VASPET-II AND VASPET-III WIND POWER PROJECT, MAHARASHTRA

Document Prepared by ReNew Power Private Limited

Project title	VASPET-II AND VASPET-III WIND POWER PROJECT, MAHARASHTRA
Project ID	VCS 1404
Monitoring period	01-01-2023 to 02-04-2023
Crediting period	03-04-2023 to 02-04-2033
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Version	1.3
VCS Standard Version	4.7
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1 PROJECT DETAILS

1.1 Summary Description of the Project

The project activity is a 49.50 MW (1.5 MW x 33 no. of WTG), Greenfield renewable wind energy projects in Sangli district in the state of Maharashtra. The purpose of the project activity is to generate clean power utilizing wind energy and sell it to the Indian grid through a long-term Power Purchase Agreement (PPA).

The details of the project activity is provided in the table below:

Sr. No.	Location No	Village	Date of Commissioning
1	VASP-15	Shedyal	03/04/2013
2	VASP-72	Shedyal	
3	VASP-142	Shedyal	
4	VASP-29	Shedyal	
5	VASP-64	Salekiri	
6	VASP-35	Salekiri	
7	VASP-09	Salekiri	
8	VASP-49	Salekiri	
9	VASP-237	Shedyal	26/06/2013
10	VASP-450	Shedyal	
11	VAPS III 698	Valsang	
12	VASP-394	Salekiri	
13	VAPS III 26	Valsang	
14	VASP-564	Valsang	03/04/2013
15	VASP-510	Valsang	
16	VASP-637	Valsang	
17	VASP-696	Valsang	24/06/2013
18	VASP-92	Shedyal	30/08/2013
19	VASP-21	Valsang	30/08/2013
20	VAPS III 397	Shedyal	26/06/2013
21	VAPS III 384V	Valsang	
22	VAPS III 440	Valsang	
23	VAPS III 58	Salekiri	01/08/2013
24	VAPS III 525	Valsang	21/08/2013
25	VAPS III 387	Valsang	01/08/2013
26	VAPS III 388	Valsang	19/07/2013
27	VAPS III 689	Valsang	21/08/2013
28	VAPS III 424	Shedyal	21/08/2013
29	VAPS III 108	Salekiri	
30	VAPS III 700/1	Valsang	

31	VAPS III 463	Valsang	21/08/2013
32	VAPS III 105	Shedyal	29/08/2013
33	VAPS III 355	Shedyal	

Contribution of the project activity to sustainable development:

Ministry of Environment Forest and Climate Change, Government of India has suggested social well-being, economic wellbeing, environmental well-being and technological well-being as the four indicators for sustainable development in the host country approval eligibility criteria for Clean Development Mechanism (CDM) projects.

The project contributes to the general well-being of the region and is in line with the sustainable development policies of Government of India, as described below:

Social well-being:

The project has resulted in the investment in the rural sector of India thereby creating employment opportunities to local population (skilled and unskilled manpower) available in and around project facility for building infrastructure, installation and maintenance and managing the wind farm thus enabling improvement in the quality of life of the people.

Economic well-being:

The land prices in the neighbouring area have gone up thereby benefiting the villagers. It helps to improve the availability of electricity as the electricity generated is fed into the grid thereby curtailing the supply demand gap. This provides new opportunities for industries and economic activities to be setup in the area thereby increasing employment opportunities.

Environmental well-being:

The project activity is a cleaner means for power generation which avoids fossil fuel based thermal power generation. Therefore, it positively contributes towards the reduction in demand for India's carbon intensive energy resources thereby conserving the non-renewable natural resources like coal, gas, oil. By substituting and hence decreasing the need for fossil fuel based power generation in the grid, the project activity will reduce GHG emissions from the country's electricity sector. Moreover, wind power projects produce no end products in the form of solid and liquid wastes. Power generation from renewable energy sources in the project activity creates global as well as local environmental benefits.

Technological well-being:

The project activity is an energy diversification measure where renewable energy is harnessed for generation of power in order to meet the increasing energy demand of the state. The associated technology for power generation does not have any associated GHG emission. These turbines deploy the advanced technology for generation as well as for grid interaction. Hence, the project would utilize environmentally safe and sound technologies in wind power

sector. Further the project demonstrates harnessing wind potential and encourages others for setting up more such projects in future.

The estimate of annual average and total GHG emission reductions for the crediting period i.e. from 03-April-2023 to 02-April-2033 is 84,105 tCO_2e per year and 841,051 t CO_2e for 10 years of crediting period.

The current monitoring period was from 01-January-2023 to 02-April-2023 (first and last days included) and the estimated annual emission reduction was 10,999 tCO_2e.

1.2 Audit History

Audit type	Period	Program	Validation/verification body name	Number of years
Validation	31-December-2012	CDM	Perry Johnson Registrars Carbon Emissions Services Inc	1
Validation	03-April-2013 to 02-April-2023	VCS	Bureau Veritas Certification Holding SAS	10 Years
Validation	03-April-2023 to 02-April-2033	VCS	Earthood Services Private Limited	10 Years
Verification	03-April-2013 – 03-August-2014	VCS	Bureau Veritas Certification Holding SAS	1 year 4 months
Verification	04-August-2014 – 02-April-2020	VCS	KBS Certification Services Pvt. Ltd.	5 years 8 months
Verification	03-April-2020 to 31-December-2021	VCS	RINA Services S.p.A (RINA)	1 year 8 months 29 days

Verification	01-January-2022 – 30-June-2022	VCS	LGAI Technological Center S. A. (Applus+ Certification)	6months
Verification	01-July-2022 – 31-December 2022	VCS	Earthood Services Private Limited	6 months
Verification	01-January-2023 – 02-April-2023	VCS	Earthood Services Private Limited	3 months 2 days
Total	03-April-2013 – 02-April-2023	-	-	10 years

1.3 Sectoral Scope and Project Type

Sectoral scope[1]	01 Energy Industries (Renewable - / Non-renewable sources)
Project activity type	Renewable type (wind)

1.4 Project Eligibility

1.4.1 General eligibility

The VCS project activity is implementation and operation of new grid-connected wind power project in Sangli district of Maharashtra, India. The project activity is eligible Sectoral scope 1 i.e. energy industries (renewable/ non-renewable sources) under the scope of the VCS Program. As per VCS Standard, ver 4.7, Appendix 3 (effective dates Updated 9 Mar 2020 for Project Activities registered under VCS Version 3, 'Registered VCS projects and projects that request registration with the VCS Program on or before 31 December 2019 remain eligible under the VCS Program for the entirety of their crediting periods'. The project has applied for registration with the VCS Program before 31 December 2019. Bureau Veritas Certification has made the Gap validation and verification of the "Vaspet-II and Vaspet III Wind Power Project, Maharashtra" in 2015. The project activity has been under continuous verification in VCS program.

[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*

1.4.2 AFOLU project eligibility

Not Applicable

1.4.3 Transfer project eligibility

Not Applicable

1.5 Project Design

The project involves setting up a wind farm of 49.50 MW ("Project) in Sangli district in the state of Maharashtra, India. Hence, the project has been designed to include a single installation of an activity and is not a grouped activity.

☒ Single location or installation

☐ Multiple locations or project activity instances (but not a grouped project)

☐ Grouped project

Grouped Project Design

Not applicable to this project activity as this is not a grouped project.

1.6 Project Proponent

Organization name	ReNew Wind Energy (Shivpur) Private Limited
Contact person	Mr. Gaurav Kumar Singh
Title	PP Representative
Address	ReNew Hub, Commercial Block-1, Zone 6, Golf Course Road, DLF City, Phase-V, Gurugram- 122009, Haryana
Telephone	+91-9113763638
Email	gaurav.singh2@renew.com

1.7 Other Entities Involved in the Project

Organization name	NA
Role in the project	-
Contact person	-

Title	-
Address	-
Telephone	-
Email	-

1.8 Ownership

ReNew Wind Energy (Shivpur) Private Limited (RWEPL) is the SPV of RPSPL and has the ownership of the wind power plant that is established through commissioning certificates of respective power plants and ReNew Power Synergy Private Limited (RPSPL) has the ownership of carbon credits.

All documents viz. purchase and work orders, establishing ownership rights including commissioning certificate are submitted to the validator for validation.

1.9 Project Start Date

Project start date	03-04-2013
Justification	As per §3.8 of VCS Standard, v4.7; the project start date is 03-April-2013 (Date of commissioning of first WEG).

1.10 Project Crediting Period

Crediting period	☐ *Seven years, twice renewable* ☐ *Ten years, fixed* ☒ Other (Project activity was registered in VCS standard v3.4 and as per VCS standard crediting period must be 10 years which is renewable twice.)
Start and end date of first or fixed crediting period	Duration of Second Crediting Period: 03-April-2023 to 02-April-2033

1.11 Project Scale and Estimated GHG Emission Reductions or Removals

Indicate the estimated annual GHG emission reductions/removals (ERRs) of the project:

☒ < 300,000 tCO2e/year (project)

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

Calendar year of crediting period	Estimated GHG emission reductions or removals (tCO_2e)
03-04-2023 to 31-12-2023	62,906
01-01-2024 to 31-12-2024	84,105
01-01-2025 to 31-12-2025	84,105
01-01-2026 to 31-12-2026	84,105
01-01-2027 to 31-12-2027	84,105
01-01-2028 to 31-12-2028	84,105
01-01-2029 to 31-12-2029	84,105
01-01-2030 to 31-12-2030	84,105
01-01-2031 to 31-12-2031	84,105
01-01-2032 to 31-12-2032	84,105
01-01-2033 to 02/04/2033	21,199
Total estimated ERRs during the first or fixed crediting period	841,051
Total number of years	10
Average annual ERRs	84,105

1.12 Description of the Project Activity

The project activity is a 49.50 MW (1.5 MW x 33 no. of WTG), Greenfield renewable wind energy projects in Sangli district in the state of Maharashtra. The purpose of the project activity is to generate clean power utilising wind energy and sell it to the Indian grid through a long term Power Purchase Agreement (PPA).

