



WIND BASED POWER GENERATION BY PANAMA WIND ENERGY GODAWARI PRIVATE LIMITED, PUNE IN THE STATE OF MAHARASHTRA, INDIA



Document Prepared by EKI Energy Services Limited



Project Title	Wind Based Power Generation by Panama Wind Energy Godawari Private Limited, Pune in the State of Maharashtra, India
Version	03
Report ID	VCS 1523
Date of Issue	11-September-2023
Project ID	1523
Monitoring Period	01-November-2022 to 31-July-2023
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1 PROJECT DETAILS

1.1 Summary Description of the Implementation Status of the Project

The purpose of the project activity is to generate power using renewable energy source (wind) and sell the power generated to the state grid. The project activity generates electricity using wind potential and converts it into kinetic energy using Wind turbines, which drives the alternators to generate energy. The generated electricity is being exported to the regional grid system which is under the purview of the Unified National Grid.

The project activity involves the installation of Wind Power Projects. The total installed capacity of the project is 80 MW; which involves operation of 40 Wind Turbine Generators (WTGs) with capacity of 2 MW each located at Maharashtra state in India. The project is promoted by Panama Wind Energy Godawari Private Limited.

The power produced displaces an equivalent amount of power from the grid, which is fed mainly by fossil fuel fired power plants. Hence, it results in reduction of GHG emissions. GHG emission reductions from the project activity is around 136,936 tonnes of CO₂e and total GHG emission reductions for the chosen 10-year crediting period is 1,369,360 tonnes of CO₂e.

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

In the Pre- project scenario the entire electricity, delivered to the grid by the project activity, had otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources.

The earliest commissioning date is 31-March-2014, the detailed date of commissioning is mentioned over section **Error! Reference source not found.** of this report. The project is running smoothly since commissioning having regular and schedule maintenance. During the current monitoring period, the project generated 86,750.29 MWh of electricity and 84,754 tCO₂e emissions have been avoided. The major breakdown is being mentioned over APPENDIX II: MAJOR BREAKDOWN DETAILS.

The Audit History for the project activity is as such-

Audit Type	Period	Program	VVB Name	Number of years
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Validation	31-March-2014 to 30-March-2024	VCS	LGAI Technological Center S.A	10 years 00 Months 00 Days
1 st Verification	31-March-2014 to 01-March-2016	VCS	LGAI Technological Center S.A	01 Year 11 Months 02 Days
2 nd Verification	02-March-2016 to 01-February-2017	VCS	Carbon Check (India) Private Ltd	00 Years 11 Months 00 Days
3 rd Verification	02-February-2017 to 01-February-2018	VCS	LGAI Technological Center S.A.	00 Years 11 Months 00 Days
4 th Verification	02-February-2018 to 28-February-2019	VCS	Earthood Services Private Limited	01 Years 00 Months 27 Days
5 th Verification	01-March-2019 to 29-February-2020	VCS	4K Earth Science Private Limited	01 Year 00 Month 00 Days
6 th Verification	01-March-2020 to 31-December-2020	VCS	KBS Certification Services Pvt. Ltd.	00 years 10 Months 00 Days
7 th Verification	01-January-2021 to 31-October-2021	VCS	LGAI Technological Center S.A.	00 Years 10 Months 00 Days
8 th Verification	01-November-2021 to 31-October-2022	VCS	VKU Certification Pvt. Ltd	01 Years 00 Month 00 Days
9 th Verification	01-November-2022 to 31-July-2023 (Current Monitoring Period)	VCS	LGAI Technological Center S.A	00 Years 09 Months 00 Days
Total	31-March-2014 to 31-July-2023	VCS	-	Verification – 9 Years 04 Months 01 Days

1.2 Sectoral Scope and Project Type

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

Sectoral Scope : 01 - Energy industries (renewable / non-renewable sources)
 Project Type : I - Renewable Energy Projects
 Project Category : ACM0002: Grid-connected electricity generation from renewable sources - Version 16.0¹

The project is not a grouped project activity.

1.3 Project Proponent

Organization name	Panama Wind Energy Godawari Private Limited
Contact person	Mr. Ashok Shintre
Title	Head Asset Management
Address	Viman Nagar 1 st Floor, Lunkad Towers, Pune Maharashtra 411 014
Telephone	+91 20 26125060
Email	ashok.shintre@o2power.in

1.4 Other Entities Involved in the Project

Organization name	EKI Energy Services Limited
Role in the Project	Project Consultant
Contact person	Mr. Vipul Sahu
Title	Project Manager
Address	Office No 201, Plot No 48, Scheme 78, Vijay Nagar Part- II, Indore 452010, India
Telephone	+91-91111112889
Email	registry@enkingint.org , vipul.sahu@enkingint.org

¹ <http://cdm.unfccc.int/methodologies/DB/EY2CL7RTEHRC9V6YQHLLAR6MJ6VEU83>

1.5 Project Start Date

Project Start Date: 31-March-2014.

The project start date is the date on which first WTG was commissioned under the Project activity.

S. No.	Machine ID	DOC ²	Village	Taluka	District	State
1	G 1	07-October-2014	Mulukwadi	Georai	Beed	Maharashtra
2	G 2	07-October-2014	Mulukwadi	Georai	Beed	Maharashtra
3	G 3	07-October-2014	Mulukwadi	Georai	Beed	Maharashtra
4	G 4	07-October-2014	Mulukwadi	Georai	Beed	Maharashtra
5	G 5	06-September-2014	Khoipti	Georai	Beed	Maharashtra
6	G 6	07-October-2014	Mulukwadi	Georai	Beed	Maharashtra
7	G 7	07-October-2014	Mulukwadi	Georai	Beed	Maharashtra
8	G 8	07-October-2014	Mulukwadi	Georai	Beed	Maharashtra
9	G 9	07-October-2014	Mulukwadi	Georai	Beed	Maharashtra
10	G 10	07-October-2014	Mulukwadi	Georai	Beed	Maharashtra
11	G 11	07-October-2014	Mulukwadi	Georai	Beed	Maharashtra
12	G 12	07-October-2014	Manmodi	Georai	Beed	Maharashtra
13	G 13	07-October-2014	Manmodi	Georai	Beed	Maharashtra
14	G 14	06-September-2014	Manmodi	Georai	Beed	Maharashtra
15	G 15	06-September-2014	Manmodi	Georai	Beed	Maharashtra
16	G 16	07-October-2014	Manmodi	Georai	Beed	Maharashtra
17	G 17	06-September-2014	Manmodi	Georai	Beed	Maharashtra
18	G 18	07-October-2014	Manmodi	Georai	Beed	Maharashtra
19	G 19	07-October-2014	Khoipti	Georai	Beed	Maharashtra
20	G 20	07-October-2014	Manyarwadi	Georai	Beed	Maharashtra
21	G 21	05-October-2014	Khoipti	Georai	Beed	Maharashtra
22	G 22	06-September-2014	Rajpimpri	Georai	Beed	Maharashtra
23	G 23	06-September-2014	Rajpimpri	Georai	Beed	Maharashtra
24	G 24	31-March-2014	Rajpimpri	Georai	Beed	Maharashtra
25	G 25	31-March-2014	Rajpimpri	Georai	Beed	Maharashtra
26	G 26	25-July-2014	Bangali Pimpla	Georai	Beed	Maharashtra
27	G 27	25-July-2014	Sindkhed	Georai	Beed	Maharashtra
28	G28	25-July-2014	Kombadwadi	Georai	Beed	Maharashtra
29	G 29	31-March-2014	Kombadwadi	Georai	Beed	Maharashtra
30	G 30	31-March-2014	Devimpri	Georai	Beed	Maharashtra
31	G 31	31-March-2014	Kombadwadi	Georai	Beed	Maharashtra
32	G 32	25-July-2014	Sushi	Georai	Beed	Maharashtra
33	G 33	31-March-2014	Sushi	Georai	Beed	Maharashtra
34	G 34	31-March-2014	Sushi	Georai	Beed	Maharashtra

² Date Of commissioning

35	G 35	31-March-2014	Sushi	Georai	Beed	Maharashtra
36	G 36	31-March-2014	Sushi	Georai	Beed	Maharashtra
37	G 37	31-March-2014	Kumbhejalgaon	Georai	Beed	Maharashtra
38	G 38	25-July-2014	Sushi	Georai	Beed	Maharashtra
39	G 39	31-March-2014	Kumbhejalgaon	Georai	Beed	Maharashtra
40	G 40	31-March-2014	Bangalipimpla	Georai	Beed	Maharashtra

1.6 Project Crediting Period

Crediting period Start Date : 31-March-2014

Crediting Period End date : 30- March-2024

Total number of years : 10 Years (Renewable)

Monitoring Period No : 9th periodical verification

The project activity adopts renewable crediting period of 10 years period which can be renewed for maximum 2 times.

