



Verified Carbon Standard

GRID CONNECTED WIND POWER PROJECT IN TAMIL NADU

Document Prepared by Apraava Renewable Energy Private Limited (AREPL) ¹

Project title	Grid Connected Wind Power Project In Tamil Nadu
Project ID	909
Monitoring period	01-01-2023 to 31-12-2023
Original date of issue	04-May-2024
Most recent date of issue	26-October-2024
Version	1.1
VCS Standard Version	4.7
Prepared by	Apraava Renewable Energy Private Limited (AREPL) 7 th Floor, FULCRUM, Sahar Road, Andheri (East), Mumbai – 400 099, India T: +91-22-6758 8888, F: +91-22-6758 8811 Email: carbongroup@apraava.com , www.apraava.com

¹ The name of the company has been changed from the CLP Wind Farm (India) Private Limited to Apraava Renewable Energy Private Limited (AREPL).

CONTENTS

PROJECT DETAILS	4
1.1 Summary Description of the Implementation Status of the Project	4
1.2 Audit History	5
1.3 Sectoral Scope and Project Type	6
1.4 Project Proponent	6
1.5 Other Entities Involved in the Project	6
1.6 Project Start Date	7
1.7 Project Crediting Period	7
1.8 Project Location	7
1.9 Title and Reference of Methodology	9
1.10 Double Counting and Participation under Other GHG Programs	9
1.11 Double Claiming, Other Forms of Credit, and Scope 3 Emissions	10
1.12 Sustainable Development Contributions	11
1.13 Commercially Sensitive Information.....	13
2 SAFEGUARDS AND STAKEHOLDER ENGAGEMENT	13
2.1 Stakeholder Engagement and Consultation.....	13
2.2 Risks to Stakeholders and the Environment.....	16
2.3 Respect for Human Rights and Equity	18
2.4 Ecosystem Health	20
3 IMPLEMENTATION STATUS	22
3.1 Implementation Status of the Project Activity	22
3.2 Deviations.....	23
3.3 Grouped Projects	23
3.4 Baseline Reassessment	23
4 DATA AND PARAMETERS.....	23
4.1 Data and Parameters Available at Validation.....	23
4.2 Data and Parameters Monitored.....	25
4.3 Monitoring Plan.....	26
5 QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS	29

5.1	Baseline Emissions	29
5.2	Project Emissions	30
5.3	Leakage Emissions.....	30
5.4	GHG Emission Reductions and Carbon Dioxide Removals.....	30
APPENDIX 1: COMMERCIALLY SENSITIVE INFORMATION.....		32
APPENDIX 2: CALIBRATION DETAILS		33

PROJECT DETAILS

1.1 Summary Description of the Implementation Status of the Project

The project is being implemented by Apraava Renewable Energy Private Limited (AREPL)² (formerly known as CLP Wind Farm (India) Private Limited) in the state of Tamil Nadu. The Wind Turbine Generators (“WTG”) or Wind Energy Generators (WEG) have been supplied by Vestas Wind Technology India Private Limited (“Vestas”). Vestas will be responsible for technology and equipment supply, as well as the operation and maintenance of the WTGs.

The project activity involved the generation of electricity using WTG. The objective of the project activity was to commission and operate a wind farm of 24.75 MW (“the Project”) in the Indian state of Tamil Nadu. The electricity generated from the wind farm will be exported to the Integrated Indian electricity grid. Distribution Licensee thereby marginally contributing towards reduction in the energy demand supply gap in the state of Tamil Nadu, diversification of grid supply and reduction of greenhouse gas emissions. Initially, the Indian electricity system is divided into two regional grids, the synchronous Northern, Eastern, Western, and North Eastern (NEWNE) grid and the Southern grid. Each grid covers several states. However, Govt. of India has decided to integrate all the regional grid systems and thus, regional grids are not existed now. Thus, now the project activity is connected to Integrated Indian Grid system.

The Project activity helps to reduce the demand- supply gap in the country and also helps in contributing to the sustainable development by using wind energy as the source of power generation and reduction of GHG emissions. The Commissioning and other relevant dates for each WEG are provided in table below:

Sr. No.	Location No.	HTSC No.	TNEB Invoice Serial Number	Date of Commissioning
1	CLPTHV-23	T110	59224760295	29-Jul-10
2	CLPTHV-28	T123	59224760308	29-Jul-10
3	CLPTHV-14	T124	59224760309	29-Jul-10
4	CLPTHV-02	T125	59224760310	29-Jul-10
5	CLPTHV-03	T126	59224760311	02-Jul-10
6	CLPTHV-07	T127	59224760312	29-Jul-10
7	CLPTHV-09	T128	59224760313	29-Jul-10
8	CLPTHV-10	T129	59224760314	29-Jul-10
9	CLPTHV-22	T130	59224760315	29-Jul-10
10	CLPTHV-15	T131	59224760316	29-Jul-10
11	CLPTHV-18	T132	59224760317	29-Jul-10
12	CLPTHV-16	T133	59224760318	29-Jul-10

² The name of the company has been changed from the CLP Wind Farm (India) Private Limited to Apraava Renewable Energy Private Limited (AREPL).

13	CLPTHV-17	T134	59224760319	29-Jul-10
14	CLPTHV-19	T135	59224760320	29-Jul-10
15	CLPTHV-20	T136	59224760321	29-Jul-10

During this monitoring period the project activity has exported 43,319.66 MWh of net energy to the Southern Grid of India (same is now part of integrated Indian grid). The total emission reductions achieved during the monitoring period from 01/01/2023 to 31/12/2023 (both days inclusive) is 40,308 tCO₂.