The details of the project activity is provided in the table below

Sr. No.	Location No	Village	Date of Commissioning
1	VASP-15	Shedyal	03/04/2013
2	VASP-72	Shedyal	
3	VASP-142	Shedyal	
4	VASP-29	Shedyal	
5	VASP-64	Salekiri	
6	VASP-35	Salekiri	
7	VASP-09	Salekiri	
8	VASP-49	Salekiri	
9	VASP-237	Shedyal	

10	VASP-450	Shedyal	26/06/2013
11	VAPS III 698	Valsang	
12	VASP-394	Salekiri	
13	VAPS III 26	Valsang	
14	VASP-564	Valsang	03/04/2013
15	VASP-510	Valsang	
16	VASP-637	Valsang	
17	VASP-696	Valsang	24/06/2013
18	VASP-92	Shedyal	30/08/2013
19	VASP-21	Valsang	30/08/2013
20	VAPS III 397	Shedyal	26/06/2013
21	VAPS III 384V	Valsang	
22	VAPS III 440	Valsang	
23	VAPS III 58	Salekiri	01/08/2013
24	VAPS III 525	Valsang	21/08/2013
25	VAPS III 387	Valsang	01/08/2013
26	VAPS III 388	Valsang	19/07/2013
27	VAPS III 689	Valsang	21/08/2013
28	VAPS III 424	Shedyal	21/08/2013
29	VAPS III 108	Salekiri	
30	VAPS III 700/1	Valsang	21/08/2013
31	VAPS III 463	Valsang	
32	VAPS III 105	Shedyal	29/08/2013
33	VAPS III 355	Shedyal	

The technical specifications are mentioned in section 4.1 of this PDD.

1.13 Project Location

The PAis located in villages Shedyal, Salekiri and Valsang in Sangli district of Maharashtra state,India.

Nearest Airport: Pune, ~290 km;

Nearest Railway Station: Karad, 75 km;

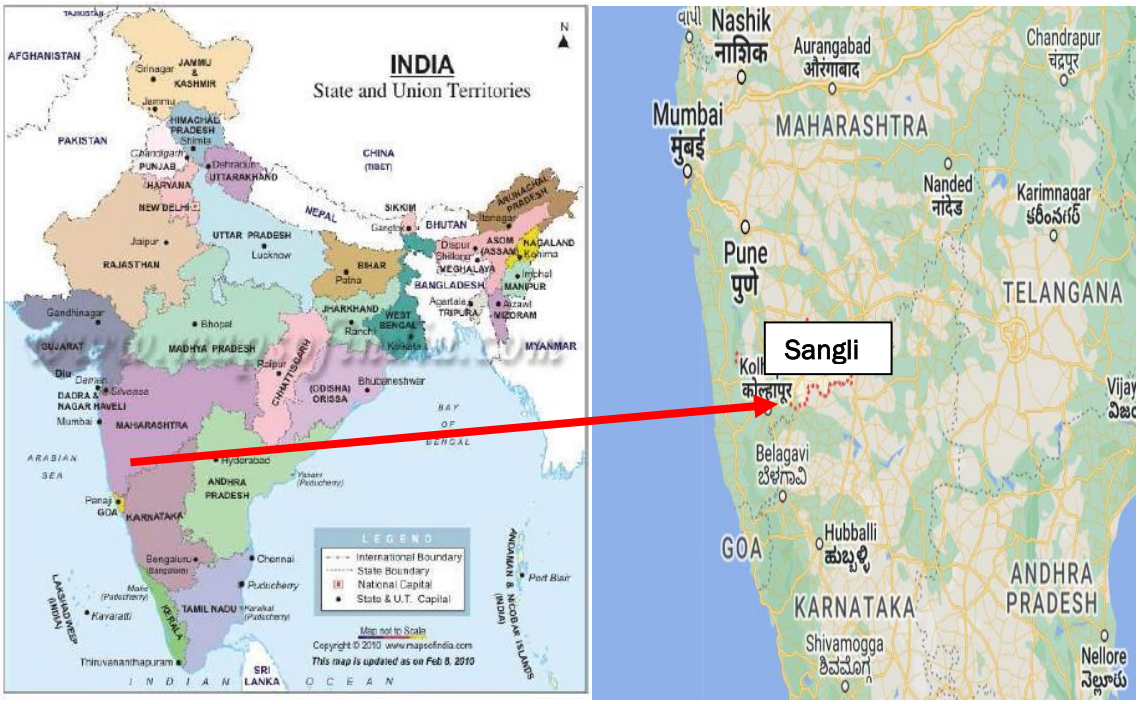
Nearest Seaport: Mumbai, 440 km

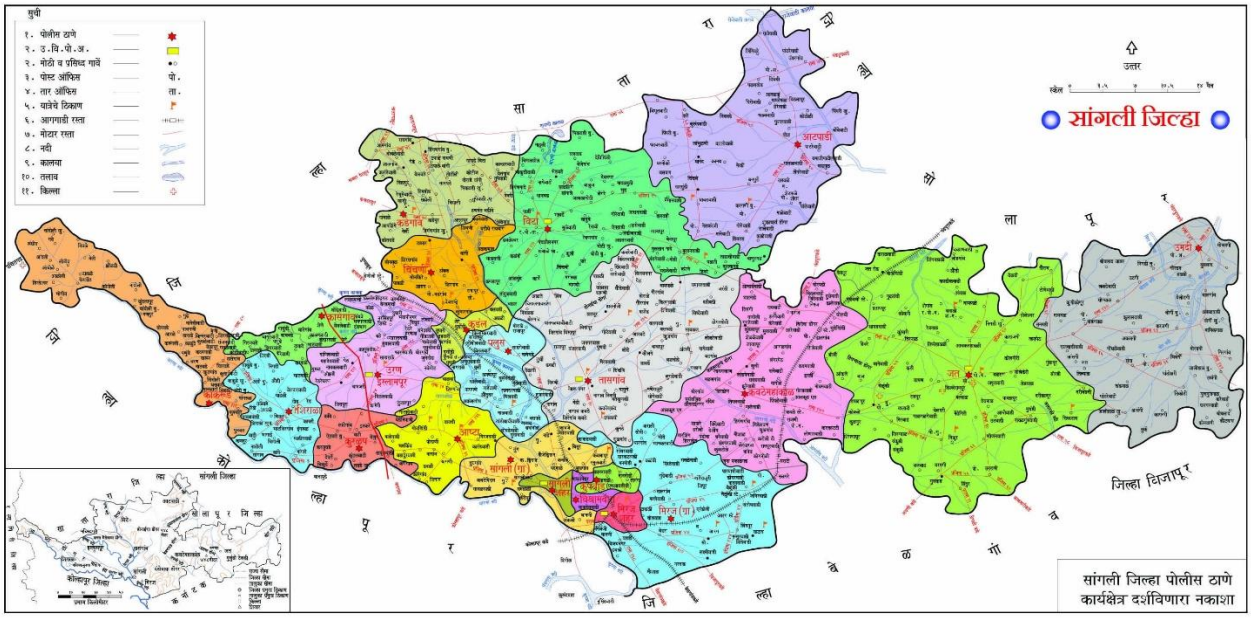
The unique geographical coordinates of the individual power units in PA (Project activity) are as follows

Sr. No.	Location No	Village	Geographical Coordinates	
			Longitude	Latitude
1	VASP-237	Shedyal	75° 20' 56.4514" E	17° 01' 14.6452" N
2	VASP-15	Shedyal	75° 19' 31.3348" E	17° 02' 53.5497" N
3	VASP-72	Shedyal	75° 20' 8.6334" E	17° 03' 3.2863" N

