



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



Infinite Environmental Solutions LLP, Indore

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¹ <https://registry.terra.org/app/projectDetail/VCS/292>

CONTENTS

1	PROJECT DETAILS.....	4
1.1	Summary Description of the Implementation Status of the Project	4
1.2	Sectoral Scope and Project Type	6
1.3	Project Proponent	6
1.4	Other Entities Involved in the Project	6
1.5	Project Start Date	7
1.6	Project Crediting Period	7
1.7	Project Location	7
1.8	Title and Reference of Methodology	8
1.9	Participation under other GHG Programs	9
1.10	Other Forms of Credit and Supply Chain (Scope 3) Emissions	10
1.11	Sustainable Development Contributions	10
2	SAFEGUARDS	14
2.1	No Net Harm	14
2.2	Local Stakeholder Consultation	14
2.3	AFOLU-Specific Safeguards	15
3	IMPLEMENTATION STATUS	15
3.1	Implementation Status of the Project Activity	15
3.2	Deviations	17
3.3	Grouped Projects	18
4	DATA AND PARAMETERS.....	18
4.1	Data and Parameters Available at Validation	18
4.2	Data and Parameters Monitored.....	19
4.3	Monitoring Plan.....	20
5	QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS	24
5.1	Baseline Emissions	24
5.2	Project Emissions	24
5.3	Leakage.....	24
5.4	Net GHG Emission Reductions and Removals	24
	APPENDIX 1: LATITUDE AND LONGITUDE OF THE WIND FARM.....	26

APPENDIX 2: ENERGY METER DETAILS.....	30
APPENDIX 3: PLANT BREAKDOWN DETAILS.....	30

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 100 Wind Turbine Generators (WTGs), each of 1.5 MW capacity (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 national grid in Gujarat and contribute to climate change mitigation efforts.

The WTGs for the project activity got commissioned between 30-September-2007 to 31-March-2008.

The total GHG emission reductions or removals generated in the fourth monitoring period of second crediting period from 01-January-2022 to 31-May-2023 (inclusive of both dates) is 281,410 tCO_{2e}.

Audit Type	Period (inclusive of both dates)	Program	VVB Name	Number of years
Validation	18-June-2009 to 17-June- 2016	CDM	Bureau Veritas Holding SAS	-
Validation	30-September- 2007 to 29- September- 2017	VCS	Bureau Veritas Holding SAS	-
Verification	30-September- 2007 to 17- June-2009	VCS	Bureau Veritas Holding SAS	1 Year 8 Months 19 days
Verification	18-June-2009 to 24- February-2010	CDM	TÜV Nord	0 Year 8 Months 7 days
Verification	25-February- 2010 to 28- February-2011	CDM	TÜV Nord	1 Year 0 Month 4 days
Verification	01-March- 2011 to 31- August-2011	CDM	TÜV Nord	0 Year 6 Months 0 days

Verification	01-September-2011 to 31-March-2012	CDM	TÜV Nord	0 Year 7 Months 0 days
Verification	01-April-2012 to 30-June-2013	CDM	TÜV Nord	1 Year 3 Months 0 days
Verification	01-July-2013 to 30-June-2014	CDM	TÜV Nord	1 Year 0 Month 0 days
Verification	01-July-2014 to 17-June-2016	CDM	TÜV Nord	1 Year 11 Months 17 days
Validation (RCP)	18-June-2016 to 17-June-2023	CDM	Earthood services private limited	-
Validation (RCP)	30-September-2017 to 29-September-2027	VCS	Earthood services private limited	-
Verification	18-June-2016 to 30-September-2019	VCS	Earthood services private limited	3 Years 3 Months 13 days
Verification	01-October-2019 to 30-June-2021	VCS	LGAI Technological Center, S.A. (Applus+ Certification)	1 Year 9 Months 0 days
Verification	01-July-2021 to 31-December-2021	VCS	LGAI Technological Center, S.A. (Applus+ Certification)	0 Year 6 Months 0 days
Verification ²	01-January-2022 to 31-May-2023	VCS	VKU Certification Pvt. Ltd	1 Year 5 Months 0 days

² Current monitoring period

Total	30-September-2007 to 31-May-2023 ³	-	-	15 Years 8 Months
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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 19.0⁴

The project is not a grouped project activity. The project does not come under AFOLU project category.

1.3 Project Proponent

Organization name	Vayu (Project 1) Private Limited (formerly BLP Vayu (Project 1) Private Limited)
Contact person	Swathy Govindasamy
Title	Senior Associate-Energy Management
Address	12th Floor, Crescent 1, Prestige Shantiniketan, ITPL Main Road, Hoodi, Whitefield, Bengaluru - 560 048, Karnataka
Telephone	-
Email	swathy.g@enel.com

1.4 Other Entities Involved in the Project

Organization name	Infinite Environmental Solutions LLP
Role in the Project	Project Consultant
Contact person	Jimmy Sah
Title	COO

³ Inclusive of current monitoring period

⁴ <https://cdm.unfccc.int/UserManagement/FileStorage/58IAGB7SZUDEO2VN6LYM30K41HFPRQ>

Address	214-215 Milinda Manor, 2 RNT Marg, Indore – 452001, (M.P.) India
Telephone	0731-4050174
Email	jimmy@infisolutions.org

1.5 Project Start Date

Project Start Date: 30-September-2007.

The WTGs for the project activity got commissioned between 30-September-2007 to 31-March-2008. All WTGs were commissioned before 31-March- 2008⁵.

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

1.6 Project Crediting Period

Project crediting period Type: Renewal crediting period.

First Crediting period:

Start date of first crediting period: 30-September-2007

End date of first crediting period: 29-September-2017

Total number of years: 10 years 00 months

Second Crediting period:

Start date of Second Crediting period: 30-September-2017

End date of Second crediting period: 29-September-2027

Total number of years: 10 years 00 months

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.

The geographical location of the projects can be depicted from the maps on the following page.

⁵ Last WTG was commissioned on 29/03/2008.



