



**Verified Carbon
Standard**

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

Project title	Wind Based Power Generation by Panama Wind Energy Godawari Private Limited, Pune in the State of Maharashtra, India
Project ID	VCS 1523
Monitoring period	01-August-2023 to 30-March-2024 (Including both days)
Crediting period	First Crediting Period: 31-March-2014 to 30-March-2024 (Including both days) Second Crediting period: 31-March-2024 to 30-March-2034 (Including both days)
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1 PROJECT DETAILS

1.1 Summary Description 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 relevant implementation dates:

S. No.	Machine ID	Commissioning Date	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	Khopti	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	Khopti	Georai	Beed	Maharashtra
20	G 20	07-October-2014	Manyarwadi	Georai	Beed	Maharashtra
21	G 21	05-December-2014	Khopti	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
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

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.

The earliest commissioning date is 31-March-2014, and the length of first crediting period is 31-March-2014 to 30-March-2024 (Including both days) and estimated GHG emission reductions from the project activity was 136,936 tCO_{2e} per year. The Project activity reduces 1,369,360 tCO_{2e} (estimated) emission reductions during the first crediting period.

The length of the second crediting is 31-March-2024 to 30-March-2034 (Including both days). GHG emission reductions from the project activity is around 131,077 tCO_{2e} per year and total GHG emission reductions for the chosen 10-year crediting period is 1,310,770 tCO_{2e} for second Crediting period.

The assets are still owned by PWEGL, as confirmed by the Power Purchase Agreements and monthly invoices, which are issued by PWEGL and have payments directed to PWEGL's account. The shareholding structure of PWEGL has changed, and now owned by O₂ Power SG PTE LTD.

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 total emission reductions achieved by this project activity in the current (monitoring period from 01-August-2023 to 30-March-2024 (Including both days)) are 61,078 tCO₂e by displacing electricity of 62,516.16 MW from fossil fuel dominated electricity grid.

1.2 Audit History

Audit type	Period	Program	Validation/verification body name	Number of years
Validation	31-March-2014 -- 30-March-2024	VCS	LGAI Technological Center S.A	10 years 00 Months 00 Days
1 st Verification	31-March-2014 -- 01-March-2016	VCS	LGAI Technological Center S.A	01 Year 11 Months 02 Days
2 nd Verification	02-March-2016 -- 01-February-2017	VCS	Carbon Check (India) Private Ltd	00 Years 11 Months 00 Days
3 rd Verification	02-February-2017 -- 01-February-2018	VCS	LGAI Technological Center S.A.	00 Years 11 Months 00 Days
4 th Verification	02-February-2018 -- 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 -- 31-December-2020	VCS	KBS Certification Services Pvt. Ltd.	00 years 10 Months 00 Days
7 th Verification	01-January-2021 - 31-October-2021	VCS	LGAI Technological Center S.A.	00 Years 10 Months 00 Days
8 th Verification	01-November-2021 -- 31-October-2022	VCS	VKU Certification Pvt. Ltd	01 Years 00 Month 00 Days
9 th Verification	01-November-2022 -- 31-July-2023	VCS	LGAI Technological Center S.A	00 Years 09 Months 00 Days
10 th Verification	01-August-2023 -- 30-March-2024 (Current Monitoring Period)	VCS	LGAI Technological Center S.A	00 Years 09 Months 00 Days
Validation for Second Crediting period	01-April-2024 -- 30-March-2034	VCS	LGAI Technological Center S.A	10 years 00 Months 00 Days

1.3 Sectoral Scope and Project Type

Sectoral scope¹	1 - Energy industries (renewable- /non-renewable sources).
Project activity type	Type I – Renewable Energy Projects

1.4 Project Eligibility

1.4.1 General eligibility

According to para 2.1.1 of VCS Program v.4.7², the scope of VCS program includes-

The Seven Kyoto Protocol Greenhouse gases	The project is expected to avoid one greenhouse gas ³ - 1. CO ₂ emissions from the production of the equivalent amount of electricity replaced by the project that would otherwise be generated by the fossil fuel fired grid power plants. Thus, the project is applicable to this scope.
Ozone-depleting substances (ODS)	Not applicable, CO ₂ is not an Ozone-depleting substance.
Project activities supported by a methodology approved under the VCS Program through the methodology development and review process	Not Applicable
Project activities supported by a methodology approved under an approved GHG program, unless explicitly excluded (see the Verra website for exclusions).	The applied methodology ACM 0002 V 22.0 of the project is one of the methodologies approved under CDM program, which is a VCS approved GHG program
Jurisdictional REDD+ programs and nested REDD+ projects as set out in the VCS Program document Jurisdictional and Nested REDD+ (JNR) Requirements.	Not Applicable.

¹ Projects, activities, or methodologies may be developed under any of the 16 VCS sectoral scopes: <https://verra.org/programs/verified-carbon-standard/vcs-program-details/#sectoral-scopes>

² <https://verra.org/wp-content/uploads/2024/04/VCS-Standard-v4.7-FINAL-4.15.24.pdf>

³ [KPRM 001-009 \(unfccc.int\)](https://unfccc.int/KPRM-001-009)

1.4.2 Furthermore, the project also does not belong to the project activities excluded in Table 1 of VCS Standard 4.7 [AFOLU project eligibility](#)

Not applicable as this is not a AFOLU project activity.

1.4.3 [Transfer project eligibility](#)

Not applicable as this project is not a transferred project or CPA.

1.5 [Project Design](#)

- ☐ Single location or installation
- ☒ Multiple locations or project activity instances (but not a grouped project)
- ☐ Grouped project

[Grouped Project Design](#)

This is not a grouped project activity.

1.6 [Project Proponent](#)

Organization name	Panama Wind Energy Godawari Private Limited
Contact person	Mr. Ashok Shintre
Title	General Manager
Address	TRIOS Coworking Private Limited Office No. 301, 3rd Floor, Lalwani House, Plot no 79, Sakore Nagar, Viman Nagar, Pune, Maharashtra 411014.
Telephone	+91 8308808174
Email	Ashok.shintre@o2power.in

1.7 [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	+91-91111 12889
Email	registry@enkingint.org, vipul.sahu@enkingint.org

1.8 Ownership

The Project is owned by **Panama Wind Energy Godawari Private Limited**, hence it possesses right of use of credits. The Ownership is demonstrated through the following documents.

- 1) Commissioning certificates for WTGs in the name of PP issued by MSEDCL.
- 2) Power Purchase Agreement with respective State Electricity Board for sale of electricity by the PP.

1.9 Project Start Date

Project start date	31-March-2014
Justification	The Project start date for this bundled VCS project activity was considered as 31-March-2014 which was the Earliest Commissioning date among the WTGs involved in the bundled project activity.

1.10 Project Crediting Period

Crediting period	☐ Seven years, twice renewable ☐ Ten years, fixed ☒ Other (The project activity adopts renewable crediting period of 10 years period which can be renewed for maximum 2 times, as per relevant guidelines of Verified Carbon Standard Version 3.2.)
Start and end date of first or fixed crediting period	First Crediting Period: 31-March-2014 to 30-March-2024 (Including both days) Second Crediting period: 31-March-2024 to 30-March-2034 (Including both days)

1.11 Project Scale and Estimated GHG Emission Reductions or Removals

The project is a large-scale project that involves setting up of 80.0 MW of wind power project.

☒ < 300,000 tCO₂e/year (project)

☐ ≥ 300,000 tCO₂e/year (large project)

Calendar year of Second crediting period	Estimated GHG emission reductions or removals (tCO ₂ e)
31-March-2024 to 31-December-2024	99,116
01-January-2025 to 31-December-2025	131,077
01-January-2026 to 31-December-2026	131,077
01-January-2027 to 31-December-2027	131,077
01-January-2028 to 31-December-2028	131,077
01-January-2029 to 31-December-2029	131,077
01-January-2030 to 31-December-2030	131,077
01-January-2031 to 31-December-2031	131,077
01-January-2032 to 31-December-2032	131,077
01-January-2033 to 31-December-2033	131,077
01-January-2034 to 30-March-2034	31,961
Total estimated ERRs during the first or fixed crediting period	1,310,770
Total number of years	10
Average annual ERRs	131,077

1.12 Description of the Project Activity

The proposed 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 Project activity is a new facility (Greenfield) and the electricity generated by the Project will be exported to the Unified INDIAN electricity grid. The Project will therefore displace an equivalent amount of electricity which would have otherwise been generated by fossil fuel dominant electricity grid. The Project Proponent plans to avail the VCS benefits for the Project.

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

The project shall result in replacing anthropogenic emissions of greenhouse gases (GHG's) estimated to be approximately 131,077 tCO₂e per year, thereon displacing 140,160MWh/year amount of electricity from the grid in the second crediting period.

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.

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

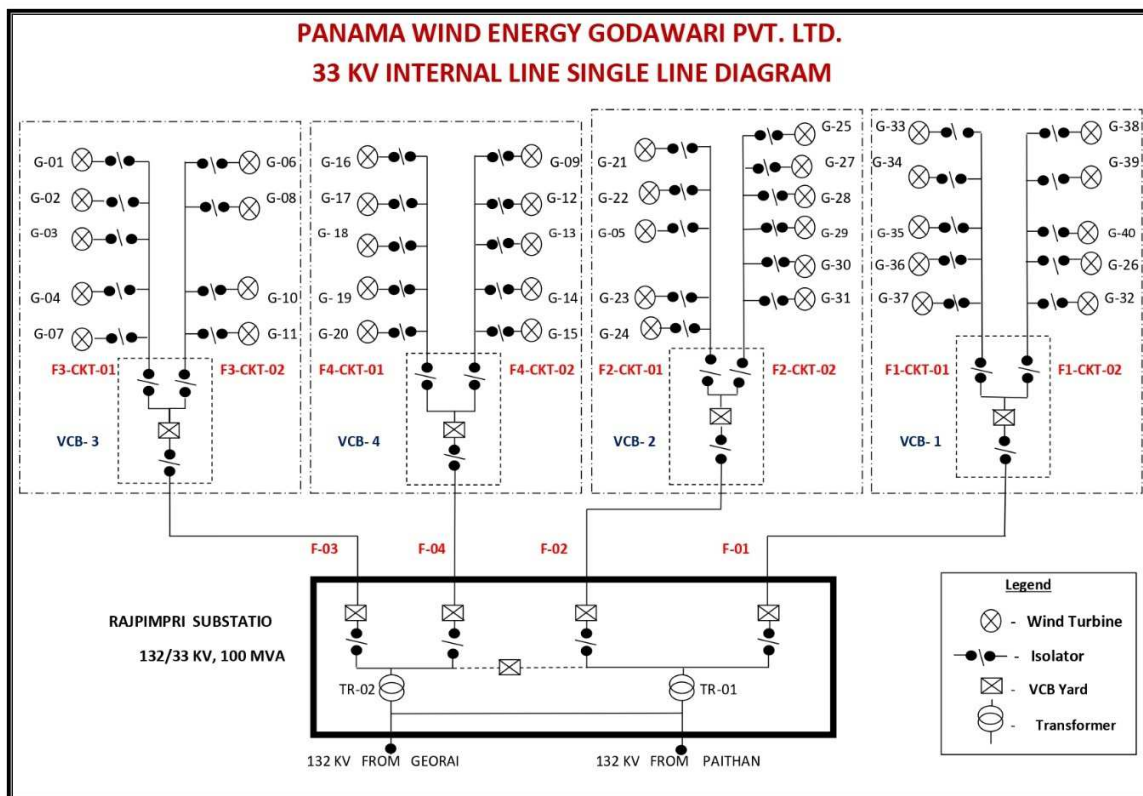
Power generated by the wind turbines is collected at 33 kV and fed to pooling substation near Rajpimpri village (5 kms away), where it is stepped up to 132kV. The pooling station itself is then connected to 132 kV grid at MSETCL existing Substation Georai.

