



**Verified Carbon
Standard**

A VERRA STANDARD

150 MW GRID CONNECTED WIND POWER BASED ELECTRICITY GENERATION PROJECT IN GUJARAT, INDIA



**INFINITE
SOLUTIONS**

Document Prepared by (Infinite Solutions)

Project Title	150 MW grid connected Wind Power based electricity generation project in Gujarat, India
Version	02
Report ID	VVER54
Date of Issue	21/07/2021
Project ID	292
Monitoring Period	01/10/2019 to 30/06/2021 (Inclusive of first and last day)
Prepared By	Infinite Solutions
Contact	214-215 Milinda Manor, Opp. Next Treasure Island, 2 RNT Marg, Indore - 452001. Landline No.: 0731-4050174 Email: jimmy@infisolutions.org Website: www.infisolutions.org

CONTENTS

1	PROJECT DETAILS.....	3
1.1	Summary Description of the Implementation Status of the Project	4
1.2	Sectoral Scope and Project Type	4
1.3	Project Proponent.....	4
1.4	Other Entities Involved in the Project	5
1.5	Project Start Date	5
1.6	Project Crediting Period.....	5
1.7	Project Location	6
1.8	Title and Reference of Methodology	6
1.9	Participation under other GHG Programs	7
1.10	Other Forms of Credit	8
1.11	Sustainable Development	8
2	SAFEGUARDS	9
2.3	AFOLU-Specific Safeguards.....	10
3	IMPLEMENTATION STATUS	10
3.1	Implementation Status of the Project Activity	10
3.2	Deviations.....	11
3.3	Grouped Projects.....	12
4	DATA AND PARAMETERS.....	12
4.1	Data and Parameters Available at Validation.....	12
4.2	Data and Parameters Monitored.....	14
4.3	Monitoring Plan	15
5	QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS	20
5.1	Baseline Emissions.....	20
5.2	Project Emissions.....	21
5.3	Leakage	21
5.4	Net GHG Emission Reductions and Removals	21
	APPENDIX 1: < LATITUDE AND LONGITUDE DETAILS OF THE WIND FARM >	23

APPENDIX 2: <ENERGY METER DETAILS> 26

1 PROJECT DETAILS

1.1 Summary Description of the Implementation Status of the Project

The project activity involves the establishment of a wind farm of 150 MW installed capacity enabling generation of electricity by state-of-art 1.5 MW capacity Wind Turbine Generators (WTGs) (One of the latest available technologies in the country developed by Suzlon Energy Limited) in the state of Gujarat.

The main purpose of the project activity is to generate electrical energy through sustainable renewable energy means using wind power and feed the generated output to the local grid in Gujarat and contribute to climate change mitigation efforts.

The WTGs for the project activity got commissioned between 30/09/2007 to 31/03/2008. All WTGs were commissioned before 31/03/2008.

The total GHG emission reductions or removals generated in this monitoring period 01/10/2019 to 30/06/2021 is 336,957 tCO_{2e}.

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.

Methodology : ACM0002: Grid-connected electricity generation from renewable sources - Version 19¹

The project is not a grouped project activity.

1.3 Project Proponent

Organization name	BLP Vayu (Project 1) Private Limited ²
-------------------	---

¹ <https://cdm.unfccc.int/UserManagement/FileStorage/58IAGB7SZUDE02VN6LYM30K41HFPRO>

² DLF Limited is no longer in existence and the entire Wind Power project is purchased by BLP Vayu (Project 1) Private Limited and accordingly received the revised Letter of Approval from the Indian DNA and the same is reflected on the CDM Project webpage. All the revised approvals from various government Agencies including the Power Purchase Agreement have been revised in the name of BLP Vayu (Project 1) Private Limited. Hence, BLP Vayu (Project 1) Private Limited is the legal owner of the project activity and project proponent for this project activity.

Contact person	Mr. Sourabh Agrawal
Title	-
Address	12 th Floor, Crescent 1, Prestige Shantiniketan, ITPL Main Road, Hoodi, Whitefield, Bengaluru - 560 048, Karnataka
Telephone	-
Email	infoegpindia@enel.com

1.4 Other Entities Involved in the Project

Organization name	Infinite Solutions
Role in the Project	Project Consultant
Contact person	Mr. Jimmy Sah
Title	Head - Sustainability
Address	214-215 Milinda Manor, Opp. Next Treasure Island, 2 RNT Marg, Indore - 452001.
Telephone	+91 9589804304
Email	jimmy@infisolutions.org

1.5 Project Start Date

Project Start Date: 30/09/2007.

The WTGs for the project activity got commissioned between 30/09/2007 to 31/03/2008. All WTGs were commissioned before 31/03/2008.

The project start date is the earliest commissioning date of the turbine.

1.6 Project Crediting Period

Project crediting period Type: Renewal crediting period

This is the second renewal crediting period for the project.

The first crediting period for the project was from 30/09/2007 to 29/09/2017.

Start date of Second Crediting period: 30/09/2017

End date of Second crediting period: 29/09/2027

Current monitoring period: 01/10/2019 to 30/06/2021 (Inclusive of first and last day)

Total number of years: 10.

