



**Verified Carbon
Standard**

TEJUVA – CHANDGARH WIND PROJECT

Document Prepared by CLP India Private Limited

Project Title	Tejuva – Chandgarh Wind Project
Version	1.1
Report ID	VER/TC/21-22
Date of Issue	10/01/2023
Project ID	1560
Monitoring Period	01-06-2021 to 30-09-2022 (both days inclusive)
Prepared By	CLP Wind Farms (India) Private Limited
Contact	7 th Floor, FULCRUM, Sahar Road, Andheri (East), Mumbai – 400 099. India T: +91-22-6758 8888 F: +91-22-6758 8811 E: carbon@clpindia.in Web link: www.clpindia.in

CONTENTS

1	PROJECT DETAILS.....	3
1.1	Summary Description of the Implementation Status of the Project	3
1.2	Sectoral Scope and Project Type	4
1.3	Project Proponent	4
1.4	Other Entities Involved in the Project	4
1.5	Project Start Date	5
1.6	Project Crediting Period	5
1.7	Project Location	5
1.8	Title and Reference of Methodology	8
1.9	Participation under other GHG Programs.....	9
1.10	Other Forms of Credit and Supply Chain (Scope 3) Emissions	9
1.11	Sustainable Development Contributions	9
2	SAFEGUARDS	12
2.1	No Net Harm	12
2.2	Local Stakeholder Consultation	12
2.3	AFOLU-Specific Safeguards	13
3	IMPLEMENTATION STATUS	13
3.1	Implementation Status of the Project Activity	13
3.2	Deviations	14
3.3	Grouped Projects	14
4	DATA AND PARAMETERS.....	14
4.1	Data and Parameters Available at Validation	14
4.2	Data and Parameters Monitored.....	16
4.3	Monitoring Plan.....	19
5	QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS	23
5.1	Baseline Emissions	23
5.2	Project Emissions	24
5.3	Leakage.....	24
5.4	Net GHG Emission Reductions and Removals.....	24
	APPENDIX 1: METER CALIBRATION DETAILS	26

1 PROJECT DETAILS

1.1 Summary Description of the Implementation Status of the Project

CLP Wind Farms (India) Private Limited (CLPWFL) has installed a wind project which is located at two wind sites viz. Tejuva site in Jaisalmer district in the state of Rajasthan and Chandgadhi site in the state of Madhya Pradesh in India. The project activity has been implemented in two phases - the first phase i.e. Tejuva site with capacity of 100.8 MW (48 * 2.1 MW) has been installed at Dilawar ka gaon, Ishaniyo ki basti, Chattrai, villages in the distt. of Jaisalmer, Rajasthan and second phase i.e. Chandgadhi site with capacity of 92 MW (46 * 2 MW) has been installed at Agrod, Amona, Bardu, Bercha, Bhayagaion, Bhikhedhi, Chandgarh, Chayan Hazam, Guradiya surdas, Jamodi, Mohammed kheda, Raheli, Ranayalkala and Samgi villages in the distt. of Dewas and Shajapur, Madhya Pradesh. The combined capacity of the project is 192.8 MW wind power project which is using Suzlon make 2.1 MW S97 Wind Turbine Generators at Tejuva site and Gamesa make 2.0 MW G97 WTG at Chandgadhi site. The project activity utilises wind power to generate clean power with a view to bring in greenhouse gas emission reductions.

The Project activity is a new facility (Greenfield) and utilizing wind energy to generate electricity and supply it to distribution licensees which is a part of the NEWNE (Northern, Eastern, Western and North-Eastern) grid of India. In the absence of Project activity, quantity of the electricity that has been delivered to the NEWNE grid, would have been sourced from the existing grid-connected fossil fuel based power plants to meet the growing electricity requirements. Hence, generation mix of Integrated Indian Grid (NEWNE grid is now merged with Integrated Indian Grid) is considered as the baseline scenario. Thus, the project activity reduces the dependency on fossil fuels which are pre-dominantly used for electricity generation in India and helps reduction of climate change impacts.