1.2 Audit History

Audit Type	Period	Program	VVB Name	Number of years
Validation and Verification	02/07/2010 - 10/06/2012	VCS	URS VERIFICATION PRIVATE LIMITED	1 year, 11 months,
Verification	11/06/2012 - 03/10/2012	VCS	URS VERIFICATION PRIVATE LIMITED	3 months
Verification	04/10/2012 - 10/05/2015	CDM	Bureau Veritas Certification	2 years, 7 months
Verification	11/05/ 2015 - 10/02/2016	CDM	URS VERIFICATION PRIVATE LIMITED	9 months
Verification	11/02/2016 - 10/07/2017	CDM	LGAI Technological Center	1 year, 5 months
Verification	11/07/2017 - 03/10/2019	CDM	Earthood Services Private Limited	2 year, 3 months
Joint Validation and Verification	01/01/2021- 31/12/2021	VCS	LGAI Technological Center	1 year
Verification	01/01/2022 to 31/12/2022	VCS	Earthood Services Private Limited	1 year
Verification	01/01/2023 to 31/12/2023	VCS	EcoLance Private Limited	1 year
Total	02/07/2010 - 31/12/2023			13 years, 6 months

1.3 Sectoral Scope and Project Type

Sectoral scope³	01-Energy Industries (renewable/non-renewable sources)
Project activity type	Type I – Renewable Energy Projects

Sectoral scope	Not applicable
AFOLU project category⁴	Not applicable
Project activity type	Not applicable

1.4 Project Proponent

Organization name	Apraava Renewable Energy Private Limited
Contact person	Raghavendra Madaiah
Title	Head – Non Utility Markets (Renewables)
Address	7th Floor, Fulcrum, Sahar Road, Andheri East, Mumbai - 400099
Telephone	+91- 22-67588888
Email	carbongroup@apraava.com

1.5 Other Entities Involved in the Project

At present, Apraava Renewable Energy Private Limited is the sole entity involved in the project.

Organization name	NA
Role in the project	NA
Contact person	NA
Title	NA
Address	NA
Telephone	NA
Email	NA

³ 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>

⁴ See Appendix 1 of the VCS Standard

1.6 Project Start Date

Project start date	02/07/2010
Justification	As per the Section 3.8 of the VCS Standard v.4.7, “The project start date of a non-AFOLU project is the date on which the project began generating GHG emission reductions or removals”. The project is a non-AFOLU project and the earliest date of interconnection with the grid is 02/07/2010. Hence, the start date of the project is 02/07/2010.

1.7 Project Crediting Period

Crediting period	<input type="checkbox"/> Seven years, twice renewable <input type="checkbox"/> Ten years, fixed <input checked="" type="checkbox"/> Other (state the selected crediting period and justify how it conforms with the VCS Program requirements) <p>The project was registered under VCS 2007.1 which allowed crediting period of a maximum of 10 years which may be renewed at most two times. As per VCS standard 4, the second crediting period was renewed for duration of 10 years from 02-July-2020 to 01-July-2030.</p>
Start and end date of first or fixed crediting period	02/07/2020 to 01/07/2030

1.8 Project Location

The Project is spread across Jangalpatti, Poomalaikundu, Govindanagram & Seepalakottai villages in Theni & Uttamaplayamtaluka Taluk of Theni district of Tamil Nadu state in India. The nearest airport and railway station are in Madurai city, which is located at a distance of approximately 75 km from the project activity site.

Project Location Map:



Project Site

The coordinates of individual WTGs of this site are as below:

S No.	Location No.	HTSC	TNEB Invoice Serial Number	Village	Taluk	Longitude (E)	Latitude (N)
1	CLPTHV-23	T110	59224760295	Poomalaikundu	Theni	77°26'10.50"	9°52'46.15"
2	CLPTHV-28	T123	59224760308	Jangalpatti	Theni	77°28'35.82"	9°54'08.24"
3	CLPTHV-14	T124	59224760309	Poomalaikundu	Theni	77°27'59.91"	9°54'45.33"
4	CLPTHV-02	T125	59224760310	Poomalaikundu	Theni	77°27'31.72"	9°54'30.80"
5	CLPTHV-03	T126	59224760311	Poomalaikundu	Theni	77°27'00.05"	9°54'29.73"
6	CLPTHV-07	T127	59224760312	Poomalaikundu	Theni	77°26'16.84"	9°54'52.23"
7	CLPTHV-09	T128	59224760313	Poomalaikundu	Theni	77°25'34.54"	9°54'07.38"
8	CLPTHV-10	T129	59224760314	Poomalaikundu	Theni	77°25'37.12"	9°53'52.07"
9	CLPTHV-22	T130	59224760315	Poomalaikundu	Theni	77°26'27.69"	9°52'59.62"
10	CLPTHV-15	T131	59224760316	Seepalakottai	Uttamaplayam	77°27'22.31"	9°52'36.71"
11	CLPTHV-18	T132	59224760317	Seepalakottai	Theni	77°28'10.93"	9°52'32.26"
12	CLPTHV-16	T133	59224760318	Jangalpatti	Theni	77°28'35.14"	9°52'32.08"
13	CLPTHV-17	T134	59224760319	Jangalpatti	Theni	77°28'51.89"	9°52'56.42"
14	CLPTHV-19	T135	59224760320	Jangalpatti	Theni	77°28'54.39"	9°53'19.14"
15	CLPTHV-20	T136	59224760321	Jangalpatti	Theni	77°29'16.57"	9°53'23.69"

1.9 Title and Reference of Methodology

Type (methodology, tool or module).	Reference ID, if applicable	Title	Version
Methodology	ACM0002	Grid-connected electricity generation from renewable sources	20.0
Tool	Tool 07	Tool to calculate the emission factor for an electricity system	7.0
Tool	Tool 01	Tool for the demonstration and assessment of additionality	6.0

1.10 Double Counting and Participation under Other GHG Programs

1.10.1 No Double Issuance

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

Yes No

1.10.2 Registration in Other GHG Programs

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

Yes No

All the 15 WTGs of this project activity are part of registered CDM Project activity which has total 30 WTGs (49.5 MW) as follows:

Project Title: Grid Connected Wind Power Project in Tamil Nadu

UNFCCC Registration Number: 7415,

<https://cdm.unfccc.int/Projects/DB/RWTUV1348481875.12/view?cp=1>

Crediting period: 04-10-2012 – 03-10-2019 (Renewable)

Renewal Status: Renewal of crediting period of the CDM has been successfully registered

Duration of 2nd crediting period: 04-10-2019 – 03-10-2026

Now the project has been transferred from CDM to VERRA, hence no double counting.