1.7 Project Location

The WTGs installed by the project proponent are distributed across the Kutch region in the villages of Lathedi, Jakhau, Nani Sindhodi, Moti Sindhodi, Chachhi, Sandhan, Budhia, Ranpar, Rapargarh, Sayra, Suthari, Vanku, and Dhutai of Gujarat state. The latitude and longitude details have been attached in Annex 1.

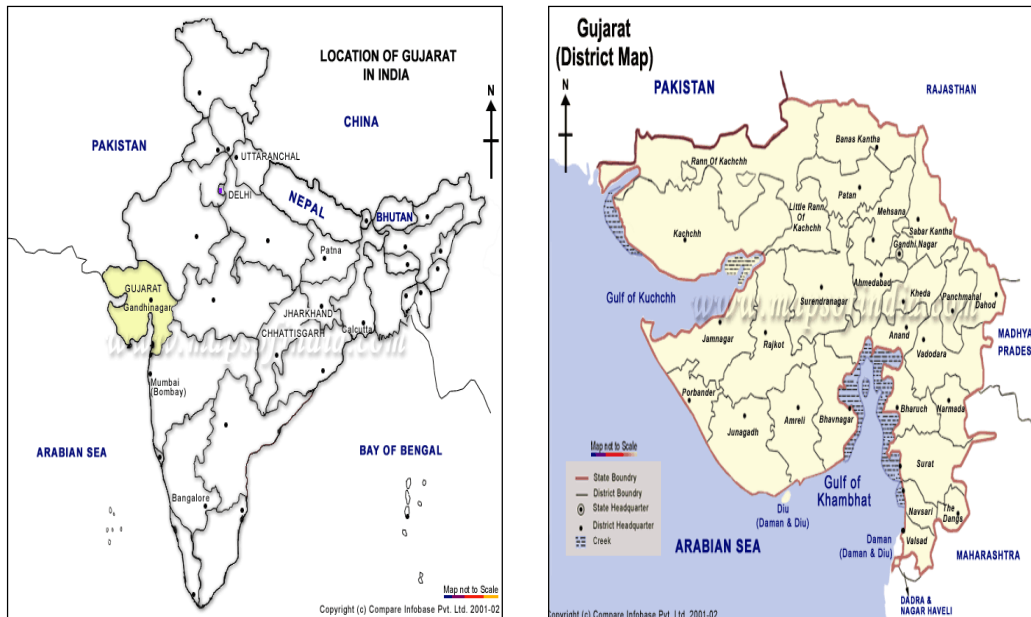


Figure 3: District Map Kachchh



1.8 Title and Reference of 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 19.0³

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)
- Methodological Tool- Tool for the demonstration and assessment of additionality⁵ - Version 07.0.0 (EB 70, Annex 08)

1.9 Participation under other GHG Programs

Participation under Other GHG Programs: The project activity is registered under Clean Development Mechanism (Ref.No:2347). The Project Proponents confirm that they will claim emissions reductions from the Project only in one mechanism for a particular period to avoid double counting.

The undertaking from PP has been submitted for no any double accounting for current monitoring period and project activity is not participated any other GHG program other than VCS.

This is a CDM Registered project activity (UNFCCC Ref No: 2347)

Under CDM Mechanism : -

CDM Mechanism (UNFCCC Ref No - 2347) ⁶	
Registration Date	18/06/2009
Monitoring period (First verification)	18/06/2009 to 24/02/2010
CERs Issued	185,275
Monitoring period (Second verification)	25/02/2010 to 28/02/2011
CERs Issued	230,857
Monitoring period (Third verification)	01/03/2011 to 31/08/2011
CERs Issued	198,654

³ <https://cdm.unfccc.int/methodologies/DB/VJ9AX539D9MLOPXN2AY9UR1N4IYGD>

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/Projects/DB/BVQI1229917560.71/view?cp=1>

Monitoring period (fourth verification)	01/09/2011 to 31/03/2012
CERs Issued	85,385
Monitoring period (fifth verification)	01/04/2012 to 30/06/2013
CERs Issued	333,305
Monitoring period (sixth verification)	01/07/2013 to 30/06/2014
CERs Issued	241,836
Monitoring period (seventh verification)	01/7/2014 to 17/06/2016
CERs Issued	476,535

1.10 Other Forms of Credit

Include the following information, as applicable:

- **Emission Trading Programs and Other Binding Limits:** The project is registered with UNFCCC CDM (UN ref. no. 2347) on 18/06/2009.

Renewal Crediting period under CDM: -

First crediting period – 18/06/2009 to 17/06/2016

Second crediting period – 18/06/2016 to 17/06/2023

- **Other Forms of Environmental Credit.** The Project has no intent to generate any other form of GHG-related environmental credit for GHG emission reductions or removals claimed under the VCS Program.

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

Web-link: <https://www.recregistryindia.nic.in/>. PP has also submitted undertaking for not availing other forms of environmental credit for the current monitoring period under consideration.

1.11 Sustainable Development

Legislative:

The project participants obtained all clearances from stakeholders hence no legal risks are anticipated.

