



**Verified Carbon
Standard**

WIND POWER PROJECT AT RAJKOT, GUJARAT



Document Prepared by ReNew Power Private Limited

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¹ <https://registry.terra.org/app/projectDetail/VCS/1045>

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1 PROJECT DETAILS

1.1 Summary Description of the Implementation Status of the Project

ReNew Wind Energy (Rajkot) Private Limited (RNWERPL), the Project Proponent (PP), has installed wind power project of 25.2 MW capacity at Villages: Godladhar, Madhavipur, Kalasar, Devpara and Madava of Rajkot district of Gujarat. The project consists of installation of 12 Suzlon make wind turbines of 2.1 MW capacity each.

Purpose of the Project activity:

The purpose of the project activity is to generate electricity using wind as renewable energy source and helping in reducing usage of fossil fuels which are used for electricity generation. This would reduce the dependency on fossil fuels and reduce the Green House Gas (GHG) emissions.

The project consists of installation of 12 Suzlon make wind turbines of 2.1 MW capacity each. The technical specifications of the S-88 model wind turbine are mentioned below:

Description	Specifications
Wind speed at rated output	14 m/s
Cut in speed	4 m/s
Cut out speed	25 m/s
Hub height	79 meters
Power regulation	Pitch
Rotor diameter	88 meters
Swept area	6082 m ²
Generator type	Asynchronous slip ring type induction generator
Generator rated power output	2100 kW
Voltage	690 V
Expected Operational Life	25 years

These turbines are supplied by Suzlon Ltd and are designed for particular wind conditions. The technology for the same is environmentally safe and sound and there is no technology transfer to the host party involved in the same. Lifetime of the WTGs is expected to be 25 years as per data shared by the technology supplier.

The relevant implementation dates

The project has been successfully implemented and declared commissioned by Gujarat Energy Development Agency (GEDA) on 29/03/2012.

The total GHG emission reductions or removals generated in this monitoring period.

The total emission reductions achieved in this monitoring period i.e. from 01-July-2022 to 31-December-2022 (First and last date included) is 15,539 tCO₂e.

The table shows the description of the validations and periodic verifications for the project activity along with this monitoring period.

Audit Type	Period	Program	VVB Name	Number of years
Validation	09-November-2012	CDM	Lloyd's Register Quality Assurance Limited	-
Verification	29-March-2012 to 31-October-2012	Pre CDM-VCS	RINA Services S.p.A. (RINA)	0 Year, 7 months, 3 days
Verification	01-November-2012 to 14-November-2012	-	-	No credits issued under any standard
Verification	15-November-2012 to 30-November-2013	CDM	RINA Services S.p.A. (RINA)	1 year, 16 days
Verification	01-December-2013 to 30-June-2015	CDM	RINA Services S.p.A. (RINA)	1 year, 7 months
Verification	01-July-2015 to 31-May-2021	VCS	KBS Certification Services Pvt. Ltd.	5 years, 11 months
Verification	01-June-2021 to 31-December-2021	VCS	RINA Services S.p.A. (RINA)	0 year, 7 months
Joint Validation & Verification	01-January-2022 to 30-June-2022	VCS	TÜV SÜD South Asia Pvt Ltd	0 year, 6 months
Verification	01-July-2022 to 31-December-2022	VCS	Earthood Services Private Limited (ESPL)	0 year, 6 months
Total	29-March-2012 to 31-December-2022			10 Years, 8 months, 19 days

1.2 Sectoral Scope and Project Type

The project activity falls under the following Sectoral scope and Project Type:

Sectoral Scope: 01 - Energy industries (renewable / non-renewable sources)

Project Type: I - Renewable Energy Projects

Project Category: Grid-connected electricity generation from renewable sources ACM0002-Version 20.0²

² <https://cdm.unfccc.int/UserManagement/FileStorage/AG07ZJQ3EXD42LT5YV9HR16M8KINPO>

