/2023	
RJB90215	Check meter	Secure	0.2	19/04/2018	18/04/2019	October 2019 to January 2020, January 2021 to February 2021, January 2022
				22/01/2020	21/01/2021	
				18/02/2021	17/02/2022	
				23/01/2022	22/01/2023	

¹⁷ Error factor 0.2% has been applied due to delay in calibration.

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