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.

WTG Location ID	Feeder Name	Feeder Connectivity
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

G1, G2, G3, G4, G6, G7, G8, G10, G11		
Location No: G14, G15, G17, G9, G12, G13, G16, G18, G19, G20	404	Feeder No. 4

Single line Diagram:



1.13 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

Sr. No.	Location No.	Village	Taluka	District	Latitude (D° M' Sec")	Longitude (D° M' Sec")
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
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:



1.14 Conditions Prior to Project Initiation

The project is a Greenfield wind power project and does not involve generation of GHG emissions for the purpose of their subsequent reduction, removal or destruction.

1.15 Compliance with Laws, Statutes and Other Regulatory Frameworks

Established in the early 1980s, the Ministry of Non-Conventional Energy Sources (MNES), renamed in 2006 to Ministry of New and Renewable Energy (MNRE), is the body that encourages the use of various renewable energy resources and efficient use of energy as the two thrust areas of sustainable development. The Ministry continues to support the implementation of a large broad-spectrum programmed covering the entire range of new and renewable energies. Most of the incentives for wind power generation are introduced at the state level. The promotion of renewable energy only figures in one clause of the Electricity Act (2003), which de-licensed standalone generation and distribution systems in rural areas. This act restructured the Indian Electricity industry and established State Regulatory Commissions (SERCs) in charge of setting electricity tariffs.

The Project has secured the necessary approvals for development and commissioning for each Wind Turbine Generator (WTG) from the state nodal agencies and adheres to local laws and regulations. It complies with relevant national regulations for energy generation in India, which include:

- The Project aligns with all applicable Indian laws and regulations, noting the following:

- Power generation using wind energy is not mandated by law or considered a compulsory option.
- State and sectoral policies are designed primarily to promote wind power projects. These policies are crafted with an understanding of the associated risks and aim to attract private investments.
- The Indian Electricity Act, 2003 (amended in May 2007) does not dictate the fuel choice for power generation.
- There are no legal constraints on the selection of a specific technology for power generation.

REC Mechanism:

The Electricity Act, 2003, the policies framed under the Act, as also the National Action Plan on Climate Change (NAPCC) provide for a roadmap for increasing the share of renewable in the total generation capacity in the country. However, Renewable Energy (RE) sources are not evenly spread across different parts of the country. On the one hand there are States (like Delhi) where the potential of RE sources is not that significant. This inhibits SERCs in these States from specifying higher Renewable Purchase Obligation (RPO). On the other hand, there are States (like Rajasthan and Tamil Nadu) where there is very high potential of RE sources. In such States there are avenues for harnessing the RE potential beyond the RPO level fixed by the SERCs. It is in this context that the concept of Renewable Energy Certificates (REC) assumes significance. This concept seeks to address the mismatch between availability of RE sources and the requirement of the obligated entities to meet their RPO.

Central Electricity Regulatory Commission (CERC) has notified Regulation on Renewable Energy Certificate (REC) in fulfilment of its mandate to promote renewable sources of energy and development of market in electricity. The framework of REC is expected to give push to RE capacity addition in the country.

1.16 Double Counting and Participation under Other GHG Programs

1.16.1 No Double Issuance

Is the project receiving or seeking credit for reductions and removals from a project activity under another GHG program?

☐ Yes ☒ No

1.16.2 Registration in Other GHG Programs

Is the project registered or seeking registration under any other GHG programs?

☐ Yes ☒ No

1.16.3 Projects Rejected by Other GHG Programs

Has the project been rejected by any other GHG programs?

☐ Yes ☒ No

1.17 Double Claiming, Other Forms of Credit, and Scope 3 Emissions

1.17.1 No Double Claiming with Emissions Trading Programs or Binding Emission Limits

Are project reductions and removals or project activities also included in an emissions trading program or binding emission limit? See the *VCS Program Definitions* for definitions of emissions trading program and binding emission limit.

☐ Yes ☒ No

1.17.2 No Double Claiming with Other Forms of Environmental Credit

Has the project activity sought, received, or is planning to receive credit from another GHG-related environmental credit system? See the *VCS Program Definitions* for definition of GHG-related environmental credit system.

☐ Yes ☒ No

1.17.3 Supply Chain (Scope 3) Emissions

Do the project activities specified in Section 1.12 affect the emissions footprint of any product(s) (goods or services) that are part of a supply chain?

☐ Yes ☒ No

1.18 Sustainable Development Contributions

1.18.1 Sustainable Development Contributions Activity Description

The project by Panama Wind Energy Godawari Private Limited contributes to India's national sustainable development priorities by generating 80 MW of clean electricity through wind power, which is fed into the Unified National Grid. This aligns with SDG 7 (Affordable and Clean Energy) by increasing the share of renewable energy in the energy mix and reducing dependence on fossil fuels. The project also contributes to SDG 13 (Climate Action) by avoiding greenhouse gas emissions through the use of wind power, a non-polluting energy source.

Additionally, the project promotes SDG 8 (Decent Work and Economic Growth) by creating both permanent and temporary employment opportunities in the region and enhancing the skills of local workers through training programs. To ensure effective monitoring and reporting, the project employs a Supervisory Control and Data Acquisition (SCADA) system to continuously

track the net electricity supplied to the grid. The data collected is used to calculate the greenhouse gas emissions avoided, forming the baseline for the project's environmental impact. The results are documented in the Joint Meter Reading (JMR) report, which is prepared based on controller data and approved by the relevant authorities.

Through these contributions, the project supports the national goals of sustainable development by providing clean energy, mitigating climate change, and fostering local economic development.

Contribution to sustainable development:

The National CDM Authority (NCDMA), which is the Designated National Authority (DNA) for the Government of India (GOI) under the Ministry of Environment, Forests and Climate Change (MoEFCC), has mentioned four indicators for the sustainable development in the interim approval guidelines for Clean Development Mechanism projects from India. Thus, the project's contribution towards sustainable development has been addressed based on the following sustainable development aspects:

- **Social well-being:** The project activity provided / provides job opportunity to local people during erection, commissioning and maintenance of the wind power projects. Frequency of visiting villages and nearby areas by skilled, technical and industrialist increase due to installation /site visit/operation and maintenance work related to Wind power project. This directly and indirectly positively effects the economy of villages and nearby area.
- **Environmental well-being:** The wind power projects is one of the cleanest renewable energy powers and does not involve any fossil fuel. There are no GHG emissions. The impact on land, water, air and soil is negligible. Thus, the project activity contributes to environmental well-being without causing any negative impact on the surrounding environment.
- **Economic well-being:** The project activity generates permanent and temporary employment opportunity within the vicinity of the project. The electricity supply in the nearby area improves which directly and indirectly improves the economy and lifestyle of the area.
- **Technological well-being:** The project activity marks a significant advancement in harnessing previously untapped wind potential and promoting the adoption of wind technology in the region. By demonstrating the effectiveness of wind turbines, the project encourages further investment in wind power projects. This success not only showcases the viability of wind energy but also motivates additional stakeholders to invest in similar technologies. Consequently, the project contributes to technological progress and the broader diffusion of renewable energy solutions.

1.18.2 Sustainable Development Contributions Activity Monitoring

The project activity has beneficial effect on the local environment and employment in the nearby region. Clean Electricity generation through wind project 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 8. The project activity generates permanent and temporary employment opportunity within the vicinity of the project. Detailed indicators are mentioned in table below. This is a voluntary project activity doesn't contribute to achieving any nationally stated sustainable development.

Positive contribution of the project to the following Sustainable Development Goals in second crediting period:

SDG target	SDG indicator	Unit	Values
7.2	7.2.1: Renewable energy share in the total final energy consumption	MWh / Year	140,160
8.6	8.6.1 Proportion of youth (aged 15-24 years) not in education, employment or training	Number / Year	01
13.0	Total greenhouse gas emissions avoided or removed.	tCO ₂ / Year	131,077

Positive contribution of the project to the following Sustainable Development Goals in Current Monitoring period:

SDG target	SDG indicator	Unit	Values
7.2	7.2.1: Renewable energy share in the total final energy consumption	MWh / Year	62,516.16
8.6	8.6.1 Proportion of youth (aged 15-24 years) not in education, employment or training	Number / Year	07
13.0	Total greenhouse gas emissions avoided or removed.	tCO ₂ / Year	61,078

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 62,516.16 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, 226,693.39 MWh (77,426.94+86,750.29+ 62,516.16) renewable electricity has been supplied to Indian grid that helps to increase the renewable energy share in the energy mix.
2)	8.6	8.6.1 Proportion of youth (aged 15-24 years) not in education, employment or training	Implemented activities to increase	Together with the technology supplier, the Project organize 07 training during current monitoring period. Training related to soft and technical skills.	Overall, 24 trainings (7+10+7) are provided.
3)	13.0	Total greenhouse gas emissions avoided or removed.	Implemented activities to increase	By supplying 62,516.16 MWh of clean electricity (generated through wind energy based.) to Indian grid, the project avoided release of 61,078 tCO ₂ e into the atmosphere during the reporting period.	Overall prevented the release of 221,478 tCO ₂ e (75,646 +84,754+ 61,078) into the atmosphere.