1.3 Project Proponent

Organization name	M/s ReNew Wind Energy (Rajkot) Private Limited
Contact person	Mr. Aditya Sharma
Title	PP Representative
Address	ReNew Hub, Commercial Block-1, Zone 6, Golf Course Road, DLF City, Phase-V, Gurugram- 122009, Haryana
Telephone	+91-8800915324
Email	Aditya.Sharma@renewpower.in

1.4 Other Entities Involved in the Project

No any other entities involved in the project for current verification period

Organization name	-
Role in the Project	-
Contact person	-
Title	-
Address	-
Telephone	-
Email	-

1.5 Project Start Date

Project Start Date: 29-March-2012 commissioning date for the WTG.

1.6 Project Crediting Period

Crediting Period Start Date: 29-March-2022

Crediting Period End Date: 28-March-2032

Total number of years: 20

Possible renewal: 2 times

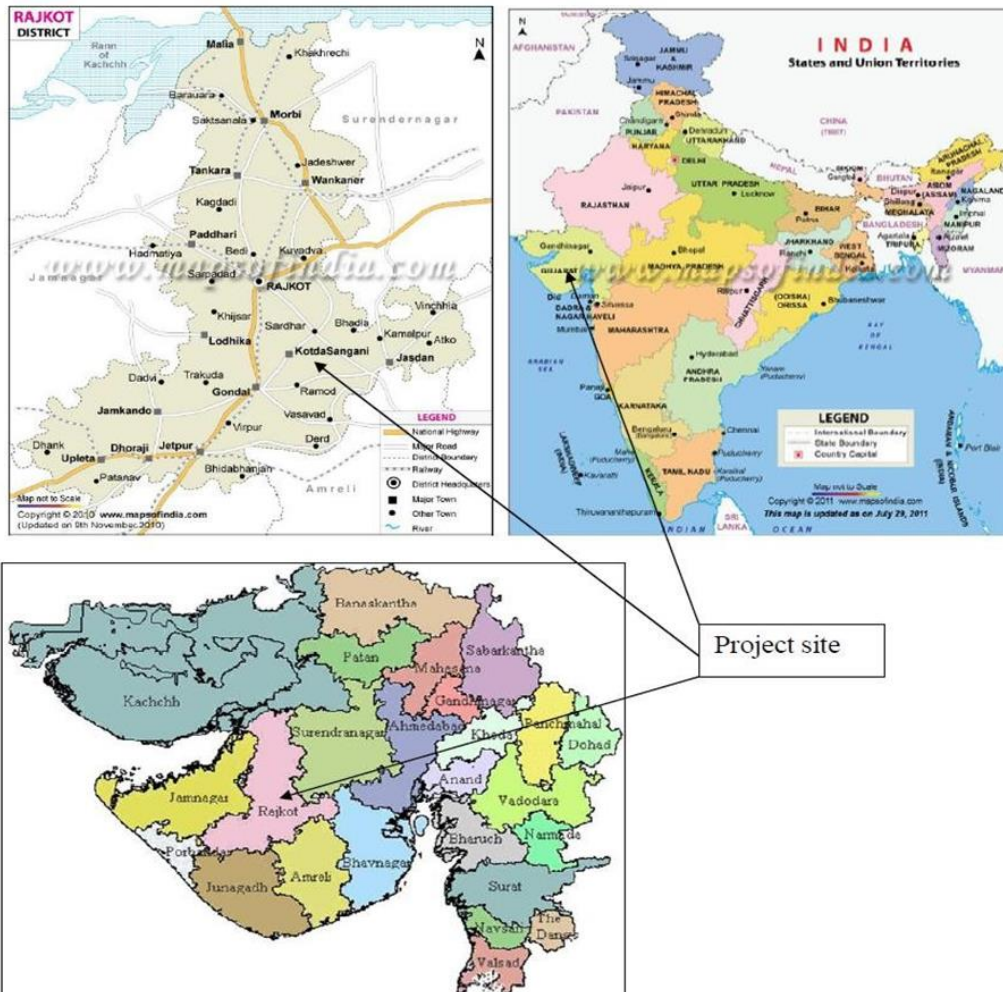
This is the second crediting period of this project activity i.e. 29-March-2022 to 28-March-2032 (inclusive of both days). The first crediting period of this project activity is 29-March-2012 to 28-March-2022 (inclusive of both days).