The details of issuance of CERs for the previous monitoring periods are as follows:

Monitoring Period Number	Monitoring Period	Issuances
1	04-10-2012 to 10-05-2015	1,89,782
2	11-05-2015 to 10-02-2016	62,357
3	11-02-2016 to 10-07-2017	164,494
4	11 -07-2017 to 03-10-2019	233,674
5	04 -10-2019 to 31-12-2020	88,221
6	01-01-2021 to 31-12-2021	45,378
7	01-01-2022 tp 31-12-2022	39,756

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

1.11.1 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.

Yes No

1.11.2 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?

Yes No

1.11.3 Supply Chain (Scope 3) Emissions

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

Yes No

The Project Activity is a wind power project and does not involve any supply chain involved in the project such as manufacturers, wholesalers, distributors and retailers. So, no indirect upstream and downstream GHG emissions are not involved in the project activity. Thus, the Scope 3 emissions are not applicable in this project activity.

1.12 Sustainable Development Contributions

Ministry of Environment and Forests, has stipulated economic, social, environment and technological well-being as the four indicators of sustainable development. The project contributes to sustainable development using the following ways:

- **Social well-being:** The project activity has generated employment opportunities for the local population in different phases of the project. Manpower requirement is there in erection and operational phase of the renewable energy project. This would result in upliftment of the living standards of the local community.
- **Economic well-being:** The project is a clean technology investment in the region, which would not have been taken place in the absence of the VCS benefits the project activity will also help to reduce the demand supply gap in the state.
- **Technological well-being:** The successful operation of project activity would lead to promotion of wind-based power generation and would encourage other entrepreneurs to participate in similar projects.
- **Environmental well-being:** Wind being a renewable source of energy, it reduces the dependence on fossil fuels and conserves natural resources, which are on the verge of depletion. Due to its zero emission the Project, activity also helps in avoiding significant amount of GHG emissions.

The project activity will generate power using zero emissions. Wind based power generation that helps to reduce GHG emissions and specific pollutants like SO_x, NO_x, and SPM associated with the conventional thermal power generation facilities.

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 43,319.66 MWh renewable electricity has been supplied to Central Grid to Indian Electricity grid during the reported period that helps to increase the renewable energy share in the energy mix.	A total of 485,801.11 MWh renewable electricity will be supplied to the Indian grid by the project activity since commissioning.
2	8.6	8.6.1: Quality of Employment	Plant records or training records for employees/O&M Contractor	01 Training has been provided during first verification period, the training was organized for staff on the technology, plant operation, emergency and safety procedure.	Overall, 01 Training per year has been provided, the training was organized for staff on the technology, plant operation, emergency and safety procedure.
3	13.0	Tonnes of greenhouse gas emissions avoided or removed	Implemented activities to increase	By generating 43,319.66 MWh renewable electricity the project has avoided emission of 40,308 tCO2e in the atmosphere.	Since commissioning the project has avoided emission of 449,839 tCO2e in the atmosphere.

1.13 Commercially Sensitive Information

No commercially sensitive information has been excluded from the public version of the monitoring report.

2 SAFEGUARDS AND STAKEHOLDER ENGAGEMENT

2.1 Stakeholder Engagement and Consultation

2.1.1 Stakeholder Identification

Stakeholder Identification	<p>Stakeholders associated with the project activity throughout its lifetime are identified at different stages of project development. The stakeholders identified are generally grouped under two categories- directly affected parties, and indirectly affected parties as shown below:</p> <ul style="list-style-type: none"> a) Representatives from EIL now WWIL; b) Employees of AREPL; c) Contractor of AREPL; d) Villagers from nearby villages <p>Furthermore, all the stakeholders mentioned above were identified at the project's validation. There has been no change in stakeholder makeup since validation.</p>
Legal or customary tenure/access rights	<p>The project activity is a greenfield wind power project and it has not involved any legal or customary tenure/access rights to territories and resources. So, this section is not applicable</p>
Stakeholder diversity and changes over time	<p>Not applicable</p> <p>This is renewable energy project and does no impact on the diversity of the stakeholders.</p>
Expected changes in well-being	<p>There are not any significant impacts due to implementation of project activity on air, water, soil quality and ambience are envisaged due to the project activity. Furthermore, wind projects in India have indirect positive socio-economic impacts:</p>

	<p>a) Job Creation: Wind energy projects create jobs in various sectors, contributing to local economic growth.</p> <p>b) Economic Growth: These projects contribute to economic growth and community investment.</p> <p>c) Reduced Electricity Rates: Wind energy can reduce electricity rates for project neighbours.</p> <p>d) Health Benefits: Wind turbines help reduce carbon footprints and improve air quality, leading to better health outcomes.</p> <p>e) Educational Opportunities: They provide educational and research opportunities, fostering innovation and knowledge exchange.</p>
<p>Location of stakeholders</p>	<p>No negative impact generated outside/inside of the project boundary.</p> <p>(All stakeholders who will be directly affected by the project activity are included within the project boundary. Further, this grouped project activity does not require the relocation of any stakeholder, Indigenous people, or local communities.)</p>
<p>Location of resources</p>	<p>Not Applicable</p> <p>(In the project activity, neither any territories and resources are owned by the stakeholders, nor they have any customary access)</p>