1.19 Additional Information Relevant to the Project

Leakage Management

The leakage management plan and implementation of leakage and risk mitigation measures are not applicable for this grouped project activity.

Commercially Sensitive Information

Not applicable as No any commercially sensitive information has been excluded from the public version of the project description. There is no commercially sensitive information.

Further Information

There are no information or incidents that will have bearing on the eligibility of the project, the net GHG emission reductions or removals, or the quantification of the project's net GHG emission reductions or removals.

2 SAFEGUARDS AND STAKEHOLDER ENGAGEMENT

2.1 Stakeholder Engagement and Consultation

2.1.1 Stakeholder Identification

Please refer to section 6 STAKEHOLDER COMMENTS of JOINT PROJECT DESCRIPTION & MONITORING REPORT) VCS Version 2 dated 15-March-2016) of the VCS registered project with reference ID number VCS 1523.

The web link of the same is given below:

<https://registry.terra.org/app/projectDetail/VCS/1523>

Stakeholder Identification	Not Applicable
Legal or customary tenure/access rights	Not Applicable
Stakeholder diversity and changes over time	Not Applicable
Expected changes in well-being	Not Applicable

Location of stakeholders	Not Applicable
Location of resources	Not Applicable

2.1.2 Stakeholder Consultation and Ongoing Communication

PP 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.

Date of stakeholder consultation	27/06/2013
Stakeholder engagement process	Invitations & Meeting Schedule: 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. Process to document the outcome: The minutes of meeting and pictures/videos of the stakeholders' communication were compiled to document the outcomes of the meeting.
Consultation outcome	The stakeholders' consultation was conducted in a very conducive atmosphere with conclusion that there were no adverse impacts related to the project activity. Instead, it would lead to a positive overall ecological, economic and health development of the project area. Adhering to the FPIC rights of the stakeholders, they were

	informed in advance regarding the implementation, the overall impacts and other relevant details of the project activity, through the stakeholders' consultation. And only after receiving the collective consent of the stakeholders, the project activity was implemented.
Ongoing communication	The Project Proponent has established an ongoing communication procedure to ensure continuous and transparent engagement with stakeholders throughout the project operational period. Mr. Ashok Shintre has been designated as the primary contact for all stakeholder communications and grievances, and can be reached via email at ashok.shintre@o2power.in or by phone at +91 83088 08174. Stakeholders also have an option to share their concerns through E-mail, phone, or by registering them in the grievance register maintained at the project site. As a part of ongoing communication with stakeholders, a dedicated visitor cum grievance register is placed at the project site near the entrance, which is accessible to stakeholders to provide their feedback on the project. Key contact details and project information are displayed on notice boards at the project site to ensure visibility. All communications are documented, reviewed by the plant management team, and appropriate follow-up actions will be taken.
Stakeholder input	The stakeholders extended their supportive consent to the project activity, upon realising that there were no ill effects of the project over the ecological or economic development of their area. Since there were no corrective inputs sought from the stakeholders for the project design, there were no alterations made to the project design.

2.1.3 Free Prior and Informed Consent

Obtaining consent	The project secured consent through inclusive community consultations, involving Indigenous Peoples (IPs), Local Communities (LCs), and customary right holders. Extensive
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	engagement, transparent information sharing, and acknowledgment of customary rights were key. Consent was documented in clear agreements accessible to all stakeholders. Conflict resolution mechanisms and ongoing engagement ensure a responsive approach. Continuous monitoring and evaluation demonstrate the commitment to transparency and positive community outcomes. The absence of ongoing conflicts reflects the project's success in aligning with stakeholder interests and maintaining a harmonious relationship with the community.
Outcome of FPIC	The Free, Prior, and Informed Consent (FPIC) process for the project resulted in a positive outcome. Transparent agreements were reached with Indigenous Peoples (IPs), Local Communities (LCs), and customary rights holders. Information disclosed included project details, potential impacts, and benefits, ensuring stakeholders' understanding. Assurance is provided that the project adheres to ethical standards - no encroachment on existing land occurred, and no forced physical or economic displacement took place. The project utilized unused, greenfield land, and the absence of relocation signifies the commitment to responsible and sustainable development practices.

2.1.4 Grievance Redress Procedure

No negative comments have been received on project activity during current monitoring period from any of the local stakeholders consulted. As all comments were very positive about the project, no further action is required. There were no further comments raised by the stakeholders and they were totally in support for setting up of these kinds of projects in the region. The local stakeholders expressed their support to the project.

Development process	The development of the grievance redressal process involved actively gathering suggestions and feedback from stakeholders to ensure that their concerns would be addressed in a fair and transparent manner. Stakeholder Consultation: The Project Proponent engaged with stakeholders, including local communities and relevant authorities, to gather their suggestions on the grievance redressal process. This ensured that the process would be accessible and meet the needs of all parties involved. Decision to Implement a Grievance Register: PP has
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	established a dedicated visitor and grievance register at the project site. This register serves as a simple and effective means for stakeholders to document their grievances along with contact details of person of point of contact. The more details are mentioned below. Accessibility: The grievance register is made easily accessible to all stakeholders at the project site, ensuring that everyone has the opportunity to raise concerns or issues as they arise. PP has appointed Mr. Ashok Shintre as the official Grievance Redressal Point of Contact. His contact details have been made publicly accessible through display at the project site's notice board at the main entrance of the project site and are included in Joint PDMR. Grievance Logging and Resolution: Stakeholders can record any grievances in the register. Upon receiving a grievance, the project team will assess the concern and take appropriate actions to address it in a timely and transparent manner. This process ensures that stakeholder concerns are heard and acted upon promptly.
Grievance redress procedure	The Grievance Redress Procedure includes: <u>Multiple Access Channels for Submission:</u> • Grievance Register available at the main entrance of the plant site. • Email: ashok.shintre@o2power.in • Phone: +91 83088 08174 These details are also prominently displayed on the notice board and main entrance for visibility. <u>Designated Point of Contact:</u> • Mr. Ashok Shintre is officially appointed as the Grievance Officer, responsible <u>for</u> receiving and managing all grievance-related matters. <u>Grievance Handling Steps:</u> • Logging the grievance in a register (maintained at Plant Main Entrance). • Initial review and discussion at the plant level. • Formulation of a resolution strategy by the site in-charge in coordination with stakeholders. • Implementation of corrective actions and

	communication with the complainant. - Follow-up and closure of the issue. <u>Reporting and Transparency:</u> - Even though no grievances were received during the current monitoring period, the Joint PDMR includes a clear description of the grievance process, and future grievances will be documented and addressed accordingly.
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2.1.5 Public Comments

Please refer to section 6 STAKEHOLDER COMMENTS of JOINT PROJECT DESCRIPTION & MONITORING REPORT) VCS Version 2 dated 15-March-2016) of the VCS registered project with reference ID number VCS 1523.

The web link of the same is given below:
<https://registry.terra.org/app/projectDetail/VCS/1523>

Comments received	Actions taken
Not Applicable	Not Applicable

2.2 Risks to Stakeholders and the Environment

	Risks identified	Mitigation or preventative measure taken
Risks to stakeholder participation	No risk identified	There are no risks related to Natural and human-induced risks to stakeholders' wellbeing.
Working conditions	No risk identified	There are no exclusions, lack of communication or barriers in the project activity, that might prevent stakeholders from engaging or participating.
Safety of women and girls	No risk identified	There are no risks related to working conditions of the employees in the project activity, due to comprehensive safety

		training programs for the workers/employees.
Safety of minority and marginalized groups, including children	No risk identified	The project activity has no negative impact over the safety of women and girls. Also, the safety concerns of the women and girls are addressed through the interactions with the stakeholders and resolved as per requirement. Moreover, the project strictly adheres to the laws for the women and girls, demonstrating the commitment to address any threat related to the safety of the women/girls of the project location.
Pollutants (air, noise, discharges to water, generation of waste, release of hazardous materials)	No risk identified	There is no risk due to generation of pollutants (noise, discharges to water, generation of waste, and release of hazardous materials), due to project activity. The project rather improves air quality by preventing fossil fuel burns and mitigates climate change by producing electricity from a clean source of energy. Additionally, the project generates only a minimal amount of solid waste, including waste cables and waste oil. All waste is handled responsibly and is disposed of by a local authorized company.

2.3 Respect for Human Rights and Equity

2.3.1 Labor and Work

Discrimination and sexual harassment	PP confirmed that there is no discrimination or sexual harassment occurred or will occur. PP also monitors workplace regularly and created a workplace that is free of sexual harassment and discrimination as per local laws and same has been demonstrated during validation assessment process.
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Management experience	The legal owners of the project instances of this project activity are leading industries of Bangladesh and they are very much experienced in following the government stipulated rules and regulations as well as the international laws. This has been demonstrated by the project proponent during validation assessment process.
Gender equity in labor and work	PP confirmed that there is no discrimination in workers with respect to gender in providing jobs and also there is no discrimination in respect to wages between genders. This has been demonstrated by the project proponent during validation assessment process.
Human trafficking, forced labor, and child labor	PP has confirmed that project activity does not and will not use victims of human trafficking, forced labor, and child labor. This has been demonstrated by the project proponent during validation assessment process.

2.3.2 Human Rights

The following demonstrations show how the project is committed to safeguard the rights of IPs, LCs, and customary right holders, while following the international human rights law⁴, the UNDRIP⁵.

- **Free, Prior, and Informed Consent (FPIC)**: The project activity has obtained the FPIC from the local stakeholders including the IPs, LCs and customary right holders, ensuring their unforced consent before the project operation, respecting their right to make decisions.
- **Non-discriminatory Participation in the Project Activity**: The project distributed devices without cultural or social biases, safeguarding the rights of IPs, LCs, and customary rights holders to be free from discrimination.
- **Employment due to the Project Activity**: The project activity also leads to the employment from the IPs, LCs and customary right holders, enabling them to exercise their right to fair treatment in employment and salary.