1.7 Project Location

The project is located in Godladhar, Madhavipur, Kalasar, Devpara & Madava villages of Rajkot district in the State of Gujarat, India.

Wind turbine wise detailed geo-coordinates are given below:

Location No.	Village/Taluka/District/State	Geographical Coordinates
G 034	Godladhar/Jasdan/Rajkot/Gujarat	N22 02 39.2 E71 18 58.5
G 036	Godladhar/Jasdan/Rajkot/Gujarat	N22 03 01.8, E71 18 08.2
G 037	Madhavipur/Jasdan/Rajkot/Gujarat	N22 03 33.6, E71 18 01.5
G 038	Godladhar/Jasdan/Rajkot/Gujarat	N22 02 52.1 E71 18 58.9
G 039	Godladhar/Jasdan/Rajkot/Gujarat	N22 03 14.8 E71 18 45.6
G 041	Madhavipur/Jasdan/Rajkot/Gujarat	N22 03 47.3, E71 17 49.0
G 042	Madhavipur/Jasdan/Rajkot/Gujarat	N22 03 45.5, E71 18 10.6
G 046	Kalasar /Jasdan/Rajkot/Gujarat	N22 05 06.0, E71 16 42.6
G 055	Devpara /Jasdan/Rajkot/Gujarat	N22 06 04.6, E71 14 19.7
G 056	Devpara /Jasdan/Rajkot/Gujarat	N22 06 18.1, E71 14 15.1
G 068	Madava /Jasdan/Rajkot/Gujarat	N22 08 36.6, E71 14 06.0
G 112	Kalasar/Jasdan/Rajkot/Gujarat	N22 04 54.0, E71 16 18.0



1.8 Title and Reference of Methodology

Title: “Grid-connected electricity generation from renewable sources” Version 20.0³
Reference: ACM0002: Large-scale Consolidated Methodology

The methodology ACM0002 refers to the latest approved versions of the following tools:

1. Tool 07 - Tool to calculate the emission factor for an electricity system, Version 07.0 (EB 100, Annex 04)⁴
2. Tool 01- Tool for the demonstration and assessment of additionality, Version 7.0⁵

1.9 Participation under other GHG Programs

Project has been registered with UNFCCC under Clean Development Mechanism program, Registration reference number is 8095⁶.

Registration Date: 09-November-2012

PP has provided undertaking that in current monitoring period, it would not claim GHG emission reduction credits in any GHG program other than that in VERRA. There would be no double counting of GHG emission reductions.

1.10 Other Forms of Credit and Supply Chain (Scope 3) Emissions

Emission Trading Programs and Other Binding Limits: The project proponent is not participating in any other emission trading program and other binding limits.

The project activity is not availing any REC benefits and the same can be confirmed from publicly available link of REC generators.

https://www.recregistryindia.nic.in/index.php/publics/registered_regens

Other Forms of Environmental Credit: The project activity neither has nor intends to generate any other form of GHG related environmental credit for GHG emission reductions or removals claimed under the VCS Program.

1.11 Sustainable Development Contributions

Contribution to sustainable development:

National CDM Authority (Indian DNA), Ministry of Environment, Forests & Climate Change (MoEFCC), Government of India has stipulated the following indicators for sustainable development in the interim approval guidelines for CDM projects:

Social well-being:

Since, the project activity is in a rural area of Gujarat, it will help in the overall development of the region. The project activity will result in generation of direct and indirect employment opportunities for the local people residing nearby villages in Rajkot, both during construction and operation phases of the project activity.