4	VASP-142	Shedyal	75° 20' 4.2664" E	17° 02' 27.6631" N
5	VASP-29	Shedyal	75° 19' 8.0164" E	17° 02' 48.5783" N
6	VASP-64	Salekiri	75° 18' 35.0024" E	17° 02' 11.8565" N
7	VASP-35	Salekiri	75° 18' 39.8914" E	17° 02' 41.1351" N
8	VASP-394	Salekiri	75° 18' 18.6328" E	17° 03' 7.5916" N
9	VASP-09	Salekiri	75° 18' 44.8077" E	17° 03' 2.2838" N
10	VASP-49	Salekiri	75° 18' 11.8762" E	17° 02' 29.9222" N
11	VASP-450	Shedyal	75° 18' 54.6680" E	17° 02' 25.2324" N
12	VASP-564	Valsang	75° 20' 7.6447" E	17° 04' 7.0070" N
13	VASP-510	Valsang	75° 20' 15.7471" E	17° 03' 26.2202" N
14	VASP-637	Valsang	75° 20' 58.5114" E	17° 03' 43.2971" N
15	VASP-696	Valsang	75° 20' 46.8109" E	17° 03' 30.5873" N
16	VASP-92	Shedyal	75° 21' 41.3580" E	17° 03' 0.8830" N
17	VASP-21	Valsang	75° 18' 26.6254" E	17° 03' 31.1435" N
18	VAPS III 397	Shedyal	75° 18' 51.7841" E	17° 01' 44.2053" N
19	VAPS III 26	Valsang	75° 18' 23.3569" E	17° 03' 19.9168" N
20	VAPS III 58	Salekiri	75° 18' 16.6827" E	17° 02' 17.7754" N
21	VAPS III 525	Valsang	75° 20' 19.5374" E	17° 03' 58.2660" N
22	VAPS III 384V	Valsang	75° 19' 3.7317" E	17° 04' 24.4203" N
23	VAPS III 387	Valsang	75° 19' 5.1874" E	17° 04' 38.9978" N
24	VAPS III 388	Valsang	75° 19' 10.1862" E	17° 05' 2.7420" N
25	VAPS III 700/1	Valsang	75° 20' 37.6648" E	17° 03' 15.9618" N
26	VAPS III 689	Valsang	75° 21' 18.2867" E	17° 03' 37.0143" N
27	VAPS III 355	Shedyal	75° 19' 44.8206" E	17° 01' 0.4797" N
28	VAPS III 698	Valsang	75° 21' 0.9283" E	17° 03' 19.7314" N
29	VAPS III 108	Salekiri	75° 18' 14.7601" E	17° 01' 42.7977" N
30	VAPS III 440	Valsang	75° 19' 6.7255" E	17° 03' 46.8951" N
31	VAPS III 463	Valsang	75° 19' 16.5582" E	17° 03' 36.3689" N
32	VAPS III 105	Shedyal	75° 21' 22.1594" E	17° 02' 47.0197" N
33	VAPS III 424	Shedyal	75° 18' 45.6317" E	17° 01' 28.2339" N

Location map of the project activity in India and Sangli district of Maharashtra





1.14 Conditions Prior to Project Initiation

Conditions prior to the project activity: The project activity is the installation and operation of anew grid-connected renewable power plant. Prior to the project initiation, there was no renewable power plant installed at the project site. The electricity delivered to the grid by the project activity would have otherwise been generated by the operation

of grid-connected power plants and bythe addition of new energy resources, as reflected in the combine margin (CM) calculations.

Baseline Scenario: As the project activity is the installation of a new grid-connected renewable power plant, in-line with §23 of applied methodology, ACM0002, version 21 the baseline scenario 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.

1.15 Compliance with Laws, Statutes and Other Regulatory Frameworks

Project activity has complied with all statutory requirements as per State regulations & received commissioning certificate form state regulatory authorities.

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

If yes, provide required evidence of no double issuance as outlined by the VCS Standard.

1.16.2 Registration in Other GHG Programs

Has the project registered under any other GHG programs?

☒ Yes ☐ No

If yes, provide the registration number and the date of project inactivity under the other GHG program.

The VCS project activity has been registered with UNFCCC under Clean Development Mechanism (CDM). The project is a component project activity and Programme of Activities

(PoA). The details are provided below:

Unique Reference No. of PoA : 9416

Name of the PoA : Promotion of renewable energy generation in India-Programme of Activities

Date of Registration : 31-December-2012

Name of the project : Vaspet-II and Vaspet III Wind Power Project, Maharashtra

Unique Reference No. of CPA : 9416-0003

Date of Inclusion : 04-August-2014

Is the project active under the other program?

☐ 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

If yes, provide all required evidence of no double claiming as outlined by the VCS Standard.

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

If yes:

Is the project proponent(s) or authorized representative a buyer or seller of the product(s) (goods or services) that are part of a supply chain?

☐ Yes ☐ No

If yes:

Has the project proponent(s) or authorized representative posted a public statement on their website saying, “Carbon credits may be issued through Verified Carbon Standard project

[project ID] for the greenhouse gas emission reductions or removals associated with [project proponent or authorized representative organization name(s)] [name of product(s) whose emissions footprint is changed by the project activities]."

☐ Yes ☐ No

1.18 Sustainable Development Contributions

1.18.1 Sustainable Development Contributions Activity Description

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

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

Economic well-being:
The project will create a business opportunity for local stakeholders such as suppliers, manufacturers, contractors etc in the Sangli district of Maharashtra.

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

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

1.18.2 Sustainable Development Contributions Activity Monitoring

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 11,544.622 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.*	*Over the lifetime of the project activity for the two crediting periods 1,715,687.04 MWh estimated renewable electricity will be supplied*
2)	*8.5*	*8.5.1 Average hourly earnings of female and male employees, by occupation, age, and persons with disabilities*	*Implemented activities to increase*	*Number of additional Employment Opportunities created: 9*	*.The project leads to overall 09 employment opportunities for the life time of the project.*
3)	*13.2*	*13.2.2 Total greenhouse gas emissions per year*	*Implemented activities to increase*	*By supplying 11,544.622 MWh of clean electricity (generated through wind energy based.) to Indian grid, the project avoided release of 10,999 tCO2e in to the atmosphere during the reporting period.*	*Over the lifetime of the project activity for the two crediting periods, 1,697,851 tCO2e is estimated to be prevented from entering the atmosphere during the entire second crediting period.*

1.19 Additional Information Relevant to the Project

Leakage Management

Not Applicable

Commercially Sensitive Information

Not Applicable.

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

Since none of the stakeholders have been changed since validation and all the identified stakeholders were involved and no new group of stakeholders are to be included for this ongoing validation of the second crediting period along with verification of the project activity. Therefore, this section is not applicable.

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

Date of stakeholder consultation	19-December-2013
Stakeholder engagement process	The PA (Project activity) implementer identified stakeholders like the local population living near PA power plants, employees, elected representatives of nearby areas, etc. as potential stakeholders. A local stakeholders' meeting was held on 19/12/2013 and invitations were by a newspaper ad (Punyanagari, Kolhapur) and a few individual invitations in (local language). The meeting was held at Venue – 507/1/2, 1st Floor, Algur, TV Nagar, Old High School Road, Jath, Tal. Jath, Dist. Sangli
Consultation outcome	The meeting was attended by total 25 people and started by welcome address from Mr. Dipak Nalavade (ReGen Powetech - WTG supplier and O&M contractor) and introductions. Mr. Kuber Turevale, a local representative was unanimously chosen as chairperson of the meeting. Mr. Rohit Joshi, representative of PA implementer introduced objectives of project, its benefits and role in reducing GHG emissions. He also discussed issue of global warming and role of CDM of the Kyoto Protocol. The meeting Chairman discussed benefits of project to the local communities. The Chairperson then summarised comments and gave his view, thanked PA implementer for the social benefits. Then attendees were requested to give comments and raise concerns if any. These are summarised in Appendix 3.
Ongoing communication	The process of local stakeholder consultation is continuous. During the current monitoring period, the project proponent has kept a grievance register in the plant site office and sought comments/grievances/suggestions from local stakeholders including the local community, government agencies, and NGOs.
Stakeholder input	Refer Appendix 3

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 NGOs. Extensive engagement, transparent information sharing, and acknowledgment of customary rights were key. 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 NGOs. 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

Development process	The stakeholders are also requested to share their experiences and grievances on a continuous basis. Site office address, email address, and contact numbers were provided to stakeholders. This information ensures that stakeholders have clear avenues to inquire and express any concerns they may have. If a stakeholder needs additional information or wishes to address a grievance, they can contact the site office where registers are used to record grievances and feedback. The grievance register is placed in a site office and is accessible to everyone.

Grievance redress procedure	A mechanism is established to address grievances and resolve potential conflicts between the project proponent and local stakeholders. The project proponent's contact information, including email address and phone number, has been shared with stakeholders, allowing them to express their ideas and concerns. In case of grievances, the nature of probable resolution is discussed with the plant head office and implemented by the site in-charge.

During this joint validation and verification process, positive feedback has been received regarding site operation. No grievances were received during this joint validation and verification, therefore, no mitigation measures were required. In case of grievances, the nature of probable resolution is discussed with the plant head office and implemented by the site in-charge.

Grievances received	Resolution and outcome
NA	NA

2.1.5 Public Comments

The public comment period commenting period had been completed before the first crediting period. No comments had been received in the commenting period.

Comments received	Actions taken
NA	*NA*

2.2 Risks to Stakeholders and the Environment

2.2.1 Management Experience

The PP's management teams have expertise and experience in implementing similar project activities and engaging communities. PP has developed similar types of projects[2] in various registries and conducted a verification process for the same. Hence, there are no risk associated to the stakeholders and environment due to the project activity.

2.2.2 Risk Assessment

[2] https://registry.goldstandard.org/projects/details/3422

https://registry.goldstandard.org/projects/details/3423

https://registry.verra.org/app/projectDetail/VCS/1851

	Risks identified	Mitigation or preventative measure taken
Natural and human-induced risks to stakeholders' wellbeing	No risk identified	The project activity is a 49.50 MW (1.5 MW x 33 no. of WTG), Greenfield renewable wind energy project. Hence, it does not cause harm to the stakeholders and their local environmental well-being. The project proponent has carefully selected the site that brings no harm to the natural ecosystem of the area.
Risks to stakeholder participation	No risk to stakeholder participation is anticipated	There are no exclusions, lack of communication or barriers in the project activity, that might prevent stakeholders from engaging or participating.
Working conditions	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 women and girls	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.
Safety of minority and marginalized groups, including children	No risk identified	No threats to the safety of minority and marginalized groups, including children, have been identified. The PP duly diligently follows the legal and human rights of children, minorities, and marginalized groups, and hence, the project poses no negative effects on them.
Pollutants (air, noise, discharges to water, generation of waste, and release of hazardous materials and chemical pesticides and fertilizers)	No risk to stakeholder participation is anticipated	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. Shadow flickering and noise effects from the project activity do not affect the residential areas as no residential area falls under the vicinity of the project activity. Also, the waste is collected and stored in appropriate bins/ storage with cover lid, separate by type of waste before contacting the contracted agencies authorized by the government to pick up for further disposal. The project rather improves air quality by

		preventing fossil fuel burns and mitigates climate change by producing electricity from a clean source of energy, i.e. wind energy.