2.3.3 Indigenous Peoples and Cultural Heritage

The project activity does not impact the tangible or intangible cultural heritage or the indigenous people nearby.

⁴ <https://www.ohchr.org/sites/default/files/Documents/Publications/fs9Rev.2.pdf>

⁵ https://www.un.org/development/desa/indigenouspeoples/wp-content/uploads/sites/19/2018/11/UNDRIP_E_web.pdf

2.3.4 Property Rights

Rights to territories and resources	Not applicable
Respect for property rights	The land / property for the project activity belongs to the project proponent and, it can be supported through the relevant documents. Additionally, the project activity has obtained the free, prior and informed consent of the stakeholders (including the IPs, LCs, and customary rights holders). This ensures that their lands are property rights are protected and respected.

2.3.5 Benefit Sharing

Process used to design the benefit sharing plan	Not applicable
Summary of the benefit sharing plan	Not applicable
Approval and dissemination of benefit sharing plan	Not applicable
Benefit sharing during the monitoring period	Not applicable

2.4 Ecosystem Health

	Risks identified	Mitigation or preventative measure taken
Impacts on biodiversity and ecosystems	No risk identified	This project activity doesn't result in adverse effects; instead, it positively impacts on the biodiversity and ecosystem by decreasing air pollution and mitigating climate change.
Soil degradation and soil erosion	No risk identified	This project is a wind power project and does not result adverse effects on Soil degradation and soil erosion.

Water consumption and stress	No risk identified	This project activity is wind power project and does not have any negative impacts on water consumption or does not lead to water stress in any way.
Usage of fertilizers	No risk identified	Since, this is a wind project activity, hence it does not account for any adverse impacts associated with the use of fertilizers.

2.4.1 Rare, Threatened, and Endangered species

Is the project located in or adjacent to habitats for rare, threatened, or endangered species?

☐ Yes ☒ No

Species or habitat	The project activity has not adversely impacted habitats for rare, threatened, or endangered species during the monitoring period.
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2.4.2 Introduction of species

Species introduced	Classification	Justification for use	Adverse effects and mitigation
Not applicable	Not applicable	Not applicable	Not applicable

2.4.3 Ecosystem conversion

Not applicable as this project does not belong to ARR, ALM, WRC or ACoGS projects

3 APPLICATION OF METHODOLOGY

3.1 Title and Reference of Methodology

Type (methodology, tool or module).	Reference ID, if applicable	Title	Version
Methodology	ACM0002	Grid-connected electricity generation	22.0 ⁶

⁶ <https://cdm.unfccc.int/methodologies/DB/XB1TX7TAZ6SLWM9B7BC67THHVD16JV>

		from renewable sources.	
Methodology ⁷	ACM0002	Grid-connected electricity generation from renewable sources.	16.0 ⁸
Sectoral Scope	01	EB 81	Annex 9
TOOL	01	Tool for the demonstration and assessment of additionality ⁹	07.0.0 (EB 70 annex 08)
TOOL	07	Tool to calculate the emission factor for an electricity system ¹⁰	07.0 (EB 100 annex 4)
Tool	11	Assessment of the validity of the original/current baseline and update of the baseline at the renewal of the crediting period ¹¹	03.0.1 (EB 66 annex 47)

3.2 Applicability of Methodology

Methodology ID	Applicability condition	Justification of compliance
ACM0002 ¹²	5. This methodology is applicable to grid-connected renewable energy power generation project activities that: - Install a Greenfield power plant; - Involve a capacity addition to (an) existing plant(s); - Involve a retrofit of (an) existing operating plants/units; - Involve a rehabilitation of (an) existing plant(s)/unit(s); or - Involve a replacement of (an) existing plant(s)/unit(s).	The project activity is installation of a new grid connected wind power plant at a site where no renewable power plant was operated prior to the implementation of the project activity (Greenfield plant) and hence this criterion is applicable.

⁷ Methodology used for Verification of current monitoring period.

⁸ <https://cdm.unfccc.int/methodologies/DB/EY2CL7RTEHRC9V6YQHLAR6MJ6VEU83>

⁹ <https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-01-v7.0.0.pdf>

¹⁰ <https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-07-v7.0.0.pdf>

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

¹² <https://cdm.unfccc.int/methodologies/DB/XB1TX7TAZ6SLWM9B7BC67THHVD16JV>

	f. Install a Greenfield power plant together with a grid-connected Greenfield pumped storage power plant. The greenfield power plant may be directly connected to the PSP or connected to the PSP through the grid.	
	7. In case the project activity involves the integration of a BESS, the methodology is applicable to grid-connected renewable energy power generation project activities that: a. Integrate BESS with a Greenfield power plant; b. Integrate a BESS together with implementing a capacity addition to (an) existing solar photovoltaic¹ or wind power plant(s)/unit(s); c. Integrate a BESS to (an) existing solar photovoltaic or wind power plant(s)/unit(s) without implementing any other changes to the existing plant(s); d. Integrate a BESS together with implementing a retrofit of (an) existing solar photovoltaic or wind power plant(s)/unit(s). e. Integrate a BESS together with a Greenfield power plant that is operating in coordination with a PSP. The BESS is located at site of the greenfield renewable power plant.	This condition is not relevant, as does not involve the integration of a Battery Energy Storage System (BESS):
	8. The methodology is applicable under the following conditions: a) Hydro power plant/unit with or without reservoir, wind power plant/unit, geothermal power plant/unit, solar power plant/unit, wave power plant/unit or tidal power plant/unit;	The proposed project activity is the installation of a wind power plant/unit. Therefore, the said criteria is not applicable
	b) In the case of capacity additions, retrofits, rehabilitations or replacements (except for wind, solar, wave or tidal power capacity addition projects) the existing plant/unit must have started commercial operation prior to the start of a minimum historical reference period of five years. The reference period is used for the calculation of baseline emissions and defined in the baseline emission section. Furthermore, no capacity expansion, retrofit, or rehabilitation of the plant/unit has been undertaken between the start of this minimum historical reference period and the implementation of the project activity;	The project activity does not involve any capacity additions, retrofits or replacements and therefore this condition is not applicable.

	c) In case of Greenfield project activities applicable under paragraph 7(a) above, the project participants shall demonstrate that the BESS was an integral part of the design of the renewable energy project activity (e.g., by referring to feasibility studies or investment decision documents);	This condition is not relevant, as does not involve the integration of a Battery Energy Storage System (BESS).
	d) The BESS should be charged with electricity generated from the associated renewable energy power plant(s). Only during exigencies 2 may the BESS be charged with electricity from the grid or a fossil fuel electricity generator. In such cases, the corresponding GHG emissions shall be accounted for as project emissions following the requirements under section 5.4.4 below. The charging using the grid or using fossil fuel electricity generator should not amount to more than 2 per cent of the electricity generated by the project renewable energy plant during a monitoring period. During the time periods (e.g., week(s), months(s)) when the BESS consumes more than 2 per cent of the electricity for charging, the project participant shall not be entitled to issuance of the certified emission reductions for the concerned periods of the monitoring period.	This condition is not relevant, as does not involve the integration of a Battery Energy Storage System (BESS):
	e) In case the project activity involves PSP, the PSP shall utilize the electricity generated from the renewable energy power plant(s) that is operating in coordination with the PSP during pumping mode.	This condition is not relevant, as does not involve the PSP.
	9. In case of hydro power plants, one of the following conditions shall apply:	The proposed project activity is the installation of a wind power plant/unit. Therefore, the said criteria is not applicable
	a) The project activity is implemented in existing single or multiple reservoirs, with no change in the volume of any of the reservoirs; or	
	b) The project activity is implemented in existing single or multiple reservoirs, where the volume of the reservoir(s) is increased and the power density calculated using equation (3), is greater than 4 W/m ² ; or	
	c) The project activity results in new single or multiple reservoirs and the power	

	density, calculated using equation (3), is greater than 4 W/m². d) The project activity is an integrated hydro power project involving multiple reservoirs, where the power density for any of the reservoirs, calculated using equation (3), is lower than or equal to 4 W/m², all of the following conditions shall apply: I. The power density calculated using the total installed capacity of the integrated project, as per equation (4), is greater than 4 W/m²; II. Water flow between reservoirs is not used by any other hydropower unit which is not a part of the project activity; III. Installed capacity of the power plant(s) with power density lower than or equal to 4 W/m² shall be; a) Lower than or equal to 15 MW; and b) Less than 10 per cent of the total installed capacity of integrated hydro power project.	
	10. In the case of integrated hydro power projects, project proponent shall: a) Demonstrate that water flow from upstream power plants/units spill directly to the downstream reservoir and that collectively constitute to the generation capacity of the integrated hydro power project; or b) Provide an analysis of the water balance covering the water fed to power units, with all possible combinations of reservoirs and without the construction of reservoirs. The purpose of water balance is to demonstrate the requirement of specific combination of reservoirs constructed under CDM project activity for the optimization of power output. This demonstration has to be carried out in the specific scenario of water availability in different seasons to optimize the water flow at the inlet of power units. Therefore, this water balance will take into account	The proposed project activity is the installation of a wind power plant/unit. Therefore, the said criteria is not applicable

	seasonal flows from river, tributaries (if any), and rainfall for minimum of five years prior to the implementation of the CDM project activity.	
	11. In the case of PSP, the project participants shall demonstrate in the PDD that the project is not using water which would have been used to generate electricity in the baseline.	This condition is not relevant, as does not involve the PSP
	12. The methodology is not applicable to: a) Project activities that involve switching from fossil fuels to renewable energy sources at the site of the project activity, since in this case the baseline may be the continued use of fossil fuels at the site; b) Biomass fired power plants/units.	The project activity is an installation of a new grid connected renewable energy project and does not involve switching from fossil fuel to renewable energy and hence this criterion is not relevant to the project activity.
	13. In the case of retrofits, rehabilitations, replacements, or capacity additions, this methodology is only applicable if the most plausible baseline scenario, as a result of the identification of baseline scenario, is “the continuation of the current situation, that is to use the power generation equipment that was already in use prior to the implementation of the project activity and undertaking business as usual maintenance”.	The project activity is a new grid connected renewable wind power plant and not a retrofits, replacement or capacity additions and therefore this criterion is not applicable to the project activity.
	14. In addition, the applicability conditions included in the tools referred to below apply	The Project Applies the following tools and is in compliance to the same. 1. Tool to calculate the emission factor for an electricity system. 2. Tool for the demonstration and assessment of additionality.