Economic well-being:

³<https://cdm.unfccc.int/UserManagement/FileStorage/AG07ZJQ3EXD42LT5YV9HR16M8KINPO>

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

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

⁶ <https://cdm.unfccc.int/Projects/DB/LRQA%20Ltd1352364786.6/view>

The project will create a business opportunity for local stakeholders such as suppliers, manufacturers, contractors etc in Rajkot region of Gujarat.

Environmental well-being:

Since, the project uses wind as renewable source for power generation; it does not lead to any greenhouse gas emission. It will avoid the fossil fuel consumption in the Indian grid and in turn it will result in SO_x, NO_x particulate matter emission reduction.

Technological well-being:

The technology that is being used in the project activity is environmentally safe and sound. The project demonstrates harnessing wind power potential in Gujarat and encourages setting up such projects in near future.

Table 1: Sustainable Development Contributions

Row number	SDG Target	SDG Indicator	Net Impact on SDG Indicator	Current Project Contributions	Contributions Over Project Lifetime
Sequential row number	SDG Target number	Number and text of SDG indicator or, if no official SDG indicator is applicable, user-defined indicator	Indicate the project's contribution to the SDG Indicator (implemented activities to increase or decrease)	Brief description of the quantifiable impact of the project's activities related to the SDG indicator, during the monitoring period.	Brief description of the cumulative quantifiable impact of the project's activities related to the SDG indicator, over the project lifetime.
1)					
2)					
3)					
4)					

This is not applicable up to 2025.

2 SAFEGUARDS

2.1 No Net Harm

As per the Schedule 1 of the EIA notification dated 01-December-2009⁷⁷, given by the Ministry of Environment and Forests under the Environment (Protection) Act 1986, the proposed Project activity does not fall under the list of activities requiring EIA as the environmental impacts for such project are not considered as significant by the host Party or Project Proponent.

Not applicable as the environmental impacts for such project are not considered as significant by the host Party or Project Proponent.

2.2 Local Stakeholder Consultation

The stakeholder meeting was conducted on during registration of the project activity. PP took due care of the comments received during LSC.

The process of local stakeholder consultation is continuous. During the current monitoring period, the project proponent has kept grievance register in plant site office and sought comments/grievances/suggestions from local stakeholders including local community, government agencies and NGOs. However, no comments/grievances/suggestions have been received from the aforementioned stakeholders during the current monitoring period.

2.3 AFOLU-Specific Safeguards

Not Applicable, as this is not an AFOLU project.

3 IMPLEMENTATION STATUS

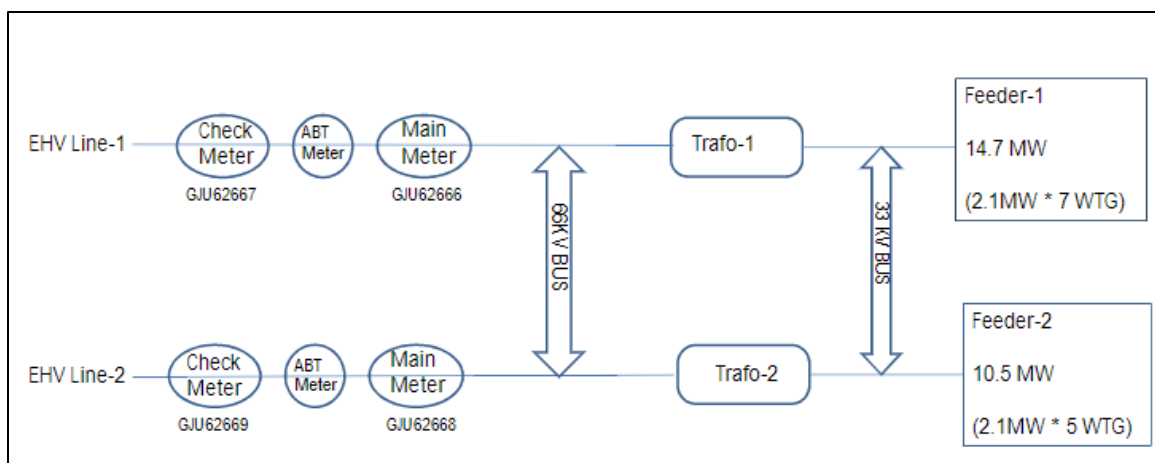
3.1 Implementation Status of the Project Activity