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 07: Tool to calculate the emission factor for an electricity system - Version 07.0 (EB 100, Annex 04)⁷

Tool 01: Tool for the demonstration and assessment of additionality - Version 07.0.0 (EB 70, Annex 08)⁸

1.9 Participation under other GHG Programs

The project activity was initially 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.

Under CDM Mechanism: -

CDM Mechanism (UNFCCC Ref No - 2347) ⁹	
Registration Date	18-June-2009
Monitoring period (First verification)	18-June-2009 to 24-February-2010
CERs Issued	185,275
Monitoring period (Second verification)	25-February-2010 to 28-February-2011
CERs Issued	230,857
Monitoring period (Third verification)	01-March-2011 to 31-August-2011
CERs Issued	198,654
Monitoring period (fourth verification)	01-September-2011 to 31-March-2012
CERs Issued	85,385
Monitoring period (fifth verification)	01-April-2012 to 30-June-2013
CERs Issued	333,305
Monitoring period (sixth verification)	01-July-2013 to 30-June-2014
CERs Issued	241,836
Monitoring period (seventh verification)	01-July-2014 to 17-June-2016
CERs Issued	476,535

⁷ <https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-07-v7.0.pdf>

⁸ <https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-01-v7.0.0.pdf>

⁹ <https://cdm.unfccc.int/Projects/DB/BVQI1229917560.71/view?cp=1>

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

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 publicly 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.

The project activity involves generation of electricity using renewable source of energy and therefore does not involve any supply chain (scope 3) during the operation of the project activity as it does not involve purchased /manufacturing goods.

1.11 Sustainable Development Contributions

Ministry of Environment, Forest and Climate Change (MoEFCC), India's Designated National Authority (DNA) for CDM projects has stipulated economic, social, environment and technological well-being as the four indicators of sustainable development. During the current monitoring period, the project has contributed to sustainable development through the following ways:

Social well-being:

- The project activity has resulted in creating job opportunities for the local population on temporary and permanent basis. Manpower is required both during erection and operation of the renewable energy projects. This would result in the improvement in living standards of the local community.
- The installation of the renewable energy projects also led to development of basic infrastructure like roads, communication with the nearby cities etc. which also improved in living standards of the local population.

Economic well-being:

- The project activity have created direct and indirect job opportunities to the local community during installation and operation of the renewable energy projects.
- The investment for the project activity instances under grouped project activity has led to the improvement in the economic activity in the local area.

Environmental well-being:

The project activity utilizes renewable energy for generating electricity which otherwise would have been generated through alternate fuel (most likely - fossil fuel) based power plants, contributing to reduction in specific emissions (emissions of pollutant/unit of energy generated) including GHG emissions. As renewable energy projects produce no end products in the form of solid waste (ash etc.), they address the problem of solid waste disposal encountered by most other sources of power. Being a renewable resource, to generate electricity contributes to resource conservation. Thus, the project causes no negative impact on the surrounding environment.

Technological well-being:

The successful operation of project activity has led to promotion of wind power generation and also encourages other entrepreneurs to participate in similar projects.

Following activities has been implemented during the current monitoring period that result in SDG contributions:



For SDG 7: About 300,395 MWh renewable electricity has been supplied to Indian grid during the reported monitoring period i.e., 01-January-2022 to 31-May-2023 (inclusive of both dates), that helps to increase the renewable energy share in the energy mix.



For SDG 13: By supplying 300,395 MWh clean electricity to Indian grid, the project avoided release of 281,410 tCO_{2e} into the atmosphere during the reporting period i.e., 01-January-2022 to 31-May-2023 (inclusive of both dates).



For SDG 8: Project proponent ensures safe working environment for all the employees. There have been no fatal and non-fatal occupational injuries during the current monitoring period i.e., 01-January-2022 to 31-May-2023 (inclusive of both dates).

Table 1: Sustainable Development Contributions

Row number	SDG Target	SDG Indicator	Net Impact on SDG Indicator	Current Project Contributions	Contributions Over Project Lifetime
1)	7.2	7.2.1: Renewable energy share in the total final energy consumption	Implemented activities to increase	300,395 MWh renewable electricity has supplied to Indian grid during the reported period that helps to increase the renewable energy share in the energy mix.	4,093,176 MWh renewable electricity has supplied to Indian grid that helps to increase the renewable energy share in the energy mix. Under VCS¹⁰: From 30-September-2007 to 17-June-2009 and from 18-June-2016 to 31-May-2023 = 2,146,945 MWh Under CDM¹¹: From 18-June-2009 to 17-June-2016 = 1,946,231 MWh
2)	8.8	8.8.1 Fatal and non-fatal occupational injuries per 100,000 workers, by sex and migrant status	Implemented activities to decrease	In the operations of the plants there have been no fatal and non-fatal occupational injuries during the reporting period.	In the operations of the plants there have been no fatal and non-fatal occupational injuries during the project's lifetime.

¹⁰ <https://registry.terra.org/app/projectDetail/VCS/292>

¹¹ <https://cdm.unfccc.int/Projects/DB/BVQI1229917560.71/view?cp=1>

3)	13.0	Tonnes of greenhouse gas emissions avoided or removed	Implemented activities to increase	By generating 300,395 MWh renewable electricity the project has avoided emission of 281,410 tCO ₂ e in the atmosphere.	Prevented the release of 3,735,207 tCO₂e into the atmosphere. VCUs issued from 30-September-2007 to 17-June-2009 and from 18-June-2016 to 31-May-2023= 1,981,537 tCO₂e CERs issued from 18-June-2009 to 17-June-2016 = 1,753,670 tCO₂e
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2 SAFEGUARDS

2.1 No Net Harm

The project activity and the initial project activity instance being wind power project, it does not involve any potential negative environmental and socio-economic impacts.

Being a renewable wind-based power generation project, it is considered as one of the cleanest forms of electricity generation projects. The wind-based power generation neither involves any type of emission in air nor generates any kind of effluent to the environment during its construction and operation phase. Project activity is not having any negative environmental impacts.