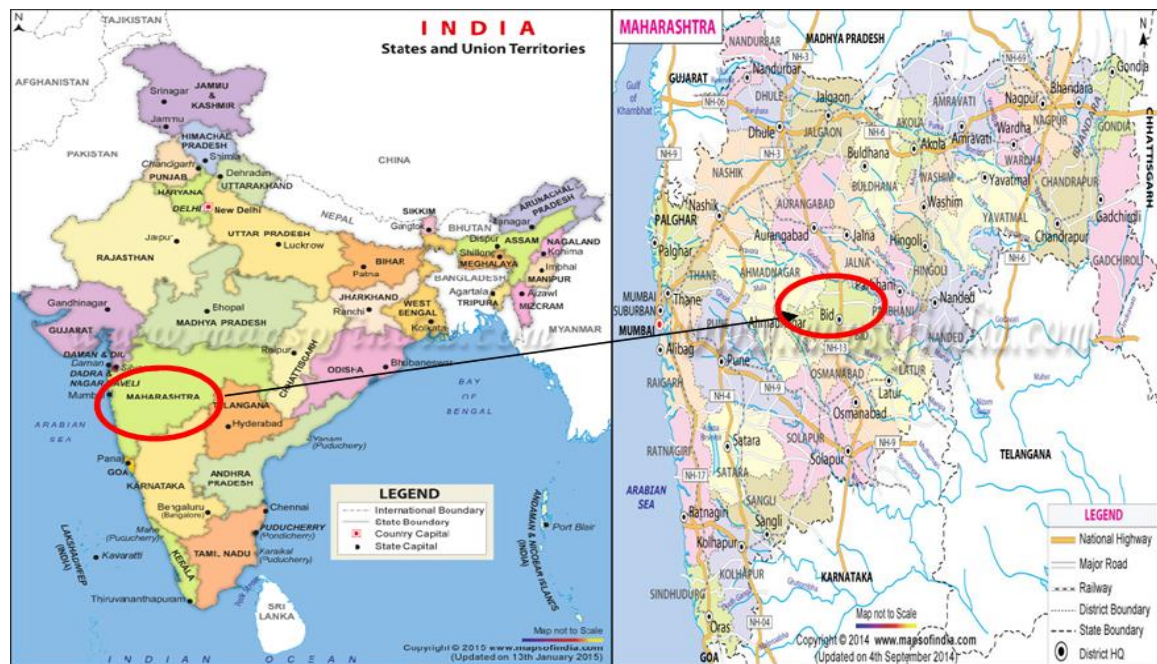
1.7 Project Location

The Geo-Coordinates of all the WTGs involved in the project activity is provided in the table below:

Sr. No.	Location No.	Village	Taluka	District	Latitude (D° M' Sec")	Longitude (D° M' Sec")
1.	G01	Mulukwadi	Georai	Beed	N19 11 35.6	E75 43 38.4
2.	G02	Mulukwadi	Georai	Beed	N19 11 12.3	E75 42 57.5
3.	G03	Mulukwadi	Georai	Beed	N19 11 50.0	E75 43 19.7
4.	G04	Mulukwadi	Georai	Beed	N19 11 30.1	E75 43 13.9
5.	G05	Khopti	Georai	Beed	N19 13 35.5	E75 41 23.4
6.	G06	Mulukwadi	Georai	Beed	N19 11 59.1	E75 43 35.4
7.	G07	Mulukwadi	Georai	Beed	N19 11 20.6	E75 43 40.8
8.	G08	Mulukwadi	Georai	Beed	N19 11 59.5	E75 43 07.2
9.	G09	Mulukwadi	Georai	Beed	N19 12 04.9	E75 42 37.4
10.	G10	Mulukwadi	Georai	Beed	N19 12 24.6	E75 43 13.1
11.	G11	Mulukwadi	Georai	Beed	N19 12 38.0	E75 43 18.6
12.	G12	Manmodi	Georai	Beed	N19 12 23.5	E75 42 36.7
13.	G13	Manmodi	Georai	Beed	N19 12 36.0	E75 42 18.5
14.	G14	Manmodi	Georai	Beed	N19 12 50.5	E75 42 24.3
15.	G15	Manmodi	Georai	Beed	N19 12 59.8	E75 42 10.8
16.	G16	Manmodi	Georai	Beed	N19 13 17.1	E75 42 10.1
17.	G17	Manmodi	Georai	Beed	N19 13 22.3	E75 41 58.6
18.	G18	Manmodi	Georai	Beed	N19 13 29.6	E75 42 29.3
19.	G19	Khopti	Georai	Beed	N19 13 41.9	E75 42 19.2

Sr. No.	Location No.	Village	Taluka	District	Latitude (D° M' Sec")	Longitude (D° M' Sec")
20.	G20	Manyarwadi	Georai	Beed	N19 13 45.5	E75 42 59.5
21.	G21	Khopti	Georai	Beed	N19 14 06.3	E75 41 40.6
22.	G22	Rajpimpri	Georai	Beed	N19 13 54.1	E75 41 27.6
23.	G23	Rajpimpri	Georai	Beed	N19 13 46.6	E75 41 03.1
24.	G24	Rajpimpri	Georai	Beed	N19 13 34.5	E75 40 24.8
25.	G25	Rajpimpri	Georai	Beed	N19 13 23.9	E75 40 11.5
26.	G26	Bangali Pimpla	Georai	Beed	N19 12 40.0	E75 37 28.9
27.	G27	Sindkhed	Georai	Beed	N19 13 09.5	E75 40 21.9
28.	G28	Kombadwadi	Georai	Beed	N19 13 25.4	E75 39 28.6
29.	G29	Kombadwadi	Georai	Beed	N19 13 43.7	E75 39 29.9
30.	G30	Devimpri	Georai	Beed	N19 13 51.7	E75 39 06.1
31.	G31	Kombadwadi	Georai	Beed	N19 13 57.4	E75 39 33.0
32.	G32	Sushi	Georai	Beed	N19 12 16.2	E75 37 44.2
33.	G33	Sushi	Georai	Beed	N19 12 59.5	E75 38 47.3
34.	G34	Sushi	Georai	Beed	N19 13 14.9	E75 38 57.3
35.	G35	Sushi	Georai	Beed	N19 13 12.2	E75 38 26.2
36.	G36	Sushi	Georai	Beed	N19 13 27.1	E75 38 20.9
37.	G37	Kumbhejalgaon	Georai	Beed	N19 13 34.4	E75 38 00.3
38.	G38	Sushi	Georai	Beed	N19 12 49.7	E75 38 08.6
39.	G39	Kumbhejalgaon	Georai	Beed	N19 13 04.7	E75 37 53.8
40.	G40	Bangalipimpla	Georai	Beed	N19 12 58.0	E75 37 31.5

The project locations have been shown in the map below:



1.8 Title and Reference of Methodology

For Methodology:

Title - Grid-connected electricity generation from renewable sources

Reference – ACM0002

Version – 16.0, Sectoral Scope: 01, EB 81, Annex 9³

The project activity also taken references from the following Tools from the tools prescribed by applied methodology:

1. Title - Tool for the demonstration and assessment of additionality

Reference – TOOL 01

Version - Version 07.0.0, EB 70, Annex 8⁴

2. Title - Tool to calculate the emission factor for an electricity system

Reference – TOOL 07

Version – 05.0, EB 87, Annex 09⁵

1.9 Participation under other GHG Programs

The Project has applied for the CDM⁶ under the Kyoto protocol which was under validation stage during 2013, however the PP did not continue the CDM validation and existing contract of CDM validation is terminated with VVB. The project completed the validation and continued verification in Verra.

