



WIND POWER PROJECT IN MAHARASHTRA, INDIA – ANDHRA LAKE PHASE - II

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

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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) with effect from 31/12/2021.

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PROJECT DETAILS

1.1 Summary Description of the Implementation Status of the Project

The project has been implemented by Apraava Renewable Energy Private Limited (AREPL) which is earlier known as CLP Wind Farms (India) Private Limited (“CLP”)². The main purpose of this project activity is to generate clean form of electricity through renewable wind energy source. Project Proponent (PP), has developed a green-field wind-based electricity generation project at Andhra Lake, Pune District, in the State of Maharashtra. The Project involved installation of 63 number of Wind World (India) Limited (formerly Enercon (India) Limited) make E-53 Wind Turbine Generators (WTGs) to generate electrical power for export to the distribution licensee. The electricity generated from the wind farm exported to the Integrated Indian electricity grid. Distribution licensee thereby marginally contributing towards reduction in the energy demand supply gap in the state of Maharashtra, diversification of grid supply and reduction of greenhouse gas emissions.

The details of Wind power project commissioning and their location of installation are mentioned in the table below:

Name of Investor	Capacity (MW)	Commissioning Date	Connection with Grid	State	Usage
Apraava Renewable Energy Private Limited	50.4 MW	19/08/2011 (First WEG)	Indian Grid	Maharashtra	Sale to state Discom

During the current monitoring period from 01/10/2022 to 31/12/2023 (first and last date included) the project activity has supplied 121,618.54 MWh of electricity, and thus contributing to the GHG reductions 113,226 tCO₂e.

1.2 Audit History

Audit Type	Period	Program	Validation/verification body name	Number of years
Validation/Verification	19/08/2011 – 29/09/2013	VCS	Bureau Veritas Certification Holding SAS	2 year, 1 months

² The name of the company has been changed from the CLP Wind Farm (India) Private Limited to Apraava Renewable Energy Private Limited (AREPL) with effect from 31/12/2021.

Verification	30/09/2013 – 31/05/2017	VCS	Earthood Services Private Limited	3 years, 8 months
Verification	01/06/2017 – 31/01/2020	VCS	Earthood Services Private Limited	2 year, 8 months
Verification	01/02/2020 – 18/08/2021	VCS	Earthood Services Private Limited	1 year, 6 months
RCP and Verification	19/08/2021 – 30/09/2022	VCS	LGAI Technological Center, S.A. (Applus+)	1 year, 1 month
Verification	01/10/2022 – 31/12/2023	VCS	EcoLance Private Limited	1 year, 3 month
Total	19/08/2011 To 31/12/2023			12 years 03 month

1.3 Sectoral Scope and Project Type

Sectoral scope ³	01-Energy Industries (renewable/non-renewable sources)
Project activity type	Type I – Renewable Energy Projects (Wind)

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

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>

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

1.6 Project Start Date

Project start date	19/08/2011
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 19/08/2011. Hence, the start date of the project is 19/08/2011.

1.7 Project Crediting Period

Crediting period	☐ Seven years, twice renewable ☐ Ten years, fixed ☒ Other : 10 years (Renewable Twice) Note: As per the registered VCS PD, the crediting period is 10 year which can be renewed twice.
Start and end date of first or fixed crediting period	19/08/2021 to 18/08/2031 (both days inclusive) Second crediting period

1.8 Project Location

The details of the project locations are mentioned in the table below:

Name of Investor	Project Capacity	State	District	Tehsil/Taluka
Apraava Renewable Energy Private Limited	50.4 MW	Maharashtra	Pune	Khed and Maval taluk

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

Sr. No.	Location No.	Date of WEC commissioning	Latitude (N)			Longitude (E)		
			Deg.	Minutes	Second	Deg.	Minutes	Second
1	19	07/01/2012	18	51	3.1	73	38	32
2	20	07/01/2012	18	51	12.8	73	38	32.3
3	21	07/01/2012	18	51	17.5	73	38	29.6
4	22	07/01/2012	18	51	23	73	38	33.7
5	23	07/01/2012	18	51	22.8	73	38	22.5
6	24	07/01/2012	18	51	29	73	38	22.3
7	25	07/01/2012	18	51	33.6	73	38	22
8	26	07/01/2012	18	51	41.4	73	38	28.7
9	27	07/01/2012	18	51	45.9	73	38	27.7
10	28	07/01/2012	18	51	53.6	73	38	30.6
11	29	07/01/2012	18	51	59.9	73	38	24.9
12	30	07/01/2012	18	52	5.1	73	38	21.9
13	31	07/01/2012	18	52	7.8	73	38	20.3
14	32	07/01/2012	18	52	15.6	73	38	18.2
15	33	07/01/2012	18	52	20.8	73	38	16.9
16	34	07/01/2012	18	52	25.6	73	38	14.5
17	35	09/02/2012	18	52	32.7	73	38	10.9
18	36	09/02/2012	18	52	33.6	73	38	1.3
19	96	19/08/2011	18	58	1.3	73	31	58.1
20	97	19/08/2011	18	58	7.4	73	31	55.6
21	107	07/01/2012	18	59	39.2	73	35	7.4
22	108	07/01/2012	18	59	29	73	35	13.5