2.1.2 Stakeholder Consultation and Ongoing Communication

<p>Ongoing consultation</p>	<p>Stakeholders' consultation is a continuous process and hence a feedback register is kept at the project site office where any stakeholder can come and share his/her feedback. The feedback irrespective of the type is taken care by PP with utmost priority.</p>
<p>Date(s) of stakeholder consultation</p>	<p>18/02/2010</p>
<p>Communication of monitored results</p>	<p>Monitored outcomes are conveyed to the stakeholders in two ways:</p> <ol style="list-style-type: none"> 1.Through VERRA Website: - PP submits third-party (i.e., VVB) verified monitoring results to VERRA, and once approved, the project documentation is made publicly available on the VERRA webpage for each monitoring period. 2.Through PP regional office: - A copy of all the project related documents and monitoring data (e.g., grievance register) is available at regional offices of the PP, which is

	accessible to all the stakeholders associated with the project activity.
Consultation records	The Local Stakeholder Consultation (LSC) records were submitted to VVB at the time of validation and grievance register records for the current monitoring period will be submitted to VVB.
Stakeholder input	<p>Stakeholder input/feedback received during LSC and the LSC report for the same had been submitted to the VVB during validation.</p> <p>Furthermore, the stakeholder feedback/grievance received during the current MP, through ongoing consultation mechanism, has been taken care as per the standard procedure adopted by PP, provided in section 2.1.4 of the VCS-MR. There were no major comments from the stakeholders which could impact on the design of the grouped project.</p>

2.1.3 Free, Prior, and Informed Consent

Consent	Before the project commissioning PP had taken appropriate approvals from relevant authorities.
Outcome of FPIC	<p>Not Applicable.</p> <p>The project activity does not affect any type of property rights, and there are no ongoing or unresolved conflicts over property rights, usage, or resources. This project activity does not involve any encroachment on land, people’s relocation, or forced physical or economic displacement.</p>

2.1.4 Grievance Redress Procedure

Grievances received	Resolution and outcome
No grievances were received during the current monitoring period	NA

The grievance mechanism process could be illustrated as below:

PP has placed a grievance register onsite where-in, the stakeholders can put down their request/complaint/requirements. Same is continuously monitored and appropriate action are also being taken by management. Furthermore, PP has also placed a notice board on site to communicate any necessary information/updates to local stakeholders. PP has found this two-way communication with local stakeholders is very effective towards sustainability of the project in long run.

As part of organizational policy, there are continuous interactions undertaken by Project Participant’s officials with local community stakeholders. During these discussions, local villagers shares their observations and comments. All the observations, comments and queries raised during discussion have been adequately responded to. Some of the suggestions have also been incorporated in the overall vision and stakeholder engagement action plan of the organization.

2.1.5 Public Comments

No public comment was received during current monitoring period.

Summary of comments received	Actions taken
No comments from stakeholder during current monitoring period.	No action is required

2.2 Risks to Stakeholders and the Environment

2.2.1 Management Experience

The PP is Independent Power Producer (IPP) and has been in the renewable energy business for more than 20 years. PP has been actively involved in design or implementation of project activity. The management is experienced and well educated as per the understanding of the carbon market. The field staff has been trained well and annual trainings are provided to keep them up to date.

2.2.2 Risk assessment

	Risk identified	Mitigation or preventative measure(s) taken
Natural and human-induced risks to stakeholders’ wellbeing	No risk identified	Project activity involves the installation of WTG which are consider as nature friendly and placed far away from human interference, hence no risk to human and nature.

<p>Risks to stakeholder participation</p>	<p>No risk identified</p>	<p>Project activity only has benefits for the stakeholders as it provided clean energy with zero risk to human and nature.</p>
<p>Working conditions</p>	<p>Safety of employees at project site</p>	<p>PP has a health and safety policy, and procedure manual in place to ensure favorable working condition.</p>
<p>Safety of women and girls</p>	<p>Sexual harassment at workplace</p>	<p>PP has Health, Safety, Security and Environment (HSSE) Policy and Prevention of Sexual Harassment at Work policies are stated as per the safety of both women and girls (Apraava Energy HSSE Policy, https://www.apraava.com/getmedia/cd8c962d-c86b-42db-8976-15c1d494b54d/Apraava-Energy-HSSE-Policy.pdf Prevention of Sexual Harassment at Workplace https://www.apraava.com/getmedia/b485f4e1-aaf3-49ae-9864-ea38aefbb18e/Handbook-on-Prevention-of-Sexual-Harassment-at-Workplace-Oct-2023.pdf)</p>
<p>Safety of minority and marginalized groups, including children</p>	<p>No risk identified</p>	<p>PP has followed all the regulations and safety protocols provided to the minority and marginalized groups. (Ref Apraava Energy Annual Integrated Report FY 2022-23)</p>
<p>Pollutants (air, noise, discharges to water, generation of waste, and release of hazardous materials and chemical pesticides and fertilizers)</p>	<p>No risk identified</p>	<p>The project activity involves installation of wind power project, which do not emit any kind of air, water, soil, and hazardous material. The waste/used oil from the turbines and transformer oil is disposed as per applicable laws.</p>

		<p>No waste water generation is envisaged from operation of wind farm.</p> <p>There will be only a marginal increase in noise levels due to operation of wind farm and there will be no significant impact on the noise levels due to the Project.</p>
--	--	--

2.3 Respect for Human Rights and Equity

2.3.1 Labor and Work

	Risks identified ⁵	Mitigation or preventative measure(s) taken
Discrimination	Discrimination on the basis of individual's race, gender, age, disability, ethnicity or cultural affiliation, sexual orientation, belief, educational background, or any other basis.	<p>PP is committed to providing an environment free from sexual harassment. PP follows company policy on 'Prevention of Sexual Harassment at the Workplace Policy' which protects from sexual harassment by vendors, contractors, and third parties. (Ref Human Rights Policy, https://www.apraava.com/getmedia/c5d64657-fa1d-4fad-a803-a8ca9727c2fa/Human-Rights-Policy.pdf)</p> <p>Prevention of Sexual Harassment at Workplace https://www.apraava.com/getmedia/b485f4e1-aaf3-49ae-9864-ea38aefbb18e/Handbook-on-Prevention-of-Sexual-Harassment-at-Workplace-Oct-2023.pdf</p>
Sexual harassment	Unwelcome acts or behavior (whether directly or by implication)	PP is committed to providing an environment free from sexual harassment. PP follows company