Tool ID	Applicability condition	Justification of compliance
Tool 7 ¹³	1. This tool may be applied to estimate the OM, BM and/or CM when calculating baseline emissions for a project activity that substitutes grid electricity that is where a project activity supplies electricity to a grid or a project activity that results in savings of electricity that would have been provided by the grid (e.g. demand-side energy efficiency projects).	The project is a grid connected Greenfield wind power project and thus the tool is applicable.

¹³ <https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-11-v3.0.1.pdf>

	2. Under this tool, the emission factor for the project electricity system can be calculated either for grid power plants only or, as an option, can include off- grid power plants. In the latter case, the conditions specified in “Appendix 2: Procedures related to off- grid power generation” should be met. Namely, the total capacity of off-grid power plants (in MW) should be at least 10 per cent of the total capacity of grid power plants in the electricity system; or the total electricity generation by off-grid power plants (in MWh) should be at least 10 per cent of the total electricity generation by grid power plants in the electricity system; and that factors which negatively affect the reliability and stability of the grid are primarily due to constraints in generation and not to other aspects such as transmission capacity.	Since the project activity is grid connected, this condition is applicable and the emission factor has been calculated accordingly.
	3. In case of CDM projects the tool is not applicable if the project electricity system is located partially or totally in an Annex I country.	Project is located in non-Annex I country and hence the tool is applicable
	4. Under this tool, the value applied to the CO ₂ emission factor of biofuels is zero.	The project is a wind power project and there is no involvement of biofuels.

Tool ID	Applicability condition	Justification of compliance
Tool 01	Para 9 - The use of the “Tool for the demonstration and assessment of additionality” is not mandatory for project participants when proposing new methodologies. Project participants may propose alternative methods to demonstrate additionality for consideration by the Executive Board. They may also submit revisions to approved methodologies using the additionality tool.	Project Owner is not proposing new methodologies.
	Para 10 - Once the additionally tool is included in an approved methodology, its application by	Project activity is applying additionality tool.

	project participants using this methodology is mandatory	
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The applicability condition for TOOL-11 “Assessment of the validity of the original/current baseline and update of the baseline at the renewal of the crediting period” is illustrated in section 3.4 of the PDD.

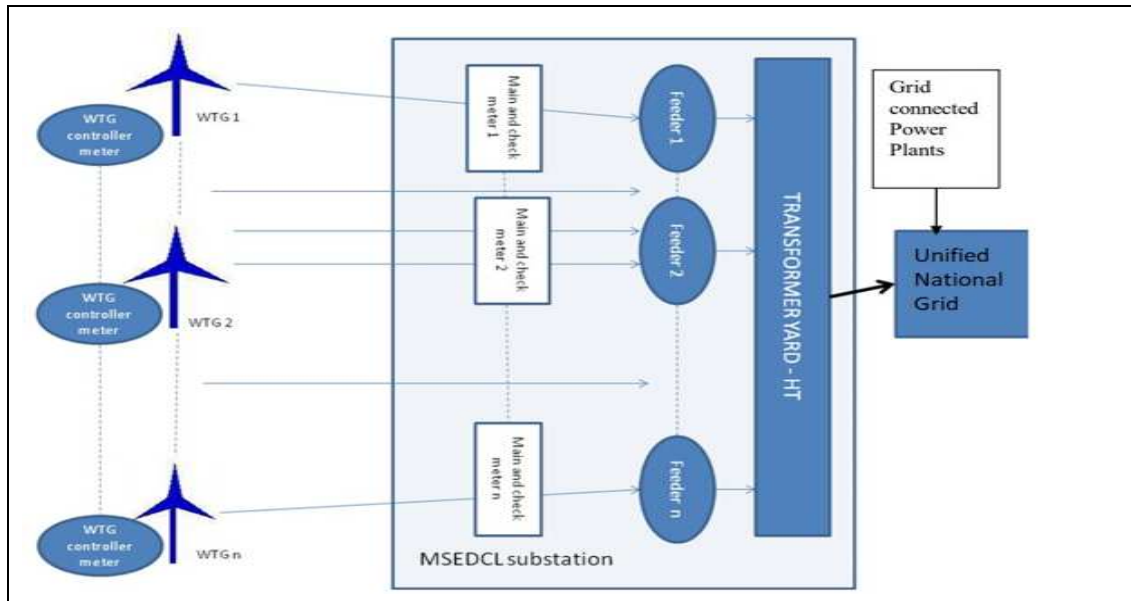
3.3 Project Boundary

As per the para 25 of applicable methodology ACM0002 (Version 22.0) “The spatial extent of the project boundary includes the project power plant and all power plants connected physically to the electricity system that the CDM project power plant is connected to”.

Therefore, the project boundary includes all the 40 numbers of WTGs connected to the sub-station, which is further connected to the network of the INDIAN grid, i.e. the project boundary also includes the INDIAN grid. Thus, the project boundary further includes all the power plants physically connected to the INDIAN grid.

Source		Gas	Included?	Justification/Explanation
Baseline	Grid-connected electricity generation	CO ₂	Yes	Major emission sources
		CH ₄	No	Excluded for simplification. This is conservative
		N ₂ O	No	Excluded for simplification. This is conservative
Project	Greenfield Wind energy conversion system	CO ₂	No	The project activity does not emit any emissions.
		CH ₄	No	No methane generation is expected to be emitted.
		N ₂ O	No	No nitrous oxide generation is expected to be emitted.

Project Boundary Diagram:



3.4 Baseline Scenario

The project activity is generation of electricity using wind energy and exporting the same to the grid system, which is also fed by other fuel sources such as fossil and non-fossil types. Emission reductions due to the project activity are considered to be equivalent to the emissions avoided in the baseline scenario by displacing the grid electricity. Emission reductions are related to the electricity exported by the project and the actual generation mix in the grid system.

As per para 27 of the methodology ACM0002 (Version 22) “The baseline scenario is electricity delivered to the grid by the project activity that would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources, as reflected in the combined margin (CM) calculations described in TOOL07”.

As the project activity displaced electricity from Integrated Indian grid, hence Integrated Indian grid connected power plants are considered for the project baseline.

For the second crediting period, the continued validity of the original baseline should be assessed. Baseline scenario for the second crediting period in line with the “Assessment of the validity of the original/current baseline and update of the baseline at the renewal of the crediting period.” Version 03.0.1¹⁴.

The tool stipulates the following steps to be carried out.

Step 1: Assess the validity of the current baseline for the next crediting period

Step 1.1: Assess compliance of the current baseline with relevant mandatory national and/or Sectoral policies

¹⁴ <https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-11-v3.0.1.pdf>

The baseline scenario remains unchanged that is electricity delivered to the grid by the project activity would have otherwise been generated by the operation of grid connected power plants and by the addition of new generation sources, as reflected in the combined margin (CM) calculations described in the TOOL 07 “Tool to calculate the emission factor for an electricity system, Version 07.0” and is in compliance with all the relevant mandatory national and/or sectoral policies.

There is currently no specific technology identified by the host country for projects aimed at meeting the NDC target, nor have any standards or guidelines been published to determine a project's contribution towards achieving the NDC target. Furthermore, India has already met its NDC target, eliminating the risk of double counting. However, if there should any guidelines be published in the future, the Project proponent (PP) will ensure that GS project activities are not used for double accounting.

Step 1.2: Assess the impact of circumstances

The baseline scenario identified at the validation of the project activity was the electricity delivered to the grid by the project activity would have otherwise been generated by the operation of grid connected power plants and by the addition of new generation sources into the grid. Thus, this project activity was a voluntary investment which intends to replace equivalent amount of electricity at grid from renewable source.

PP was not bound to incur this investment; hence absence of project activity (i.e. the investment) does not lead to any continued baseline practice for PP within their scope whereas the continued operation of the project activity would continue to replace equivalent amount of electricity at grid. Hence, the same baseline as identified in the previous crediting period is still valid for the project. Therefore, the assessment of the changes in market characteristics is not required for the renewal of the project's crediting period.

Nevertheless, there is an impressive growth attained by the Indian Power Sector within the recent years, the installed capacity has grown from mere 1,713 MW in 1950 to 416,059 MW as on 31.03.2023, consisting of 237,269 MW Thermal, 125,160 MW RES (Renewable Energy Source) and 6,780 MW Nuclear. Sector-wise details of installed capacity are shown in Table 1¹⁵.

Table 1: Sector- wise installed capacity (MW) as on 31/03/2023 (CEA Database version 19)¹⁶

Sector	Thermal					Nuclear	Hydro	RES	Total
	Coal	Lignite	Gas	Diesel	Total				
State	67537.50	1150.00	7012.05	280.31	75979.86	0.00	27254.45	2492.11	105726.43
Central	65100.00	3640.00	7237.91	0.00	75977.91	6780.00	15664.72	1632.30	100054.93
Private	72598.00	1830.00	10574.24	308.89	85311.14	0.00	3931.00	121035.39	210277.53
All India	205235.50	6620.00	24824	589	237269	6780.00	46850	125160	416059

¹⁵ https://cea.nic.in/wp-content/uploads/baseline/2024/04/User_Guide_Version_19.0.pdf

¹⁶ https://cea.nic.in/wp-content/uploads/baseline/2024/04/User_Guide_Version_19.0.pdf

It is evident from Table 1 that the installed capacity is predominantly coal based and therefore, is a major source of carbon dioxide emissions in India. Hence, there exists scope for reducing the CO₂ emissions in the country by way of fuel substitution, increased use of renewable energy sources, and also by improving the thermal efficiency of power generation.

Thus, current baseline remains same and there is no impact if circumstances, existing at the time of requesting renewal of crediting period.

Step 1.3: Assess whether the continuation of the use of current baseline equipment(s) or an investment is the most likely scenario for the crediting period for which renewal is requested

As explained in step 1.2, the baseline scenario was the electricity import/generation from the power plants connected to the electricity grid. The project activity in green field project and there is no any baseline equipment or investment involved in project activity. Therefore, this condition is not applicable to the project activity. As per registered JOINT PROJECT DESCRIPTION & MONITORING REPORT version 02 dated 15-March-2016, the life of the plant is 25 years. Hence remaining technical lifetime of the equipment is applicable for RCP.