Sr. No.	Location No.	Date of WEC commissioning	Latitude (N)			Longitude (E)		
			Deg.	Minutes	Second	Deg.	Minutes	Second
23	109	07/01/2012	18	59	24.1	73	35	17
24	110	07/01/2012	18	59	20.1	73	35	21.7
25	111	07/01/2012	18	59	14.1	73	35	25.9
26	112	07/01/2012	18	59	10.8	73	35	29.5
27	113	07/01/2012	18	59	7.9	73	35	33.4
28	115	07/01/2012	18	59	1.5	73	35	47.3
29	116	07/01/2012	18	58	57.8	73	35	53
30	117	07/01/2012	18	58	51.7	73	36	1.2
31	118	07/01/2012	18	58	47.8	73	36	4.2
32	119	07/01/2012	18	58	43	73	36	8.1
33	120	07/01/2012	18	58	37.9	73	36	10
34	121	07/01/2012	18	58	34.2	73	36	13.9
35	122	07/01/2012	18	58	29	73	36	19.1
36	123	09/02/2012	18	58	25.6	73	36	21.7
37	124	09/02/2012	18	58	21.6	73	36	26.8
38	190	13/02/2012	18	48	24	73	33	38.2
39	191	13/02/2012	18	48	28.9	73	33	36.1
40	193	13/02/2012	18	48	40.6	73	33	42.7
41	194	13/02/2012	18	48	47.5	73	33	46.3
42	195	13/02/2012	18	48	48	73	33	35.5
43	196	13/02/2012	18	48	54.2	73	33	34.1
44	197	13/02/2012	18	48	58.5	73	33	31.1
45	198	13/02/2012	18	49	4.1	73	33	30.6
46	199	22/03/2012	18	49	8	73	33	27.4
47	200	22/03/2012	18	49	12.9	73	33	26.3
48	201	03/03/2012	18	49	17.8	73	33	27.2
49	202	22/03/2012	18	49	24.1	73	33	26.8
50	203	22/03/2012	18	49	29.2	73	33	24.9
51	204	03/03/2012	18	49	31.5	73	33	16.4
52	205	03/03/2012	18	49	36.5	73	33	14.4
53	206	03/03/2012	18	49	41.8	73	33	16.2

Sr. No.	Location No.	Date of WEC commissioning	Latitude (N)			Longitude (E)		
			Deg.	Minutes	Second	Deg.	Minutes	Second
54	207	03/03/2012	18	49	48.1	73	33	16.8
55	208	03/03/2012	18	49	52.8	73	33	16.1
56	209	03/03/2012	18	49	58.3	73	33	16.4
57	210	22/03/2012	18	50	4	73	33	14.1
58	211	22/03/2012	18	50	6.4	73	33	9.2
59	212	22/03/2012	18	50	9.9	73	33	4.4
60	213	22/03/2012	18	50	14.7	73	32	58.2
61	214	22/03/2012	18	50	20.2	73	32	52.8
62	500	07/01/2012	18	50	54.4	73	38	29.4
63	511	12/12/2011	18	59	33.3	73	35	10.3

The Location no. 190, 191, 193-198, 200, 201, 199 are connected to feeder 1, Location no. 202, 203, 204-209, 210-214 are connected to feeder 2, Location no. 19-34, 35, 36, 500 are connected to feeder 3, Location no. 107-113, 115-124, 511 are connected to feeder 5 and Location no. 96-97 are connected to feeder 8.

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	21.0
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	7.0

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

The project has participated as CDM projects titled “Wind power project in Maharashtra, India – Andhra Lake Phase - II” and UNFCCC No: 7491.

The project link is:

<https://cdm.unfccc.int/Projects/DB/LROA%20Ltd1348755977.79/view?cp=1>

However, PP has not claimed any CERs from the CDM project activity from project registration to till date. CLPWFL has claimed the carbon credits from only one GHG programme during a monitoring period which would ensure that there will be no double counting of emission reductions. Further, carbon credits would be claimed only from one GHG programme which will ensure that there will be no double counting of emission reductions.