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 first machine under this project activity was commissioned on 29-03-2015 and last machine was commissioned on 29-12-2015.

During this monitoring period the project activity has exported 503.72 GWh of energy to the NEWNE Grid of India. The total emission reductions achieved during the monitoring period from 01-06-2021 to 30-09-2022 is 498,683 tCO₂.

The audit history of the project is provided below:

Audit Type	Period	Program	VVB Name	Number of years
Validation and Verification	29-03-2015 to 31-07-2016	<u>VCS</u>	<u>URS VERIFICATION PRIVATE LIMITED</u>	1 year, 4 months
Verification	01-08-2016 to 31-07-2018	<u>VCS</u>	<u>Earthood Services Private Limited</u>	2 years

Verification	01-08-2018 to 31-07-2020	<u>VCS</u>	<u>Earthood Services Private Limited</u>	2 years
Verification	01-08-2020 to 31-05-2021	<u>VCS</u>	<u>Earthood Services Private Limited</u>	10 months
Verification	01-06-2021 to 30-09-2022	<u>VCS</u>	<u>LGAI Technological Center S.A.</u>	1 year, 4 months
Total	29-03-2015 to 30-09-2022	VCS		7 years, 6 months

1.2 Sectoral Scope and Project Type

Sectoral scope: 1 Energy Industries (renewable -/ non renewable sources)

Project Type: I, Renewable energy project

The project is not a grouped project.

1.3 Project Proponent

Organization name	CLP Wind Farms (India) Private Limited
Contact person	Navneet Kumar
Title	Manager – Carbon & Sustainability
Address	7 th Floor, FULCRUM, Sahar Road, Andheri (East), Mumbai – 400 099. India
Telephone	+ 91 22 6758 8888
Email	<u>Carbon@clpindia.in</u>

1.4 Other Entities Involved in the Project

Organization name	Not Applicable
Role in the Project	Not Applicable
Contact person	Not Applicable
Title	Not Applicable
Address	Not Applicable
Telephone	Not Applicable

Email	Not Applicable
-------	----------------

1.5 Project Start Date

The project start date is 29-03-2015 which is the date of commissioning of the first wind turbine installed under the project activity

1.6 Project Crediting Period

The length of the Crediting period of the project activity is 10 years (Renewable) starting from 29-03-2015 to 28-03-2025.

1.7 Project Location

The project activity is implemented in 2 phases. Phase –I is located at Dilawar ka gaon, Ishaniyo ki basti and Chattrei, villages in the distt. of Jaisalmer, Rajasthan. Further, the remaining WTGs are installed at Agrod, Amona, Bardu, Bercha, Bhayagaion, Bhikhedhi, Chandgarh, Chayan Hazam, Guradiya surdas, Jamodi, Mohammed kheda, Raheli, Ranayalkala and Samgi villages in the distt. of Dewas and Shajapur in Madhya Pradesh which constitutes the phase-II of the project activity. The location details of project activity are given in below table:

Phase 1: Tejuva Site with a total capacity of 100.8 MW (48 WTGs)