Moreover, renewable wind-based power generation projects are promoted by Indian government. According to Final Document on Revised Classification of Industrial Sectors Under Red, Orange, Green and White Categories (29-February-2016)¹², the wind power projects come under White category of industries which are practically non-polluting. Therefore, does not require an Environmental Impact Assessment (EIA) and there is no necessity of obtaining the Consent to Operate.

As per section 04 page 31 of the report published by Ministry of New and Renewable Energy (MNRE) on September 2013 (Developmental Impacts and Sustainable Governance Aspects of Renewable Energy)¹³, “As established by life-cycle assessment, RE projects have comparatively low environmental externalities that too are limited to project development phase. The RE projects don’t generate solid or liquid effluents during operations and thereby pollution of land, surface water or ground water resources is not anticipated from such projects. During the operations phase the impacts on the surrounding environment are negligible and are reversible in nature and can be mitigated by proper Environmental Management plan.”

Thus, there is no harm identified from the project and hence no mitigations measures are applicable.

2.2 Local Stakeholder Consultation

DLF¹⁴ has organized a stakeholder consultation meeting with the local villagers on 10-January-2008 and 11-January-2008 to inform them on the environmental and social impacts of the project activity and discuss their concerns regarding the project activity.

The following stakeholders were involved:

1. Local villagers and representatives of village governing body including NGOs

¹² https://moef.gov.in/wp-content/uploads/2017/07/Latest_118_Final_Directions.pdf

¹³ <http://164.100.94.214/sites/default/files/uploads/report-on-developmental-impacts-of-RE.pdf>

¹⁴ During first crediting period the project WTGs ownership has got changed from DLF Limited to BLP Vayu (Project 1) Private Limited.

2. Gujarat Energy Development Agency
3. Gujarat Urja Vikas Nigam Limited
4. Supplier of WTG

The meeting was organized in six different locations (Suthari, Arikhana, Rapargarh, Jakhau, Lathedi, and Chachhi) on the above specified dates. People from nearby villages at these locations were also called. Villagers were informed through oral (Dhindhora) and written announcements about the meeting. The oral (Dhindhora) announcements were made on 7-January-2008 to inform the villagers about the agenda of the stakeholder meeting. Written notices were also pasted on the main gate of the project site on 7-January-2008 for the stakeholder meeting. The oral (Dhindhora) announcements were also made on the day of the stakeholder meeting (i.e. 10-January-2008 and 11-January-2008) to call the stakeholders on the venue. Registered letters to each village head (sarpanch) nearby the project activity was also sent on 7-January-2008 to send their written comments on the project activity. The meetings were organized by the DLF with the help of the developer Suzlon Energy Ltd. All participants were informed in their local language about the salient features and environmental benefits of the project activity. Over 100 villagers took part in the meetings at different locations are people living or working in a close vicinity to the project area. The stakeholder consultation was widely announced by means of written notifications in town hall and of oral announcements, so that every interested person could attend the meeting.

During the current monitoring period, the PP has kept grievance register in plant site office seeking complaints/grievances from local community. During the current monitoring period, as a part of maintenance activity some of the comments have been received from the stakeholder (mainly employees) related to the resolution of minor technical issues w.r.t proper maintenance and execution of the project activity, which were addressed and resolved by the concerned person for the smooth functioning of the project activity as per response mentioned in the grievance register. These comments do not have any impact in the project design.

2.3 AFOLU-Specific Safeguards

Not applicable to this as this is not an AFOLU project activity.

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 WTGs for the project activity have got commissioned between 30-September-2007 to 31-March- 2008. The project has been operational barring from routine shut down for maintenance of WTGs, during the current monitoring period. There is substantial increase in the breakdown hours due to preventive measures and scheduled maintenance activity to upgrade the performance of the wind turbine.

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

Parameter Specifications

1.5 MW -Suzlon ¹⁵	
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
Rotor Voltage	
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.

The major shutdown observed during the current monitoring period in the project activity is due to preventive measures and scheduled maintenance activity to upgrade the performance of the wind turbine. However, the plant was not totally shut down during breakdown hours, only the affected parts were shut down. Total breakdown hours for the current monitoring period are 8,0941.05 hours which 6.54% of the total available hours. The details of the breakdown with description are mentioned in Appendix 3.

¹⁵ <https://www.suzlon.com/pdf/product/Suzlon-S82-product-brochure.pdf>

3.2 Deviations

3.2.1 Methodology Deviations

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

3.2.2 Project Description Deviations

The following project deviations were considered during the previous monitoring period:

Monitoring period number: Third monitoring period of second crediting period

Duration of MP: 01-July-2021 to 31-December-2021

Deviation 1:

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

- i. Electricity supplied to GUVNL (EG_y)
- ii. Quantity of Electricity exported to GUVNL facility ($EG_{y, Export}$)
- iii. Electricity generated by each WEG (EG_{WEG})
- iv. 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_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-February-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.

Deviation 3:

The contact details of the Project Proponent and the other entities involved has been updated in Section 1.3 and Section 1.4 and other minor editorial corrections has been done in the third monitoring period.

The above-mentioned deviations are of permanent nature and does not have any impact on the project applicability, baseline scenario and additionality.

The following deviation-4 is considered during the current monitoring period:

Monitoring period number: fourth monitoring period of second crediting period

Duration of MP: 01-January-2022 to 31-May-2023

As per the VCS registered PD, the PP company name is “BLP Vayu (Project 1) Private Limited”. However, PP company name has been changed to “Vayu (Project 1) Private Limited” on 24-March-2020. The same has been intimated to Verra during previous verification process on 06-March-2023 through mail with the supporting document.

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 _{OM,y}
Data unit	tCO ₂ /MWh
Description	Operating Margin CO ₂ emission factor in year y
Source of data	Calculated from CEA database ¹⁶ , Version 14
Value applied:	0.9610 (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 2015-16, 2016-17 & 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 the calculation of the Baseline Emission
Comments	This parameter is fixed ex-ante for the entire crediting period.