⁵ 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.

		policy on 'Prevention of Sexual Harassment at the Workplace Policy' which protects from sexual harassment by vendors, contractors, and third parties.
Gender equity in labor and work	Biasness in hiring, promotions or terminations	The PP is Independent Power Producer (IPP) and has been in the renewable energy business for more than 20 years. The PP has policies in place to ensure fair opportunity and equal pay for work done to both men and women.
Forced labor	No risk identified	PP complies with the core labour standards for the ADB financed portion of the Project by engaging those contractors and other providers of goods and services who do not employ forced labour
Child labor	No risk identified	PP complies with the core labour standards for the ADB financed portion of the Project by engaging those contractors and other providers of goods and services who do not employ child labour
Human trafficking	No risk identified	The PP works with ethical suppliers as per code of conduct policy and no such scenario is envisaged for the project activity.

2.3.2 Human Rights

Risks identified	Mitigation or preventative measure(s) taken
No risk identified	The project activity is a greenfield Wind power project and wind mills are installed in approved/permitted areas. The project does not affect the indigenous people and their cultural heritage.

2.3.3 Indigenous Peoples and Cultural Heritage

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

No risk identified	The project activity is a greenfield Wind power project and wind mills are installed in approved/permitted areas. The project does not affect the indigenous people and their cultural heritage.
--------------------	--

2.3.4 Property Right

Risks identified	Mitigation or preventative measure(s) taken
No risk identified	The project activity is a greenfield wind power project. This project does not infringe with property rights and resources. Hence, there is no need to implement any measures to protect and preserve the property rights of stakeholders, IPs, LCs, and customary rights holders.

2.3.5 Benefit Sharing

Summary of the benefit sharing plan	Project activity is a greenfield wind power project where the benefit sharing is not applicable.
Benefit sharing during the monitoring period	Not applicable because the project activity does not have any impacts property right.

2.4 Ecosystem Health

	Risk identified	Mitigation or preventative measure(s) taken during the monitoring period
Impacts on biodiversity and ecosystems	No risk identified	This project activity does not involve any activity which may negatively impact biodiversity and ecosystem. The locations identified for the WTG do not comprise of any trees or shrubs in the immediate vicinity. Provision of adequate spaces between each turbine for movement of birds which reduces the potential for accidental collision has been provided as per the project site layout plan.
Soil degradation and soil erosion	Dispersion of soil	Temporary paved areas are constructed to be used while refueling the machineries, in case of any

		accidental spill the soil will be cut and stored securely for disposal with hazardous waste.
Water consumption and stress	No risk identified	Since the project activity is wind power plant, there is no water consumption and stress is likely to be caused.

2.4.1 Rare, Threatened, and Endangered species

Species or habitat	Since the project activity is greenfield wind power project, no ecosystem impact were identified during validation
Areas needed for habitat connectivity	Not Applicable

	Risks identified	Mitigation or preventative measure(s) taken
Habitats for rare, threatened, and endangered species	Since the project activity is greenfield wind power project, no ecosystem impact was identified during validation	Not Applicable
Areas for habitat connectivity	Since the project activity is greenfield wind power project, no ecosystem impact was identified during validation	Not Applicable

2.4.2 Introduction of species

This project activity neither involve any planting activities nor introduction of species. Hence, not applicable.

Species introduced	Classification	Justification for use	Adverse effects and mitigation
Not Applicable	Not Applicable	Since the project activity is greenfield wind power project, it is not applicable as project activity does not introduce any species.	Not Applicable

This grouped project activity does not involve introduction of any species which may be invasive in nature.

Existing invasive species	Mitigation measures to prevent the spread or continued existence of invasive species
Not Applicable	Not Applicable

	Risks identified	Mitigation or preventative measure(s) taken
Invasive species	Not Applicable	Not Applicable

2.4.3 Ecosystem conversion

The project activity is a greenfield wind power project. This project activity does not involve ARR, ALM, WRC or ACoGS activities. Hence, not applicable.

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

3 IMPLEMENTATION STATUS

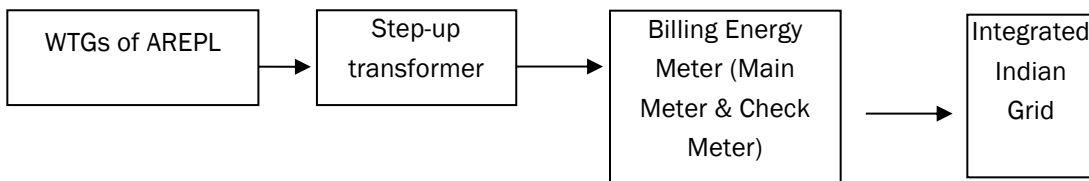
3.1 Implementation Status of the Project Activity

All the WTGs of the Project are commissioned and the Project is fully implemented. The commissioning dates of the individual WTGs have been provided in section 1.7.

Events that may impact the GHG emission reductions or removals and monitoring:

There are few events of minor breakdown, repair and maintenance for which there was no energy generation by the WTGs, for that period PP has applied the error factor as prescribed by the technical specification of the WTGs. Regular O&M activities were conducted but barring them the project activity has been exporting electricity continuously since commissioning. There were neither major breakdowns nor other events for the project activity during the monitoring period that may impact the GHG emission reductions for the project activity.

Monitoring equipment line diagram at project Site is detailed as below: -



No events or situations happened during the reported monitoring period which can alter the applicability of the applied methodology.