SI No	WTG ID	Geo Co-ordinates		Commissioning Dates
		Latitude (North)	Longitude (East)	
1	HBR-020	27 ° 06' 39.2040" N	70 ° 37' 52.3200" E	30-Jun-2015
2	HBR-021	27 ° 06' 58.5360" N	70 ° 37' 32.5920" E	30-Jun-2015
3	HBR-022	27 ° 07' 09.7320" N	70 ° 37' 20.4960" E	30-Jun-2015
4	HBR-023	27 ° 07' 13.4040" N	70 ° 36' 59.2200" E	6-Aug-2015
5	HBR-024	27 ° 07' 28.5960" N	70 ° 36' 44.6040" E	6-Aug-2015
6	HBR-025	27 ° 07' 36.0840" N	70 ° 36' 24.4080" E	6-Aug-2015
7	HBR-027	27 ° 06' 21.1680" N	70 ° 37' 05.2320" E	6-Aug-2015
8	HBR-028	27 ° 06' 03.6720" N	70 ° 38' 10.7520" E	6-Aug-2015
9	HBR-029	27 ° 05' 55.3920" N	70 ° 38' 29.0760" E	6-Aug-2015
10	HBR-030	27 ° 05' 32.1360" N	70 ° 39' 26.6040" E	28-Aug-2015
11	HBR-031	27 ° 05' 19.7160" N	70 ° 39' 53.6400" E	28-Aug-2015
12	HBR-032	27 ° 04' 46.9200" N	70 ° 40' 10.0200" E	28-Aug-2015
13	HBR-033	27 ° 04' 54.3000" N	70 ° 39' 55.0080" E	28-Aug-2015
14	HBR-034	27 ° 05' 06.4320" N	70 ° 39' 30.1680" E	29-Mar-2015

SI No	WTG ID	Geo Co-ordinates		Commissioning Dates
		Latitude (North)	Longitude (East)	
15	HBR-035	27° 05' 18.3120" N	70° 38' 56.2560" E	29-Mar-2015
16	HBR-036	27° 05' 18.6720" N	70° 38' 32.4240" E	29-Mar-2015
17	HBR-037	27° 05' 29.1480" N	70° 38' 04.7400" E	28-Aug-2015
18	TJW-001	27° 05' 21.5160" N	70° 37' 02.8200" E	28-Aug-2015
19	TJW-002	27° 05' 05.1000" N	70° 37' 41.0520" E	6-Aug-2015
20	TJW-003	27° 04' 51.3840" N	70° 37' 55.9920" E	29-Mar-2015
21	TJW-004	27° 04' 42.2760" N	70° 38' 29.1840" E	29-Mar-2015
22	TJW-005	27° 04' 42.3120" N	70° 39' 05.6520" E	29-Mar-2015
23	TJW-006	27° 04' 26.2560" N	70° 39' 25.5600" E	29-Mar-2015
24	TJW-007	27° 04' 55.8480" N	70° 37' 02.4240" E	14-Aug-2015
25	TJW-010	27° 04' 24.8520" N	70° 38' 05.7840" E	29-Mar-2015
26	TJW-014	27° 03' 57.0240" N	70° 37' 56.5680" E	29-Mar-2015
27	TJW-015	27° 03' 59.2200" N	70° 38' 20.4720" E	29-Mar-2015
28	TJW-017	27° 04' 05.8800" N	70° 39' 02.8800" E	30-Jun-2015
29	TJW-018	27° 03' 42.6960" N	70° 39' 23.7960" E	30-Jun-2015
30	TJW-019	27° 03' 05.5800" N	70° 39' 26.9640" E	6-Aug-2015
31	TJW-020	27° 03' 17.5680" N	70° 39' 01.0800" E	6-Aug-2015
32	TJW-021	27° 03' 22.9320" N	70° 38' 37.8600" E	6-Aug-2015
33	TJW-022	27° 03' 30.1320" N	70° 38' 18.3120" E	29-Mar-2015
34	TJW-029	27° 02' 58.4520" N	70° 38' 43.6200" E	6-Aug-2015
35	TJW-030	27° 02' 47.6880" N	70° 38' 57.9840" E	6-Aug-2015
36	TJW-031	27° 02' 38.2920" N	70° 39' 24.5880" E	6-Aug-2015
37	TJW-033	27° 01' 46.0920" N	70° 39' 01.2240" E	14-Aug-2015
38	TJW-034	27° 02' 04.2720" N	70° 38' 46.7520" E	28-Aug-2015
39	TJW-035	27° 02' 13.5240" N	70° 38' 32.5680" E	30-Jun-2015
40	TJW-036	27° 02' 40.8120" N	70° 38' 23.8560" E	29-Mar-2015
41	TJW-037	27° 01' 59.6640" N	70° 37' 58.5120" E	30-Jun-2015
42	TJW-038	27° 01' 50.3400" N	70° 38' 08.9160" E	30-Jun-2015
43	TJW-039	27° 01' 37.0920" N	70° 38' 25.7280" E	30-Jun-2015
44	TJW-040	27° 01' 25.9320" N	70° 38' 38.1840" E	14-Aug-2015
45	TJW-041	27° 01' 14.5200" N	70° 38' 52.3320" E	14-Aug-2015
46	TJW-042	27° 00' 33.3720" N	70° 38' 29.6880" E	6-Aug-2015
47	TJW-043	27° 00' 50.4000" N	70° 38' 12.6240" E	6-Aug-2015
48	TJW-045	27° 01' 06.3120" N	70° 37' 37.0200" E	6-Aug-2015