Step 1.4: Assessment of the validity of the data and parameters

This step stipulates that “Where emission factors, values or emission benchmarks are used and determined only once for the crediting period, they should be updated, except if the emission factors, values or emission benchmarks are based on the historical situation at the site of the project activity prior to the implementation of the project and cannot be updated because the historical situation does not exist anymore as a result of the VCS project activity.”

In the context of the present project activity the emission factor has been updated along with the approach used to calculate the emission factor.

Step 2: Update the current baseline and the data and parameters

As evident from the explanation provided above the baseline scenario remains unchanged. Only the approach used to calculate the baseline emission factor is updated as per the latest version of CEA database available at the time of PDD submission for renewal.

In line with the CDM project standard version 03.0, the impact of new relevant national and/or sectoral policies and circumstances on the baseline taking into account relevant EB guidance with regard to renewal of the crediting period at the time of requesting renewal of crediting period; and the correctness of the application of an approved baseline methodology for the determination of the continued validity of the baseline or its update, and the estimation of emission reductions for the applicable crediting period

Impact of the national and/or sectoral policies and circumstances upon the baseline scenario of the project activity

The Government of India enacted the Electricity Act in the year 2003¹⁷ to harmonize and rationalize the provisions in the existing laws. The Act consolidated the laws relating to generation, transmission, distribution, trading and use of electricity. With the Enactment of the act, the then existing laws viz, The Indian Electricity Act 1910¹⁸, The Electricity Supply Act, 1948¹⁹ and The Electricity Regulatory

¹⁷ <https://cercind.gov.in/Act-with-amendment.pdf>

¹⁸ <https://www.cercind.gov.in/IEA1910.pdf>

Commissions Act, 1998 were repealed. The Electricity Act 2003 was in force at the time of the completion of the baseline study for the registered PDD.

Section 3 of the said act required the Central Government to prepare the national electricity policy and tariff policy, in consultation with the State Governments and the Authority for development of the power system based on optimal utilization of resources such as coal, natural gas, nuclear substances or materials, wind and renewable sources of energy. In accordance with the section 3 of the Electricity Act 2003, the Central Government notified the National Electricity Policy on 12-February-2005 which was in force at the time of completion of the baseline study as stated in the registered PDD of the project activity. This policy has not been revised since then and is currently in force as well.

In addition to the above policies, State Electricity Regulatory Commissions (SERCs) have announced preferential tariffs and Indian Renewable Energy Development Agency (IREDA) provides term loan assistance towards establishing biomass power projects. All these fiscal and financial incentives were in force at the time of completion of the baseline study for the registered PDD of the project activity and still continue to exist.

There are no mandatory national and/or sectoral policies have come into effect that would affect the compliance of the current baseline. Hence, it can be concluded the current baseline complies with all relevant mandatory national and/or sectoral policies that have come into effect after the submission of the project activity for validation and are applicable at the time of requesting renewal of the crediting periods.

However, in spite of the financial incentives given by the government to renewable power projects in India the generation from the low cost must run resources connected to the Southern Grid has not increased to such an extent that this would lead to more than 50% contribution from the low cost must run resources towards the total generation from the Indian Grid.

The approved consolidated baseline methodology, ACM0002 (Version 22), has been used to determine the baseline and the estimation of emission reductions for the applicable crediting period. As referred in the methodology “Tool to calculate the emission factor for an electricity system” (version 07.0) has been used to determine continued validity of the baseline based on combined margin (CM) calculations.

As per CEA database version 19, the fossil fuel dominated electricity is more than renewable sector and is continuing with same pattern. In light of the above discussion, it is to be concluded that in accordance with relevant guidelines stipulated in the Project Standard version 03.0, national and/or sectoral policies and circumstances had been considered towards formulating the OM & BM baseline scenario. Hence the baseline scenario as applied for the present project activity remains justified.

As per the approved consolidated Methodology ACM0002 (Version 22) para 27: “If the project activity is the installation of a Greenfield power plant with or without a BESS as described under paragraph 5(a) or paragraph 7(a) or paragraph 7(e) above, the baseline scenario is electricity delivered to the grid by the project activity that would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources, as reflected in the combined margin (CM) calculations described in TOOL07

The project activity involved setting up of wind power project to produce electricity and supply to the grid. In the absence of the project activity, the equivalent amount of power would have been supplied by the state grid part of Indian Grid, which is fed mainly by fossil fuel fired plants.

¹⁹ <https://cercind.gov.in/ElectSupplyAct1948.pdf>

In the absence of the project activity, the equivalent amount of power would have been drawn from the state grid. Hence, the baseline for the project activity is the equivalent amount of power from the Indian grid.

The combined margin ($EF_{grid,CM,y}$) is the result of a weighted average of two emission factor pertaining to the electricity system: the operating margin (OM) and build margin (BM). Calculations for this combined margin must be based on data from an official source²⁰ (where available) and made publicly available. The CEA database version 19 is the latest available data at the time of PD submission to VVB for validation, hence same is considered for emission factor calculations.

The combined margin of the Indian grid used for the project activity is as follows:

Parameter	Value	Nomenclature	Source
$EF_{grid,CM,y}$	0.9352 tCO ₂ /MWh	Combined margin CO ₂ emission factor for the project electricity system in year y	Calculated as the last 3 year (2020-2021, 2021-2022 and 2022-23) generation-weighted average, sourced from Baseline CO ₂ Emission Database, Version 19.0, December 2023 published by Central Electricity Authority (CEA), Government of India.
$EF_{grid,OM,y}$	0.9580 tCO ₂ /MWh	Operating margin CO ₂ emission factor for the project electricity system in year y	Calculated as the last 3-year (2020-2021, 2021-2022 and 2022-23) generation-weighted average, sourced from Baseline CO ₂ Emission Database, Version 19.0, December 2023 published by Central Electricity Authority (CEA), Government of India.
$EF_{grid,BM,y}$	0.8670 tCO ₂ /MWh	Build margin CO ₂ emission factor for the project electricity system in year y	Baseline CO ₂ Emission Database, Version 19.0, December 2023 published by Central Electricity Authority (CEA), Government of India.

This emission factor will remain fixed for entire crediting period.

The baseline emission calculation for the project activity is attributable to the CO₂ Emission that could have been produced by the fossil fuel based power plants in absence of the project activity. Therefore, the amount electricity supplied to the Indian Grid will be multiplied by the grid emission factor to calculate the baseline emissions reduced by the project activity.

3.5 Additionality

Please refer to section 2.5 of JOINT PROJECT DESCRIPTION & MONITORING REPORT (version 2 dated 15-March-2016 of The Verified Carbon Standard (VCS) Program with Project ID 1523²¹.

As per section 3.9.8 of VCS Standard V4.7²², A full reassessment of additionality is not required when renewing the project crediting period.

²⁰ https://cea.nic.in/wp-content/uploads/baseline/2024/04/User_Guide_Version_19.0.pdf

²¹ <https://registry.terra.org/app/projectDetail/VCS/1523>

3.5.1 Regulatory Surplus

Is the project registered or seeking registration in an UNFCCC Annex 1 or Non-Annex 1 country?

☐ Annex 1 country ☒ Non-Annex 1 country

Are the project activities mandated by any law, statute, or other regulatory framework?

☐ Yes ☒ No²³

If the project is located inside a Non-Annex 1 country and the project activities are mandated by a law, statute, or other regulatory framework, are such laws, statutes, or regulatory frameworks systematically enforced?

☒ Yes ☐ No

3.5.2 Additionality Methods

Please refer to section B 2.5 of JOINT PROJECT DESCRIPTION & MONITORING REPORT (VCS Version 2 dated 15-March-2016) of the VERRA registered VCS project with reference no. 1523.

The web link of the same is given below: <https://registry.verra.org/app/projectDetail/VCS/1523>

In India, there is no any regulation to install the wind projects and the project activity is a voluntary step taken by PP. In India, the fossil fuel based thermal power generation is dominant over the renewable based power generation; thus baseline scenario remains same as original. As discussed in joint VCS PD and MR, there is no Impact of the national and/or sectoral policies and circumstances upon the baseline scenario of the project activity and project activity is additional as per CDM Tool for the demonstration and assessment of additionality and as per VCS Program rules.

3.6 Methodology Deviations

There is no any methodology deviation applicable for the project activity.

4 IMPLEMENTATION STATUS

4.1 Implementation Status of the Project Activity

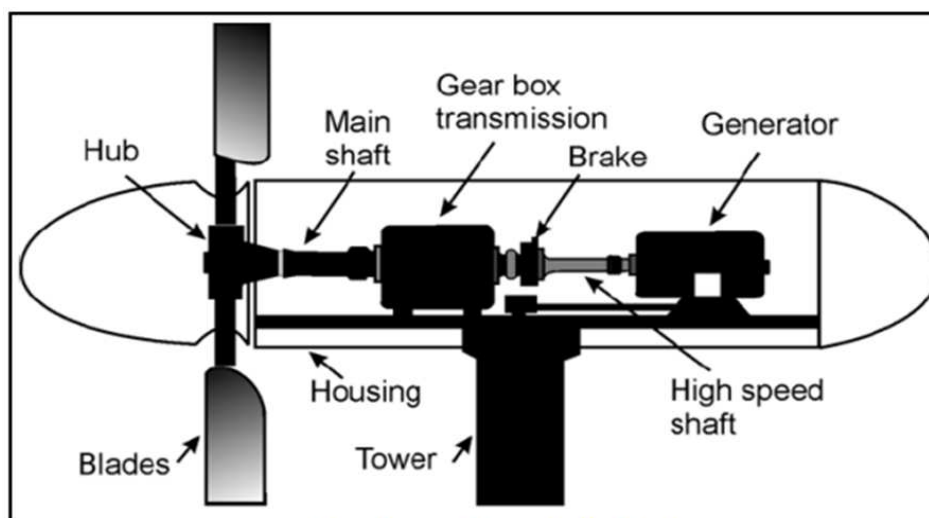
As per the applicable methodology, a Greenfield power plant is defined as “a new renewable energy power plant that is constructed and operated at a site where no renewable energy power plant was operated prior to the implementation of the project activity”.

²² <https://verra.org/wp-content/uploads/2024/04/VCS-Standard-v4.7-FINAL-4.15.24.pdf>

²³ The mandated laws, statutes, or other regulatory frameworks require project activities are being mentioned in Section 1.15.

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.



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.