1.10.2 Registration in Other GHG Programs

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

☐ Yes ☒ No

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? See the *VCS Program Definitions* for definitions of emissions trading program and 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? See the *VCS Program Definitions* for definition of 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 121,618.54 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 1,202,742.34 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	1 Training has been provided during current verification period, The training was organized for staff on the technology, plant operation, emergency and safety procedure.	Overall, at least 1 Training annually has been provided each year throughout the entire crediting period, 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 121,618.54 MWh renewable electricity the project has avoided emission of 113,226 tCO ₂ e in the atmosphere.	Since commissioning the project has avoided emission of 1,138,134 tCO ₂ e 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	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: a) Representatives from EIL now WWIL; b) Employees of AREPL; c) Contractor of AREPL; d) Villagers from nearby villages Furthermore, all the stakeholders mentioned above were identified at the project's validation. There has been no change in stakeholder makeup since validation.
Legal or customary tenure/access rights	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
Stakeholder diversity and changes over time	Stakeholders identified for this project activity are diverse in nature – in terms of socio-economic status, age and gender wise and the diversity is unlikely to change over time.
Expected changes in well-being	Expected changes

	1. Economic well-being – the project activity is likely to provide employments to the locality thus economic well beings are expected 2. Environmental well-being – as this project activity 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 and specific pollutants like SOx, NOx, and SPM associated with the conventional thermal power generation facilities.
Location of stakeholders	Location: Khed and Maval taluk Pune, Maharashtra, India
Location of resources	Not Applicable

2.1.2 Stakeholder Consultation and Ongoing Communication

Ongoing consultation	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.
Date(s) of stakeholder consultation	19/02/2010
Communication of monitored results	The meeting was outlined towards making aware local stakeholders including local community, local administration representatives, NGOs working for environmental cause etc., about the project activity that involves waste water treatment and electricity generation with the primary objective of reducing emissions of GHG emission in compared to pre-project or baseline scenario. The feedbacks/comments received from stakeholders were quite positive and no negative comments were received. The questions asked by stakeholders were only on process and these ere explained by PP representatives.
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	Stakeholder input/feedback received during LSC and the LSC report for the same had been submitted to the VVB during validation. 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.
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2.1.3 Free, Prior, and Informed Consent

Consent	The project activity is greenfield wind power project, in which all the approvals and prior consent to operate have been taken from the local authorities and there was no objection from their side.
Outcome of FPIC	The project activity involves the installation of wind power project which has not encroached any kind of land from the local and government authorities.

2.1.4 Grievance Redress Procedure

Grievances received	Resolution and outcome
No grievances were received during the current monitoring period	The project has not received any negative comments from the stakeholders. Hence, it is not applicable.

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.
Risks to stakeholder participation	No risk identified	Project activity only has benefits for the stakeholders as it provided clean energy with zero risk to human and nature.
Working conditions	Safety of employees at project site	Project activities create indirect livelihood opportunities for local people. The working conditions are in line with government norms.
Safety of women and girls	Sexual harassment at workplace	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)
Safety of minority and marginalized groups, including children	No risk identified	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)
Pollutants (air, noise, discharges to water, generation of waste, and release of hazardous materials and chemical pesticides and fertilizers)	No risk identified	Project does not cause air, noise, water pollution or release hazardous materials.(EIA Report by TCE Consulting Engineers Limited dated March 2010)

2.3 Respect for Human Rights and Equity

2.3.1 Labor and Work

	Risks identified ⁴	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	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

⁴ 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.

	background, or any other basis.	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)
Sexual harassment	Unwelcome acts or behavior (whether directly or by implication)	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. PP has policies in place to inform management and employees about the avoidance of corruption, code of conduct, and business ethics. (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)
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	The PP is Independent Power Producer (IPP) and has been in the renewable energy business for more than 20 years. PP has policies which prohibits child labor or forced, involuntary or trafficked labor in any form. All employees shall treat one another with respect, dignity and common courtesy.
Child labor	No risk identified	The PP is Independent Power Producer (IPP) and has been in the renewable energy business for more than 20 years. PP has policies which prohibits child labor or forced, involuntary or trafficked labor in any form. All employees shall treat one

		another with respect, dignity and common courtesy.
Human trafficking	No risk identified	The PP is Independent Power Producer (IPP) and has been in the renewable energy business for more than 20 years. PP has policies which prohibits child labor or forced, involuntary or trafficked labor in any form. All employees shall treat one another with respect, dignity and common courtesy.

2.3.2 Human Rights

Risks identified	Mitigation or preventative measure(s) taken
No risk identified	There have been no human rights violation with any stakeholders during construction and operation of the project activity.