Phase 2: Chandgadh Site with a total capacity of 92 MW (46 WTGs)

Sl. No	WTG ID	Geo Co-ordinates		Commissioning Date
		Latitude (North)	Longitude (East)	
1	R-1	23° 09' 17.8200" N	76° 16' 00.4800" E	31-Mar-2015
2	R-4	23° 08' 35.5560" N	76° 17' 36.8880" E	31-Mar-2015
3	R-16-N	23° 07' 53.2560" N	76° 19' 23.3040" E	30-Jun-2015
4	R-17-N	23° 08' 07.8720" N	76° 19' 02.2440" E	31-Mar-2015
5	R-24-N	23° 08' 37.2480" N	76° 18' 44.8200" E	30-Jun-2015
6	R-35-N	23° 10' 01.5240" N	76° 19' 07.5000" E	30-Oct-2015
7	R-40	23° 10' 44.4000" N	76° 20' 45.0960" E	30-Jun-2015
8	R-42	23° 10' 28.6680" N	76° 21' 11.4480" E	30-Jun-2015
9	R-47	23° 11' 30.9120" N	76° 21' 18.6480" E	30-Oct-2015
10	R-54-N	23° 12' 21.6720" N	76° 20' 14.7120" E	30-Jun-2015
11	R-60-N	23° 12' 43.1640" N	76° 20' 46.8960" E	30-Oct-2015
12	R-62	23° 13' 08.0760" N	76° 21' 15.7320" E	29-Dec-2015
13	R-69-N1	23° 13' 42.3120" N	76° 19' 45.6240" E	30-Jun-2015
14	R-70	23° 13' 49.9080" N	76° 19' 21.5760" E	31-Mar-2015
15	R-79	23° 14' 47.1480" N	76° 19' 14.7000" E	30-Oct-2015
16	R-84-N	23° 15' 56.8080" N	76° 17' 56.4000" E	30-Oct-2015
17	R-87	23° 14' 37.2120" N	76° 18' 41.6880" E	30-Oct-2015
18	R-89	23° 08' 24.4680" N	76° 19' 05.5200" E	31-Mar-2015
19	R-94-N2	23° 13' 04.4040" N	76° 20' 10.3560" E	30-Jun-2015
20	R-97	23° 12' 15.3720" N	76° 19' 44.6160" E	31-Mar-2015
21	R-101-N	23° 13' 54.8400" N	76° 18' 53.7120" E	30-Oct-2015
22	R-103-N	23° 10' 31.6200" N	76° 20' 39.7320" E	30-Jun-2015
23	R-104-N	23° 10' 20.1000" N	76° 20' 47.5440" E	30-Oct-2015
24	R-106	23° 14' 05.8920" N	76° 19' 21.3960" E	30-Oct-2015
25	R-108	23° 13' 27.4440" N	76° 17' 53.5560" E	30-Jun-2015
26	R-109	23° 08' 41.8200" N	76° 18' 07.7760" E	31-Mar-2015
27	R-111	23° 11' 59.4600" N	76° 19' 53.4000" E	31-Mar-2015
28	R-112	23° 09' 38.4840" N	76° 17' 17.3040" E	31-Mar-2015
29	R-113	23° 10' 11.7840" N	76° 14' 47.7600" E	31-Mar-2015
30	R-115	23° 10' 38.4240" N	76° 17' 39.9480" E	31-Mar-2015
31	R-121	23° 13' 24.1320" N	76° 19' 48.8640" E	31-Mar-2015
32	Gch-30	23° 15' 47.3040" N	76° 18' 34.7760" E	29-Dec-2015
33	Gch-160	23° 11' 38.5800" N	76° 16' 09.0120" E	29-Dec-2015