The project start date (31-March-2014) is the date on which first WTG was commissioned under the Project activity.

S. No.	Machine ID	DOC ²⁴	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

²⁴ Date Of commissioning

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	Khopti	Georai	Beed	Maharashtra
20	G 20	07-October-2014	Manyarwadi	Georai	Beed	Maharashtra
21	G 21	05-October-2014	Khopti	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	G 28	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
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

Details of Wind Power Project Technology and Emission Reductions from anthropogenic sources are mentioned in [section 1.12](#).

The operational lifetime of major project equipment is estimated to be 25 years.

During this monitoring period 01-August-2023 to 30-March-2024 (including both days) total emission reductions achieved are 61,078 tCO₂e by displacing electricity of 62,516.16 MWh from fossil fuel based electricity grid. The project is running smoothly since commissioning, there were no instances / events occurred that would alter the GHG reductions, methodology applicability and monitoring procedure. This went for the schedule maintenance at regular intervals. Further breakdown details is being mentioned in **Error! Reference source not found..**

5 QUANTIFICATION OF ESTIMATED GHG EMISSION REDUCTIONS AND REMOVALS

5.1 Baseline Emissions

As per section 5.5, para 57 of ACM0002 Version 22.0, Baseline emissions include only CO₂ emissions from electricity generation in fossil fuel fired power plants that are displaced due to the project activity. The methodology assumes that all project electricity generation above baseline levels would have been generated by existing grid-connected power plants and the addition of new grid-connected power plants. The baseline emissions are to be calculated as follows:

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

Where:

BE _y	:	Baseline emissions in year y (tCO ₂ /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 CO ₂ 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” (t CO ₂ /MWh)

Calculation of EG_{PJ,y} =

The methodology ACM0002 (Version 22.0) has procedures for calculation of EG_{PJ, y} for the following cases:

- (a) Greenfield plants,
- (b) Retrofits and replacements, and
- (c) Capacity additions.

As the proposed project activity is Greenfield plant, option (a) as provided in the methodology ACM0002 (Version 22.0) shall be applicable and is described below:

“If the project activity is the installation of a new grid-connected renewable power plant/unit at a site where no renewable power plant was operated prior to the implementation of the project activity, then:

$$EG_{PJ,y} = EG_{facility,y}$$

Where:

$EG_{PJ,y}$	:	Quantity of net electricity generation that is produced and fed into the grid as a result of the implementation of the CDM project activity in year y (MWh/yr)
$EG_{facility,y}$	:	Quantity of net electricity generation supplied by the project plant/unit to the grid in year y (MWh/yr)

Calculation of $EF_{grid, CM, y}$:

The methodology ACM0002 (Version 22.0) requires that the combined margin for the grid be calculated in accordance with the procedure provided in the “Tool to calculate the emission factor for an electricity system”.

As per version 4 of Tool to calculate emission factor for an electricity system, following steps are included in the calculation of the emission factor for the baseline scenario:

STEP 1: Identify the relevant electricity systems;

STEP 2: Choose whether to include off-grid power plants in the project electricity system (optional);

STEP 3: Select a method to determine the operating margin (OM);

STEP 4: Calculate the operating margin emission factor according to the selected method;

STEP 5: Calculate the build margin (BM) emission factor;

STEP 6: Calculate the combined margin (CM) emission factor.

The Central Electricity Authority (CEA) has published CO₂ baseline database in its version 19 (December, 2023). The values for OM, BM, CM are given excluding and including imports. For the present project activity, including imports are considered.

STEP 1: Identify the relevant electricity power systems:

Grid/project electricity system is defined by the spatial extent of the power plants that are physically connected through transmission and distribution lines to the project activity (e.g. the renewable power plant location or the consumers where electricity is being saved) and that can be dispatched without significant transmission constraints. The Southern grid and the INDIAN Grid form the two independent regional grids of India. As the project activity comprises the project activity located in the state of Maharashtra, the INDIAN grid is applicable to the proposed CDM project.

Each state in a regional grid meets its own demand with its own generation facilities and also with allocation from power plants owned by the central sector. Depending on the demand and generation, there are electricity exports and imports between states in the regional grid. The volume of the net transfers between the regions in India is relatively small and electricity is

largely produced and consumed within the same states. Consequently, it is appropriate to assume that the impacts of the project activity will be confined to the regional grid in which it is located. Hence for the purpose of estimation of the baseline emission factor, the INDIAN grid has been chosen as the relevant electricity system²⁵.

NEWNE				Southern
Northern	Eastern	Western	North-Eastern	
Chandigarh	Bihar	Chhattisgarh	Arunachal Pradesh	Kerala
Delhi	Jharkhand	Gujarat	Assam	Karnataka
Haryana	Orissa	Daman & Diu	Manipur	Tamil Nadu
Himachal Pradesh	West Bengal	Dadar & Nagar Haveli	Meghalaya	Andhra Pradesh
Jammu & Kashmir	Sikkim	Madhya Pradesh	Mizoram	
Punjab	Andaman & Nicobar	Maharashtra	Nagaland	
Rajasthan		Goa	Tripura	
Uttar Pradesh				
Uttarakhand				

STEP 2: Choose whether to include off-grid power plants in the project electricity system (optional) Project participants have the option of choosing between the following two options to calculate the operating margin and build margin emission factor:

Option I: Only grid power plants are included in the calculation.

Option II: Both grid power plants and off-grid power plants are included in the calculation.

The Project Participant has chosen Option I : Only grid power plants in the calculation.

STEP 3: Select a method to determine the operating margin (OM) method The calculation of the operating margin emission factor ($EF_{grid,OM,y}$) is based on one of the following methods, which are described under Step 4:

- (a) Simple OM, or
- (b) Simple adjusted OM, or
- (c) Dispatch data analysis OM, or
- (d) Average OM.

The data required to calculate simple adjusted OM or Dispatch data analysis is not possible due to lack of availability of this activity data to the project developers. The choice of other two

²⁵ https://cea.nic.in/wp-content/uploads/baseline/2024/04/User_Guide_Version_19.0.pdf

options for calculating the operating margin emission factor depends on the generation of electricity from low cost/must run sources. In the context of the methodology low cost/must run resources typically include hydro, geothermal, wind, low-cost biomass, nuclear and solar generation.

Share of Must-Run (Hydro/Nuclear) (% of Net Generation)

	2018-19	2019-20	2020-21	2021-22	2022-23
INDIAN	14.5%	17.0%	16.5%	15.8%	15.33%

Data Source: Central Electricity Authority (CEA) database Version 19 (December, 2023)

The above data clearly shows that the percentage of total grid generation by low cost/must run plants (on the basis of average of three most recent years) for the INDIAN and Southern grids is less than 50 % of the total generation. Thus, the average emission rate method cannot be applied, as low cost/must run resources constitute less than 50% of total grid generation.

The “Simple operating margin” has been calculated as per the weighted average emissions (in tCO₂/MWh) of all generating sources serving the system, excluding hydro, geo-thermal, wind, low-cost biomass, nuclear and solar generation; For the simple OM, the simple adjusted OM and the average OM, the emissions factor can be calculated using either of the two following data vintages:

- Ex ante option: If the ex-ante option is chosen, the emission factor is determined once at the validation stage, thus no monitoring and recalculation of the emissions factor during the crediting period is required. Or
- Ex post option: If the ex-post option is chosen, the emission factor is determined for the year in which the project activity displaces grid electricity, requiring the emissions factor to be updated annually during monitoring.

PP has chosen ex ante option for the calculation of OM with 3 years generation weighted average of the most recent years available at the time of submission of VCS-PD to the VVB for validation.

OM determined at validation stage will be the same throughout the crediting period. There will be no requirement to monitor & recalculate the emission factor during the crediting period.

STEP 4: Calculate the operating margin emission factor (EF_{grid,OM,y}) according to the selected method The operating margin emission factor has been calculated using a 3 year data vintage:

The operating margin emission factor has been calculated using a 3-year data vintage:

Net Generation in Operating Margin (GWH) (incl. Imports)			
	2020-21	2021-22	2022-23
Indian Grid	958,218	1,035,672	1,117,846
Simple Operating Margin (tCO ₂ /MWh) (incl. Imports) (1) (2)			
	2020-21	2021-22	2022-23
Indian Grid	0.9402	0.9605	0.9710

STEP 5: Calculate the build margin emission factor ($EF_{grid,BM,y}$)

Option 1 as described above is chosen to calculate the build margin emission factor for the project activity. BM is calculated ex-ante based on the most recent information available at the time of submission of PDD and is fixed for the entire crediting period.

Build Margin (tCO ₂ /MWh) (not adjusted for imports)	
	2022-23
INDIAN Grid	0.8670

(With sample group constituting most recent capacity additions to the grid comprising 20% of the system generation)

STEP 6: Calculate the combined margin (CM) emissions factor Combined Margin –

The combined margin is the weighted average of the simple operating Margin and the build margin. In particular, for intermittent and non-dispatchable generation types such as wind and solar photovoltaic, the Tool to calculate the emission factor for an electricity system, Version 07.0, EB 100, Annex 4, allows to weigh the operating margin and Build margin at 75% and 25%, respectively.