2.3 Respect for Human Rights and Equity

2.3.1 Labor and Work

	Risks identified[3]	Mitigation or preventative measure(s) taken
Discrimination	No risk identified	PP shall oblige to create a workplace free of sexual harassment and no discrimination as per local law and same will be demonstrated during validation assessment process.
Sexual harassment	No risk identified	
Equal pay for equal work	No risk identified	PP has implemented several measures to ensure equal pay for equal work. These measures include conducting regular pay equity reviews to identify and address any disparities in pay, providing training and resources to managers and employees on fair pay practices, and establishing clear job descriptions and performance metrics to ensure that all employees are evaluated fairly and objectively.
Gender equity in labor and work	No risk identified	No discrimination in workers with respect to gender in providing jobs and also there is no discrimination in respect to

[3] The identified risks and commensurate mitigation or preventative measure(s) for forced labor, child labor, and human trafficking, must be inclusive of staff and contracted workers employed by third parties.

		wages between genders. The same is being taken care of as per the company's policies by the project proponent during the validation assessment process.
Forced labor	No risk identified	Project activity does not and will not use victims of human trafficking, forced labor, and child labor. The same is being taken care of as per the company's policies by the project proponent during the validation assessment process.
Child labor	No risk identified	
Human trafficking	No risk identified	

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 law[4], the UNDRIP[5] and ILO Convention 169-

- **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.

Risks identified	Mitigation or preventative measure(s) taken
NA	NA

2.3.3 Indigenous Peoples and Cultural Heritage

[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

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

Risks identified	Mitigation(s) or preventative measure taken
NA	NA

2.3.4 Property Rights

Risks identified	Mitigation or preventative measure(s) taken
N/A	The land / property for the project activity belongs to the project proponent. 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	**Since the above section 2.3.4 is not applicable, hence this section is also not applicable.**
Summary of the benefit sharing plan	N/A
Approval and dissemination of benefit sharing plan	N/A
Benefit sharing during the monitoring period	N/A

2.4 Ecosystem Health

	Risks identified	Mitigation or preventative measure(s) 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 activity keeps check of the soil degradation and soil erosion by periodic monitoring.
Water consumption and stress	No risk identified	This project activity is a wind power project and does not have any negative impacts on water consumption or does not lead to water stress in any way.

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 and habitat	**The project activity has not adversely impacted habitats for rare, threatened, or endangered species during the monitoring period.**
Areas needed for habitat connectivity	The project has not adversely impacted areas needed for habitat connectivity during the monitoring period.

	Risks identified	Mitigation or preventative measure(s) taken
Habitats for rare, threatened, and endangered species	NA	NA
Areas for habitat connectivity	NA	NA

2.4.2 Introduction of species

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

Existing invasive species	Mitigation measures to prevent the spread or continued existence of invasive species
NA	NA

	Risks identified	Mitigation or preventative measure(s) taken
Invasive species	NA	NA

2.4.3 Ecosystem conversion

Since, the project activity is neither ARR, ALM, WRC nor ACoGS, hence this information is not applicable.

	Risks identified	Mitigation or preventative measure(s) taken
Ecosystem conversion	NA	NA

3 APPLICATION OF METHODOLOGY

3.1 Title and Reference of Methodology

Type (methodology, tool or module).	Reference ID, if applicable	Title	Version
Methodology	ACM0002[6]	Grid-connected electricity generation from renewable sources 'Consolidated baseline methodology for grid-connected electricity generation from renewable sources' Reference: http://cdm.unfccc.int/methodologies/DB/MPY3HVJIMTKE5P0UNTYE827D6Q7EHB The CPA does not involve application of multiple methodologies.	Version 21.0
Tool	Tool 7	Tool to calculate the emission factor for an electricity system"	Ver. 07.0.0, EB 100, Annex 4

[6] https://cdm.unfccc.int/methodologies/DB/HF3LP6O41YY0JIP1DK6ZRJO9RSCX3S

Tool	Tool 1	Tool for the demonstration and assessment of additionality	Ver. 07.0.0, EB 70, Annex 08
Tool	Tool 11	Assessment of the validity of the original/current baseline and update of the baseline at the renewal of the crediting period	Ver. 3.0.1, EB 66 annex 47

These Tools can be referred from the link

https://cdm.unfccc.int/Reference/tools/index.html

3.2 Applicability of Methodology

The project activity is new grid-connected wind power project in Sangli district of Maharashtra,India . Version 21.0 of ACM0002 methodology is applicable to grid-connected renewable power generation project activities that:

(a) Install a Greenfield power plant.

(b) Involve a capacity addition to (an) existin g plant(s);

(c) Involve a retrofit of (an) existing operating plants/units.

(d) Involve a rehabilitation of (an) existing plant(s)/unit(s); or

(e) Involve a replacement of (an) existing plant(s)/unit(s).

The project activity is wind based renewable energy source, zero emission power project connected to the different state grids, which forms part of the Indian electricity grid. The project activity will displace fossil fuel-based electricity generation that would have otherwise been provided by the operation and expansion of the fossil fuel based power plants in Indian grid. The approved consolidated baseline and monitoring methodology ACM0002 Version 21.0 is the choice of the baseline and monitoring methodology and it is applicable because:

Comparison of project activity characteristics and eligibility criteria of version 21.0 of ACM0002

Methodology ID	Applicability condition	Justification of compliance

ACM0002	1. This methodology is applicable to grid-connected renewable energy power generation project activities that: (a) Install a Greenfield power plant; (b) Involve a capacity addition to (an) existing plant(s); (c) Involve a retrofit of (an) existing operating plants/units; (d) Involve a rehabilitation of (an) existing plant(s)/unit(s); or (e) Involve a replacement of (an) existing plant(s)/unit(s)	The project activity is a Renewable Energy Project i.e. Wind Power Project which falls under applicability criteria option 1 (a) i.e., "Install a Greenfield power plant". Hence the project activity meets the given applicability criterion.
	2. 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	The project is installation of new wind based electricity generation plants (does not involves the integration of a BESS). Hence this criterion is not applicable

	retrofit of (an) existing solar photovoltaic or wind power plant(s)/unit(s).	
	3. The methodology is applicable under the following conditions: (a) The project activity may include renewable energy power plant/unit of one of the following types: 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; (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 started commercial operation prior to the start of a minimum historical reference period of five years, used for the calculation of baseline emissions and defined in the baseline emission section, and 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 option (a) of applicability criteria 2 is applicable as project is renewable energy wind power plant/unit.
	4. In case of hydro power plants, one of the	The project is installation of new wind based electricity generation plants (not a hydro power plant). Hence this criterion is not applicable.

	following conditions shall apply:[7] (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/m^2; or (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/m^2, 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/m^2; (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	

[7] Project participants wishing to undertake a hydroelectric project activity that result in a new reservoir or an increase in the volume of an existing reservoir, in particular where reservoirs have no significant vegetative biomass in the catchments area, may request a revision to the approved consolidated methodology.

	power density lower than or equal to 4 W/m^2 shall be: a) Lower than or equal to 15 MW; and Less than 10 percent of the total installed capacity of integrated hydro power project.	
	5. In the case of integrated hydro power projects, project proponent shall: 6. 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 7. 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 VCS 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 seasonal flows from river, tributaries (if any), and rainfall for minimum five years prior to	The project is wind energy project and thus the criterion is not applicable to this project activity.

	implementation of VCS project activity.	
	8. 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 Greenfield and there is no switching of fossil fuel to renewable energy. Hence the criteria is not applicable to the project activity The project is not a biomass fired power plant. Hence the criteria is not applicable to the project activity.
	9. 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".	Not applicable, the wind energy project is a Green field project activity and this project is not the enhancement or up gradation project.
	10. In addition, the applicability conditions included in the tools referred to below apply.[8]	Please refer tables below.
Applicability conditions of "Tool to calculate the emission factor for an electricity system", - Version 07.0		
	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	This condition is applicable. OM, BM and CM are estimated using the tool under section B.6.3 for calculating baseline emissions.

[8] The condition in the "Combined tool to identify the baseline scenario and demonstrate additionality" that all potential alternative scenarios to the proposed project activity must be available options to project participants; does not apply to this methodology, as this methodology only refers to some steps of this tool.

	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).	
	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, two sub-options under the step 2 of the tool are available to the project participants, i.e. option IIa and option IIb. If option IIa is chosen, the conditions specified in "Appendix 2: be met. Namely, the total capacity of off-grid Procedures related to off-grid power generation" should 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.
	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.	The project activity is located in India, a non-Annex I country. Therefore, this criterion is not applicable for the project activity.
	Under this tool, the value applied to the CO_2 emission factor of biofuels is zero.	The project activity is a grid connected wind power project/ unit and does not involve emission from

		biofuels. Therefore, this criterion is not applicable.