The project is successfully implemented and declared commissioned by Gujarat Energy Development Agency (GEDA) on 29-March-2012.

Wind Power plant are running satisfactorily during the reported monitoring period. There are no special events occur during the reported monitoring period. Hence, no impact occurs on the GHG emission reduction from the project activity. No major equipment has been replaced or exchanged during this period. There was no such event occurred that may impact the GHG emission reductions or removals and monitoring.

The project boundary includes the Wind Project activity, sub-station, grid and all power plants connected to grid. The proposed project activity will evacuate power to the Indian grid.

⁷⁷ <https://hspcb.gov.in/content/notification/EIA%202006/EIA-Notification-01-12-2009.pdf>



3.2 Deviations

3.2.1 Methodology Deviations

There is no request for methodology deviation applied during current monitoring period.

3.2.2 Project Description Deviations

In the registered PD, the project has considered 7WTGs selling power under preferential tariff and 5 WTGs selling power under open access. However, it has been found that 11 WTGs are selling power under preferential tariff and one WTG is selling power under open access.

The open access tariff and preferential tariff considered for equity IRR estimation in the project PD is higher compared to the actual tariffs as per the signed PPA.

Particulars	Tariff considered in Registered PD	Actual tariff as per PPA
Open access tariff for 23.1 MW capacity)	INR 3.9 per kWh	INR 2.64 per kWh (PPA dated 29-Mar 2012)
Preferential tariff (for 2.1 MW capacity)	INR 3.56 per kWh	INR 3.25 per kWh (PPA dated 1-Feb 2020)

Since the actual tariff at which energy is sold is lower compared to the tariff considered in Registered PD for equity IRR estimation, hence the project design change has no adverse impact on project baseline and applicability of methodology.

3.3 Grouped Projects

Not Applicable, as this is not a grouped project activity.

4 DATA AND PARAMETERS

4.1 Data and Parameters Available at Validation

Data / Parameter	$EF_{grid,OM,y}$
Data unit	tCO ₂ /MWh
Description	Simple operating margin for Indian grid
Source of data	CO ₂ baseline database (Version 17) published by CEA in October 2021 ⁸
Value applied	0.9522
Justification of choice of data or description of measurement methods and procedures applied	This value is calculated by taking weighted average of 3 years values for Simple Operating Margin of Indian grid viz. 2018-19, 2019-20 and 2020-21
Purpose of Data	Calculation of baseline emissions
Comments	Fixed ex-ante for entire crediting period

Data / Parameter	$EF_{grid,BM,y}$
Data unit	tCO _{2e} /MWh
Description	Build margin for Indian grid
Source of data	CO ₂ baseline database (Version 17) published by CEA in October 2021 ⁹
Value applied	0.8653
Justification of choice of data or description of measurement methods and procedures applied	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, and Government of India.
Purpose of Data	Calculation of baseline emissions
Comments	Fixed ex-ante for entire crediting period

Data / Parameter	W_{OM}
Data unit	%
Description	Weightage of operating margin emissions factor
Source of data	Latest version of the “Tool to calculate the emission factor for an electricity system” (Version 07.0, EB 100, Annex 4) ¹⁰

⁸ https://cea.nic.in/wp-content/uploads/tpe_cc/2022/02/User_Guide_ver_17_2021.pdf