3.2 Deviations

3.2.1 Methodology Deviations

No methodology deviation is applied during the monitoring period.

3.2.2 Project Description Deviations

PP name has been changed from CLP Wind Farm (India) Private Limited to Apraava Renewable Energy Private Limited (AREPL) as mentioned in section 1.1.

3.3 Grouped Projects

Not applicable, as the project is not a grouped project.

3.4 Baseline Reassessment

Did the project undergo baseline reassessment during the monitoring period?

- Yes No

4 DATA AND PARAMETERS

4.1 Data and Parameters Available at Validation

Data / Parameter	EF _{grid,OM,y}
Data unit	tCO _{2e} /MWh
Description	Weighted average (net electricity generation) Operating Margin (OM) Emission Factor of Southern Regional Electricity Grid
Source of data	The CO ₂ Baseline Database for the Indian Power Sector - Ministry of Power: Central Electricity Authority (CEA) Version 17.
Value applied:	0.9522
Justification of choice of data or description of	Operating Margin Emission Factor has been calculated by the Central Electricity Authority using the simple OM approach in accordance with "Tool and BM values as per Version 7.0 of methodological tool

measurement methods and procedures applied	to calculate the emission factor for an electricity system” and using data base of CEA. Computed once during PDD finalization.
Purpose of Data	Baseline Emission For the calculation of Emission Factor of the grid
Comments	Operating margin emission factor is fixed ex-ante. The data will be archived for two years beyond the crediting period

Data / Parameter	EF _{grid,BM,y}
Data unit	tCO ₂ e/MWh
Description	Build Margin (BM) Emission Factor of Integrated Indian Grid
Source of data	The CO ₂ Baseline Database for the Indian Power Sector - Ministry of Power: Central Electricity Authority (CEA) Version 17.
Value applied:	0.8653
Justification of choice of data or description of measurement methods and procedures applied	The Build Margin Emission Factor has been calculated by the Central Electricity Authority using the simple OM approach in accordance with "Tool to calculate the emission factor for an electricity system"
Purpose of Data	Baseline Emission calculation
Comments	Build margin emission factor is fixed ex-ante

Data / Parameter	Ratio OM:BM
Data unit	-
Description	Ratio of Operating margin to build margin used for calculation of combined margin for wind energy project
Source of data	The CO ₂ Baseline Database for the Indian Power Sector - Ministry of Power: Central Electricity Authority (CEA) Version 17.
Value applied:	75:25
Justification of choice of data or description of measurement methods and procedures applied	Same ratio has been selected in accordance with "Tool to calculate the emission factor for an electricity system"

Purpose of Data	Baseline Emission calculation
Comments	Ratio is fixed ex-ante.

Data / Parameter	$EF_{grid,CM,y}$
Data unit	tCO ₂ /MWh
Description	Combined Margin Emission Factor
Source of data	The CO ₂ Baseline Database for the Indian Power Sector - Ministry of Power: Central Electricity Authority (CEA) Version 17.
Value applied:	0.9305
Justification of choice of data or description of measurement methods and procedures applied	The Combined Margin Emission Factor has been calculated using the simple OM approach in accordance with "Tool to calculate the emission factor for an electricity system"
Purpose of Data	Baseline Emission calculation
Comments	Combined margin emission factor is fixed ex-ante

4.2 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	The electricity supplied to the grid would be taken from the Joint Meter Reading Report / Energy Generation Statement issued by TNEB for each WTG. TNEB issues this report / statement based on the generation recorded by meters located near each WTG
Description of measurement methods and procedures to be applied	The net electricity supplied to the grid is measured by the main meters and check meters (export and import values) installed by TNEB at the metering point near each WTG. The Total Net Electricity supplied to the grid by the project activity is the summation of Net Electricity supplied by individual 15 WTG of the project activity. For details monitoring equipment refer appendix 2.

Frequency of monitoring/recording	Monthly
Value monitored	43,319.66 MWh
Monitoring equipment	<p>Accuracy of meters: 0.2s</p> <p>Frequency of calibration: Once in five years</p> <p>The quantity of net electricity supplied will be cross-verified from the invoice raised to TNEB by the project proponent. The meter details and calibration are provided in the appendix-2 of MR.</p>
QA/QC procedures to be applied	<p>Accuracy of meters: 0.2s</p> <p>Frequency of calibration: Once in five years.</p> <p>The quantity of net electricity supplied has been cross verified from the invoice raised to TNEB by AREPL.</p>
Purpose of the data	Calculation of baseline emissions or baseline net GHG removals by sinks
Calculation method	Not Applicable
Comments	The data will be archived for two years after the end of the last crediting period or till the last issuance of CERs for the project activity, whichever is later.

4.3 Monitoring Plan

The approved large-scale methodology ACM0002 (version 20), stipulates the monitoring of the net electricity generation supplied by the project plant/unit to the grid. Project proponent has signed an “Operation and Maintenance” contract with Vestas for operation & maintenance of WTGs. The performance of the WTGs, safety in operation and scheduled /breakdown maintenances are organized and monitored by the Vestas and their activities are supervised by AREPL through their site staff. Vestas also provides daily generation data to AREPL through website.

A power purchase agreement has been signed with TNEB. AREPL has installed two identical energy meters – main meter and check meters of 0.5s or more accuracy class (0.2s) at each WTG’s 33kV outgoing feeder (metering point). All the energy meters are duly approved, tested and sealed by TNEB. The main meter readings at the metering point are undertaken every month jointly by the representatives of the TNEB officials and representative of AREPL for the previous month. The meter readings are jointly certified by representatives of the TNEB officials and AREPL.