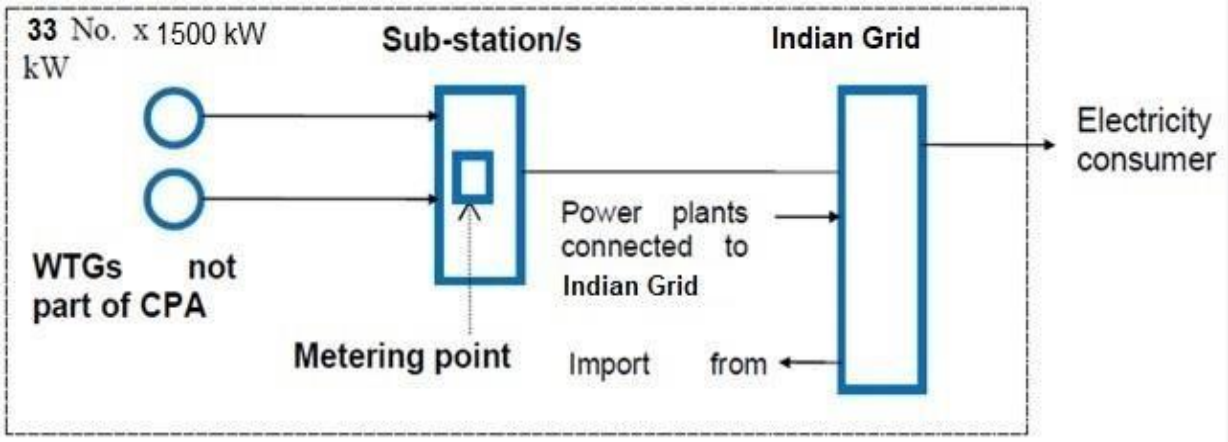
Tool 01: Tool for the demonstration and assessment of additionality (version 07)	
Applicability Conditions	**Justification of eligibility**
Para 9 – The use of the "Tool for the demonstration and assessment of additionality" is not mandatory for project owner when proposing new methodologies. Project owner may propose alternative method 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 additionality tool is included in an approved methodology, its application by project owner using this methodology is mandatory.	Project activity is applying additionality tool.

3.3 Project Boundary

Project boundary has ascertained using para 22 of ACM0002 (Version 21.0 - "The spatial extent of the project boundary includes the project power plant/unit and all power plants/units connected physically to the electricity system that the CDM project power plant is connected to".

Hence the both the project boundary includes the Wind Power Project activity, sub-station, grid andall power plants connected to grid. The project activity evacuates power to the Indian grid.

For PAs with common metering point (at substation)



Schematic of the project boundary

Source		Gas	Included?	Justification/Explanation
Baseline	CO_2 emissions from electricity generation in fossil fuel fired power plants that are displaced due to theproject activity	CO_2	Yes	Main emission source
		CH_4	No	Minor emission source
		N_2O	No	Minor emission source
		---	---	---
Project	Wind energy project	CO2	No	Wind energy projects do not emit GHGs and need not consider project emissions
		CH4	No	The project activity does not emit methane (CH4) hence no project emission considered
		N2O	No	The project activity does not emit nitrous oxide (N2O) hence no project emission considered

3.4 Baseline Scenario

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 03.0.1[9].

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

The baseline scenario remains unchanged and is in compliance with all the relevant mandatory national and/or Sectoral policies.

Step 1.2: Assess the impact of circumstances

[9] https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-11-v3.0.1.pdf

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 under VCS.

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-March-2023. Sector-wise de-tails of installed capacity are shown in Table 1. However, it is evident from Table 1[10] 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 CO_2 emissions in the country by increased use of renewable energy sources.

Furthermore, project participant has considered the latest available CO_2 Baseline Database (CEA database, version 19) at the time of requesting renewal of the crediting period for establishing the baseline emission factor, which itself considered all the new circumstances. Hence, the new circumstances do not have an impact on the baseline emission. As per below table, the fossil fuel based thermal power generation is dominant over the renewable based power generation, thus baseline scenario remains same as original.

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

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

Note: These capacities are not identical with those listed in the Excel database, because the database excludes renewable, few small diesel and steam units.

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 CO_2 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.

[10] https://cea.nic.in/wp-content/uploads/tpe cc/2022/02/User Guide ver 17 2021.pdf

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.

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 CDM 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 VCS standard version 4.7, section 3.9.8, 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 2003 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 1910, The Electricity Supply Act, 1948 and The Electricity Regulatory 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, hydro and renewable sources of energy. In accordance with the section 3 of the Electricity Act 2003, the Central Government notified

the National Electricity Policy[11] 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.

The state electricity regulatory commission issues tariff order in respect of procurement of power generated from renewables and there is 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 period.

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 21.0), 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 21.0) para 22: “If the project activity is the installation of a Greenfield power plant, the baseline scenario 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 to calculate the emission factor for an electricity system”.

The project activity involves 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 Indian grid, which is fed mainly by fossil fuel fired plants.
In the absence of the project activity, the equivalent amount of power would have been drawn from the Indian grid. Hence, the baseline for the project activity is the equivalent amount of power from the Indian grid.

[11] http://www.cercind.gov.in/Act-with-amendment.pdf

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 source (where available) and made publically available. The CEA database version 19 is the latest available data at the time of PDD 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 weighted average of the operating margin (0.75) & build margin (0.25) values, sourced from Baseline CO_2 Emission Database, Version 19.0, December – 23 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 (2020-21, 2021-22,2022-2023) generation-weighted average, sourced from Baseline CO_2 Emission Database, Version 19.0, December – 23 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 – 23 published by Central Electricity Authority (CEA), Government of India.

3.5 Additionality

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 ☒ No

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

If no, describe which mandated laws, statutes, or other regulatory frameworks require project activities and provide evidence of systematic non-enforcement to demonstrate regulatory surplus.

The implementation of the project activity is a voluntary initiative as taken by the project proponent and is not mandatory or a legal requirement;

• The Electricity Act, 2003, does not restrict or allow any authority to restrict the fuel choice for power generation; and

• The applicable Environmental Regulations do not restrict the use of wind energy and there is nolegal requirement on the selection of a particular technology

3.5.2 Additionality Methods

Please refer to CDM POA 9416-0003 CPA for a demonstration of additionality.

3.6 Methodology Deviations

There has not been any methodology deviation during the aforesaid monitoring period (01-January-2023 to 02-April-2023).

Project activity was registered in VCS standard v3.4 and as per VCS standard crediting period must be 10 years which is renewable twice. However, VCS PD mentioned as "Project Crediting Period: 03-April-2013 – 02-April-2020, Number of years: 7 years". There was a typo error while mentioning the crediting period Thus, we have taken deviation during the VCS verification period 03-April-2020 to 31-December-2021 to change the crediting period as 10 years which is renewable twice which was approved.

4 IMPLEMENTATION STATUS

4.1 Implementation Status of the Project Activity

The Project Activity is implementation of a 49.50 MW wind power project consisting of 33 Wind Turbine Generators (WTGs) of individual capacity 1.5 MW in Sangli district, Maharashtra by ReNew Wind Energy (Shivpur) Private Limited. The project is completely commissioned and connected to Indian grid. A comprehensive list of WTGs commissioning dates is provided below.

Location No.	Agg. Capacity (MW)	District	State	Commissioning Date
VASP-35 VASP-49 VASP-64 VASP-09 VASP-510 VASP-564 VASP-637 VASP-29 VASP-72 VASP-142 VASP-15	16.50	Sangli	Maharashtra	03-April-2013
VASP III-388	1.50			19-April-2013

Location No.	Agg. Capacity (MW)	District	State	Commissioning Date
VASP-696	1.50			24-June-2013
VASP III-384V VASP III-397 VASP III-440 VASP III-26 VASP III-698 VASP-237 VASP-450 VASP-394	12.00			26-June-2013
VASP III-387 VASP III-58	3.00			01-August-2013
VASP III-700/1 VASP III-424 VASP III-108 VASP III-463 VASP III-525 VASP III-689	9.00			21-August-2013
VASP III-105 VASP III-355	3.00			29-August-2013
VASP-92 VASP-21	3.00			30-August-2013

The technical specifications of WTGs are shown below:

Parameter	Specification/ Value (With Unit)
Manufacturer	ReGen Powertech Private Limited
Rated Power	1500Kw
Rotor Diameter	82 m
Hub Height	85 m
Turbine Type	Direct drive horizontal axis with variable rotor speed
Power Regulation	Independent electromechanical pitch system for each blade
Cut-in wind speed	3 m/s
Rated wind speed	13 m/s
Cut-out wind speed	22 m/s
Operational range of rot. Speed	9 – 17.3 rpm
Orientation	Upwind
No. of blades	3
Blade Material	Glass fibre reinforced plastic
Gear box type	Gearless
Generator type	Synchronous, variable speed
Braking	Aerodynamic
Output voltage	620V
Tower height	85 m
Useful life	20 years

The project has been under operation since commissioning without any major breakdowns. Though normal breakdowns due to O&M measures are continuously being worked upon by the dedicated O&M contractor for the project's WTGs. There have been no events that may have an impact on the GHG emissions or removals during the current monitoring period.

Further, there are no changes to the project participant for the project activity during the monitoring period.