⁹ https://cea.nic.in/wp-content/uploads/tpe_cc/2022/02/User_Guide_ver_17_2021.pdf

¹⁰ <https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-07-v7.0.pdf>

Value applied	0.75
Justification of choice of data or description of measurement methods and procedures applied	Default values used as per the “Tool to calculate the emission factor for an electricity system” Version 07.0
Purpose of Data	Calculation of baseline emissions
Comments	-

Data / Parameter	W_{BM}
Data unit	%
Description	Weightage of build margin emissions factor
Source of data	Latest version of the “Tool to calculate the emission factor for an electricity system” (Version 07.0, EB 100, Annex)11
Value applied	0.25
Justification of choice of data or description of measurement methods and procedures applied	Default values used as per the “Tool to calculate the emission factor for an electricity system” Version 07.0
Purpose of Data	Calculation of baseline emissions
Comments	-

Data / Parameter	$EF_{grid,CM,y}$
Data unit	tCO ₂ e/MWh
Description	Emission factor for Indian grid
Source of data	Calculated from CEA database, Version 17, OCT 2021 ¹²
Value applied	0.9305
Justification of choice of data or description of measurement methods and procedures applied	This value is calculated using $EF_{grid,OM,y}$ and $EF_{grid,BM,y}$ values as per Version 07.0 of methodological tool to calculate the emission factor for an electricity system
Purpose of Data	Calculation of baseline emissions
Comments	-

¹¹ <https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-07-v7.0.pdf>

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

4.2 Data and Parameters Monitored

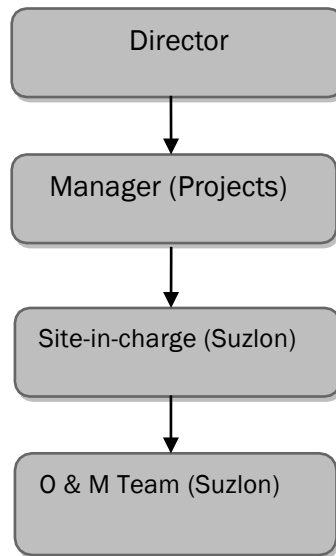
Data / Parameter	EG _{facility,y}
Data unit	MWh/ year
Description	Quantity of net electricity generation supplied by the project plant/unit to the grid in year y
Source of data	Certificate for share of electricity generated by Wind farm provided by GETCO
Description of measurement methods and procedures to be applied	The electricity generated and fed into the grid shall be monitored using special energy meters which are ABT meters. Monitoring: Continuous measurement and at least monthly recording. Archiving: Electronic and Paper Data type: Measured & Calculated Recording Frequency: Continuous monitoring and monthly recording Responsibility: The O&M site-in-charge shall be responsible for the regular recording of data. Calibration Frequency: once in 3 years Accuracy Class: 0.2S (Active) and 0.5S (Reactive)
Frequency of monitoring/recording	Continuous measurement and at least monthly recording
Value monitored	16,700.16 MWh
Monitoring equipment	ABT meter with accuracy class 0.2S (Active) and 0.5S (Reactive)
QA/QC procedures to be applied	The Quantity of net electricity generation from the certificate for share of electricity will be cross-checked with the invoices for the sale of power by the project proponent. The meter(s) shall be calibrated and maintained by the state utility as per their own schedule and this frequency of meter calibration is not within the control of the Project Proponent.
Purpose of the data	Calculation of baseline emissions
Calculation method	-
Comments	The data are kept for two years after the end of the crediting period or the last issuance of CERs for this project activity, whichever occurs later.

4.3 Monitoring Plan

In Monitoring & Verification protocol, the objective is to have clear, credible and accurate monitoring, evaluation and verification procedures. This involves recording, data collection

of all wind turbines, metering of electricity generated at substation, on daily basis as well as on monthly basis. The general conditions for metering, recording, meter readings, meter inspections, Test & Checking and communication are as per the Power Purchase Agreement with the state utility.