During registration, calibration frequency has been considered once in three years. However, in actual practice, state utility conducted the accuracy check of all interface meters once in five years. These meters also tested whenever the energy and other quantities recorded by the meter are abnormal or inconsistent with electrically adjacent meters. Same is in line with para 18.1.b of the notification dated 17/03/2006 published by Central Electricity Board, Govt. of India (www.aegcl.co.in/Metering_Regulations_Of_CEA_17_03_2006.pdf). Testing and calibration has

been done by state utility which is beyond the control of Project Participant. Therefore, the frequency of meter testing is once in five years. All meters are tested at the Metering Point.

Metering procedure

The metering is carried out at TNEB meter located near to each WTG (30 TNEB dedicated meters for 15 WTGs of the project activity). This is the metering point wherein the Joint Meter Reading (JMR) is carried out every month in presence of the representatives of the project proponent & the state electricity utility (TNEB). This JMR is used for calculation of the amount of electricity supplied to the Integrated Indian grid against which the utility makes the payment to the project proponent. The JMR document contains “export”, “import” and “net export” of the electricity to/from the Integrated Indian Grid . In case of failure of main meter reading, check meter will be used for the purpose of JMR and billing.

The general conditions set out for metering, recording, meter readings, meter inspections, Test & Checking and communication are as per the PPA (power purchase agreement) with TNEB. Metering: The electricity supplied to the Integrated Indian grid is metered through the two way export meter installed by TNEB at the high voltage side of the step up transformer installed at the project Site.

Metering Equipment: The metering equipment is an electronic trivector meter of accuracy class 0.2s required for the project. The meters are owned, maintained and operated by TNEB. The metering equipment is maintained in accordance with the electricity standards prevalent in Tamil Nadu. The meter details (serial no, type, make etc) and calibration are provided in the appendix-1 of MR.

Meter Readings: The monthly meter readings are taken jointly by the TNEB and representative of AREPL for the last month. At the conclusion of each meter reading appointed representative of the TNEB and AREPL, sign the document indicating the number of kWh injected by the main meter. AREPL has also installed the check meter. The check meter reading shall only be considered when main meter is found to be defective or stopped. However, in this monitoring period same incident has not reported by TNEB representative.

Apart from the main meter and the check meter, every WTG is equipped with an inbuilt meter (called controller) which continuously records the electricity generated by each WTG.

Inspection of Energy Meters: The two-way revenue meters are of 0.2s class are installed at grid interconnection point. The meter is jointly inspected and sealed on behalf of the parties and is not to be interfered with by either party except in the presence of the other party or its accredited representative.

Meter Test Checking: The meter is tested for accuracy with reference to a portable standard meter owned by TNEB. The meter is deemed to be working satisfactorily if the errors are within specifications for meters of 0.2. The consumption registered by the main meter alone holds good for the purpose of metering electricity supplied to the grid as long as the error in the meter is within the permissible limits.

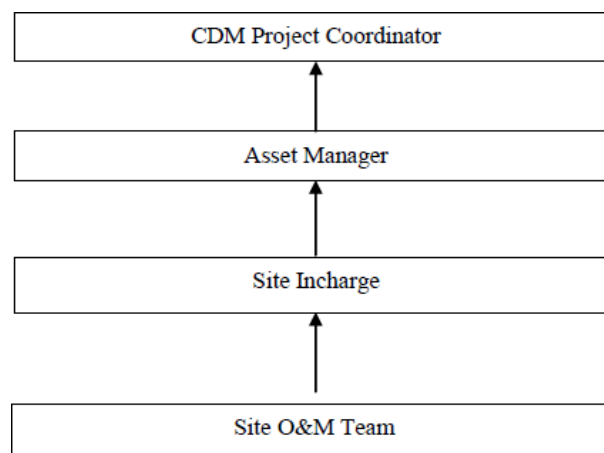
Readings of both Main and Check meters shall be taken every month and shall be compared with each other. Following QA-QC scenarios are planned to demonstrate accuracy of the metering equipment,

- If the difference between the readings of both meters is lower than total permissible error of both the meters, reading of Main meter is considered for emission reduction calculation
- If the difference between the readings of both meters is higher than total permissible error of both the meters then both the meters shall be tested.
- During such test, if Main meter is found working within the permissible limits then, reading of Main meter will be considered for emission reduction calculation and Check meter will be calibrated
- During such test, if Check meter is found working within the permissible limits then, reading of Check meter will be considered for emission reduction calculation and Main meter will be calibrated
- During such test, if error of both the meters are found to be more than their individual permissible error limits, then error of Main meter will be applied in a conservative manner to its reading in emission reduction calculation. Such correction will be applied to entire generation record starting from the last calibration due date to the date of testing.

In this monitoring period, no such incident has reported by the TNEB representatives. The details of calibration for the current monitoring period are provided in Annexure 1 of this report.

Project management structure

The operation and maintenance team consist of representatives of technology supplier, Vestas, who records the readings and prepare daily generation reports of all the WTGs. The primary recording of the electricity fed to the electricity grid is carried out jointly at the TNEB meter located near each WTG. The organizational and management structure for the monitoring of the project activity is as follows:



The project team is delegated with the responsibility to monitor and document the electricity generated and also safe keeping of the recorded data. The project team is also responsible for calculation of emission reduction in the most transparent and relevant manner. All the monitoring data is stored/will be recorded and kept under safe custody. The organizational structure for the monitoring plan with responsibilities is provided below:

Designation	Responsibilities
CDM Project Coordinator	<ul style="list-style-type: none"> Overall CDM project management Ensures adherence to monitoring plan Estimation of Emission Reductions Holds complete control over monitoring aspects pertaining to the project
Asset Manager	<ul style="list-style-type: none"> Verification of Data (Consistency & Completeness) Storage of Data (Archiving) Review / Corrective and preventive Actions QA/QC procedures
Site Incharge	<ul style="list-style-type: none"> Verification of Data (Consistency & Completeness) Storage of Data (Archiving) Operation & Maintenance
Site O&M team	<ul style="list-style-type: none"> Recording of monitored data Storage of Data (Archiving) Operation & Maintenance