Socio-economic well-being:

Project activity has generated direct and indirect employment for skilled and unskilled manpower during construction phase as well as during operational stage and thus helped in controlling migration from the region and alleviation of poverty.

The project activity's contribution of power supply towards the Indian grid is helping in the upliftment of the social life of the people by ensuring a sustainable and reliable source of power for the region.

The Project activity has improved the infrastructural facilities like water availability, road, and medical facilities etc. in the region.

Environmental well-being:

The project activity generates clean and green power thus causing negligible emissions of greenhouse gases. By building and operating the power project, much pollution is avoided. In the absence of the project activity, equivalent power would have been generated based on the fossil fuels resulting in more Green House Gas emissions into the atmosphere.

The project activity has reduced the dependence on fossil fuels for power generation thus conserving the natural reserves. The project has led to greenhouse gas emission reduction and hence contributed in mitigating climate change

Technological well-being:

The project activity has increased awareness and interest among the private players to make investments in similar areas. The project activity envisages installation of high efficiency turbines and generators and the power will be transmitted at high voltage to ensure low losses. Moreover, the technology being used is well established, most updated and environmentally safe.

2 SAFEGUARDS

2.1 No Net Harm

There are no negative environmental and/or socio-economic impacts due to the project.

2.2 Local Stakeholder Consultation

The project has already been registered under VCS mechanism. The Local stakeholder consultation process was conducted during the validation stage. Hence it is not applicable.

There were no negative comments received during the meeting and stakeholders appreciated proactive efforts taken by project proponent towards reducing emissions.

For ongoing communication, the PP has also placed a grievance register onsite where in the stakeholder can put down his/her complain and the same if found genuine will be addressed immediately.

However, there is no negative feedback has been reported within this monitoring period.

2.3 AFOLU-Specific Safeguards

This is not applicable to the project activity as for non-AFOLU projects, this section is not required.

3 IMPLEMENTATION STATUS

3.1 Implementation Status of the Project Activity

The project activity involves the installation of 100 WTGs (New) of 1.5 MW each. The project activity installs the wind farm at a barren land. The WEGs planned to be installed are new

The WTGs for the project activity have got commissioned between 30/09/2007 to 31/03/2008.

The project has been operational barring from routine shut down for maintenance of WTGs, no significant incident or downtime has been observed to be taken place during the current monitoring period. So, no events have happened that may impact the GHG emission reductions or removals and monitoring in this monitoring period.

The technical details of WTG are detailed below in the table:

Parameter	Specifications
	1.5 MW -Suzlon
Rotor	
Installed electrical output	1500 kW
Diameter	82.0 m
Cut-in wind speed	4 m/s
Rated wind speed	14 m/s
Cut-out wind speed	20 m/s
Rotor swept area	5281 m ²
Rotational speed	16.30 RPM
Regulation	Pitch
Generator	
Type	Asynchronous, 4 Poles
Rated output	1500 kW
Rotational speed	1511 RPM
Operating voltage	690 V
Frequency	50 Hz
Insulation class	H
Cooling system	Air cooled
Gear Box	

Type	3 stage gear box; 1 planetary and 2 helical
Manufacturer	Winergy/Hansen
Gear Ratio	02:35.1
Nominal Load	1650 kW
Yaw system	
Drive	Active electrical yaw motors
Bearing	Polyamide slide bearing
Safety system	
Aerodynamic brake	3 independent systems with blade pitching
Mechanical brake	Hydraulic disc brake

The electricity generated by the project is exported to the Indian electricity grid. The project activity will therefore displace an equivalent amount of electricity which would have otherwise been generated by fossil fuel dominant electricity grid.

The project activity has been in operation continuously since its commissioning. There have been no emergencies happened to the monitoring system. There are no events or situation that occurred during the monitoring period which may impact the applicability of the methodology.

There is no major shutdown observed during the current monitoring period in the project activity.

3.2 Deviations

2.3.1 Methodology Deviations

There are no methodology deviations applied during this monitoring period. Hence, this section is not applicable to the project activity.

2.3.2 Project Description Deviations

The following project deviations are considered during the current monitoring period:

Deviation (1):

As per the registered monitoring plan (section 4.2), following parameters are to be monitored

- Electricity supplied to GUVNL ($EG_{PJ,y}$)
- Quantity of Electricity exported to GUVNL facility($EG_{y, Export}$)
- Electricity generated by each WEG(EG_{WEG})
- Electricity generation recorded at the Vacuum Circuit Breaker (VCB) (EG_{VCB})

However in actual monitoring practice, parameters (ii),(iii) & (iv) do not used in the emission reductions calculation and the value of $EG_{PJ,y}$ is directly sourced from the monthly share certificates issued by state utility is used in the calculation of emission reductions. Hence the

project proponent has not regarded the parameters (ii),(iii) & (iv) in the monitoring plan and considered this change as project deviation. Since this change is in line with the actual monitoring plan implemented, hence does not have any impact on applicability of methodology, project design or the appropriateness of the baseline scenario.

Deviation (2):

As per the registered monitoring plan, calibration frequency of the energy meters is once in a year. The calibration is not under the purview of the Project Participant and is performed by the state utility (GUVNL) and as per the notification dated 10/02/2010, issued by the state utility "As per the provision of the relevant code, all meters are to be tested at least once in five years unless any problem is observed. However, as per the GUVNL, the ABT meters will have to be tested once in 3 years."