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

The project has not included in National or International Emission Trading Programs and Other Binding Limits. The project activity is not availing any REC benefits and the same can be confirmed from publicly available link of REC generators.

PP does not avail other forms of environmental credit for the same crediting period under consideration. The project is now only eligible to create National Renewable Energy Certificate in which PP has not applied. The same be cross-checked with the Web-link: https://www.recregistryindia.nic.in/index.php/publics/accredited_regens.

³ <https://cdm.unfccc.int/methodologies/DB/EY2CL7RTEHRC9V6YQHAR6MJ6VEU83>

⁴ <https://cdm.unfccc.int/methodologies/PAMethodologies/tools/am-tool-01-v7.0.0.pdf>

⁵ <https://cdm.unfccc.int/methodologies/PAMethodologies/tools/am-tool-07-v5.0.pdf>

⁶ <https://cdm.unfccc.int/Projects/Validation/DB/3EXK45ZD9TYCX75US5098OUPIT809D/view.html>

1.11 Sustainable Development Contributions

The project activity has beneficial effect on the local environment and employment in the nearby region. Clean Electricity generation through Wind technology result in avoidance of consumption of fossil fuels which results in contribution to SDG 7. The emission avoidance through these activities results in contribution to SDG 13. All the workers at site are trained which results in increase of skills, which contributes to SDG 4. Detailed indicators are mentioned in table 1. This is a voluntary project activity doesn't contribute to achieving any nationally stated sustainable development priorities. There is no compliance for monitoring and reporting the emission reduction and SDG contribution from the project activity.

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	About 86,750.29 MWh renewable electricity has been supplied to Indian grid during the reported period that helps to increase the renewable energy share in the energy mix.	Overall, 164,177.23 MWh (77,426.94+86,750.29) renewable electricity has been supplied to Indian grid that helps to increase the renewable energy share in the energy mix.
2)	4.4	4.4.1: Proportion of youth and adults with information and communication technology (ICT) skills, by type of skills	Implemented activities to increase	Together with the technology supplier, the Project organize 10 training during current monitoring period. Training related to soft and technical skills.	Overall, 17 trainings (7+10) are provided.
3)	13.0	Total greenhouse gas emissions avoided or removed.	Implemented activities to increase	By supplying 86,750.29 MWh of clean electricity (generated through wind energy based.) to Indian grid, the project avoided release of 84,754 tCO ₂ e in to the atmosphere during the reporting period.	Overall prevented the release of 160,400 tCO ₂ e (75,646 +84,754) into the atmosphere.

2 SAFEGUARDS

2.1 No Net Harm

The project activity does not involve any major construction activity. It primarily requires the installation of the WTGs, interfacing the generators with the State Electricity Board by setting up HT transmission lines and installation of other accessories.

Section 3.3 and 3.4 report on “Developmental Impacts and Sustainable Governance Aspects of Renewable Energy Projects” prepared by MNRE dated September 2013. This report clearly mentioned that wind power project activity operations do not result in direct air pollution, noise pollution.

Please refer web-link (<https://smartnet.niua.org/sites/default/files/resources/report-on-developmental-impacts-of-RE.pdf>) for above report.

Thus, there are no any potential negative environmental and socio-economic significant impacts due to implementation of project activity on air, water, soil quality and ambience are envisaged due to the project activity.

2.2 Local Stakeholder Consultation

As a part of continuous feedback from stakeholders, mechanism was established to consider and implement grievances or inputs received from the local stakeholders. Meeting with local stakeholder and continuous grievance is a part of stakeholder engagement. In-case of physical meeting, a prior information to concern authorities, meeting notice, formal telephonic call are made in order to remind and extract maximum engagement. The participation and feedbacks are logged in an attendance register and feedback registers respectively. The overall responsibility lies with Site In-charge under the supervision from the Head Office team. In case of grievances, the nature of probable resolution is discussed with the plant head office and implemented by the site in-charge. The responsibilities included invitations, follow-up, organizing meeting, feedbacks, documentation and successful grievance redressal, if any. The physical meeting was organized at the time of validation and the information are presented over registered PD. The local stakeholders were informed about the continuous grievance mechanisms and the contact information for the site representative is shared.

The stakeholders of the project activity were invited to attend the stakeholder meeting on 27/06/2013 through newspaper advertisement (in Lokprasna, dated 20/06/2013). Personal invitations were also sent to the prominent members of the regions in the vicinity. A stakeholder meeting was held at Beed district on 27/06/2013, involving the local stakeholders. The meeting was attended by local villagers, panchayat members and representatives of Panama Wind Energy Godawari Private Limited. The stakeholders were explained about the project activity and the

various benefits arising out of the project activity. A discussion was held in which the views of the local stakeholders were addressed.

The PP also placed a grievance register onsite in where the stakeholder can put down his/her complain and the same if found genuine have to address immediately. For the global stakeholders, the suggestion and the grievance can be submitted to ashok.shintre@o2power.in. There were no other comments logged by the local stakeholders for the current and prior monitoring periods. The grievance register copy is shared with VVB.

2.3 AFOLU-Specific Safeguards

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

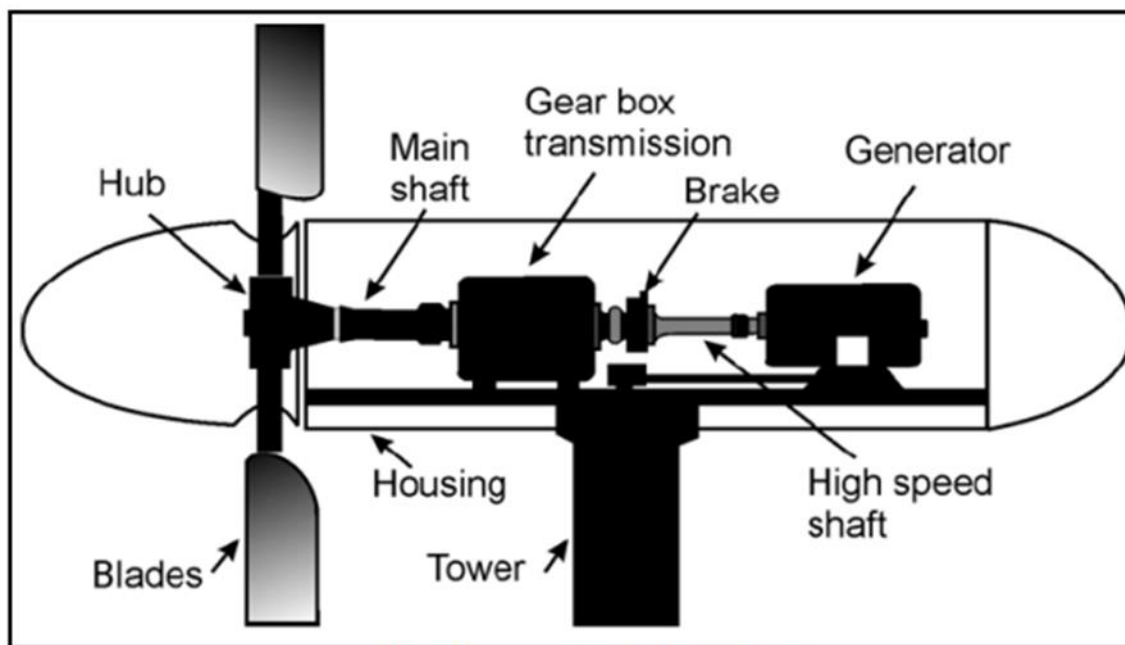
3 IMPLEMENTATION STATUS

3.1 Implementation Status of the Project Activity

The Project activity is a new facility (Greenfield) and the electricity generated by the Project is being exported to the Unified National Grid. The Project therefore displaces an equivalent amount of electricity which had otherwise been generated by fossil fuel dominant electricity grid. The Project Proponent plans to avail the VCS benefits for the Project.