Data / Parameter	EF _{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,

¹⁶ <https://cea.nic.in/cdm-co2-baseline-database/?lang=en>

	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 _{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 _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 is as per the provisions of the power purchase agreement. The WEGs of a single customer (Vayu (Project 1) Private Limited, (formerly BLP Vayu (Project 1) Private Limited)) in this case) at a particular site are connected to a Vacuum Circuit Breaker metering yard (VCB) which inturn 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.

	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 applied	300,395 MWh
Monitoring equipment	Electricity Meters of 0.2s Class. Detail of the calibration has been provided as Appendix 2
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 Net Quantity of Electricity exported to the grid as per Share certificate issued by GETCO can be cross verified by the invoice.
Purpose of data	Calculation of Baseline emissions
Calculation method	N/A
Comments	The data will be archived electronically for two years after the end of the last crediting period or the last issuance of VCU 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);

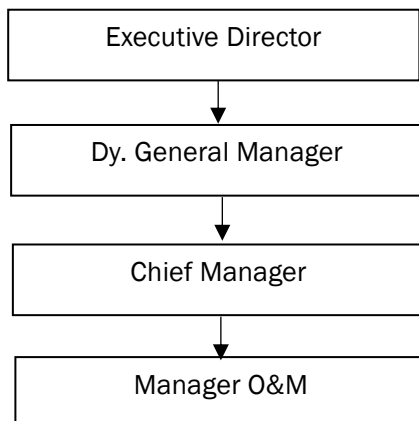
For the project activity to establish its creditable emission reduction, it records the actual electricity generation, which displaces equivalent units of electricity at the operating and build margin of the grid. Since the simple OM emission factor is calculated based on a 3-year average, based on the 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 ACM0002) 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, Vayu (Project 1) Private Limited (formerly BLP Vayu (Project 1) Private Limited) 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 Vayu (Project 1) Private Limited (formerly BLP Vayu (Project 1) Private Limited) 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 Vayu (Project 1) Private Limited (formerly BLP Vayu (Project 1) Private Limited).

Vayu (Project 1) Private Limited (formerly BLP Vayu (Project 1) Private Limited) has formulated a Project Team to ensure proper and continuous monitoring of the performance of turbines and generation of power.



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.

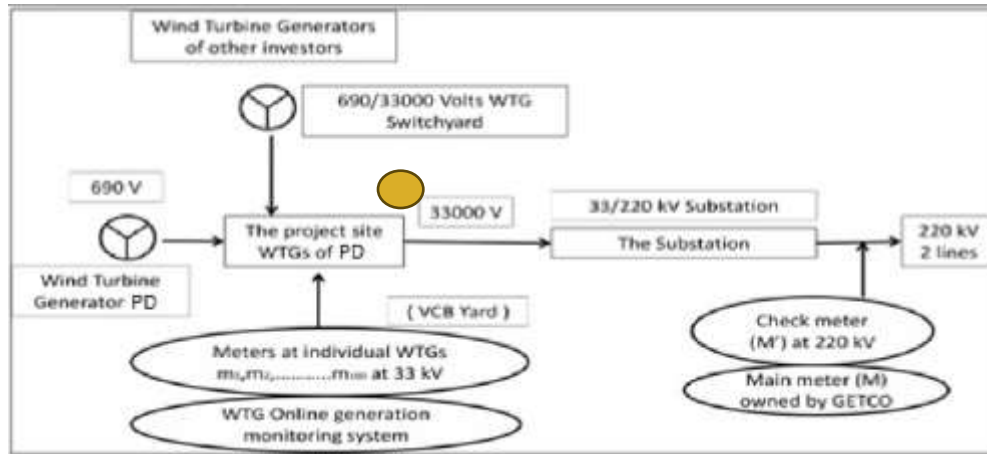
Metering layout

- The pooling meters at substation of GETCO main meter (M) and check meter (M') are installed at 220 KV side at the substation.
- 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.
- Data monitoring takes place at the GETCO main meter at substation (M), GETCO Check meter at substation (M'), and WTGs (m1, m2, m3,.....m100).
- The electricity metered at the GETCO meter (M) is proportionally divided among the customers connected to the meter on the basis of the pro rata 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 prorate 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 WTGs 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 Vayu (Project 1) Private Limited (formerly BLP Vayu (Project 1) Private Limited), 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 inturn 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 rata 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 Vayu (Project 1) Private Limited (formerly BLP Vayu (Project 1) Private Limited)/ 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 a year. The calibration of the meters installed in VCB yard will take place once three years as per the metering code prevalent in the state of Gujarat and GETCO notification dated 10-February-2010.
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 VCU for this project activity, whichever occurs later.
7. The billing is on monthly basis. Vayu (Project 1) Private Limited (formerly BLP Vayu (Project 1) Private Limited) 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. Vayu (Project 1) Private Limited (formerly BLP Vayu (Project 1) Private Limited) 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 $\pm 0.2s$ 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 0.2s 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:
 - o The period since the immediately preceding test of the relevant Main meter; or
 - o One hundred and eighty (180) days immediately preceding the test at which the relevant Main meter was determined to be defective or inaccurate.

VCU Issuance

- a) The emission reduction calculations will be done on the basis of net electricity supplied to the grid as per the meter installed at GSS and the electricity metered at the GETCO meter is

proportionally divided by the GETCO officials among the customers connected to the meter on the basis of the pro rata readings taken at the VCB end.

- b) In the event that the GETCO meter error is found at the time of the meter calibration after the issuance of VCUs during the monitoring period, the correction of the meter error for the VCU calculation will be incorporated in the next issuance of the VCUs.