Following the above guidance, the calibration frequency is updated from annual to once in 3 years and considered this change as project deviation.

The above project deviation is in line with the guidance provided under section 3.18.2 point 2. of VCS standard v4.1. However, it does not impact the existing applicability conditions of the methodology, additionality, or the appropriateness of the baseline scenario.

3.3 Grouped Projects

This is not a grouped project activity. Hence, the same is not applicable to the 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	Operating Margin CO ₂ emission factor in year y
Source of data	Calculated from CEA database, Version 14 ⁷
Value applied	0.9610 (Indian Grid)
Justification of choice of data or description of	Calculated as per "Tool to calculate the emission factor for an electricity system, version 07.0.0" as 3-year generation weighted average using data for the years 2015-16, 2016-17 & 2017-18. The data are obtained from "CO ₂ Baseline Database for Indian

⁷http://www.cea.nic.in/reports/others/thermal/tpece/cdm_co2/database_14.zip

measurement methods and procedures applied	Power Sector” version 14.0, published by the Central Electricity Authority, Ministry of Power, Government of India.
Purpose of Data	For the calculation of the Baseline Emission
Comments	This parameter is fixed ex-ante for the entire crediting period.

Data / Parameter	$EF_{grid, BM, y}$
Data unit	tCO ₂ /MWh
Description	Build Margin CO ₂ emission factor in year y
Source of data	Calculated from CEA database, Version 14
Value applied	0.8644 (Indian Grid)
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 07.0.0” as 3-year generation weighted average using data for the years 2017-18. The data are obtained from “CO ₂ Baseline Database for Indian Power Sector” version 14.0, published by the Central Electricity Authority, Ministry of Power, Government of India
Purpose of Data	For Calculation of baseline emissions
Comments	This parameter is fixed ex-ante for the entire crediting period

Data / Parameter	$EF_{grid, CM, y}$
Data unit	tCO ₂ /MWh
Description	Combined Margin CO ₂ emission factor in year y
Source of data	Calculated from CEA database, Version 14
Value applied	0.9368 (Indian Grid)
Justification of choice of data or description of measurement methods and procedures applied	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
Comments	This parameter is fixed ex-ante for the entire crediting period.

4.2 Data and Parameters Monitored

Data / Parameter	EG _{PJ, y}
Data unit	MWh
Description	Electricity supplied to GUVNL
Source of data	Certificate for share of electricity generated by the wind farm.
Description of measurement methods and procedures to be applied	Net electricity generated will be calculated at the main meter connected to the incoming feeder of GUVNL. The procedures for metering will be as per the provisions of the power purchase agreement. The WEGs of a single customer (BLP in this case) at a particular site are connected to a Vacuum Circuit Breaker metering yard (VCB) which in turn connects to a feeder that ultimately leads to the main GETCO meter at the substation maintained by Suzlon. Data monitoring takes place at the VCB metering yard and GETCO meter at the substation. The electricity metered at the GETCO meter is proportionally divided among the customers connected to the meter on the basis of the pro data readings taken at the VCB end. The emission reduction calculations are done on the basis of the GETCO Main meter reading (net electricity exported to the grid) after deducting imports from the grid as mentioned in the share certificate issued on monthly basis. The electricity measurements at VCB meter and GETCO meter are continuous and recorded on monthly basis.
Frequency of monitoring/recording	Continuous measurement and at least monthly recording
Value monitored	359,690 MWh
Monitoring equipment	Electricity Meters ⁸ of 0.2s Class
QA/QC procedures to be applied	All the meters will be tested by the state utility once in three years as per the metering code prevalent in the state of Gujarat and GETCO notification. The PP has no control on the same. The detailed QA/QC procedures have been mentioned in Section B.7.2 below. The Net Quantity of Electricity exported to the grid as per Share certificate issued by GETCO can be cross verified by the invoice.
Purpose of the data	Calculation of Baseline emissions
Calculation method	NA

⁸The calibration details for energy meters has been provided in Appendix -2 of the MR.

Comments

The data will be archived electronically for two years after the end of the last crediting period or the last issuance of VERs for this project activity, whichever occurs later.

4.3 Monitoring Plan

The methodology requires monitoring of the following parameters:

- Electricity generation from the proposed project activity;

- Data needed to recalculate the build margin emission factor, if needed, consistent with applicable methodology (ACM0002);

For the project activity to establish its creditable emission reduction, it records the actual electricity generation, which displaces equivalent units of electricity at the operating and build margin of the grid. Since the simple OM emission factor is calculated based on a 3-year average, based on the most recent statistics available at the time of PDD preparation, its updation based on ex post monitoring is not required. For BM calculation, option 1 (refer ACM 0002) has been chosen, which is calculated ex ante based on the most recent information, hence its monitoring is also not required.