The project proponent proposes following arrangements in order to carry out metering and O & M activities for all wind turbines:



At 33 kV/66 kV Parveda substation (Currently managed by Suzlon), there are two feeders; Feeder 1 to which 7 wind turbines and Feeder 2 to which 5 wind turbines are connected. Main meter, check meter and ABT meters are located at the substation.

The meter readings are reported to the site-in-charge and the compiled reports are sent to the Manager (Projects) and Director. The Manager is monitoring overall activity of the project and report to the Director. As per O & M schedule, the operation and maintenance activities are carried out by trained and qualified technical staff of Suzlon.

Each party are maintaining complete and accurate records and all other data required by each of them for the purposes of proper administration and the operation of the project.

5 QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS

5.1 Baseline Emissions

Baseline Emissions (BE_y)

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

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 CDM project activity in year y (MWh/yr)
EF_{grid,CM,y} : Combined margin CO₂ emission factor for grid connected power generation in year y calculated using the latest version of the “Tool to calculate the emission factor for an electricity system” (tCO₂e/MWh)

Hence,

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

$$BE_y = 16,700.16 \text{ (MWh)} * 0.9305 \text{ (tCO}_2\text{/MWh)}$$

$$BE_y = 15,539 \text{ tCO}_2 \text{ (Rounded down to nearest integer value)}$$

5.2 Project Emissions

As per the guidance provided in the methodology ACM0002 (Version 20.0), “For most renewable power generation project activities, PE_y = 0.

5.3 Leakage

The methodology ACM0002 (Version 20.0) does not consider any leakage emissions.

Hence, LE_y = 0

5.4 Net GHG Emission Reductions and Removals

Emission reductions are calculated as follows:

$$ER_y = BE_y - PE_y$$

Where:

- ER_y = Emission reductions in year y (t CO₂e/yr)
BE_y = Baseline emissions in year y (t CO₂/yr)
PE_y = Project emissions in year y (t CO₂e/yr)

Year	Baseline emissions or removals (tCO ₂ e)	Project emissions or removals (tCO ₂ e)	Leakage emissions (tCO ₂ e)	Net GHG emission reductions or removals (tCO ₂ e)
01-July-2022 to 31-December-2022	15,539	0	0	15,539
Total	15,539	0	0	15,539

It is to be noted here that as per the estimated emission reduction to be achieved from the project activity for the current monitoring period is 23,816 tCO₂e, whereas actual emission reductions achieved are 15,539 tCO₂e, which is approximately 34.75 % lower than the estimated emission reductions. The generation of electricity depends upon many other climatic conditions, which are not within the control of the project participant. The lower

generation during the current verification period is due to certain natural conditions and it doesn't breach the additionality of the project. Hence, it is acceptable.

<u>Ex-ante emissions reductions/r emovals</u>	<u>Achieved emissions reductions/re movals</u>	<u>Percent difference</u>	<u>Justification for the difference</u>
23,816	15,539	34.75 %	The generation of electricity depends upon many other climatic conditions, which are not within the control of the project participant. The lower generation during the current verification period is due to certain natural conditions and it doesn't breach the additionality of the project. Hence, it is acceptable.

APPENDIX I: <METER CALIBRATION DETAILS>

Meter	66 KV PAREWADA- KAMALAPUR S/S ABT METER LINE 1	66 KV PAREWADA- KAMALAPUR S/S ABT METER LINE 2
Make	Larsen & Toubro	Larsen & Toubro
Serial number	GJ-1045-A	GJ-1046-A
Calibration Date	05-January-2022	05-January-2022
Calibration due date	04-January-2025	04-January-2025
Previous calibration date	31-January-2018	31-January-2018
Previous calibration due date	30-January-2021	30-January-2021