5 QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS

5.1 Baseline Emissions

As per the applied methodology:

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

$EF_{grid,CM,y}$: 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 (tCO₂e/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:

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

For the period 01-January-2022 to 31-May-2023

$$\text{Baseline Emission} = 300,395 \times 0.9368$$

$$= 281,410 \text{ tCO}_2\text{e}$$

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 $tCO_2/year$

BE_y = Baseline emission in $tCO_2/year$

PE_y = Project emissions in $tCO_2/year$

Year	Baseline emissions or removals (tCO_2e)	Project emissions or removals (tCO_2e)	Leakage emissions (tCO_2e)	Net GHG emission reductions or removals (tCO_2e)
Year A (01-January-2022 - 31-December-2022)	203,336	0	0	203,336
Year B (01-Januray-2023 - 31-May-2023)	78,074	0	0	78,074
Total	281,410	0	0	281,410

<u>Ex-ante emissions reductions/removals</u>	<u>Achieved emissions reductions/removals</u>	<u>Percent difference</u>	<u>Justification for the difference</u>
461,153	281,410	-38.98%	The decrease in the actual emission reduction achieved during the current monitoring period is due to the natural wind availability which is an uncontrollable factor and breakdown due to preventive measure and scheduled maintenance activity at site.

Total Emission Reduction achieved in this Monitoring Period is 281,410 tCO_2e . There is around 38.98%¹⁷ lesser emission reduction achieved during the current monitoring period as compared to the projected ERs of equivalent period which is due to low value of actual PLF (16.17%) vs estimated PLF of 26.50% in the registered PD. Actual PLF is low primarily due to low wind flow pattern which is not in the control of the project proponent as no major breakdown has been observed other than the scheduled.

Scheduled breakdown hours have been observed as part of preventive measures and scheduled maintenance activity to upgrade the performance of the wind turbine as the project activity has completed around 15 years of operation since commissioning. The summary of the breakdown has been provided in the appendix 3 which includes breakdown hours due to grid failure and scheduled maintenance. Total breakdown hours during the current monitoring period are around 80,941 hrs. which is 6.54% of the total operational hours of the project activity.

¹⁷ Detailed calculation has been provided in ER calculation sheet.

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

Site: Jakhau, District Kutch, Gujarat

Sl. No	Loc. No.	Zone	Latitude			Longitude		
			Degree	Minute	Second	Degree	Minute	Second
1	M-726	42 Q	23	12	30.2	68	40	21.4
2	M-727	42 Q	23	12	17.9	68	40	27.8
3	M-744	42 Q	23	12	45.9	68	40	33.5
4	M-745	42 Q	23	12	53.5	68	40	59.4
5	M-746	42 Q	23	12	40.9	68	41	3.9
6	M-747	42 Q	23	12	27.2	68	41	18.1
7	M-748	42 Q	23	12	12.7	68	41	10.0
8	M-749	42 Q	23	12	4	68	41	20
9	M-750	42 Q	23	11	43.5	68	41	29.7
10	M-761	42 Q	23	12	40.8	68	41	31.7
11	M-762	42 Q	23	12	1	68	41	44.6
12	M-764	42 Q	23	11	35.7	68	41	56.2
13	M-765	42 Q	23	11	20.5	68	42	21.6
14	M-770	42 Q	23	12	34.3	68	41	57.7
15	M-771	42 Q	23	12	20	68	41	49.2
16	M-772	42 Q	23	12	10.6	68	42	6.9
17	M-773	42 Q	23	11	57.1	68	42	8.6
18	M-774	42 Q	23	11	45.2	68	42	16.3
19	M-775	42 Q	23	11	33.7	68	42	23.5
20	M-783	42 Q	23	12	52.8	68	42	13.7
21	M-785	42 Q	23	12	27.8	68	42	26
22	M-786	42 Q	23	12	1.9	68	42	32.5
23	M-787	42 Q	23	11	35.3	68	42	55.1
24	M-789	42 Q	23	12	19.1	68	42	39.3
25	M-790	42 Q	23	12	1.9	68	42	54.7
26	M-791	42 Q	23	11	48.4	68	42	57.3
27	M-792	42 Q	23	11	13.6	68	43	23.3
28	M-793	42 Q	23	11	57.0	68	43	17.6
29	M-794	42 Q	23	14	3.6	68	42	57.9
30	M-810	42 Q	23	14	30.26	68	43	43.19
31	M-632	42 Q	23	9	42.9	68	43	16.8
32	M-634	42 Q	23	10	29.8	68	43	39.4

Site: Lathedi, District Kutch, Gujarat

1	M-260	42 Q	22	58	20	68	58	29
2	M-262	42 Q	22	58	15.7	68	58	49.2
3	M-263	42 Q	22	58	49	68	59	27
4	M-264	42 Q	22	59	11	68	59	42
5	M-265	42 Q	22	59	26	69	00	03
6	M-266	42 Q	22	58	36	68	58	46
7	M-268	42 Q	22	58	30	68	59	29
8	M-269	42 Q	22	57	34	69	00	06
9	M-270	42 Q	22	57	18	69	00	33
10	M-272	42 Q	22	59	04	69	00	19
11	M-275	42 Q	22	57	29	69	00	49
12	M-276	42 Q	22	57	16	69	00	53
13	M-277	42 Q	22	57	03	69	00	60
14	M-280	42 Q	22	57	45	69	01	04
15	M-282	42 Q	22	56	58	69	01	26
16	M-286	42 Q	22	57	11	69	01	43
17	M-288	42 Q	22	57	36	69	01	52
18	M-289	42 Q	22	57	21	69	02	01
19	M-290	42 Q	22	59	20	69	00	51
20	M-291	42 Q	22	59	10	69	01	06
21	M-292	42 Q	22	58	52	69	01	15
22	M-293	42 Q	22	58	38	69	01	15
23	M-296	42 Q	22	58	26	69	01	43
24	M-297	42 Q	22	59	12	69	01	49
25	M-299	42 Q	22	58	40	69	02	04