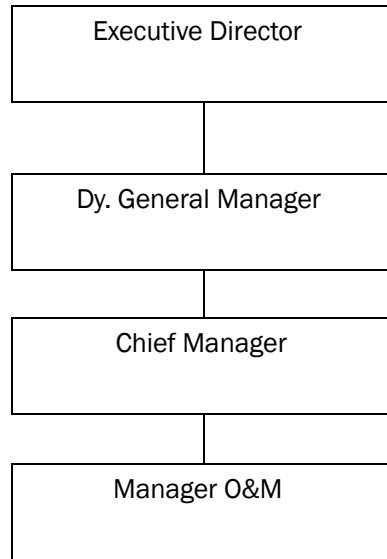
Hence, under the monitoring protocol for the project it is required to: Monitor and record the electricity generated and exported by the wind farm to the National grid.

To ensure trouble free operations and efficient generations through all the wind turbines, BLP has entered into a comprehensive Operation and Maintenance agreement with the manufactures of the turbines for a period of 20 years. The contractor Suzlon, under the O&M contract with BLP is responsible for the operation and maintenance of the project activity for the entire crediting period.

The authority and responsibility of project management as well as registration, monitoring, measurement and reporting lies with BLP.

BLP has formulated a Project Team to ensure proper and continuous monitoring of the performance of turbines and generation of power.

The same has been outlined as follows:



Responsibilities

Executive Director: To be responsible for overall project management.

Dy. General Manager: To be responsible for generation data CDM related monitoring, internal verification and presenting the same to the Executive director. To verify if the monitored data is normal. To calculate the emission reductions regularly and write the monitoring report.

Chief Manager: To conduct the monitoring task strictly based on the monitoring manual and registered PDD. To record required monitored parameters. To report the monitoring results to the Dy. General Manager.

Manager O&M. For O&M monitoring and coordinate with the O&M contractor Suzlon for smooth functioning of the wind farm. To assess regular maintenance of monitoring equipment.

The O&M personnel of Suzlon are qualified engineers and are trained at the WTG manufacturing facility of Suzlon Energy Limited at Daman for operating and ensuring best performance of the WTGs

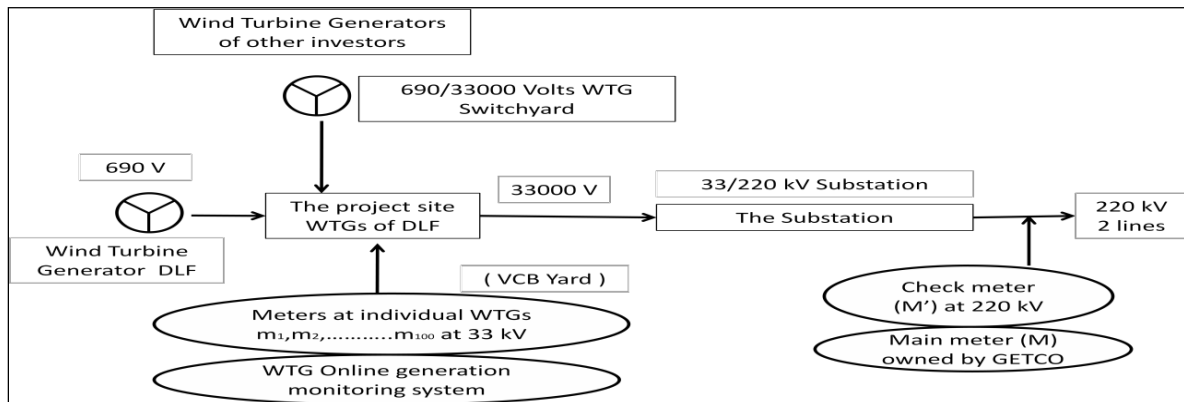
Metering layout

- a) The pooling meters at substation of GETCO main meter (M) and check meter (M') are installed at 220 KV side at the substation.

- b) The meters at WTG (m) are bidirectional meters recording the electricity export and import to the grid. The net electricity exported to the grid is calculated as difference of electricity exported minus the electricity imported.
- c) Data monitoring takes place at the GETCO main meter at substation (M), GETCO Check meter at substation (M'), and WTGs (m1, m2, m3,.....m100).
- d) The electricity metered at the GETCO meter (M) is proportionally divided among the customers connected to the meter on the basis of the prorata readings taken at the individual WTG meter (m).

There is a transmission loss between the individual WTGs and the substation. This loss is proportionally divided among the WTGs connected to the meter on the basis of the prorata readings taken at the individual WTG meter (m). The final share certificate issued to the project proponent is based on the electricity generated minus the line losses.

Figure: The wire diagram for the meters at substation:



Metering and related issues

1. As the WEGs are owned by more than one investor at the site, the ABT compliant meter at the pooling sub-station is installed by GETCO on 33/220 KV side. A tri vector meter is installed in the VCB metering yard. At the end of the month, in respect of DLF, a statement of active energy injection and reactive energy drawal of their WEGs is issued. This statement is the final measurement of the energy supplied to the GUVNL/DISCOM by the company for the preceding month for the purpose of payment.
2. Net electricity generated is calculated at the main meter connected to the incoming feeder of GUVNL. The procedures for metering will be as per the provisions of the power purchase agreement. The WEGs of a single customer (DLF in this case) at a particular site are connected

to a Vacuum Circuit Breaker metering yard (VCB) which in turn connects to a feeder that ultimately leads to the main GETCO meter at the substation maintained by Suzlon. Data monitoring takes place at the VCB metering yard and GETCO meter at the substation. The electricity metered at the GETCO meter is proportionally divided among the customers connected to the meter on the basis of the prorata readings taken at the VCB end. The emission reduction calculations are done on the basis of the GETCO Main meter reading (net electricity exported to the grid) after deducting imports from the grid as mentioned in the share certificate issued on monthly basis.