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	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.
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Benefit sharing during the monitoring period	Not applicable because the project activity does not have any impacts property right.
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2.4 Ecosystem Health

	Risk identified	Mitigation or preventative measure(s) taken during the monitoring period
Impacts on biodiversity and ecosystems	No risk identified	The project activity is wind power plant. This project activity does not involve any activity which may negatively impact biodiversity and ecosystem.
Soil degradation and soil erosion	No risk identified	The project activity is wind power plant. This project activity does not involve any activity which may result in soil degradation and soil erosion.
Water consumption and stress	No risk identified	The project activity is wind power plant. This project activity does not involve any activity which may consume water or result in any kind of water stress.

2.4.1 Rare, Threatened, and Endangered species

Species or habitat	After installation or during the install of WTGs there is no impact to the rare, threatened or endangered species of the surroundings.
Areas needed for habitat connectivity	Not Applicable

	Risks identified	Mitigation or preventative measure(s) taken
Habitats for rare, threatened, and endangered species	Not Applicable	Not Applicable
Areas for habitat connectivity	Not Applicable	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 groped 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

Andhra Lake Ph-II has implemented of a 50.4 MW wind power project consisting of 63 Wind Electric Generators (WEGs) of individual capacity 0.8 MW by Apraava Renewable Energy Private Limited (AREPL). Total capacity of 50.4 MW has been commissioned. The first WEG under this project has commissioned on 19-Aug-2011 and last WEG has been commissioned on 28-Dec-2011. Thus, the project is now operation to its full operational capacity of 50.4 MW. A comprehensive list of WEGs commissioning dates is provided under section 1.8.

The project activity has been implemented as per the description in the registered VCS PD. The Project is owned by Apraava Renewable Energy Private Limited (AREPL) and WWIL is responsible for operation and maintenance of the wind farm. 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 projects WEGs. There has 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. Further, there are no changes to the project participant for the project activity during the monitoring.

Technology Details –

The project uses Wind World India Ltd's wind energy technology. The project activity implements E-53 model of 0.8 MW WEGs.



The technical details for the WEG is as follows:

Turbine model	WWIL E- 53
Rated power	0.8 MW
Rotor diameter	52.9 m
Hub height	74 m
Turbine Type	Gearless, variable speed, variable pitch control
Power regulation	Independent electromechanical pitch system for each blade.
Cut in wind speed	3 m/s
Rated wind speed	12.6 m/s
Cut out Wind speed	24-28 m/s
Rated rotational speed	32 rpm
Operating range rot. speed	12-29 rpm
Orientation	Upwind
No of Blades	3
Blade Material	Fibre Glass Epoxy reinforced with integral lightning protection

Gear box type	Gear less
Generator type	Synchronous generator
Braking	Aerodynamic
Output Voltage	400 V
Tower	74 m concrete

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 Farms (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 _{OM,y}			
Data unit	tCO ₂ /MWh			
Description	Operating margin CO ₂ emission factor of Indian Integrated Grid			
Source of data	Central Electricity Authority: CO2 Emission Database CEA CO2 Baseline database Version 18.0			
Value applied:		2019-20	2020-21	2021-22
	Net Generation in Operating Margin (GWh)	965,009	958,218	1,035,672

	Simple Operating Margin (tCO ₂ /MWh)	0.9541	0.9402	0.9605
	Wt. Average (tCO ₂ /MWh)	0.9518		
Justification of choice of data or description of measurement methods and procedures applied	Calculated as per “Tool to calculate the emission factor for an electricity system, version 07”. The data are obtained from “CO ₂ Baseline Database for Indian Power Sector” 18.0, published by the Central Electricity Authority, Ministry of Power, Government of India.			
Purpose of Data	Calculation of Baseline emissions			
Comments	This database is an official publication of Government of India for the purpose of baseline emission calculations. It is based on most recent data available to the Central Electricity Authority and hence considered authentic. As the calculation of baseline emission has been done ex ante its value will remain fixed for the entire crediting period.			