Site: Kadoli, District Kutch, Gujarat

1	M-526	42 Q	23	4	59.2	68	49	32.4
2	M-589	42 Q	23	6	13.1	68	51	38.9

Site: Sindhodi, District- Kutch, Gujarat

Sl. No	Loc. No.	Zone	Latitude			Longitude		
			Degree	Minute	Second	Degree	Minute	Second
1	M-417	42 Q	23	6	35.8	68	46	28
2	M-418	42 Q	23	6	23.7	68	46	34.2
3	M-419	42 Q	23	6	13.1	68	46	43
4	M-420	42 Q	23	6	0.1	68	46	40.8
5	M-421	42 Q	23	5	51.5	68	46	54.5
6	M-422	42 Q	23	5	34.7	68	46	55.5
7	M-431	42 Q	23	6	39.5	68	46	54.5
8	M-439	42 Q	23	4	54.4	68	47	42.6
9	M-440	42 Q	23	4	44.3	68	47	48.4
10	M-443	42 Q	23	9	3.4	68	45	44.7
11	M-444	42 Q	23	8	53.8	68	45	55.56
12	M-455	42 Q	23	6	35.4	68	47	14.2

13	M-456	42 Q	23	6	23	68	47	24.6
14	M-464	42 Q	23	9	29.9	68	46	1.1
15	M-465	42 Q	23	9	15	68	46	3.3
16	M-478	42 Q	23	5	37.7	68	48	22.3
17	M-479	42 Q	23	5	22.1	68	48	10.2
18	M-506	42 Q	23	6	10.6	68	48	8.6
19	M-508	42 Q	23	5	51.2	68	48	18.2
20	M-514	42 Q	23	9	30.4	68	46	49.5
21	M-533	42 Q	23	6	32.2	68	48	46.4
22	M-544	42 Q	23	6	12.5	68	49	13.6
23	M-586	42 Q	23	7	4.4	68	50	34.2
24	M-587	42 Q	23	6	53.3	68	50	43.8
25	M-640	42 Q	23	10	2.9	68	45	24.70
26	M-641	42 Q	23	9	45.2	68	45	14.8
27	M-643	42 Q	23	10	16.2	68	45	7.1
28	M-645	42 Q	23	8	50.4	68	45	27.7
29	M-667	42 Q	23	6	51.3	68	46	48.2

Site: Suthari, District- Kutch, Gujarat

Sl. No	Loc. No.	Zone	Latitude			Longitude		
			Degree	Minute	Second	Degree	Minute	Second
1	M-97	42 Q	23	03	17	68	52	41
2	M-145	42 Q	23	06	10	68	53	40
3	M-148	42 Q	23	05	43	68	53	37
4	M-150	42 Q	23	04	58	68	54	08
5	M-161	42 Q	23	04	09	68	53	38
6	M-164	42 Q	23	06	11	68	54	27
7	M-170	42 Q	23	05	35	68	54	26
8	M-172	42 Q	23	05	54	68	55	26
9	M-201	42 Q	23	03	47	68	55	26
10	M-202	42 Q	23	01	59	68	55	47
11	M-213	42 Q	23	04	47	68	55	17
12	M-230	42 Q	23	02	28	68	57	25

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. Meter serial no. GJ-2318-A has been replaced with meter serial no. GJ-5468-A on 09-November-2022.

220kV Substation				
Meter Serial No.	Substation details	Accuracy class	Present calibration date	Due date
GJ-2319-A	Suthari ABT Meter Line 1	0.2 s	05-October-2021	04-October-2024
GJ-2320-A	Suthari ABT Meter Line 2	0.2 s	05-October-2021	04-October-2024
GJ-2317-A	Nani Sindhodi ABT Meter Line 1	0.2 s	04-October-2021	03-October-2024
GJ-2318-A	Nani Sindhodi ABT Meter Line 2	0.2 s	04-October-2021	03-October-2024
GJ-2468-A	Nani Sindhodi ABT Meter Line 2	0.2s	20-June-2022	19-June-2023

APPENDIX 3: <PLANT BREAKDOWN DETAILS>

Month	State	Site	Section	Formula Parameter	Breakdown Hrs.
Jan-22	GJ - Kutch	Jakhau	Jakahu - I	Grid failure	910
Jan-22	GJ - Kutch	Kadoli	Kadoli	Grid failure	37.5
Jan-22	GJ - Kutch	Lathedi	Lathedi	Grid failure	875
Jan-22	GJ - Kutch	Nanisindhodi	Nanisindhodi	Grid failure	1224.75
Jan-22	GJ - Kutch	Suthari	Kadoli	Grid failure	103
Jan-22	GJ - Kutch	Jakhau	Jakahu - I	Scheduled maintenance	59.75
Jan-22	GJ - Kutch	Suthari	Kadoli	Scheduled maintenance	22.25
Jan-22	GJ - Kutch	Lathedi	Lathedi	Scheduled maintenance	66
Jan-22	GJ - Kutch	Nanisindhodi	Nanisindhodi	Scheduled maintenance	11.5