3. Whenever there is a major difference between the readings of the Main meter (GETCO meter) and the 33kV feeder at Suzlon Substation / VCB meter at wind farm end, the following steps shall be taken.
 - i. Checking of CT and PT connections
 - ii. Testing of accuracy of meters at site and at GETCO meter

If the difference exists even after such checking or testing, then the defective meter shall be replaced with a correct meter.

4. In case of conspicuous failures like burning of meter and erratic display of metered parameters and when the error found in testing of meter is beyond the permissible limit of error provided in the relevant standard, the meter shall be immediately replaced with a correct meter.
5. Sealing and maintenance of meters:
 - i. The GETCO meter shall be sealed in the presence of representatives of BLP / Suzlon, GEDA and GETCO.
 - ii. Any meter seal(s) shall be broken only by the GEDA /GETCO/ representative in the presence of DLFs representative whenever the main metering system or the 33kV metering system is to be inspected, tested, adjusted, repaired or replaced.
 - iii. The GETCO meter at the substation will be calibrated once in three years. The calibration of the meters installed at substations will take place once in three years as per the metering code prevalent in the state of Gujarat and GETCO notification dated 10/02/2010. The PP has no control on the same.
6. Records: DLF maintains an accurate and up-to-date operating log at the project site with records of:

- i. 24 Hours logs of real and reactive power generation, frequency, transformer tap position, bus voltage(s), Main meter and other meter readings and any other data mutually agreed.
 - ii. Any unusual conditions found during operation/inspections
 - iii. All the records will be kept for two years after the end of the crediting period or the last issuance of CERs for this project activity, whichever occurs later.
7. The billing is on monthly basis. BLP raises invoice and submit to GUVNL for payment based on joint meter reading as certified at the end of each month for the energy supplied.
8. The electronic data is archived for 2 years or up to the end of the crediting period, whichever late.

Billing and meter failure related issues:

- a) The billing is on monthly basis. BLP raises invoice and submit to GUVNL for payment based on joint meter reading as certified at the end of each month for the energy supplied
- b) Billing for the failure period:
 - i. In the event that any GETCO meter fails to register or upon being tested is found not to be accurate within ± 0.2 s of the energy injected in the grid, shall for the period be measured on the basis of the value registered by the corresponding meter at the feeder end.
 - ii. In the event that both GETCO meter and the corresponding check meter at the substation fail to register, or upon being tested, be found not to be accurate within ± 0.2 s the energy injected in the grid, shall for the period be adjusted by immediately restoring and recalibrating the GETCO meter and the corresponding check meter at the substation end and the correction applied to the consumption registered by the GETCO meter.
 - iii. The period referred to in the two points above is the actual period during which inaccurate measurements were made if such period can be determined or, if not readily determinable, the shorter of:
 - The period since the immediately preceding test of the relevant Main meter; or
 - One hundred and eighty (180) days immediately preceding the test at which the relevant Main meter was determined to be defective or inaccurate

VER Issuance

- a) The emission reduction calculations will be done on the basis of net electricity supplied to the grid after subtracting the losses incurred due to transmission from the WEG to the GETCO feeder.
- b) In the event that the date of registration is in the middle of the month, while the share certificate for the electricity generation is issued on monthly basis. The VERs will be estimated based on the generation of VCB meter readings at the WTGs for the period from the start date of the project registration and the end of the month.
- c) In the event that the GETCO meter error is found at the time of the meter calibration after the issuance of CERs during the crediting period, the correction of the meter error for the VER calculation will be incorporated in the next issuance of the CERs.

5 QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS

5.1 Baseline Emissions

As per description earlier under this document:

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

$EF_{grid,CM,y}$: 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” (tCO₂/MWh)

$EG_{PJ,y}$: 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.)

BE_y : Baseline emissions in year y (tCO_{2e}/yr.)

Baseline Emission factor (Indian Grid) for the second crediting period:

$$EF_{Grid,CM,y} = 0.9368 \text{ tCO}_2/\text{MW}$$

Therefore, Baseline Emissions:

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

For period 01/10/2019 to 30/06/2021

$$\begin{aligned}\text{Baseline Emission} &= 359,690 \times 0.9368 \\ &= 336,957 \text{ tCO}_2\text{e (Rounded down)}\end{aligned}$$

5.2 Project Emissions

The project activity involves in harnessing renewable Wind power. So, the emissions from the project are zero. Hence, $PE_y = 0$.

5.3 Leakage

No leakage emissions have been considered and hence the leakage emission is zero.