Sl. No	WTG ID	Geo Co-ordinates		Commissioning Date
		Latitude (North)	Longitude (East)	
34	Gch-156	23° 08' 16.6920" N	76° 17' 23.1000" E	29-Dec-2015
35	Gch-196	23° 09' 36.7920" N	76° 14' 31.2360" E	29-Dec-2015
36	Gch-185-N	23° 07' 08.5800" N	76° 16' 36.4800" E	29-Dec-2015
37	Gch191-N1	23° 10' 54.6240" N	76° 13' 45.0840" E	29-Dec-2015
38	Gch-147	23° 09' 55.5480" N	76° 14' 46.5720" E	29-Dec-2015
39	Gch-220-A1	23° 06' 46.4400" N	76° 17' 11.3280" E	29-Dec-2015
40	Gch-157	23° 11' 24.5760" N	76° 16' 26.2200" E	29-Dec-2015
41	Gch-224-N	23° 08' 52.6560" N	76° 15' 53.6040" E	29-Dec-2015
42	Gch-248	23° 09' 33.2640" N	76° 13' 20.4600" E	29-Dec-2015
43	Gch-250-N	23° 07' 06.0960" N	76° 17' 44.1240" E	29-Dec-2015
44	Gch-222-A3	23° 06' 24.8760" N	76° 17' 14.0640" E	29-Dec-2015
45	Gch-252	23° 10' 58.5840" N	76° 16' 53.1480" E	29-Dec-2015
46	R-85-N	23° 15' 47.0520" N	76° 18' 06.1560" E	30-Oct-2015

1.8 Title and Reference of Methodology

Following approved baseline & monitoring methodology is applied in this project activity:

Sectoral Scope: 1, Energy industries (renewable/ non-renewable sources)

Project Category: ACM0002, Version-17, "Grid-connected electricity generation from renewable sources" (<http://cdm.unfccc.int/methodologies/DB/8W400U6E7LFHHYH2C4JR1RJWWO4PVN>)

The tools referenced in this methodology are:

1. Tool to calculate the emission factor for an electricity system Version 05.0.0, Annex 9 of EB 87 Report (<http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-07-v5.0.pdf>)
2. Guidelines:
Methodological tool for Investment analysis, Version-06, Annex-12 of EB 85 Report (<https://cdm.unfccc.int/Reference/tools/index.html>)

Tool for the demonstration and assessment of additionality, Version-07, Annex-08 of EB 70 Report (<https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-01-v7.0.0.pdf>)

1.9 Participation under other GHG Programs

The project activity has not been registered or currently seeking registration under any other GHG programs.