In wind energy generation, kinetic energy of wind is converted into mechanical energy and subsequently into electrical energy. Wind has considerable amount of kinetic energy when blowing at high speeds. This kinetic energy when passes through the blades of the wind turbines, it is converted into mechanical energy and rotates the wind blades. When the wind blades rotate, the connected generator also rotates, thereby producing electricity.

During the current monitoring period, the project generated 86,750.29 MWh of electricity and 84,754 tCO₂e emissions have been avoided. The earliest commissioning date is 31-March-2014. The achieved GHG emission is 17.25 % is lower than the estimated value due to Major breakdowns of WTG the details of which is added in Appendix-II.



Major Mechanical Parts of a Wind Turbine

The total installed capacity of the project is 80 MW; which involves operation of 40 Wind Turbine Generators (WTGs) with capacity of 2 MW each located at Maharashtra state in India.

Wind Power Project Technology Details –

The technology employed, converts wind energy to electrical energy. In wind power generation, energy of wind is converted into mechanical energy and subsequently into electrical energy. The technology is an environment friendly technology since there are no GHG emissions associated with the electricity generation. There is no transfer of technology involved in the project activity.

The project activity comprises a total of 40 WTG's of Gamesa India Limited. The commissioning of the project activity has been completed and details are mentioned in section 1.5.

Technical details for Gamesa G97-2.0 MW, 2000 KW Machine

Particulars	Details
Model	Gamesa G97-2.0 MW
Rated Power	2000kW
Diameter	97 m
Swept Area	7,390 m ²
Rotational Speed	9.6 - 17.8 rpm
Design Lifetime	25 years

Power generated by the wind turbines is collected at 33 kV and fed to pooling substation near Rajpimpri village (5 kms away), where it is stepped up to 132kV. The pooling station itself is then connected to 132 kV grid at MSETCL existing Substation Georai.

Emission Reductions from anthropogenic sources:

The wind power generated from the Project is displacing the electricity generated from thermal power stations feeding into Unified National Grid and is replacing the usage of diesel generators for meeting the power demand during shortage periods. Since, the wind power is Green House Gas (GHG) emissions free, the power generated prevents the anthropogenic GHG emissions generated by the fossil fuel based thermal power stations comprising coal, diesel, furnace oil and gas. The estimation of GHG reductions by this project is limited to carbon dioxide (CO₂) only.

The achieved GHG emission is 17.25 % is lower than the estimated value, attribute to a significant Breakdown of WTG. Further details about this breakdown is being mentioned in APPENDIX II: MAJOR BREAKDOWN DETAILS.

3.2 Deviations

3.2.1 Methodology Deviations

No methodology deviation is applied during previous and current monitoring period.

3.2.2 Project Description Deviations

Deviation 01 : The 12 WTGs commissioned on 31-March-2014 for locations G 33, G 34, G 35, G 36, G 37, G 39, G 40 connected to feeder -01 (actual) and G 24, G 25, G 29, G 30, G 31 connected to feeder -02 at the 132/99 kv Rajpimpri Substation in the Georai Taluka of Beed district, However, during the issuance of the commissioning certificates, there was an error in the feeder numbers provided. This mistake was subsequently identified and rectified by the Maharashtra State Electricity Distribution Company Limited on 19-January-2021. Also, Feeder shifting letter is being provided to verification team.

Id and new feeder connectivity with actual WTGs location:

Feeder connectivity Details	Old WTGs connected to feeder as per Commissioning Certificate	New/Actual WTGs connected to feeder as per Credit note and Site practice.
Feeder Number: 01	G24, G25, G29, G30, G31, G38, G26, G32	G33, G34, G35, G36, G37, G39, G40, G26, G32, G38
Feeder Number: 02	G27, G28, G21, G05, G22, G23, G33, G34, G35, G36, G37, G39, G40	G24, G25, G29, G30, G31, G27, G28, G05, G22, G23, G21

The deviation does not negatively impact the conservativeness of the quantification of GHG emission reductions or removals and the deviations relate only to the criteria and procedures for monitoring or measurement, and do not relate to any other part of the methodology. Deviation does not alter additionality, calculation of emission reduction and the project design. The nature of this deviation is permanent.

3.3 Grouped Projects

The project is not a grouped project thus this is not applicable.

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 10, December 2014 ⁷
Value applied	0.9862
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 05.0.0” as 3-year generation weighted average using data for the years 2011-2012, 2012-2013 & 2013-2014. The data are obtained from “CO ₂ Baseline Database for Indian Power Sector” version 10.0, 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 10, December 2014 ⁷
Value applied	0.9495
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 05.0.0” for the year 2013-2014. The data is obtained from “CO ₂ Baseline Database for Indian Power Sector” version 10.0, 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.

⁷ https://cea.nic.in/wp-content/uploads/baseline/2020/07/user_guide_ver10.pdf

Data / Parameter	$EF_{grid,CM,y}$
Data unit	tCO ₂ /MWh
Description	Combines Margin CO ₂ emission factor in year y
Source of data	Calculated from CEA database, Version 10, December 2014 ⁷
Value applied	0.9770
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	Quantity of net electricity generation supplied by the project (Wind) plant/unit to the grid during monitoring period
Source of data	Joint meter readings by Maharashtra State Electricity Distribution Company Limited (MSEDCL)
Description of measurement methods and procedures to be applied	The value of net electricity generation supplied to the grid as per Joint Meter Reading Report forms the basis for calculation of the emission reductions; which can be cross checked from the invoice raised to DISCOM (Maharashtra State Electricity Distribution Company Limited). Net electricity supplied to grid is calculated as the difference of the measured values of “export” and “import” of electricity through the dedicated SEB energy meter installed at the delivery point (i.e., the connected substation). Net electricity generated and supplied by the project (Wind) plant/unit to the grid = Electricity Export to the grid – Electricity Import from the grid

	Monthly meter readings are taken from the main and check meter installed at the substation and certified by the representatives of State Electricity Board (SEB) Officials and the representatives of the project proponent. for apportioning procedure refer section 4.3 of the registered PD.
Frequency of monitoring/recording	Continuous monitoring, hourly measurement and at least monthly recording.
Value monitored	86,750.29
Monitoring equipment	Monitoring: Tri vector meter ⁸ is used Data type: Measured Type of meter: Static type meter (Main & Check). Both are Bidirectional meters. Class of meter: 0.2s
QA/QC procedures to be applied	The energy meter readings are taken on a monthly basis Energy meters is be calibrated once in five year and faulty meters are replaced immediately. All the energy meters are under the control of the state utility and calibration of energy meters is also under the jurisdiction of state utility. The Net electricity exported to the grid and cross checked against the invoice raised by the PP towards the DISCOM The details of main meter and check meter are provided in section APPENDIX I: Calibration Records
Purpose of the data	Calculation of Baseline emissions
Calculation method	Net generation (MWh) = Export (MWh) - Import (MWh)
Comments	The data is being archived electronically and maintained for the entire crediting period plus two years.