Feb-22	GJ - Kutch	Jakhau	Jakahu - I	Grid failure	315.25
Feb-22	GJ - Kutch	Kadoli	Kadoli	Grid failure	100.25
Feb-22	GJ - Kutch	Lathedi	Lathedi	Grid failure	1580
Feb-22	GJ - Kutch	Nanisindhodi	Nanisindhodi	Grid failure	514.75
Feb-22	GJ - Kutch	Suthari	Arikhana	Grid failure	130.75
Feb-22	GJ - Kutch	Jakhau	Jakahu - I	Scheduled maintenance	315
Feb-22	GJ - Kutch	Lathedi	Lathedi	Scheduled maintenance	101.75
Feb-22	GJ - Kutch	Nanisindhodi	Nanisindhodi	Scheduled maintenance	214.5
Feb-22	GJ - Kutch	Suthari	Arikhana	Scheduled maintenance	11.25
Mar-22	GJ - Kutch	Jakhau	Jakahu - I	Grid failure	1031.25
Mar-22	GJ - Kutch	Kadoli	Kadoli	Grid failure	44.75
Mar-22	GJ - Kutch	Lathedi	Lathedi	Grid failure	2675.75
Mar-22	GJ - Kutch	Nanisindhodi	Nanisindhodi	Grid failure	778.25
Mar-22	GJ - Kutch	Suthari	Kadoli	Grid failure	351.5
Mar-22	GJ - Kutch	Jakhau	Jakahu - II	Scheduled maintenance	600.25
Mar-22	GJ - Kutch	Kadoli	Kadoli	Scheduled maintenance	38.5
Mar-22	GJ - Kutch	Lathedi	Lathedi	Scheduled maintenance	506.75
Mar-22	GJ - Kutch	Nanisindhodi	Nanisindhodi	Scheduled maintenance	560
Mar-22	GJ - Kutch	Suthari	Suthari	Scheduled maintenance	259.75
Apr-22	GJ - Kutch	Jakhau	Jakahu - I	Grid failure	1067.75
Apr-22	GJ - Kutch	Kadoli	Kadoli	Grid failure	7.5
Apr-22	GJ - Kutch	Lathedi	Lathedi	Grid failure	270.25
Apr-22	GJ - Kutch	Nanisindhodi	Nanisindhodi	Grid failure	232.75
Apr-22	GJ - Kutch	Suthari	Kadoli	Grid failure	22.75
Apr-22	GJ - Kutch	Jakhau	Jakahu - II	Scheduled maintenance	40.25
May-22	GJ - Kutch	Jakhau	Jakahu - I	Grid failure	6
May-22	GJ - Kutch	Kadoli	Kadoli	Grid failure	1
May-22	GJ - Kutch	Lathedi	Lathedi	Grid failure	351.75
May-22	GJ - Kutch	Nanisindhodi	Nanisindhodi	Grid failure	136.25
May-22	GJ - Kutch	Suthari	Kadoli	Grid failure	26
May-22	GJ - Kutch	Lathedi	Lathedi	Scheduled maintenance	46
Jun-22	GJ - Kutch	Jakhau	Jakahu - I	Grid failure	198.5
Jun-22	GJ - Kutch	Kadoli	Kadoli	Grid failure	36
Jun-22	GJ - Kutch	Lathedi	Lathedi	Grid failure	983
Jun-22	GJ - Kutch	Nanisindhodi	Nanisindhodi	Grid failure	383

Jun-22	GJ - Kutch	Suthari	Kadoli	Grid failure	418
Jun-22	GJ - Kutch	Jakhau	Jakahu - I	Scheduled maintenance	23.75
Jun-22	GJ - Kutch	Kadoli	Kadoli	Scheduled maintenance	1.25
Jun-22	GJ - Kutch	Lathedi	Lathedi	Scheduled maintenance	3.25
Jun-22	GJ - Kutch	Nanisindhodi	Vanku	Scheduled maintenance	20
Jun-22	GJ - Kutch	Suthari	Suthari	Scheduled maintenance	18.5
Jul-22	GJ - Kutch	Jakhau	Jakahu - I	Grid failure	3297.25
Jul-22	GJ - Kutch	Kadoli	Kadoli	Grid failure	138.25
Jul-22	GJ - Kutch	Lathedi	Lathedi	Grid failure	2084.5
Jul-22	GJ - Kutch	Nanisindhodi	Nanisindhodi	Grid failure	2800.25
Jul-22	GJ - Kutch	Suthari	Arikhana	Grid failure	589.75
Jul-22	GJ - Kutch	Jakhau	Jakahu - I	Scheduled maintenance	8051.75
Jul-22	GJ - Kutch	Kadoli	Kadoli	Scheduled maintenance	226.25
Jul-22	GJ - Kutch	Lathedi	Lathedi	Scheduled maintenance	6307.75
Jul-22	GJ - Kutch	Nanisindhodi	Nanisindhodi	Scheduled maintenance	10271
Jul-22	GJ - Kutch	Suthari	Suthari	Scheduled maintenance	1136.75
Aug-22	GJ - Kutch	Jakhau	Jakahu - I	Grid failure	585
Aug-22	GJ - Kutch	Kadoli	Kadoli	Grid failure	3.75
Aug-22	GJ - Kutch	Lathedi	Lathedi	Grid failure	446.25
Aug-22	GJ - Kutch	Nanisindhodi	Nanisindhodi	Grid failure	153.25
Aug-22	GJ - Kutch	Suthari	Kadoli	Grid failure	109.5
Aug-22	GJ - Kutch	Lathedi	Lathedi	Scheduled maintenance	8.75
Aug-22	GJ - Kutch	Nanisindhodi	Nanisindhodi	Scheduled maintenance	28
Sep-22	GJ - Kutch	Jakhau	Jakahu - I	Grid failure	3161.25
Sep-22	GJ - Kutch	Kadoli	Kadoli	Grid failure	22.5
Sep-22	GJ - Kutch	Lathedi	Lathedi	Grid failure	514
Sep-22	GJ - Kutch	Nanisindhodi	Nanisindhodi	Grid failure	2076.75
Sep-22	GJ - Kutch	Suthari	Suthari	Grid failure	588.5
Sep-22	GJ - Kutch	Jakhau	Jakahu - I	Scheduled maintenance	296.5
Sep-22	GJ - Kutch	Lathedi	Lathedi	Scheduled maintenance	202.75
Sep-22	GJ - Kutch	Nanisindhodi	Nanisindhodi	Scheduled maintenance	135
Sep-22	GJ - Kutch	Suthari	Suthari	Scheduled maintenance	2.5