Data / Parameter	EF _{BM,y}
Data unit	tCO ₂ /MWh
Description	Build margin CO ₂ emission factor of Indian Intergard grid
Source of data	Central Electricity Authority: CO ₂ Emission Database CEA CO ₂ Baseline database Version 18.0
Value applied:	0.8687
Justification of choice of data or description of measurement methods and procedures applied	Calculated as per “Tool to calculate the emission factor for an electricity system, version 07”. The data are obtained from “CO ₂ Baseline Database for Indian Power Sector” 18.0, published by the Central Electricity Authority, Ministry of Power, Government of India.
Purpose of Data	Calculation of Baseline emissions
Comments	This database is an official publication of Government of India for the purpose of baseline emission calculations. It is based on most recent data available to the Central Electricity Authority and hence considered authentic. As the calculation of baseline emission has

	been done ex ante its value will remain fixed for the entire crediting period.
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Data / Parameter	$EF_{grid,CM,y}$	
Data unit	tCO ₂ /MWh	
Description	Combined CO ₂ emission factor of Indian Integrated Grid	
Source of data	Central Electricity Authority: CO ₂ Emission Database CEA CO ₂ Baseline database Version 18.0 ⁵	
Value applied:	Operating margin CO ₂ emission factor (tCO ₂ /MWh)	0.9518
	Build margin CO ₂ emission factor (tCO ₂ /MWh)	0.8687
	Weighted Average (tCO ₂ /MWh)	= 0.9518* 0.75 + 0.8687 *0.25 = 0.9310
Justification of choice of data or description of measurement methods and procedures applied	Calculated as per “Tool to calculate the emission factor for an electricity system, version 07”. The data are obtained from “CO ₂ Baseline Database for Indian Power Sector” version 18.0 published by the Central Electricity Authority, Ministry of Power, Government of India.	
Purpose of Data	Calculation of Baseline emissions	
Comments	This database is an official publication of Government of India for the purpose of baseline emission calculations. It is based on most recent data available to the Central Electricity Authority and hence considered authentic. As the calculation of baseline emission has been done ex ante its value will remain fixed for the entire crediting period.	

4.2 Data and Parameters Monitored

Data / Parameter	$EG_{export,y}$
Data unit	MWh/yr

⁵ <https://cea.nic.in/cdm-co2-baseline-database/?lang=en>

Description	Quantity of electricity exported by the Project to the grid in year y
Source of data	Joint Meter Reading Sheets and credit notes issued by Maharashtra State Electricity Distribution Co. Ltd. (MSEDCL) for all the feeders to which WTGs of the project activity are connected. $EG_{\text{export},y}$ is the summation of readings of individual Joint Meter Reading Sheets.
Description of measurement methods and procedures to be applied	AREPL has duly installed the approved ABT meters with accuracy class of 0.2s with online metering features at the metering point (Main Meter). AREPL has also installed Check meter with separate CT/PT of class 0.2s. Quantity of electricity exported by the Project to the grid has been calculated using the sum of readings taken at the main/check meter installed at the interconnection points. Data monitoring is being taking place at the substation on a continuous basis and recorded on at least monthly basis. On the basis of these readings taken, a generation report has also been issued by MSEDCL.
Frequency of monitoring/recording	Monthly
Value monitored	121,698.32 MWh
Monitoring equipment	AREPL has duly installed the approved ABT meters with accuracy class of 0.2s with online metering features at the metering point (Main Meter). AREPL has also installed Check meter with separate CT/PT of class 0.2s. Quantity of electricity exported by the Project to the grid has been calculated using the sum of readings taken at the main/check meter installed at the interconnection points. Data monitoring is being taking place at the substation on a continuous basis and recorded on at least monthly basis. On the basis of these readings taken, a generation report has also been issued by MSEDCL. For Type, Accuracy Class, Serial numbers of energy meters kindly refer Appendix 01.
QA/QC procedures to be applied	The readings from main and check meters installed at the interconnection point have been checked every month at the time of metering of electricity generation. In case the meters are found to be operating beyond the permissible limits, it shall be immediately sent for calibration. The frequency of meter testing is once in 5 years. It would be prudent to note that the meter testing and calibration is not within the control of the Project Proponent.
Purpose of the data	Baseline Emissions calculation
Calculation method	Measured Value

Comments	The data will be kept for two years after the end of the crediting period or the last issuance of VERs for this Project activity, whichever occurs later.
Data / Parameter	EG _{import,y}
Data unit	MWh/yr
Description	Quantity of electricity imported by the Project from the grid in year y
Source of data	Joint Meter Reading Sheets and credit notes issued by Maharashtra State Electricity Distribution Co. Ltd. (MSEDCL) for all the feeders to which WTGs of the project activity are connected. EG _{import, y} is the summation of readings of individual Joint Meter Reading Sheets.
Description of measurement methods and procedures to be applied	Quantity of electricity imported by the Project to the grid is calculated using the sum of readings taken at the main/check meter installed at the interconnection points. Data monitoring has been done at the substation on continuous basis and recorded on at least a monthly basis. On the basis of these readings taken, a generation report is issued by MSEDCL.
Frequency of monitoring/recording	Monthly
Value monitored	79.78 MWh
Monitoring equipment	AREPL has duly installed the approved ABT meters with accuracy class of 0.2s with online metering features at the metering point (Main Meter). AREPL has also installed Check meter with separate CT/PT of class 0.2s. Quantity of electricity imported by the Project to the grid has been calculated using the sum of readings taken at the main/check meter installed at the interconnection points. Data monitoring is being taking place at the substation on a continuous basis and recorded on at least monthly basis. On the basis of these readings taken, a generation report has also been issued by MSEDCL. For Type, Accuracy Class, Serial numbers of energy meters kindly refer Appendix 01.
QA/QC procedures to be applied	The readings from main and check meters installed at the interconnection point have been checked every month at the time of metering of electricity generation. In case the meters are found to be operating beyond the permissible limits, it shall be immediately sent for calibration. The frequency of meter testing is once in 5 years. It would be prudent to note that the meter testing and calibration is not within the control of the Project Proponent.