5.4 Net GHG Emission Reductions and Removals

As per the applied methodology, emission reductions are calculated as follows:

$$ER_y = BE_y - PE_y$$

Where,

ER_y = Emission Reduction in tCO₂/year

BE_y = Baseline emission in tCO₂/year

PE_y = Project emissions in tCO₂/year

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)
2019(01/10/2019 to 31/12/2019)	43,499	0	0	43,499
2020(01/01/2020 to 31/12/2020)	194,052	0	0	194,052
2021(01/01/2021 to 30/06/2021)	99,406	0	0	99,406
Total	336,957	0	0	336,957

There is a decrease in actual emission reduction achieved during the current monitoring period in comparison to the estimated emission reduction for the equivalent period based on the registered annual emission reduction. Detailed calculation has been provided in ER calculation sheet. This is due to the natural wind availability which is not a controlled factor.

Total Emission Reduction achieved in this Monitoring Period is 336,957 tCO_{2e}

There is around 41% lesser emission reduction achieved during the current monitoring period as compared to the projected ERs of equivalent period, which is due to the low wind flow pattern at the site which is not in the control of the project proponent.

APPENDIX 1: < LATITUDE AND LONGITUDE DETAILS OF THE WIND FARM >

Site: Jakhau, District Kutch, Gujarat

Sl. No	Loc .No	Zone	TurbineCo-ordinate		Latitude			Longitude		
			X	Y	Degree	Minute	Second	Degree	Minute	Second
1	M-726	42Q	466499	2566625	23	12	30.2	68	40	21.4
2	M-727	42Q	466681	2566249	23	12	17.9	68	40	27.8
3	M-744	42Q	466846	2567109	23	12	45.9	68	40	33.5
4	M-745	42Q	467581	2567340	23	12	53.5	68	40	59.4
5	M-746	42Q	467708	2566954	23	12	40.9	68	41	3.9
6	M-747	42Q	468112	2566530	23	12	27.2	68	41	18.1
7	M-748	42Q	468125	2566237	23	12	17.7	68	41	18.6
8	M-749	42Q	468165	2565817	23	12	4	68	41	20
9	M-750	42Q	468440	2565185	23	11	43.5	68	41	29.7
10	M-761	42Q	468499	2566947	23	12	40.8	68	41	31.7
11	M-762	42Q	468862	2565724	23	12	1	68	41	44.6
12	M-764	42Q	469192	2564945	23	11	35.7	68	41	56.2
13	M-765	42Q	469913	2564475	23	11	20.5	68	42	21.6
14	M-770	42Q	469239	2566747	23	12	34.3	68	41	57.7
15	M-771	42Q	468994	2566307	23	12	20	68	41	49.2
16	M-772	42Q	469499	2566017	23	12	10.6	68	42	6.9
17	M-773	42Q	469544	2565603	23	11	57.1	68	42	8.6
18	M-774	42Q	469762	2565236	23	11	45.2	68	42	16.3
19	M-775	42Q	469968	2564882	23	11	33.7	68	42	23.5
20	M-783	42Q	469694	2567314	23	12	52.8	68	42	13.7
21	M-785	42Q	470043	2566546	23	12	27.8	68	42	26
22	M-786	42Q	470224	2565748	23	12	1.9	68	42	32.5
23	M-787	42Q	470867	2564930	23	11	35.3	68	42	55.1
24	M-789	42Q	470420	2566278	23	12	19.1	68	42	39.3
25	M-790	42Q	470857	2565748	23	12	1.9	68	42	54.7
26	M-791	42Q	470929	2565331	23	11	48.4	68	42	57.3
27	M-792	42Q	471667	2564261	23	11	13.6	68	43	23.3
28	M-793	42Q	471680	2565620	23	11	57.8	68	43	23.7
29	M-794	42Q	470955	2569490	23	14	3.6	68	42	57.9
30	M-810	42Q	472137	2570272	23	14	29.1	68	43	39.5