4.3 Monitoring Plan

Aim of monitoring:

The monitoring methodology specified in the methodology requires that the project-monitoring plan to consist of monitoring of quantity of net electricity supplied to the grid in the year y. In order to monitor the mitigation of GHG due to the project activity, the total energy exported needs to be measured. The net energy supplied to grid by the project activity multiplied by emission factor for regional grid, results in forming the baseline for the project activity. Supervisory control and data

⁸ The details of main meter and check meter are provided in section APPENDIX I: Calibration Records.

acquisition (SCADA) s used for continuous monitoring and the JMR is prepared based upon the controller data upon the approval of the concerned authorities.

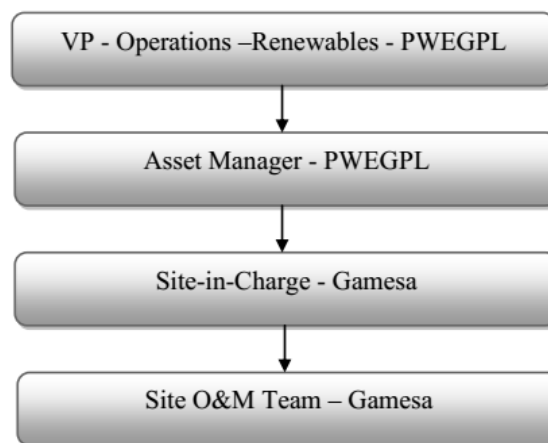
Since the baseline emission factor is based on an ex-ante determination, monitoring of this parameter is not required. The sole parameter for monitoring is the net electricity exported to the grid.

Monitoring roles and responsibilities

The operational and management structure implemented for data monitoring is as follows:

The monitoring plan is developed in accordance with the modalities and procedures for CDM project activities and is proposed for grid-connected wind power project being implemented in Maharashtra, India. The monitoring plan, which is implemented by the project proponent describes about the monitoring organization, parameters to be monitored, monitoring practices, quality assurance, quality control procedures, data storage and archiving.

The authority and responsibility for registration, monitoring, measurement, reporting and reviewing of the data rests with the project proponent. PP proposed the following structure for data monitoring, collection, data archiving and calibration of equipment's for this project activity. The team comprises of the following members:



PP has assigned the responsibility of operation and maintenance of WTGs to Gamesa wind turbines private limited.

Responsibilities of Head: Overall functioning and maintenance of the project activity.

Responsibilities of Plant In-charge: Responsibility for Maintains the data records, ensures completeness of data, and reliability of data (calibration of equipment's).

Responsibilities of Shift In-charge: Responsibility for day-to-day data collection and maintains day to day log book for monitored data.

Procedures for internal audit of compliance with monitoring procedures

An internal audit team comprising of the VP-Operations, Asset Manager and other members (if needed by the VP-Operations) are independently conduct internal audit of monitored data. The

internal audit is conducted atleast once every year and more than once if required by the VP-Operations.

The internal audit team is reviewing all the records pertaining to energy production, exports, imports. The team is also checking the monitoring equipment's for accuracy and whether calibration was performed.

The Site-in-charge in association with the Site O&M Team is answering all the queries raised by the internal audit team

The internal audit team has communicated to the Site-in-charge and Site O&M Team about the non-compliances (if any) with the monitoring plan. The internal audit team are also suggesting corrective actions and indicate areas of improvement to the personnel involved in monitoring the data.

Site-in-charge is close the non-conformances prior to the verification visit by the DOE

QA/QC procedures:

The energy meters at the feeders are maintained and owned by Maharashtra State Electricity Board (MSEB). Neither the project proponent nor the site personnel have any control over it. The records are cross-checked with the records of sold electricity to MSEDCL. The meters are calibrated by MSEB at-least once in five years.

Data Archiving:

Monthly data is being archived electronically and in paper form and stored for the entire crediting period and two years thereafter.

Training and maintenance requirements:

Training on the machine is an essential pre-requisite, to ensure necessary safety of man and machine. Further, in order to maximize the output from the WTGs, it is extremely essential, that the engineers and technicians understand the machines and keep them in good health. In order to ensure, that O&M team is deft at handling technical snags on top of the turbine, the necessity of ensuring that they are capable of climbing the tower with absolute ease and comfort has been established. Each and every site personnel is provided with proper training to meet the requirements of the Operations and maintenance. This ultimately leads to creativity in problem solving.

A monthly joint meter reading of the energy meters is taken by MSEDCL officials and O&M contractors (representatives of the project investor). Apportioning of net electricity generation from each WTG connected to Unified National Grid grid is then determined as follows:

1	Apportioning Ratio	=	$\frac{\text{Generation at WTG Controller}}{\text{Total Generation of All WTG Controller for the feeder}}$
2	Electricity Import from WTG by the grid (EG_{import})	=	Import from Main/Check Meter * Apportioning Ratio
3	Electricity Export to the WTGs by the grid (EG_{export})	=	Export from Main/Check Meter * Apportioning Ratio

4	Net electricity generated by WTG	=	Electricity Import from WTG by the grid – Electricity Export to the WTGs by the grid
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Above steps for calculation of EG_{import} and EG_{export} are carried out by MSEDCL Officials & energy break-up sheet is issued by the MSEDCL Officials. Based on the break-up sheets Project investor raises invoice to DISCOM which forms the cross-check for the net electricity generated. The Project investor has no role in the entire procedure of apportioning

Emergency Preparedness and Uncertainty Procedure:

In case Main meter or check meter is found to be outside the acceptable limits of accuracy or faulty or not functioning properly, it is being repaired, recalibrated or replaced as soon as possible. In the event that the Main meter is not in service as a result of maintenance, repairs or calibration, the check meter is being used. In case both the main and check meter are found to be outside the acceptable limits of accuracy or faulty or not functioning properly, both the meters shall be calibrated immediately and the error percentage found in the main meter during its calibration shall be applied to its metered energy data for the entire period since its last calibration to obtain the corrected value of net electricity exported to the grid. However, no such case has been observed.

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

- Apportioning the net electricity exported to grid, as recorded in the consolidated Share Certificate / JMR Report / Credit Notes certified by the respective state DISCOM, based on the number of days in the monitoring period and the number of days for which Share Certificate / JMR Report / Credit Notes was prepared.

The calculated value after apportioning is being used for calculation of emission reductions during that period.

WTG Location ID	Feeder Name	Feeder Connectivity	Single Line Block Diagram
Location No: G33, G34, G35, G36, G37, G39, G40, G26, G32, G38	401	Feeder No. 1	
Location No: G24, G25, G29, G30, G31, G27, G28, G05, G22, G23, G21	402	Feeder No. 2	
Location No:	403	Feeder No. 3	