Purpose of the data	Baseline Emissions calculation
Calculation method	Measured Value
Comments	The data will be kept for two years after the end of the crediting period or the last issuance of VERs for this Project activity, whichever occurs later.

Data / Parameter	EG _{facility,y}
Data unit	MWh/yr
Description	Quantity of net electricity generation supplied by the project plant/unit to the grid in year y
Source of data	Joint Meter Reading Sheets and credit notes issued by Maharashtra State Electricity Distribution Co. Ltd. (MSEDCL) for all the feeders to which WTGs of the project activity are connected.
Description of measurement methods and procedures to be applied	Net electricity supplied by the project is calculated as the difference of electricity exported to and imported from the grid measure using the readings taken at the main/check meter installed at the interconnection point. $EG_{\text{facility},y} = EG_{\text{export},y} - EG_{\text{import},y}$ Joint Meter Reading Sheets and generation report issued by Maharashtra State Electricity Distribution Co. Ltd. (MSEDCL) on a monthly basis is used for this purpose.
Frequency of monitoring/recording	Monthly
Value monitored	121,618.54 MWh
Monitoring equipment	Not applicable as it is a calculated value
QA/QC procedures to be applied	The value of this parameter can be cross checked with all the invoices generated for the sold electricity during the year y.
Purpose of the data	Baseline Emissions calculation
Calculation method	Measured value
Comments	The data will be kept for two years after the end of the crediting period or the last issuance of VERs for this Project activity, whichever occurs later.

4.3 Monitoring Plan

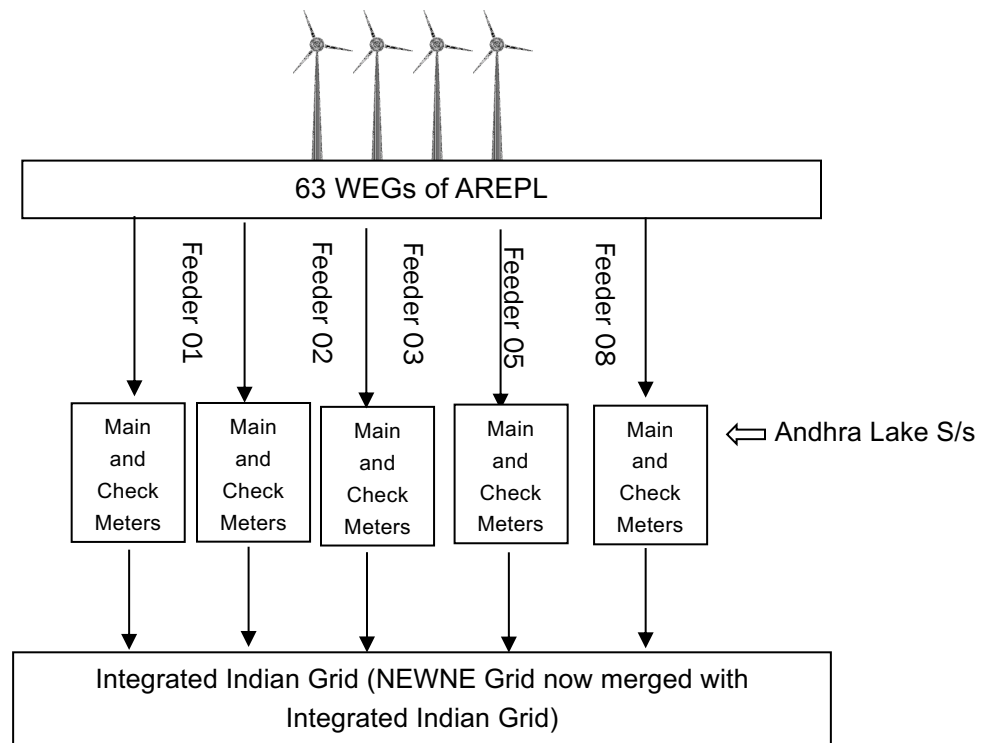
Wind World India Limited (WWIL) is O&M contractor for the project activity. WWIL is responsible for the maintaining all the monitoring data on behalf of state utility in respect of the project activity. WWIL has implemented the management structure for managing the monitored data.