Oct-22	GJ - Kutch	Jakhau	Jakahu - I	Grid failure	147.5
Oct-22	GJ - Kutch	Kadoli	Kadoli	Grid failure	5.5
Oct-22	GJ - Kutch	Lathedi	Lathedi	Grid failure	145.25
Oct-22	GJ - Kutch	Nanisindhodi	Nanisindhodi	Grid failure	199.5
Oct-22	GJ - Kutch	Suthari	Suthari	Grid failure	51.25
Oct-22	GJ - Kutch	Jakhau	Jakahu - I	Scheduled maintenance	720.75
Oct-22	GJ - Kutch	Kadoli	Kadoli	Scheduled maintenance	93
Oct-22	GJ - Kutch	Lathedi	Lathedi	Scheduled maintenance	457.75
Oct-22	GJ - Kutch	Nanisindhodi	Nanisindhodi	Scheduled maintenance	582.75
Oct-22	GJ - Kutch	Suthari	Suthari	Scheduled maintenance	462.5
Nov-22	GJ - Kutch	Jakhau	Jakahu - I	Grid failure	256.5
Nov-22	GJ - Kutch	Kadoli	Kadoli	Grid failure	21.25
Nov-22	GJ - Kutch	Lathedi	Lathedi	Grid failure	207.5
Nov-22	GJ - Kutch	Nanisindhodi	Nanisindhodi	Grid failure	925
Nov-22	GJ - Kutch	Suthari	Suthari	Grid failure	118.75
Nov-22	GJ - Kutch	Jakhau	Jakahu - I	Scheduled maintenance	348.5
Nov-22	GJ - Kutch	Lathedi	Lathedi	Scheduled maintenance	382.5
Nov-22	GJ - Kutch	Nanisindhodi	Nanisindhodi	Scheduled maintenance	402.5
Dec-22	GJ - Kutch	Jakhau	Jakahu - I	Grid failure	41
Dec-22	GJ - Kutch	Kadoli	Kadoli	Grid failure	23.25
Dec-22	GJ - Kutch	Lathedi	Lathedi	Grid failure	1211.75
Dec-22	GJ - Kutch	Nanisindhodi	Nanisindhodi	Grid failure	163.75
Dec-22	GJ - Kutch	Suthari	Suthari	Grid failure	169.5
Dec-22	GJ - Kutch	Kadoli	Kadoli	Scheduled maintenance	12
Dec-22	GJ - Kutch	Lathedi	Lathedi	Scheduled maintenance	9.25
Dec-22	GJ - Kutch	Nanisindhodi	Nanisindhodi	Scheduled maintenance	8.75
Jan-23	GJ - Kutch	Jakhau	Jakahu - I	Grid failure	152.25
Jan-23	GJ - Kutch	Kadoli	Kadoli	Grid failure	33.5
Jan-23	GJ - Kutch	Lathedi	Lathedi	Grid failure	578.75
Jan-23	GJ - Kutch	Nanisindhodi	Nanisindhodi	Grid failure	1087
Jan-23	GJ - Kutch	Suthari	Arikhana	Grid failure	230.5
Jan-23	GJ - Kutch	Jakhau	Jakahu - I	Scheduled maintenance	145.75
Jan-23	GJ - Kutch	Kadoli	Kadoli	Scheduled maintenance	17.25

Jan-23	GJ - Kutch	Lathedi	Lathedi	Scheduled maintenance	40.5
Jan-23	GJ - Kutch	Nanisindhodi	Nanisindhodi	Scheduled maintenance	186.25
Jan-23	GJ - Kutch	Suthari	Arikhana	Scheduled maintenance	87.75
Feb-23	GJ - Kutch	Jakhau	Jakahu - I	Grid failure	752.5
Feb-23	GJ - Kutch	Kadoli	Kadoli	Grid failure	70.75
Feb-23	GJ - Kutch	Lathedi	Lathedi	Grid failure	62.5
Feb-23	GJ - Kutch	Nanisindhodi	Nanisindhodi	Grid failure	447.75
Feb-23	GJ - Kutch	Suthari	Kadoli	Grid failure	288.25
Feb-23	GJ - Kutch	Jakhau	Jakahu - I	Scheduled maintenance	169.5
Feb-23	GJ - Kutch	Lathedi	Lathedi	Scheduled maintenance	542.5
Feb-23	GJ - Kutch	Nanisindhodi	Nanisindhodi	Scheduled maintenance	388.25
Mar-23	GJ - Kutch	Jakhau	Jakahu - I	Grid failure	739.5
Mar-23	GJ - Kutch	Kadoli	Kadoli	Grid failure	25.25
Mar-23	GJ - Kutch	Lathedi	Lathedi	Grid failure	1391.25
Mar-23	GJ - Kutch	Nanisindhodi	Nanisindhodi	Grid failure	198
Mar-23	GJ - Kutch	Suthari	Suthari	Grid failure	145.5
Mar-23	GJ - Kutch	Jakhau	Jakahu - I	Scheduled maintenance	618
Mar-23	GJ - Kutch	Kadoli	Kadoli	Scheduled maintenance	43.5
Mar-23	GJ - Kutch	Lathedi	Lathedi	Scheduled maintenance	85.5
Mar-23	GJ - Kutch	Nanisindhodi	Nanisindhodi	Scheduled maintenance	104
Mar-23	GJ - Kutch	Suthari	Suthari	Scheduled maintenance	201
Apr-23	GJ - Kutch	Jakhau	Jakahu - I	Grid failure	49.25
Apr-23	GJ - Kutch	Kadoli	Kadoli	Grid failure	147.25
Apr-23	GJ - Kutch	Lathedi	Lathedi	Grid failure	633.75
Apr-23	GJ - Kutch	Nanisindhodi	Nanisindhodi	Grid failure	290.75
Apr-23	GJ - Kutch	Suthari	Arikhana	Grid failure	150.5
Apr-23	GJ - Kutch	Jakhau	Jakahu - I	Scheduled maintenance	82.5
May-23	GJ - Kutch	Jakhau	Jakahu - I	Grid failure	600.5
May-23	GJ - Kutch	Kadoli	Kadoli	Grid failure	35.6
May-23	GJ - Kutch	Lathedi	Lathedi	Grid failure	1000
May-23	GJ - Kutch	Nanisindhodi	Nanisindhodi	Grid failure	98.3
May-23	GJ - Kutch	Suthari	Suthari	Grid failure	88.5
May-23	GJ - Kutch	Jakhau	Jakahu - I	Scheduled maintenance	360.7

May-23	GJ - Kutch	Kadoli	Kadoli	Scheduled maintenance	45.2
May-23	GJ - Kutch	Lathedi	Lathedi	Scheduled maintenance	85.5
May-23	GJ - Kutch	Nanisindhodi	Nanisindhodi	Scheduled maintenance	120.4
May-23	GJ - Kutch	Suthari	Suthari	Scheduled maintenance	180.6