5 QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS

5.1 Baseline Emissions

The baseline emissions are calculated as follows:

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

Where:

BE_y = Baseline emissions in year y (tCO₂)

$EG_{PJ,y}$ = 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)

$EF_{\text{grid,CM,y}}$ = Combined margin CO₂ emission factor for Integrated Indian grid connected power generation in year y calculated using the latest version of the “Tool to calculate the emission factor for an electricity system”

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

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

Where:

$EG_{PJ,y}$ = Quantity of net electricity generation that is produced and fed into the grid as a result of the implementation of the project activity in year y (MWh)

Baseline emissions (BE_y) are calculated as follows:

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

Thus,

$$\begin{aligned} BE_y &= 43,319.66 \times 0.9305 \text{ tCO}_2\text{e} \\ &= 40,308 \text{ tCO}_2\text{e} \end{aligned}$$

5.2 Project Emissions

The project activity involves harnessing of wind energy and its conversion to electricity. Hence according to ACM0002 Version 20.0.0, there will be no project emissions in the project activity $PE_y = 0$

5.3 Leakage Emissions

As per ACM0002 Version 20.0.0, no leakage has been considered for the calculation of emission factor.

5.4 GHG Emission Reductions and Carbon Dioxide Removals

Vintage period	Baseline emissions (tCO ₂ e)	Project emissions (tCO ₂ e)	Leakage emissions (tCO ₂ e)	Reduction VCUs (tCO ₂ e)	Removal VCUs (tCO ₂ e)	Total VCUs (tCO ₂ e)
2023 (01/01/2023 to 31/12/2023)	40,308	0	0	40,308	0	40,308
Total	40,308	0	0	40,308	0	40,308

Vintage period	Ex-ante estimated reductions/removals	Achieved reductions/removals	Percent difference	Explanation for the difference
2023 (01/01/2023 to 31/12/2023)	56,132	40,308	-28.19%	The generation has found to be 28.19% lower than the estimated and it is due to seasonal and cyclical variation in wind characteristics which is beyond the control of project participant.

APPENDIX 1: COMMERCIALY SENSITIVE INFORMATION

Section	Information	Justification
Not applicable	not applicable	The project activity is greenfield wind power project, there are no commercially sensitive information so this section is not applicable.

APPENDIX 2: CALIBRATION DETAILS

HTSC No.	Meter Details	Meter Serial Number	Previous Calibration Date	Latest Calibration Date	Valid Till	Accuracy Class	Make
T110*	Main Meter	624921	05-04-2017	12-04-2023	11-04-2028	0.2s	HPL Electric
	Check Meter	3033736	08-12-2017	12-04-2023	11-04-2028	0.2s	HPL
T123*	Main Meter	3033730	08-12-2017	24-01-2023	23-01-2028	0.2s	HPL
	Check Meter	5839971	29-05-2017	24-01-2023	23-01-2028	0.2s	Genus
T124*	Main Meter	1379648	27-05-2017	11-04-2023	10-04-2028	0.2s	Genus
	Check Meter	3033750	08-12-2017	11-04-2023	10-04-2028	0.2s	HPL
T125*	Main Meter	3033745	08-12-2017	24-01-2023	23-01-2028	0.2s	HPL
	Check Meter	HT 2180087	21-05-2020	24-01-2023	23-01-2028	0.2s	EDMI
T126*	Main Meter	HT 2180279	08-12-2017	11-04-2023	10-04-2028	0.2s	EDMI
	Check Meter	3033747	08-12-2017	11-04-2023	10-04-2028	0.2s	HPL
T127*	Main Meter	625156	03-04-2017	12-04-2023	11-04-2028	0.2s	HPL Electric
	Check Meter	3033728	08-12-2017	12-04-2023	11-04-2028	0.2s	HPL
T128*	Main Meter	4321966	30-05-2017	12-04-2023	11-04-2028	0.2s	Genus
	Check Meter	3033714	08-12-2017	12-04-2023	11-04-2028	0.2s	HPL
T129*	Main Meter	HT 2180305	08-12-2017	12-04-2023	11-04-2028	0.2s	EDMI
	Check Meter	3033713	08-12-2017	12-04-2023	11-04-2028	0.2s	HPL
T130*	Main Meter	625093	05-04-2017	12-04-2023	11-04-2028	0.2s	HPL Electric
	Check Meter	3033739	08-12-2017	12-04-2023	11-04-2028	0.2s	HPL

T131*	Main Meter	3033725	08-09-2017	10-04-2023	09-04-2028	0.2s	HPL
	Check Meter	3033726	08-12-2017	10-04-2023	09-04-2028	0.2s	HPL
T132*	Main Meter	625097	04-04-2017	10-04-2023	09-04-2028	0.2s	HPL Electric
	Check Meter	3033729	08-12-2017	10-04-2023	09-04-2028	0.2s	HPL
T133*	Main Meter	624927	11-04-2017	10-04-2023	09-04-2024	0.2s	HPL Electric
	Check Meter	3033741	08-12-2017	10-04-2023	09-04-2028	0.2s	HPL Electric
T134*	Main Meter	624929	11-04-2017	10-04-2023	09-04-2028	0.2s	HPL Electric
	Check Meter	3033721	08-12-2017	10-04-2023	09-04-2028	0.2s	HPL Electric
T135*	Main Meter	625096	04-04-2017	10-04-2023	09-04-2028	0.2s	HPL Electric
	Check Meter	3033711	08-12-2017	10-04-2023	09-04-2028	0.2s	HPL Electric
T136*	Main Meter	625094	04-04-2017	10-04-2023	09-04-2028	0.2s	HPL Electric
	Check Meter	3033715	08-12-2017	10-04-2023	09-04-2028	0.2s	HPL Electric

* PP has applied the maximum error factor due to delay in the calibration of energy meters for entire month conservatively.