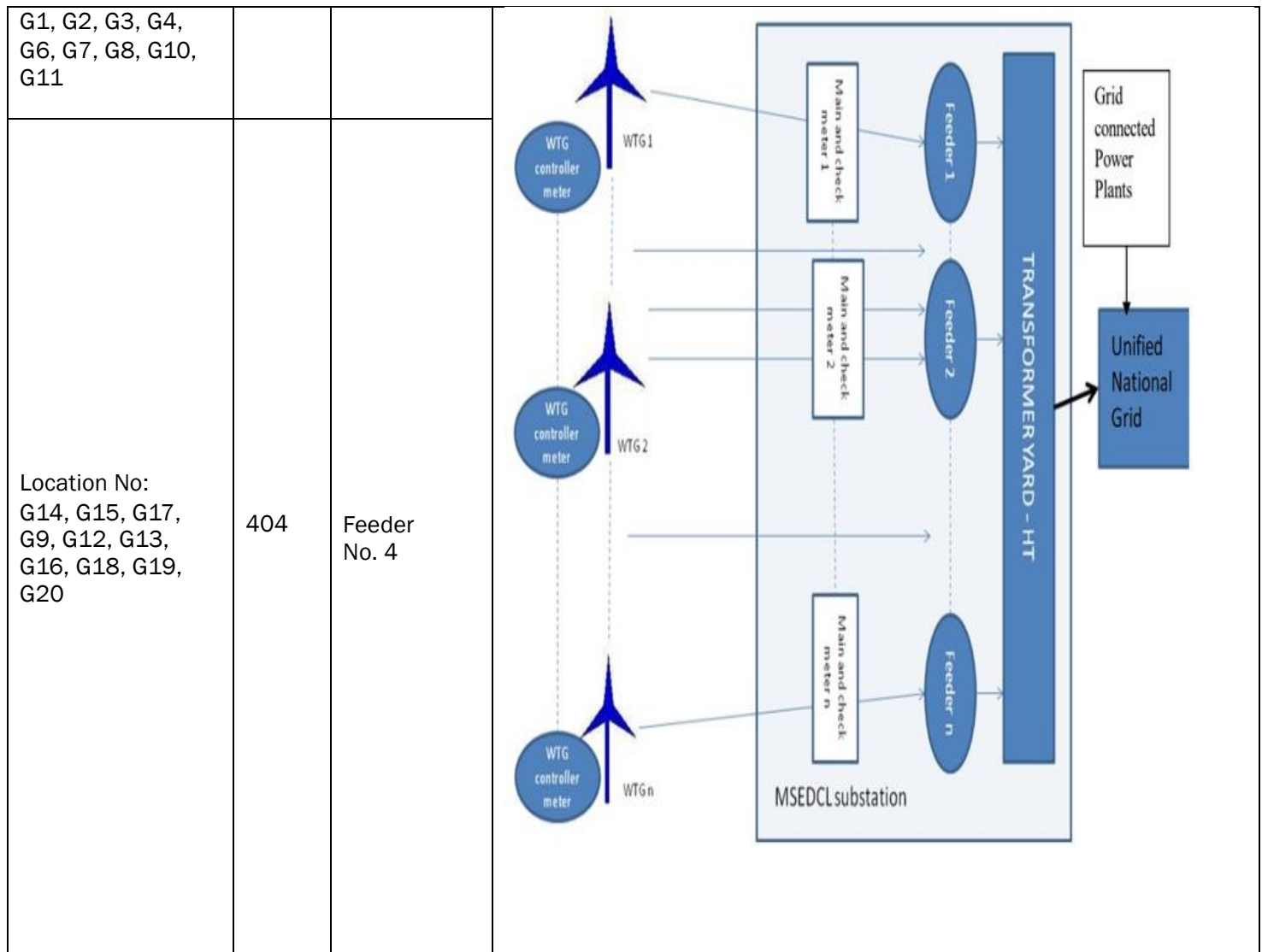


Figure 1. Line Diagram to show the monitoring system

5 QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS

5.1 Baseline Emissions

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

Where,

BE_y : Baseline emissions in year y (tCO₂e/yr)

- $EG_{PJ, y}$: Quantity of net electricity generation that is produced and fed into the grid as a result of the implementation of the VCS project activity in year y (MWh/yr)
- $EF_{grid, CM, y}$: Combined margin CO₂ emission factor for grid connected power generation in year y calculated using the latest version of the “Tool to calculate the emission factor for an electricity system” (tCO₂e/MWh)

Parameter	Unit	Value
$EG_{PJ, y}$	MWh	86,750.29
$EF_{grid, CM, y}$	tCO ₂ e/MWh	0.9770
	=	86,750.29 * 0.9770
	=	84,754 tCO ₂ e (Rounded down)

5.2 Project Emissions

The Project emission calculation as per para 35 of ACM0002 version 16,

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

Where,

$$PE_y = \text{Project emissions in year y (tCO}_2\text{e/year)}$$

$$PE_{FF, y} = \text{Project emissions from fossil fuel consumption in year y (tCO}_2\text{e/year)}$$

$$PE_{GP, y} = \text{Project emission from the operation of geothermal power plants due to the release of non-condensable gases in year y (tCO}_2\text{e/year)}$$

$$PE_{HP, y} = \text{Project emissions from water reservoirs of hydro power plants in year y (tCO}_2\text{e/year)}$$

$PE_{FF, y} = 0$, As per para 37 of ACM0002 version 16, “For all renewable energy power generation project activities, emissions due to the use of fossil fuels for the backup generator can be neglected”

$PE_{GP, y}$ = Not applicable for the wind power Projects

$PE_{HP, y}$ = Not applicable for the wind power Projects

Therefore, $PE_y = 0$

5.3 Leakage

As per para 60 of ACM0002 version 16, No leakage emissions need to be considered for the project activity.

5.4 Net GHG Emission Reductions and Removals

The Formula used to calculate the net emission reduction for the project activity is

$$ER_y = BE_y - PE_y$$

Where,

ER_y = Emission Reduction in tCO₂/year

BE_y = Baseline emission in tCO₂/year

PE_y = Project emissions in tCO₂/year

For the project activity during the current monitoring period, as per section 5.1

Vintage wise calculation

Duration: 01-Novmeber-2022 to 31-December-2022

$$BE_y = 8,265.68 * 0.977$$

$BE_y = 8,075$ tCO₂e (rounded down values)

Duration: 01-January-2023 to 31-July-2023

$$BE_y = 78,484.61 * 0.977$$

$BE_y = 76,679$ tCO₂e (rounded down values)

Total Baseline: 8,075 tCO₂e + 76,679 tCO₂e

$BE_y = 84,754$ tCO₂e (Rounded down)

$PE_y = 0$ tCO₂e

$$ER_y = BE_y - PE_y$$

$$ER_y = 84,754 \text{ tCO}_2\text{e} - 0 \text{ tCO}_2\text{e}$$

$$ER_y = 84,754 \text{ tCO}_2\text{e}$$

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)
Year 1 (01-Novmeber-2022 to 31-December-2022)	8,075	0	0	8,075
Year 2 (01-January-2023 to 31-July-2023)	76,679	0	0	76,679

Total	84,754	0	0	84,754
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In the year 2022, the achieved emission reduction is notably lower by 64.71% compared to the estimated reduction specified in the registered Project Design Document (PDD) for the corresponding 61-day vintage period. This discrepancy can be attributed to a breakdown. Similarly, for the year 2023, the actual emission reduction is 3.59% lower than the anticipated reduction outlined in the registered PDD for the corresponding 212-day vintage period. This variance is also due to a breakdown.

<u>Ex-ante emissions reductions/removals</u>	<u>Achieved emissions reductions/removals</u>	<u>Percent difference</u>	<u>Justification for the difference</u>
22,885 tCO ₂ e - for monitoring period 01-November-2022 to 31-December-2022	8,075 tCO ₂ e	-64.71%	This is due to Breakdown of the WTGs. The details of the same are available in Appendix II Major Breakdown Details.
79,535 tCO ₂ e - for monitoring period 01-January-2023 to 31-July-2023	76,679 tCO ₂ e	-3.59%	This is due to Breakdown of the WTGs. The details of the same are available in Appendix II Major Breakdown Details.
102,420 tCO ₂ e (Total)	84,754 tCO ₂ e	-17.25 %	This is due to Breakdown of the WTGs. The details of the same are available in Appendix II Major Breakdown Details.