This approved monitoring methodology requires monitoring of the following:

Net electricity supplied from the project activity. While Emission factor of the project activity is fixed ex ante hence no further monitoring of this parameter is required. As per ACM0002 leakage need not be considered hence leakage has not been considered for the project activity. Hence, the sole parameter for monitoring is the net electricity supplied by the project activity to the grid.

The Project activity is operated by WWIL (O&M contractor for the project activity) and managed by the PP. The operational and maintenance contract for the project activity is with WWIL, which is an ISO 9001 certified company. WWIL follows the documentation practices to ensure the reliability and availability of the data for all the activities as required from the identification of the site, wind resource assessment, logistics, finance, construction, commissioning and operation of the wind power project.

Calibration of Meters: The readings from main and check meters installed at the interconnection point has been checked every month at the time of metering of electricity generation. In case the meters are found to be operating beyond the permissible limits, it shall be immediately sent for calibration. The frequency of meter testing is once in 5 years. Location of the meters are mentioned below:



Apportioning of electricity:

In case dates of monitoring period do not match with the dates of Joint Meter Reading Sheets / Credit notes issued by Maharashtra State Electricity Distribution Co. Ltd. (MSEDCL). Specific for this project, out of 5 feeders only 1 feeder (feeder 8) has both project and non-project WECs connected. Rest 4 Feeders (feeder 1, 2, 3 & 5) are only connected with project WECs, Therefore, generation recorded in these 4 feeders are not required to be apportioned except the cases when monitoring period do not match with the dates of Joint Meter Reading dates. In case, of Feeder 8, apportioning is done in every month based on total individual WEC generation and feeder reading of net generation recorded.

Apportioning has been carried out based on ratio of generation data recorded using LCS meters installed at the WTG. The LCS meters do not require calibration as the energy readings of electricity generated at the LCS meter is cross verified by the energy calculated by inverting system installed in the WTGs.

The emission reductions of that particular period (from the date of registration of the project till the end of the month) 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 Maharashtra State Electricity Distribution Co. Ltd. (MSEDCL).

The sample calculation is furnished below:

Generation from AREPL WTGs for the monitoring period = A (From LCS data) Generation from AREPL WTGs for the billing period = B (From LCS data)

Net energy exported from AREPL WTGs for the billing period = C (JMR/Generation share report by MSEDCL)

Net energy export used for calculation of emission reduction for the monitoring period = $(C * A/B)$

Calibration Details of billing meters for the project activity are provided in the Appendix 1.

Frequency of meter reading: The meters installed at the metering point will have 15 minutes block online reading. However, the main/check meter reading at the metering point is undertaken jointly by the representative of the MSEDCL and authorized officials of the AREPL on 1st day of every month for the preceding month.

Data archiving: Data has been archived electronically. The data would be archived two years after crediting period or last issuance whichever is later.

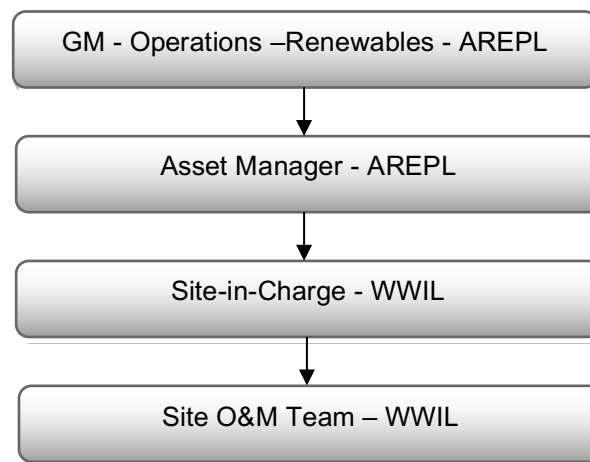
Training and maintenance requirements: Training on the machine is an essential pre-requisite, to ensure necessary safety of man and machine. Further, in order to maximize the output from the Wind Energy Generators (WEGs), it is extremely essential, that the engineers and technicians understand the machines and keep them in good health. In order to ensure that WWIL's service staffs is deft at handling technical snags on top of the turbine, the necessity of ensuring that they

are capable of climbing the tower with absolute ease and comfort has been established. The WWIL Training Academy provides need-based training to meet the training requirements of WWIL projects. The training is contemporary, which results in imparting focused knowledge leading to value addition to the attitude and skills of all trainees. This ultimately leads to creativity in problem solving.