5 QUANTIFICATION OF ESTIMATED GHG EMISSION REDUCTIONS AND REMOVALS

5.1 Baseline Emissions

As per the approved consolidated Methodology ACM0002, version 21.0:

Baseline emissions include only CO_2 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:

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

Where:

BE_y = Baseline emissions in year y (t CO_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 CDM 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 Version 7.0" (t CO_2/MWh)

As per the para 49 of ACM0002, v21.0,

If the project activity is the installation of a Greenfield power plant, then:

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

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

As per methodology, combined grid emission factor as per the "Tool to calculate the emission factor for an electricity system" version 7.0 is calculated as below.

CO_2 Baseline Database for the Indian Power Sector, version 19, December 2023[12] published by Central Electricity Authority (CEA), Government of India has been used for the calculation of emission reduction.

As per Methodological tool: Tool to calculate the emission factor for an electricity system (Version 7.0, EB 100, Annex 4), following six steps have been followed:

(a) **Step 1:** Identify the relevant electricity systems;

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

(c) **Step 3:** Select a method to determine the operating margin (OM);

(d) **Step 4:** Calculate the operating margin emission factor according to the selected method;

(e) **Step 5:** Calculate the build margin (BM) emission factor;

(f) **Step 6:** Calculate the combined margin (CM) emission factor.

Step 1: Identify the relevant electricity systems

As described in tool "For determining the electricity emission factors, identify the relevant project electricity system. Similarly, identify any connected electricity systems". It also states that "If the DNA of the host country has published a delineation of the project electricity system and connected electricity systems, these delineations should be used". Keeping this into consideration, the Central Electricity Authority (CEA), Government of India have Indian grid.

However, since August 2006, however, all regional grids except the Southern Grid had been integrated and were operating in synchronous mode, i.e., at same frequency. Consequently, the Northern, Eastern, Western and North-Eastern grids were treated as a single grid named as NEWNE grid from FY 2007-08 onwards for the purpose of this CO_2 Baseline Database. As of 31 December 2013, the Southern grid has also been synchronized with the NEWNE grid, hence forming one unified Indian Grid. Since the project supplies electricity to the Indian grid, emissions generated due to the electricity generated by the Indian grid as per CM calculations will serve as the baseline for this project.

Table: Geographical Scope of Indian Electricity Grid

[12] https://cea.nic.in/cdm-co2-baseline-database/?lang=en

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

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

Project Proponent may choose 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.

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

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 and Dispatch data analysis OM is not possible due to lack of availability of data to project developers. The choice of other two options for calculating operating margin emission factor depends on 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)

	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23
India	15.1%	14.6%	14.3%	14.5%	17.0%	16.5%	15.8%	15.33%

Data Source: Central Electricity Authority (CEA) database Version 19, December 2023[13]

The above data clearly shows that the percentage of total grid generation by low-cost/ must-run plants (on the basis of average of five most recent years) for the Indian grid is less than 50 % of the total generation. Thus, the Average OM method cannot be applied, as low cost/must run resources constitute less than 50% of total grid generation.

The simple OM emission factor is calculated as the generation-weighted average CO_2 emissions per unit net electricity generation (tCO_2/MWh) of all generating power plants serving the system, not including low-cost/must-run power plants/units.

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:

(a) **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

(b) **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.

Project Proponent has chosen ex-ante option for calculation of Simple OM emission factor using a 3-year generation-weighted average, based on the most recent data available at the time of submission of the PD to the Verifier 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 ($EF_{grid,OMSimple,y}$) according to the selected method

[13] https://cea.nic.in/cdm-co2-baseline-database/?lang=en

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**	**2022-2023**
INDIAN Grid	958,218	1,035,672	1,117,846

Simple Operating Margin (tCO_2/MWh) (incl. Imports)						
	2017-18	**2018-19**	**2019-20**	**2020-21**	**2021-22**	**2022-203**
INDIAN Grid	0.9543	0.9603	0.9541	0.9402	0.9605	0.9710

Weighted Generation Operating Margin	
INDIAN Grid	**0.9580**

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

As per Methodological tool: "Tool to calculate the emission factor for an electricity system" (Version 7.0, EB 100, Annex 4) para 72:

In terms of vintage of data, project owner can choose between one of the following two options:

(a) **Option 1 -** for the first crediting period, calculate the build margin emission factor ex ante based on the most recent information available on units already built for sample group m at the time of PD submission to the Verifier for validation. For the second crediting period, the build margin emission factor should be updated based on the most recent information available on units already built at the time of submission of the request for renewal of the crediting period to the Verifier. For the third crediting period, the build margin emission factor calculated for the second crediting period should be used. This option does not require monitoring the emission factor during the crediting period.

(b) **Option 2 -** For the first crediting period, the build margin emission factor shall be updated annually, ex post, including those units built up to the year of registration of the project activity or, if information up to the year of registration is not yet available, including those units built up to the latest year for which information is available. For the second crediting period, the build margin emissions factor shall be calculated ex ante, as described in Option

1 above. For the third crediting period, the build margin emission factor calculated for the second crediting period should be used.

Option 1 as described above is chosen by Project Owner 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 PD and is fixed for the entire crediting period.

Option 1 as described above is chosen by Project Owner 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 PD and is fixed for the entire crediting period.

Build Margin (tCO_2/MWh) (not adjusted for imports)	
	2022-23
INDIAN Grid	**0.8670**

Step 6: Calculate the combined margin (CM) emission factor ($EF_{grid,CM,y}$)

As per Methodological tool: "Tool to calculate the emission factor for an electricity system" (Version 7.0, EB 100, Annex 4) para 81:

The calculation of the combined margin (CM) emission factor ($EF_{grid,CM,y}$) is based on one of the following methods:

(a) Weighted average CM; or

(b) Simplified CM.

Project Owner has chosen option (a) i.e weighted average CM to calculate the combined margin emission factor for the project activity.

The combined margin emissions factor is calculated as follows:

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

Where:

$EF_{grid,BM,y}$ = Build margin CO_2 emission factor in year y (t CO_2/MWh)

$EF_{grid,OM,y}$ = Operating margin CO_2 emission factor in year y (t CO_2/MWh)

W_{OM} = Weighting of operating margin emissions factor (per cent)

W_{BM} = Weighting of build margin emissions factor (per cent)

The following default values should be used for W_{OM} and W_{BM}:

For wind project activities: W_{OM} = 0.75 and W_{BM} = 0.25 (owing to their intermittent and non-dispatchable nature) for the first crediting period and for subsequent crediting periods. Since project activity is of power generation by using wind, the above weightage has been considered for OM and BM.

Therefore, $EF_{grid,CM,y}$ = 0.9580 * 0.75 + 0.8670 * 0.25

= 0.9352 tCO_2/MWh

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:

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

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 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" (tCO_2/MWh)

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

$EG_{PJ,y}$ = 89,932 MWh

$EF_{grid,CM,y}$ = 0.9352 tCO2/MWh Thus,

BEy = 84,105 tCO2

PEy and LEy = 0

ERy = BEy = 84,105 tCO_2

5.2 Project Emissions

As per the guidance provided in the methodology ACM0002 (Version 21.0), "For most renewable power generation project activities, PE_y = 0.

5.3 Leakage Emissions

No Leakage emissions are considered. Hence, LE_y= 0

5.4 Estimated GHG Emission Reductions and Carbon Dioxide Removals

The quantification of Carbon Dioxide reductions has been calculated as per the approved consolidated methodology ACM0002, version 21.0.

The baseline emissions are to be calculated as follows:

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

Where:

BEy	=	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 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" (tCO_2/MWh)

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

$EG_{PJ,y}$ = 49.5 (MW) x 20.74% (PLF) x 365 (days) x 24(hours) = 89,932 MWh

$EF_{grid,CM,y}$ = 0.9352 tCO2/MWh Thus,

BEy = 84,105 tCO2

PEy and LEy = 0

ERy = BEy = 84,105 tCO_2

For Vintage period -03-04-2023 to 31-12-2023

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

$EG_{PJ,y}$ = 49.5 (MW) x 20.74% (PLF) x 273 (days) x 24(hours) = 67,264.798 MWh

$EF_{grid,CM,y}$ = 0.9352 tCO2/MWh Thus,

BEy = 62,906 tCO2

PEy and LEy = 0

ERy = BEy = 62,906 tCO_2

For Vintage period - 01-01-2033 to 02-04-2033

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

$EG_{PJ,y}$ = 49.5 (MW) x 20.74% (PLF) x 92 (days) x 24(hours) = 22,667.990 MWh

$EF_{grid,CM,y}$ = 0.9352 tCO2/MWh Thus,

BEy = 21,199 tCO2

PEy and LEy = 0

ERy = BEy = 21,199 tCO_2

Vintage period	Estimated baseline emissions (tCO_2e)	Estimated project emissions (tCO_2e)	Estimated leakage emissions (tCO_2e)	Estimated reduction VCUs (tCO_2e)	Estimated removal VCUs (tCO_2e)	Estimated total VCUs (tCO_2e)
03-04-2023 to 31-12-2023	62,906	0	0	62,906	0	62,906
01-01-2024 to 31-12-2024	84,105	0	0	84,105	0	84,105
01-01-2025 to 31-12-2025	84,105	0	0	84,105	0	84,105
01-01-2026 to 31-12-2026	84,105	0	0	84,105	0	84,105
01-01-2027 to 31-12-2027	84,105	0	0	84,105	0	84,105
01-01-2028 to 31-12-2028	84,105	0	0	84,105	0	84,105
01-01-2029 to 31-12-2029	84,105	0	0	84,105	0	84,105
01-01-2030 to 31-12-2030	84,105	0	0	84,105	0	84,105

01-01-2031 to 31-12-2031	84,105	0	0	84,105	0	84,105
01-01-2032 to 31-12-2032	84,105	0	0	84,105	0	84,105
01-01-2033 to 02-04-2033	21,199	0	0	21,199	0	21,199
Total	841,051	0	0	841,051	0	841,051

6 MONITORING

6.1 Data and Parameters Available at Validation

Data / Parameter	$EF_{grid\ BM,y}$
Data unit	tCO2/MWh
Description	The Build Margin emission factor of Indian grid
Source of data	Calculated as per the "Tool to calculate the emission factor for an electricity system". CO_2 Emission Database, Version 19, December-2023 published by Central Electricity Authority (CEA), Government of India. https://cea.nic.in/wp-content/uploads/baseline/2024/04/User_Guide__Version_19.0.pdf
Value applied:	0.8670
Justification of choice of data or description of measurement methods and procedures applied	As per the "Tool to calculate the emission factor for an electricity system". Calculated as the latest information (2022-2023)
Purpose of Data	Calculation of baseline emissions
Comments	Parameter was determined ex-ante and would not be monitored during the crediting period.