APPENDIX I: CALIBRATION RECORDS

Project Feeder and Calibration Details:

Location: 132 Kv Rajpimpri S/s				Class of Meter: 0.2s		Make & Model: Elster A 1800	
WTG Location ID	Feeder Name	No. of WTGs	Feeder Connectivity	Main Meter Sr. No.	Check Meter Sr. No.	Calibration date	Validity of Calibration
Location No: G33, G34, G35, G36, G37, G39, G40, G26, G32, G38	401	10	Feeder No. 1	5288748	5288752	21-August-2020	20-August-2025
Location No: G24, G25, G29, G30, G31, G27, G28, G05, G22, G23, G21	402	11	Feeder No. 2	5288749	5288753	21-August-2020	20-August-2025
Location No: G1, G2, G3, G4, G6, G7, G8, G10, G11	403	09	Feeder No. 3	5288750	5288751	21-August-2020	20-August-2025
Location No: G14, G15, G17, G9, G12, G13, G16, G18, G19, G20	404	10	Feeder No. 4	5288754	5288755	21-August-2020	20-August-2025

APPENDIX II: MAJOR BREAKDOWN DETAILS

Date	Turbine Number	WTG TOTAL DOWN TIME	STOPPAGE DETAILS
02-November-2022	G 08	23:59:20	Error code: 10007 - Manual stop for yawgear replacement work,WIP From 00:00 to 23:59
03-November-2022	G 08	23:59:20	Error code: 10007 - Manual stop for yawgear replacement work,WIP From 00:00 to 23:59
03-November-2022	G 38	23:59:20	Error code: 10007 - Manual stop for oil seal replacement work from 00:00 to 23:59
04-November-2022	G 35	23:59:20	Error Code: 205 - Low level hydraulic group refrigeration oil from 00:00 to 23:59
04-November-2022	G 38	23:59:20	Error code: 10007 - Manual stop for oil seal replacement work from 00:00 to 23:59
05-November-2022	G 35	23:59:20	Error Code: 205 - Low level hydraulic group refrigeration oil from 00:00 to 23:59
05-November-2022	G 38	23:59:20	Error code: 10007 - Manual stop for oil seal replacement work from 00:00 to 23:59
06-November-2022	G 35	23:59:20	Error Code: 205 - Low level hydraulic group refrigeration oil from 00:00 to 23:59
07-November-2022	G 03	23:59:20	Error code:205 - low level hydraulic group refrigeration oil from 00:00 to 23:59
07-November-2022	G 27	23:59:00	Error code:205 - low level hydraulic group refrigeration oil from 00:00 to 23:59
07-November-2022	G 35	23:59:20	Error Code: 205 - Low level hydraulic group refrigeration oil from 00:00 to 23:59
08-November-2022	G 03	23:59:20	Error code:205 - low level hydraulic group refrigeration oil from 00:00 to 23:59
08-November-2022	G 27	23:59:20	Error code:205 - low level hydraulic group refrigeration oil from 00:00 to 23:59
08-November-2022	G 35	23:59:20	Error Code: 205 - Low level hydraulic group refrigeration oil from 00:00 to 23:59
08-November-2022	G 38	23:59:20	Error Code: 205 - Low level hydraulic group refrigeration oil from 00:00 to 23:59
09-November-2022	G 03	23:59:20	Error code:205 - low level hydraulic group refrigeration oil from 00:00 to 23:59
09-November-2022	G 35	23:59:20	Error Code: 205 - Low level hydraulic group refrigeration oil from 00:00 to 23:59
09-November-2022	G 38	23:59:20	Error Code: 205 - Low level hydraulic group refrigeration oil from 00:00 to 23:59
10-November-2022	G 03	23:59:20	Error code:205 - low level hydraulic group refrigeration oil from 00:00 to 23:59
10-November-2022	G 05	23:49:20	Error code: 5216 - Grid Voltage Failure From 15:21 to 15:31 & Error code: 5209 - SF6 breaker T connector Failure From 00:00 to 15:21 & 15:31 to 23:59

10-November-2022	G 27	23:49:20	Error code: 5216 - Grid Voltage Failure From 15:21 to 15:31 & Error code:205 - low level hydraulic group refrigeration oil from 00:00 to 15:21 & 15:31 to 23:49
10-November-2022	G 35	23:59:20	Error Code: 205 - Low level hydraulic group refrigeration oil from 00:00 to 23:59
10-November-2022	G 38	23:59:20	Error Code: 205 - Low level hydraulic group refrigeration oil from 00:00 to 23:59
11-November-2022	G 03	23:59:20	Error code:205 - low level hydraulic group refrigeration oil from 00:00 to 23:59
11-November-2022	G 05	23:59:20	Error code: 5209 - SF6 breaker T conector Failure From 00:00 to 23:59
11-November-2022	G 27	23:59:20	Error code:205 - low level hydraulic group refrigeration oil from 00:00 to 23:59
11-November-2022	G 35	23:59:20	Error Code: 205 - Low level hydraulic group refrigeration oil from 00:00 to 23:59
12-November-2022	G 03	23:59:20	Error code:205 - low level hydraulic group refrigeration oil from 00:00 to 23:59
12-November-2022	G 05	23:59:20	Error code: 5209 - SF6 breaker T conector Failure From 00:00 to 23:59
12-November-2022	G 35	23:59:20	Error Code: 205 - Low level hydraulic group refrigeration oil from 00:00 to 23:59
13-November-2022	G 03	23:59:20	Error code:205 - low level hydraulic group refrigeration oil from 00:00 to 23:59
13-November-2022	G 05	23:59:20	Error code: 5209 - SF6 breaker Failure From 00:00 to 23:59
13-November-2022	G 35	23:59:20	Error Code: 205 - Low level hydraulic group refrigeration oil from 00:00 to 23:59
14-November-2022	G 05	23:59:20	Error code: 5209 - SF6 breaker Failure From 00:00 to 23:59
14-November-2022	G 35	23:59:20	Error Code: 205 - Low level hydraulic group refrigeration oil from 00:00 to 23:59
15-November-2022	G 05	23:59:20	Error code: 5209 - SF6 breaker Failure From 00:00 to 23:59
15-November-2022	G 35	23:59:20	Error Code: 205 - Low level hydraulic group refrigeration oil from 00:00 to 23:59
16-November-2022	G 05	23:59:20	Error code: 5209 - SF6 breaker Failure From 00:00 to 23:59
16-November-2022	G 19	23:59:20	Error code: 107 - Yawing motor thermal relays from 00:00 to 23:59
16-November-2022	G 35	23:59:20	Error Code: 205 - Low level hydraulic group refrigeration oil from 00:00 to 23:59
16-November-2022	G 38	23:59:20	Error Code: 205 - Low level hydraulic group refrigeration oil from 00:00 to 23:59
17-November-2022	G 05	23:59:20	Error code: 5209 - SF6 breaker Failure From 00:00 to 23:59
17-November-2022	G 19	23:59:20	Error code: 107 - Yawing motor thermal relays from 00:00 to 23:59
17-November-2022	G 35	23:59:20	Error Code: 205 - Low level hydraulic group refrigeration oil from 00:00 to 23:59
17-November-2022	G 38	23:59:20	Error Code: 205 - Low level hydraulic group refrigeration oil from 00:00 to 23:59
18-November-2022	G 05	23:59:20	Error code: 5209 - SF6 breaker Failure From 00:00 to 23:59