The baseline emission factor is calculated using the combined margin approach as described in the following steps:

Calculation of Baseline Emission Factor ($EF_{grid,CM,y}$)

The baseline emission factor $EF_{grid,CM,y}$ is calculated as the weighted average of the Operating Margin emission factor ($EF_{grid,OM,y}$) and the Build Margin emission factor ($EF_{grid,BM,y}$):

$$EF_{grid,CM,y} = W_{OM} * EF_{grid,OM,y} + W_{BM} * EF_{grid,BM,y}$$

Where,

W_{OM}	75% weight of operating margin emissions factor (%)
W_{BM}	25% weight of operating margin emissions factor (%)
$EF_{grid,CM,y}$	Build margin CO ₂ emission factor of a particular grid in year y; calculated as described in Steps 3&4 above (tCO ₂ /MWh)
$EF_{grid,CM,y}$	Build margin CO ₂ emission factor of a particular grid in year y; calculated as described in Steps 5 above (tCO ₂ /MWh)

Baseline Emission factor (INDIAN Grid)

$$EF_{INDIAN, CM, y} = 0.75 * 0.9580 + 0.25 * 0.8670 = 0.9352 \text{ tCO}_2/\text{MWh}$$

Therefore, Baseline Emissions: $BE_y = EG_{PJ,y} \times EF_{grid,CM,y}$

$$BE_y = 140,160 \times 0.9352 = 131,077 \text{ tCO}_2 \text{ (Rounded down value)}$$

5.2 Project Emissions

The Project emission calculation as per para 40 of ACM0002 version 22. For most renewable energy power generation project activities, $PE_y = 0$. However, some project activities may involve project emissions that can be significant. These emissions shall be accounted for as project emissions by using the following equation:

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

Where,

PE_y	=	Project emissions in year y (tCO ₂ e/year)
$PE_{FF,y}$	=	Project emissions from fossil fuel consumption in year y (tCO ₂ e/year)
$PE_{GP,y}$	=	Project emission from the operation of dry, flash steam or binary geothermal power plants in year y (tCO ₂ e/year)
$PE_{HP,y}$	=	Project emissions from water reservoirs of hydro power plants and pumped storage plants in year y (tCO ₂ e/year)
$PE_{BESS,y}$	=	Project emissions from charging of a BESS using electricity from the grid or from fossil fuel electricity generators (t CO ₂ e/yr)
$PE_{PSP,y}$	=	Project emissions from utilizing electricity from the grid for pumping operation of PSP in excess to the production of the renewable power plant operating in coordination with the PSP (t CO ₂ e/yr)

$PE_{FF,y} = 0$, As per para 41 of ACM0002 version 22, “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

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

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

Therefore, $PE_y = 0$

5.3 Leakage Emissions

As per para 71 of ACM0002 version 22, No leakage emissions needs to considered for the project activity.

Therefore, $LE_y = 0$

5.4 Estimated GHG Emission Reductions and Carbon Dioxide Removals

$$ER_y = BE_y - PE_y - LE_y$$

As the project activity is a wind project, there is no any leakage emissions from the project activity.

Hence, $LE_y = 0$

Therefore, Emission Reductions for this project activity calculated as follows:

$$ER_y = BE_y - PE_y$$

Where:

ER_y = Emission reductions in year y (t CO₂e/yr)

BE_y = Baseline emissions in year y (t CO₂e/yr)

Therefore, Net GHG Emission Reductions and Removals are calculated as follows:

$$ER_y = BE_y - PE_y$$

$$ER_y = 131,077 \text{ tCO}_2$$

Vintage period	Estimated baseline emissions (tCO ₂ e)	Estimated project emissions (tCO ₂ e)	Estimated leakage emissions (tCO ₂ e)	Estimated reduction VCUs (tCO ₂ e)	Estimated removal VCUs (tCO ₂ e)	Estimated total VCUs (tCO ₂ e)
31-Mar-2024 to 31-Dec-2024	99,116	0	0	99,116	0	99,116
01-Jan-2025 to 31-Dec-2025	131,077	0	0	131,077	0	131,077
01-Jan-2026 to 31-Dec-2026	131,077	0	0	131,077	0	131,077
01-Jan-2027 to 31-Dec-2027	131,077	0	0	131,077	0	131,077
01-Jan-2028 to 31-Dec-2028	131,077	0	0	131,077	0	131,077
01-Jan-2029 to 31-Dec-2029	131,077	0	0	131,077	0	131,077
01-Jan-2030 to 31-Dec-2030	131,077	0	0	131,077	0	131,077
01-Jan-2031 to 31-Dec-2031	131,077	0	0	131,077	0	131,077

01-Jan-2032 to 31-Dec-2032	131,077	0	0	131,077	0	131,077
01-Jan-2033 to 31-Dec-2033	131,077	0	0	131,077	0	131,077
01-Jan-2034 to 30-Mar-2034	31,961	0	0	31,961	0	31,961
Total	1,310,770	0	0	1,310,770	0	1,310,770

6 MONITORING

6.1 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 19, December 2023
Value applied:	0.9580
Justification of choice of data or description of measurement methods and procedures applied	Calculated as generation-weighted average using the data of last 3-year (2020-21, 2021-22 and 2022-23), sourced from Baseline CO ₂ Emission Database, Version 19.0, December-23 published by Central Electricity Authority (CEA), Government of India.
Purpose of data	For the calculation of the Baseline Emission
Comments	This parameter is fixed ex-ante for the entire second 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 19, December 2023
Value applied:	0.8670
Justification of choice of data or description of measurement methods and procedures applied	Calculated as generation-weighted average using the data of last 3-year (2020-21, 2021-22 and 2022-23), sourced from Baseline CO ₂ Emission Database, Version 19.0, December-23 published by Central Electricity Authority (CEA), Government of India.
Purpose of data	For the calculation of the Baseline Emission
Comments	This parameter is fixed ex-ante for the entire second crediting period.

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 19, December 2023
Value applied:	0.9352
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: $EF_{grid,BM,y} = \text{Build margin CO}_2 \text{ emission factor in year y (tCO}_2\text{/MWh)}$

	$EF_{grid,OM,y}$ = 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 second crediting period.

6.2 Data and Parameters Monitored

Data / Parameter	$EG_{facility,y}$
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 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 applied:	140,160
Monitoring equipment	Monitoring: Tri vector meter ²⁶ 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 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 2: CALIBRATION RECORDS.
Purpose of 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.

6.3 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 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.

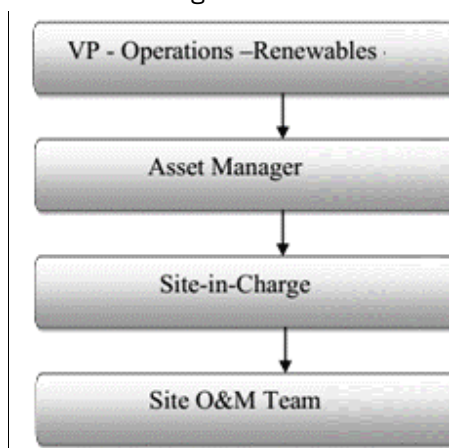
²⁶ The details of main meter and check meter are provided in section APPENDIX 2: Calibration Records.

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 Suzlon global services 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 VVB

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	=	$\frac{\text{Generation at WTG Controller}}{\text{Total Generation of all WTG controller for feeder}}$
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

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.

7 QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS

7.1 Data and Parameters Monitored

Monitoring period Duration: 01-August-2023 to 30-March-2024

Data / Parameter	$EG_{facility,y}$
Data unit	MWh
Description	Quantity of net electricity generation supplied by the project (Wind) plant/unit to the grid in year y
Value applied:	62,516.16

Comments

The data are archived electronically and maintained for the entire crediting period plus two years

7.2 Baseline Emissions

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

Where:

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

$EG_{\text{facility},y}$: Quantity of net electricity generation supplied by the project plant/unit to the grid in year y (MWh/yr)

$EF_{\text{grid, CM, } y}$: 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)

7.3 Project Emissions

The Project emission calculation as per methodology ACM0002 version 22²⁷,

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

Where,

- PE_y = Project emissions in year y (tCO₂e/year)
- $PE_{FF,y}$ = Project emissions from fossil fuel consumption in year y (tCO₂e/year)
- $PE_{GP,y}$ = Project emission from the operation of dry, flash steam or binary geothermal power plants in year y (tCO₂e/year)
- $PE_{HP,y}$ = Project emissions from water reservoirs of hydro power plants and pumped storage plants in year y (tCO₂e/year)
- $PE_{BESS,y}$ = Project emissions from charging of a BESS using electricity from the grid or from fossil fuel electricity generators (t CO₂e/yr)
- $PE_{PSP,y}$ = Project emissions from utilizing electricity from the grid for pumping operation of PSP in excess to the production of the renewable power plant operating in coordination with the PSP (t CO₂e/yr)

$PE_{FF,y} = 0$, As per para 41 of ACM0002 version 22, “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

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

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

²⁷ <https://cdm.unfccc.int/methodologies/DB/XB1TX7TAZ6SLWM9B7BC67THHVD16JV>

Therefore, $PE_y = 0$

7.4 Leakage Emissions

As per methodology ACM0002 version 22, No leakage emissions need to be considered for the project activity.

7.5 GHG Emission Reductions and Carbon Dioxide Removals

$$ER_y = BE_y - PE_y$$

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 period	Baseline emissions (tCO ₂ e)	Project emissions (tCO ₂ e)	Leakage emissions (tCO ₂ e)	Reduction VCU (tCO ₂ e)	Removal VCU (tCO ₂ e)	Total VCU (tCO ₂ e)
01-August-2023 to 31-December-2023	45,474	0	0	45,474	0	45,474
01-Jan-2024 to 30-March-2024	15,604	0	0	15,604	0	15,604
Total	61,078	0	0	61,078	0	61,078

Vintage details for current monitoring period:

Vintage period	Ex-ante estimated reductions/removals	Achieved reductions/removals	Percent difference	Explanation for the difference
01-August-2023 to 31-December-2023	57,400	45,474	-20.78 %	This is due to Breakdown of the WTGs. The details of the same are available in Appendix 3: Major Break Down details
01-January-2024 to 30-March-2024	33,765	15,604	-53.79 %	This is due to Breakdown of the WTGs. The details of the same are available in Appendix 3: Major Break Down details

Total	91,165	61,078	-33.00 %	This is due to Breakdown of the WTGs. The details of the same are available in Appendix 3: Major Break Down details
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APPENDIX 1: COMMERCIALLY SENSITIVE INFORMATION

Not Applicable

Section	Information	Justification
1	Not Applicable	Not Applicable
2	Not Applicable	Not Applicable
3	Not Applicable	Not Applicable
4	Not Applicable	Not Applicable

APPENDIX 2: 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
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APPENDIX 3: MAJOR BREAK DOWN DETAILS

Location number	Stoppage date	Stop time	Start date	Start time	Total Stoppage hours	Error	Action
PWEGPL-20	24-August-2023	17:00	26-October-2023	16:40	1511:40:00	Transformer Mounting hardware broken	Transformer Mounting hardware replaced with crane
PWEGPL-23	19-October-2023	11:46	29-March-2024	12:00	3876:14:00	Blade crack	Blade repair is under repairs same is expected to restore by 12-March-2024
PWEGPL-06	10-February-2024	8:54	14-February-24	11:24	98:30:00	DE & NDE Bearing Replacement	DE & NDE Bearing Replacement
Total Stoppage Hours					5486:24:00		