Data / Parameter	$EF_{grid\ OM,y}$
Data unit	tCO_2/MWh
Description	The Operating Margin emission factor of Indian grid
Source of data	Calculated as per the "Tool to calculate the emission factor for an electricity system". CO_2 Emission Database, Version 19, December-2023 published by Central Electricity Authority (CEA), Government of India. https://cea.nic.in/wp-content/uploads/baseline/2024/04/User_Guide__Version_19.0.pdf
Value applied:	0.9580
Justification of choice of data or description of measurement methods and procedures applied	As per the "Tool to calculate the emission factor for an electricity system". Calculated as the last 3 year (2020-21, 2021-22, 2022-2023) generation-weighted average, sourced from Baseline CO_2 Emission Database, Version 19 December 2023 published by Central Electricity Authority (CEA), Government of India.
Purpose of Data	Calculation of baseline emissions
Comments	Parameter was determined ex-ante and would not be monitored during the crediting period.

Data / Parameter	$EF_{grid\ CM,y}$
Data unit	tCO_2/MWh
Description	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" for Indian Grid.
Source of data	Calculated as per the "Tool to calculate the emission factor for an electricity system". CO_2 Emission Database, Version 19, December-2023 published by Central Electricity Authority (CEA), Government of India. https://cea.nic.in/wp-content/uploads/baseline/2024/04/User_Guide__Version_19.0.pdf

Value applied:	0.9352
Justification of choice of data or description of measurement methods and procedures applied	Calculated as the weighted average of the operating margin (0.75) & build margin (0.25) values, sourced from Baseline CO2 Emission Database, Version 19.0, December – 23 published by Central Electricity Authority (CEA), Government of India.
Purpose of Data	Calculation of baseline emissions
Comments	-

6.2 Data and Parameters Monitored

Data / Parameter	$EG_{facility,y}$
Data unit	MWh
Description	Quantity of net electricity generation supplied by the project plant/unit to the grid in year y
Source of data	Joint meter reading OR Credit Note provided by Maharashtra State Electricity Distribution Co. Ltd. (MSEDCL)
Description of measurement methods and procedures applied	The JMR is usually taken once in month for the bulk/ revenue meter at the common substation. Also with the individual WTG controller electricity meters (both import and export) or CMS data, the JMR also gives (where applicable – apportioned) electricity import of each WTG and losses till metering point. By using these data, net export by the WTGs in the PA will be calculated (as in some case net export is not explicitly reported in JMR). Recording Frequency: Continuous monitoring and monthly recording Responsibility: The operators/ O&M team will be responsible for measurement Calibration Testing Frequency: Annually Accuracy class of meters: 0.2s/ 0.5s (as per state regulation) Archiving: Crediting Period + 2 years
Frequency of monitoring/recording	Continuous measurement and at least monthly recording

<table>
<tr><td>Value applied:</td><td>89,932</td></tr>
<tr><td>Monitoring equipment</td><td>Electricity meters (bulk, WTG controller/ CMS)
Recording: Electronic and paper
Meter Details:
<table>
<tr><th>FEEDER #</th><th>STATUS</th><th>S. NO.</th><th>ACCURACY CLASS</th></tr>
<tr><td rowspan="2">01</td><td>Main</td><td>13769363</td><td>0.2s</td></tr>
<tr><td>Check</td><td>02797655</td><td>0.2s</td></tr>
<tr><td rowspan="2">02</td><td>Main</td><td>13813570</td><td>0.2s</td></tr>
<tr><td>Check</td><td>13813547</td><td>0.2s</td></tr>
<tr><td rowspan="2">06</td><td>Main</td><td>13813551</td><td>0.2s</td></tr>
<tr><td>Check</td><td>X1350784</td><td>0.2s</td></tr>
<tr><td rowspan="2">07</td><td>Main</td><td>15687854</td><td>0.2s</td></tr>
<tr><td>Check</td><td>14953662</td><td>0.2s</td></tr>
</table></td></tr>
<tr><td>QA/QC procedures applied</td><td>Cross check measurement results with records for sold electricity – where electricity sale is applicable</td></tr>
<tr><td>Purpose of data</td><td>Baseline emissions calculation</td></tr>
<tr><td>Calculation method</td><td>Net Electrcity Exported = Electricity Export - Electricity Import</td></tr>
<tr><td>Comments</td><td>Data will be archived for more than two years after end of crediting period or last issuance, whichever later</td></tr>
</table>

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6.3 Monitoring Plan

The monitoring team includes PP's employees and O&M contractor's representatives.

Meter readings are taken jointly at the appointed date by PP's representative, Regen Powertech Pvt. Ltd. official and Maharashtra State Electricity Distribution Company Limited (MSEDCL) official. The same is reported as Joint Meter Reports (JMR). The same is reported to the O&M team and the complied reports will be generated in the form of Credit Notes.

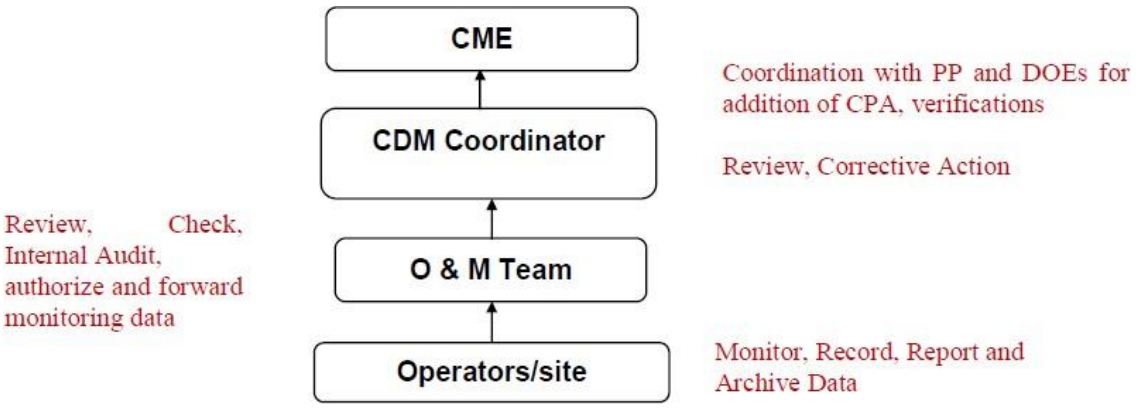
Net electricity supplied by the project activity to the grid is cross-checked with records for sold electricity by invoices raised for the payment purpose.

One metering system is there at the substation and another at the WTG site. If the variation between the two meter readings is significant for the monthly recording of data, the meters would be reset and calibrated. The measurement is taken from the MSEDCL energy meter which is located in the substation. Meter reading will be carried out in every calendar month.

The accuracy of monitoring parameter is ensured by adhering to the calibration and testing procedure as set in the power purchase agreement. The project adheres to all mandatory regulatory and statutory requirements at the state as well as national level. The energy meters installed are tri-vector meters of 0.2% accuracy class. The meter details are given in the below table:

FEEDER #	STATUS	Old S. NO.	New S.NO	Date of replacement	ACCURACY CLASS
01	Main	13769363	Q0788361	12/03/2024	0.2s
	Check	02797655	02797655	NA	0.2s
02	Main	13813570	13813570	NA	0.2s
	Check	13813547	Q0793603	12/03/2024	0.2s
06	Main	13813551	Q0788360	12/03/2024	0.2s
	Check	X1350784	X1350784	NA	0.2s
07	Main	15687854	15687854	NA	0.2s
	Check	14953662	Q0828036	12/03/2024	0.2s

The operational and management structure implemented by PP and O&M contractor is as follows:



In some cases, if a particular feeder/ substation has other WTGs not part of this PA connected through same electricity meter, apportioning is used. Even otherwise, to get WTG/ project owner wise electricity supplied to grid, apportioning is required and is carried out as below.

Apportioning of net electricity supplied is done with reference to the electricity generated from individual WTGs. The MSEDCL will issue a monthly Joint Energy Meter Readings sheet for actual power exported from the wind farm to the grid. Apportioning of net electricity supplied, as per the Joint Energy Meter Readings sheet, by each project owner is done based on the individual meter readings of each wind turbine. The apportioning will be done by electricity purchaser (representative of MSEDCL) in cases jointly with the PP. The Credit

Notes with electricity buyer will be used to calculate actual net electricity supplied to the grid and on the basis of that GHG emission reductions by the project activity will be calculated.