Sl. No	Loc .No	Zone	TurbineCo-ordinate		Latitude			Longitude		
			X	Y	Degree	Minute	Second	Degree	Minute	Second
1	M-417	42Q	476904	2555707	23	6	35.8	68	46	28
2	M-418	42Q	477078	2555335	23	6	23.7	68	46	34.2
3	M-419	42Q	477329	2555010	23	6	13.1	68	46	43
4	M-420	42Q	477267	2554611	23	6	0.1	68	46	40.8
5	M-421	42Q	477656	2554345	23	5	51.5	68	46	54.5
6	M-422	42Q	477682	2553828	23	5	34.7	68	46	55.5
7	M-431	42Q	477650	2555940	23	6	43.4	68	46	54.2
8	M-439	42Q	479020	2552587	23	4	54.4	68	47	42.6
9	M-440	42Q	479185	2552277	23	4	44.3	68	47	48.4
10	M-443	42Q	475680	2560249	23	9	3.4	68	45	44.7
11	M-444	42Q	476114	2559916	23	8	52.6	68	46	0
12	M-455	42Q	478217	2555695	23	6	35.4	68	47	14.2
13	M-456	42Q	478513	2555311	23	6	23	68	47	24.6
14	M-464	42Q	476146	2561063	23	9	29.9	68	46	1.1
15	M-465	42Q	476208	2560604	23	9	15	68	46	3.3
16	M-478	42Q	480153	2553918	23	5	37.7	68	48	22.3
17	M-479	42Q	479808	2553437	23	5	22.1	68	48	10.2
18	M-506	42Q	479765	2554928	23	6	10.6	68	48	8.6
19	M-508	42Q	480035	2554331	23	5	51.2	68	48	18.2
20	M-514	42Q	477524	2561078	23	9	30.4	68	46	49.5
21	M-526	42Q	482146	2552731	23	4	59.2	68	49	32.4
22	M-533	42Q	480840	2555592	23	6	32.2	68	48	46.4
23	M-544	42Q	481612	2554985	23	6	12.5	68	49	13.6
24	M-586	42Q	483907	2556578	23	7	4.4	68	50	34.2
25	M-587	42Q	484179	2556236	23	6	53.3	68	50	43.8
26	M-589	42Q	485745	2554999	23	6	13.1	68	51	38.9
27	M-632	42Q	471476	2561472	23	9	42.9	68	43	16.8
28	M-634	42Q	472120	2562911	23	10	29.8	68	43	39.4
29	M-640	42Q	474637	2562070	23	10	2.6	68	45	7.9
30	M-641	42Q	474529	2561612	23	9	47.7	68	45	4.2
31	M-643	42Q	474614	2562490	23	10	16.2	68	45	7.1
32	M-645	42Q	475195	2559849	23	8	50.4	68	45	27.7
33	M-667	42Q	477285	2556235	23	6	52.9	68	46	41.4

Site: Suthari,District-Kutch,Gujarat

Sl. No	Loc .No	Zone	TurbineCo-ordinate		Latitude			Longitude		
			X	Y	Degree	Minute	Second	Degree	Minute	Second
1	M-97	42Q	487503	2549591	23	03	17	68	52	41
2	M-145	42Q	489261	2554731	23	06	05	68	53	43
3	M-148	42Q	489273	2554332	23	05	52	68	53	43
4	M-150	42Q	489987	2552678	23	04	58	68	54	08
5	M-161	42Q	489140	2551184	23	04	09	68	53	38
6	M-164	42Q	490517	2554940	23	06	11	68	54	27
7	M-170	42Q	490498	2553813	23	05	35	68	54	26

8	M-172	42Q	492206	2554411	23	05	54	68	55	26
9	M-201	42Q	492210	2550490	23	03	47	68	55	26
10	M-202	42Q	492800	2547164	23	01	59	68	55	47
11	M-213	42Q	492059	2552245	23	04	44	68	55	21
12	M-230	42Q	495578	2548079	23	02	28	68	57	25
13	M-260	42Q	497420	2540448	22	58	20	68	58	29
14	M-262	42Q	497920	2540371	22	58	18	68	58	47
15	M-263	42Q	499070	2541337	22	58	49	68	59	27
16	M-264	42Q	499497	2542007	22	59	11	68	59	42
17	M-265	42Q	500094	2542471	22	59	26	69	00	03
18	M-266	42Q	497903	2540945	22	58	36	68	58	46
19	M-268	42Q	499118	2540745	22	58	30	68	59	29
20	M-269	42Q	500164	2539032	22	57	34	69	00	06
21	M-270	42Q	500927	2538522	22	57	18	69	00	33
22	M-272	42Q	500544	2541801	22	59	04	69	00	19
23	M-275	42Q	501383	2538875	22	57	29	69	00	49
24	M-276	42Q	501518	2538488	22	57	16	69	00	53
25	M-277	42Q	501707	2538086	22	57	03	69	00	60
26	M-280	42Q	501826	2539374	22	57	45	69	01	04
27	M-282	42Q	502460	2537935	22	56	58	69	01	26
28	M-286	42Q	502934	2538312	22	57	11	69	01	43
29	M-288	42Q	503188	2539098	22	57	36	69	01	52
30	M-289	42Q	503445	2538636	22	57	21	69	02	01
31	M-290	42Q	501450	2542291	22	59	20	69	00	51
32	M-291	42Q	501968	2541808	22	59	04	69	01	09
33	M-292	42Q	502122	2541425	22	58	52	69	01	15
34	M-293	42Q	502122	2541002	22	58	38	69	01	15
35	M-296	42Q	502924	2540621	22	58	26	69	01	43
36	M-297	42Q	502998	2542175	22	59	16	69	01	45
37	M-299	42Q	503539	2541068	22	58	40	69	02	04

APPENDIX 2: <ENERGY METER DETAILS>

Substation Energy Meter Details:

Please note that Energy Meter calibration is controlled by state government regulatory body and thus PP has no control over the government body proceedings.

220 KV Substations				
Meter Serial No	Substation details/location	Accuracy class	Calibration date	Due date
GJ -2319 -A	Suthari ABT Meter Line 1	0.2 s	18/08/2018	18/08/2021
GJ-2320-A	Suthari ABT Meter Line 2	0.2 s	18/08/2018	18/08/2021
GJ-2317-A	Nani Sindhodi ABT Meter Line 1	0.2 s	20/08/2018	20/08/2021
GJ-2318-A	Nani Sindhodi ABT Meter Line 2	0.2 s	20/08/2018	20/08/2021