18-November-2022	G 35	23:59:20	Error Code: 205 - Low level hydraulic group refrigeration oil from 00:00 to 23:59
18-November-2022	G 38	23:59:20	Error Code: 205 - Low level hydraulic group refrigeration oil from 00:00 to 23:59
19-November-2022	G 35	23:59:20	Error Code: 205 - Low level hydraulic group refrigeration oil from 00:00 to 23:59
19-November-2022	G 38	23:59:20	Error Code: 205 - Low level hydraulic group refrigeration oil from 00:00 to 23:59
20-November-2022	G 35	23:59:20	Error Code: 205 - Low level hydraulic group refrigeration oil from 00:00 to 23:59
20-November-2022	G 38	23:59:20	Error Code: 205 - Low level hydraulic group refrigeration oil from 00:00 to 23:59
21-November-2022	G 35	23:59:20	Error Code: 205 - Low level hydraulic group refrigeration oil from 00:00 to 23:59
21-November-2022	G 38	23:59:20	Error Code: 205 - Low level hydraulic group refrigeration oil from 00:00 to 23:59
22-November-2022	G 38	23:59:20	Error Code: 205 - Low level hydraulic group refrigeration oil from 00:00 to 23:59
23-November-2022	G 38	23:59:20	Error Code: 205 - Low level hydraulic group refrigeration oil from 00:00 to 23:59
24-November-2022	G 38	23:59:20	Error Code: 205 - Low level hydraulic group refrigeration oil from 00:00 to 23:59
25-November-2022	G 38	23:59:20	Error Code: 205 - Low level hydraulic group refrigeration oil from 00:00 to 23:59
26-November-2022	G 38	23:59:20	Error Code: 205 - Low level hydraulic group refrigeration oil from 00:00 to 23:59
27-November-2022	G 12	23:59:20	Error code: 10007 - manual stop for pitch cylinder oil seal replacement work from 00:00 to 23:59
27-November-2022	G 38	23:59:20	Error Code: 205 - Low level hydraulic group refrigeration oil from 00:00 to 23:59
28-November-2022	G 12	23:59:20	Error code: 10007 - manual stop for pitch cylinder oil seal replacement work from 00:00 to 23:59
28-November-2022	G 38	23:59:20	Error code: 10007 - manual stop for pitch cylinder replacement work from 00:00 to 23:59
29-November-2022	G 12	23:59:20	Error code: 10007 - manual stop for pitch cylinder oil seal replacement work from 00:00 to 23:59
29-November-2022	G 38	23:59:20	Error code: 10007 - manual stop for pitch cylinder replacement work from 00:00 to 23:59
30-November-2022	G 12	23:59:20	Error code: 10007 - manual stop for pitch cylinder oil seal replacement work from 00:00 to 23:59
30-November-2022	G 38	23:59:20	Error code: 10007 - manual stop for pitch cylinder replacement work from 00:00 to 23:59
01-December-2022	G 12	23:59:20	Error code: 10007 - manual stop for pitch cylinder oil seal replacement work from 00:00 to 23:59
01-December-2022	G 38	23:59:20	Error code: 10007 - manual stop for pitch cylinder replacement work from 00:00 to 23:59
02-December-2022	G 12	23:59:20	Error code: 10007 - manual stop for pitch cylinder oil seal replacement work from 00:00 to 23:59
02-December-2022	G 38	23:59:20	Error code: 10007 - manual stop for pitch cylinder replacement work from 00:00 to 23:59
03-December-2022	G 12	23:59:20	Error code: 10007 - manual stop for pitch cylinder oil seal replacement work from 00:00 to 23:59

03-December-2022	G 38	23:59:20	Error code: 10007 - manual stop for pitch cylinder replacement work from 00:00 to 23:59
04-December-2022	G 12	23:59:20	Error code: 10007 - manual stop for pitch cylinder oil seal replacement work from 00:00 to 23:59
04-December-2022	G 38	23:59:20	Error code: 10007 - manual stop for pitch cylinder replacement work from 00:00 to 23:59
05-December-2022	G 12	23:59:20	Error code: 10007 - manual stop for pitch cylinder oil seal replacement work from 00:00 to 23:59
05-December-2022	G 38	23:59:20	Error code: 10007 - manual stop for pitch cylinder replacement work from 00:00 to 23:59
06-December-2022	G 12	23:59:20	Error code: 10007 - manual stop for pitch cylinder oil seal replacement work from 00:00 to 23:59
07-December-2022	G 12	23:59:20	Error code: 10007 - manual stop for pitch cylinder oil seal replacement work from 00:00 to 23:59
08-December-2022	G 12	23:59:20	Error code: 10007 - manual stop for pitch cylinder oil seal replacement work from 00:00 to 23:59
09-December-2022	G 12	23:59:20	Error code: 10007 - manual stop for pitch cylinder oil seal replacement work from 00:00 to 23:59
10-December-2022	G 12	23:59:20	Error code: 10007 - manual stop for pitch cylinder oil seal replacement work from 00:00 to 23:59
11-December-2022	G 12	23:59:20	Error code: 10007 - manual stop for pitch cylinder oil seal replacement work from 00:00 to 23:59
12-December-2022	G 12	23:59:20	Error code: 10007 - manual stop for pitch cylinder oil seal replacement work from 00:00 to 23:59
13-December-2022	G 12	23:59:20	Error code: 10007 - manual stop for pitch cylinder oil seal replacement work from 00:00 to 23:59
14-December-2022	G 12	23:59:20	Error code: 10007 - manual stop for pitch cylinder oil seal replacement work from 00:00 to 23:59
14-December-2022	G 31	23:59:00	Error code: 5238 - Error in phase t of the inverter from 00:00 to 23:59
15-December-2022	G 12	23:59:20	Error code: 10007 - manual stop for pitch cylinder oil seal replacement work from 00:00 to 23:59
15-December-2022	G 31	23:59:00	Error code: 5238 - Error in phase t of the inverter from 00:00 to 23:59
16-December-2022	G 12	23:59:20	Error code: 10007 - manual stop for pitch cylinder oil seal replacement work from 00:00 to 23:59
16-December-2022	G 31	23:59:00	Error code: 5238 - Error in phase t of the inverter from 00:00 to 23:59
14-January-2023	G 38	23:59:00	Error Code: 804 - Difference between 2 blades very high from 00:00 To 23:59
15-January-2023	G 38	23:59:00	Error Code: 804 - Difference between 2 blades very high from 00:00 To 23:59
23- January-2023	G 36	23:22:00	Error code: 5203 - Heating/coolant thermal magnetic failure from 00:37 to 23:59 & Error code: 5216 - Grid Voltage failure from 00:26 to 00:27
13-March-2023	G 40	23:59:00	Error Code: 700 - PLC/Converter Communication Failure From 00:00 To 23:59
14-March-2023	G 40	23:59:00	Error Code: 700 - PLC/Converter Communication Failure From 00:00 To 23:59
15-March-2023	G 11	23:59:00	Error Code: Low level hydraulic group refrigeration oil from 00:00 To 23:59
20-April-2023	G 24	23:59:00	Error code: 803 - low pitch valve in stop mode from 00:00 to 23:59

21-April-2023	G 24	23:59:00	Error code: 803 - low pitch valve in stop mode from 00:00 to 23:59
22-April-2023	G 24	23:59:00	Error code: 803 - low pitch valve in stop mode from 00:00 to 23:59
23-April-2023	G 24	23:59:00	Error code: 803 - low pitch valve in stop mode from 00:00 to 23:59
24-April-2023	G 24	23:59:00	Error code: 803 - low pitch valve in stop mode from 00:00 to 23:59
29-April-2023	G 03	23:59:00	Error Code: 2509 - SF 6 Breaker Tripped (T connector failure) From 00:00 to 23:59
09-May-2023	G 05	23:59:00	Error code:700-PLC/converter communication failure from 00:00 to 23:59
10-May-2023	G 05	23:59:00	Error code:700-PLC/converter communication failure from 00:00 to 23:59
10-May-2023	G 15	23:59:00	Error code :5226-IGBT drive power supply failure 00:00 to 23:59
11-May-2023	G 15	23:59:00	Error code :5226-IGBT drive power supply failure 00:00 to 23:59
15-May-2023	G 24	23:24:00	Error code:412-Gearbox fan thermal relays from 00:00 to 23:24
18-May-2023	G 05	23:59:00	Error code: 700 - PLC/Converter communication failure from 00:00 to 23:59
21-Jun-2023	G 17	23:59:00	Error code: 2509 - Communication error from 00:00 to 23:59 (software problem)