The net electricity exported to the grid by project activity is referred from monthly credit note readings. The main billing meter at substation records total export, and total import by all the connected WTGs to the substation through a feeder. The electricity export and import by a WTG of the PP is then calculated by using the following formulae as given below. This is the billable reading against which the PP raises invoice to the state electricity board.

Formula:

$$\text{Net Generation of a WTG@ for credit:} \quad \frac{\text{kWh individual generation at WTG Controller X Total (Export kWh – Import kWh) @ EB at cumulative meter at feeder}}{\text{Total Controller Generation of WTGs connected on a feeder}}$$

Procedures for handling data uncertainty:

a) In case main meter is faulty: In the event that the main metering system is not in the service as result of maintenance, repairs or testing, then the back metering system shall be used during the period the main metering system is not in service and the provisions above shall apply to the reading of the backup metering system.

b) In case both the meters are faulty: When the Main Metering System and/or Backup Metering System and/or any component thereof is found to be outside the acceptable limit of accuracy or otherwise not functioning properly, it shall be repaired, recalibrated or replaced as soon as possible by the MSEDCL. The error observed during this calibration will be applied to all readings from last correct JMR / last meter calibration. MSEDCL will ensure that metering system is tested for accuracy at least once in year and report furnished along with joint meter reading.

Any meter seal(s) shall be broken only by the authorised officer of MSEDCL in the presence of representative of Power Producers/ Developers, whenever the Main Metering System or the backup metering system is to be inspected, tested, adjusted, repaired or replaced.

In case, the monitoring period starts mid-month, the reading for that month will be apportioned based on the daily electricity export data give by the O&M contractor. This will be also checked with the average daily export arrived from that month's JMR and the conservative of the two will be used for the emission reduction calculation.

Apportioning Procedure:

Procedure for apportioning of electricity:

1) In case the start/end dates of monitoring period do not match with the start/end dates of Joint Meter Reading Sheets / Generation reports issued by MSEDCL, following

apportioning procedure will be applied for the first and the last monitoring period within a particular crediting period:

Apportioning will be carried out based on ratio of generation data recorded using LCS installed at the each WTG. The emission reductions of that particular period (between the start/end date of monitoring period and the end/start of the billing period) will be calculated based on percentage generation of that particular period at WTG using LCS data multiplied with the total units generated in the month as per the Joint Meter Reading Sheets / Generation report issued by MSEDCL. The calculation formula has been furnished below:

Generation from all project WTGs for the period y1= $EG_{WTGcontroller,i,y1}$

Generation from all project WTGs for the period y2 = $EG_{WTGcontroller,i,y2}$

Net energy supplied used for calculation of emission reduction for the monitoring period y1,

i.e $EG_{facility, y1}$=

$$\sum_{i=1}^{N} ((EG_{export,i,y2} - EG_{import,I,y2}) * (EG_{WTGcontroller,i,y1} / EG_{WTGcontroller,i,y2}))$$

Where:

y1	=	No. of days within a billing period up to which generation is considered for emission reduction calculation
y2	=	No. of days in the billing period
N	=	No. of feeders to which project WTGs are connected to.

2) In case if there are project and non-project WTGs connected to a particular feeder i, the quantity of net electricity supplied by project WTGs to the grid connected to that particular feeder will be calculated based on the formula specified below:

Total generation from all project WTG(s) connected to the feeder i in period y	=	$EG_{WTG_controller,i,y}$
Total generation from all project and non-project WTGs connected to thefeeder i in period y	=	$EG_{All_controller,i,y}$
Quantity of net electricity exported by all (project and non-project) WTGs connected to feeder i to the grid in period y	=	$EG_{export,i,y}$
Quantity of net electricity imported by all (project and non-project) WTGs connected to feeder i to the grid in period y	=	$EG_{import,i,y}$

Net electricity supplied by the project WTGs connected to feeder i to the grid in period y

= $EG_{facility,y}$ =

$$\sum_{i=1}^{N} ((EG_{export,i,y} - EG_{import,I,y}) * (EG_{WTGcontroller,i,y} / EG_{All_controller,i,y}))$$

Where N = No. of feeders to which project WTGs are connected to.

3) In cases where both scenarios mentioned above exist at the same time (i.e. both project and non- project WTGs connected to the same feeder(s) and the start/end date of the monitoring periods do not match with those of the JMR readings), firstly the apportioning as per point # 2 above will be applied for the billing period y2 to estimate the Net electricity supplied by the project WTGs connected to feeder Z to the grid in period y2. Then this value would replace (EGexport,y2 – EGimport,y2) in the formula specified under point # 1 above to arrive at the Net energy export used for calculation of emission reduction for the monitoring period y1.

7 QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS

7.1 Data and Parameters Monitored

For first crediting period

Data / Parameter	$EG_{facility, y}$
Data unit	MWh
Description	Quantity of net electricity generation supplied by the project plant/unit to the grid in year y
Value applied:	11,544.622
Comments	The data are being archived both in electronic and paper format for crediting period + 2 years.

7.2 Baseline Emissions

For first crediting period

Baseline Emissions (BE_y)

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

= 11,544.622 (MWh) * 0.9528 (tCO_2/MWh)

= 10,999 tCO_2 (Rounded down to nearest integer value)

7.3 Project Emissions

As per the guidance provided in the methodology ACM0002 (Version 13), "For most renewable power generation project activities, PE y = 0.

7.4 Leakage Emissions

The methodology ACM0002 (Version 13) does not consider any leakage emissions. Hence, LE_y= 0

7.5 GHG Emission Reductions and Carbon Dioxide Removals

Emission reductions are calculated as follows:

$$ER_y = BE_y - PE_y$$

Where:
ER_y = Emission reductions in year y (t CO_2e/yr)
BE_y = Baseline emissions in year y (t CO_2/yr)
PE_y = Project emissions in year y (t CO_2e/yr)

Net Emission Reduction from 01-January-2023 to 02-April-2023 (Monitoring Period under First Crediting Period)

Vintage period	Baseline emissions (tCO_2e)	Project emissions (tCO_2e)	Leakage emissions (tCO_2e)	Reduction VCUs (tCO_2e)	Removal VCUs (tCO_2e)	Total VCUs (tCO_2e)
01-January-2023 to 02-April-2023	10,999	0	0	10,999	0	10,999
Total	**10,999**	**0**	**0**	**10,999**	**0**	**10,999**

Vintage period	Ex-ante estimated reductions/ removals	Achieved reductions/ removals	Percent difference	Explanation for the difference
01-01-2023 to 02-Apr-2023	21,596	10,999	-49.07%	The generation of electricity depends upon many other climatic conditions, which are not within the control of the project participant.

Total	**21,596**	**10,999**	**-49.07%**	-

APPENDIX 1: COMMERCIALLY SENSITIVE INFORMATION

Use the table below to describe the commercially sensitive information included in the project description to be excluded in the public version.

Section	Information	Justification
NA	NA	NA

APPENDIX 2: < CALIBRATION DETAILS >

FEEDER #	STATUS	S. NO.	ACCURACY CLASS	DOC 2021-22	VALIDITY	DOC 2022-23	VALIDITY
01	Main	13769363	0.2s	07-October - 2021	06-October - 2022	19-September-2022	18-September-2023
	Check	02797655	0.2s	07-October - 2021	06-October - 2022	19-September-2022	18-September-2023
02	Main	13813570	0.2s	07-October - 2021	06-October - 2022	19-September-2022	18-September-2023
	Check	13813547	0.2s	07-October - 2021	06-October - 2022	19-September-2022	18-September-2023
06	Main	13813551	0.2s	07-October - 2021	06-October - 2022	19-September-2022	18-September-2023
	Check	X1350784	0.2s	07-October - 2021	06-October - 2022	19-September-2022	18-September-2023
07	Main	15687854	0.2s	07-October - 2021	06-October - 2022	19-September-2022	18-September-2023
	Check	14953662	0.2s	07-October - 2021	06-October - 2022	19-September-2022	18-September-2023

APPENDIX 3: <STAKEHOLDER INPUTS >

Sr. No	Query / comments from stakeholders Response from PP	Response from PP
1	Mr. Arun Shinde Is it true that wind mills move away rain clouds?	The clounds are mush higher than the height of wind mills and hence it is not likely to have any imapct on rain. Further reference was made to studies from Indian Institute of Tropical Meteorology and Center fo Wind Energy Technology on same conclusion.
2	Mr. Jagtap S.B. Why cant the electricity generation from this project be directly supplied to the local community?	The generated electriicty is suplied to the state electricty distribution company which distributes it as per the state policy. PP can not supply electricity directly to the local community.
3	Mr. Akash Whether wind projects harm local property value?	There would not be any negative impact on the property values due to the presence of wind farms. In fact, the development of wind farms will subsequently increase the property value owing to the overall development in the region.
4	Mr. Mahesh Jalake What are the direct and indirect benefits to local people from the project?	The project would generate local job oportunities, which will help in the overall socio-economic development of the region. Additionally, a number of social corporate responsibility initiaves would be undertaken, which would be identified based on the specific needs of local populace.

*For the RCP along with verification of the current monitoring period, VVB has taken the interview of the local stakeholders.