Monitoring roles and responsibilities

AREPL has formulated a Project Team to ensure proper and continuous monitoring of the performance of turbines and generation of power.

The operation and management structure implemented by the AREPL for the purpose of the Project activity is illustrated below:



The Project activity is operated by WWIL (O&M contractor for the project activity) and managed by the PP. The operational and maintenance contract for the project activity is with WWIL, which is an ISO 9001 certified company. WWIL follows the documentation practices to ensure the reliability and availability of the data for all the activities as required from the identification of the site, wind resource assessment, logistics, finance, construction, commissioning and operation of the wind power project. The data for the project is compiled by the O&M Contractor and subsequently stored by the PP, the data flows as per the below mentioned flow chart starting from Site O&M team which monitors day to day operational data and monthly recording. The roles and responsibilities for the project are described as below:

Data Recording

The state utility and representative of concerned Power Producer / developer shall jointly read the metering system every month at the delivery point.

Meter readings taken jointly will be signed by the representatives of state utility and of concerned power producer/developer. If Power Producer/ Developer"s representative is not present for joint meter reading then the meter reading taken by state utility shall be considered as final; provided

a signed copy of the meter reading is sent to the Power Purchase / Developer within twenty four (24) hours of such reading of the main metering system or back up metering system as the case may be.

Emergency Preparedness

In case of any abrupt breakdown, the fault will be immediately identified by the O&M personnel. All minor faults shall be taken care of by the O & M personnel, In case of any major faults, the grid personnel will be informed and replacement of the equipment shall be made within 24 hours.

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 Emission (BE_y):

Baseline emissions (BE_y) are calculated as follows:

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

Vintage Period	Net Electricity Export (MWh)	Emission Factor (tCO ₂ /MWh)	Baseline Emissions (tCO ₂)
2022 (01/10/2022 to 31/12/2022)	16,474.93	0.9310	15,338
2023 (01/01/2023 to 31/12/2023)	1,05,143.62	0.9310	97,888
	1,21,618.54		1,13,226

5.2 Project Emissions

The project activity involves harnessing of wind energy and its conversion to electricity. Hence according to ACM0002 Version 21.0.0, there will be no project emissions in the project activity
 $PE_y = 0$

5.3 Leakage Emissions

As per ACM0002 Version 21.0.0, 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)
2022 (01/10/2022 to 31/12/2022)	15,338	0	0	15,338	0	15,338
2023 (01/01/2023 to 31/12/2023)	97,888	0	0	97,888	0	97,888
Total	1,13,226	0	0	1,13,226	0	1,13,226

Vintage period	Ex-ante estimated reductions/removals	Achieved reductions/removals	Percent difference	Explanation for the difference
2022 (01/10/2022 to	18,802	15,338	-18.42%	The actual PLF achieved in the applied MP is 22% which 21.21%

31/12/2022)				higher as compared to registered VCS PD. As per registered VCS PD, the IRR for the Project does not exceed the benchmark even after 43.8% increase in PLF/Net generation. Hence, PLF increase of 22% is well below additionality limits and there is no adverse impact on additionality due to this variation. The increase in PLF is due to seasonal and cyclical variation in wind characteristics which is beyond the control of project participant.
2023 (01/01/2023 to 31/12/2023)	74,596	97,888	31.22%	
Total	93,398	1,13,226	21.23%	

APPENDIX 1: COMMERCIALLY 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

Main Meter

Feeder No.	Meter identification-SI No.	Meter Make	Accuracy Class	Date of Calibration	Valid Till
1	13099002	Elster	0.2s	13/07/2021	12/07/2026
2	13098999	Elster	0.2s	13/07/2021	12/07/2026
3	13099003	Elster	0.2s	13/07/2021	12/07/2026
4	13098998	Elster	0.2s	13/07/2021	12/07/2026
5	13098996	Elster	0.2s	13/07/2021	12/07/2026

Check Meter

Feeder No.	Meter identification-S No.	Meter Make	Accuracy Class	Date of Calibration	Valid Till
1	13099006	Elster	0.2s	13/07/2021	12/07/2026
2	13099007	Elster	0.2s	13/07/2021	12/07/2026
3	13099000	Elster	0.2s	13/07/2021	12/07/2026

Feeder No.	Meter identification-S No.	Meter Make	Accuracy Class	Date of Calibration	Valid Till
4	13099001	Elster	0.2s	13/07/2021	12/07/2026
5	13098997	Elster	0.2s	13/07/2021	12/07/2026