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

- Emission Trading Programs and Other Binding Limits: The project has not participated in any Emissions Trading Programs other than VCS scheme. The related emission reductions have not and will not be claimed under any other GHG programs.
- Other Forms of Environmental Credit: The project has been exclusively taken up as VCS project and has not been applied for any other form of environmental credit.
- Participation under Other GHG Programs: The project has been exclusively taken up as VCS project and has not been applied for any other form of environmental credit

1.11 Sustainable Development Contributions

The National CDM Authority (NCDMA) which is the Designated National Authority (DNA) for the Government of India (GoI) in the Ministry of Environment and Forests (MoEF) has stipulated four indicators for sustainable development in the interim approval guidelines for Clean Development Mechanism (CDM) projects from India¹. The contribution of this project activity towards in terms of these four indicators is provided below:

1. Social Well Being:

- The project activity has led to the development of supporting infrastructure such as road network etc., in the wind park location, which also provides access to the local population.
- The project activity leads to alleviation of poverty by establishing direct and indirect benefits through employment generation and improved economic activities by strengthening of local grid of the state electricity utility.
- Use of a renewable source of energy reduces the dependence on imported fossil fuels and associated price variation thereby leading increased energy security.

2. Environmental Well Being:

- The project activity involves use of renewable energy source for electricity generation instead of fossil fuel based electricity generation which would have emitted gaseous, liquid and/or solid effluents/wastes.
- Being a renewable resource, using wind energy to generate electricity contributes to resource conservation. Thus the project causes no negative impact on the surrounding environment contributing to environmental well-being.

¹ http://cdmindia.nic.in/host_approval_criteria.htm

3. Economic Well Being:

- The project activity requires temporary and permanent, skilled and semi-skilled manpower at the wind park; thus, project activity has created additional employment opportunities.
- The generated electricity is being fed into the Western regional grid through local grid, thereby improving the grid frequency and availability of electricity to the local consumers (villagers & sub-urban habitants) which has provided new opportunities for industries and economic activities to be setup in the area thereby resulting in greater local employment, ultimately leading to overall development.

4. Technological Well Being:

Increased interest in wind energy projects will further push R&D efforts by technology providers to develop more efficient and better machinery in future.

Table 1: Sustainable Development Contributions

Row number	SDG Target	SDG Indicator	Net Impact on SDG Indicator	Current Project Contributions	Contributions Over Project Lifetime
Sequential row number	SDG Target number	Number and text of SDG indicator or, if no official SDG indicator is applicable, user-defined indicator	Indicate the project's contribution to the SDG Indicator (implemented activities to increase or decrease)	Brief description of the quantifiable impact of the project's activities related to the SDG indicator, during the monitoring period.	Brief description of the cumulative quantifiable impact of the project's activities related to the SDG indicator, over the project lifetime.
Not Applicable	Not Applicable	Not Applicable	Since PP did not monitor SDG activities during current or previous monitoring period, No SDG indicator and its impact has been reported.	Not Applicable	Not Applicable

2 SAFEGUARDS

2.1 No Net Harm

In line with Ministry of Environment Forest and Climate Change, Govt. of India, Environmental Impact Assessment (EIA) is not mandatory for wind energy project. However, as per CLP's internal governance system, EIA is mandatory for all projects. Thus, EIA has been conducted before project installation and found that this project does not have any negative environmental and socio-economic impacts. Thus, this is not applicable for this project activity.

2.2 Local Stakeholder Consultation

CLPWFPL had identified different stakeholders for its wind power project as per the different phases of Implementation. Separate stakeholder consultation was carried out for all the 2 phases. Following are the identified stakeholders,

- a) Representatives from O&M contractor;
- b) Employees of CLPWFPL;
- c) Contractor of CLPWFPL;
- d) Villagers from nearby villages

As the project is located at two project sites, thus, two separate stakeholders' meeting were organized to receive comprehensive feedback from the local peoples. Description of the same are mentioned below:

At Tejuva project, the meeting was carried out by CLPWFPL on 22/02/2012 at the Suzlon Infrastructure Services Limited office at 11.30 am in Jaisalmer District. All stakeholders were invited via newspaper advertisement was made on 10/02/2012, and also by public notice.

At Chandgarh project site, the meeting was carried out by CLPWFPL on 08/09/2016 at the Site office of CLP Wind Farms (India) Private Limited at 2:00 pm in Dewas, Madhya Pradesh district. All stakeholders were invited via personal invitation letters and public notices.

The local stakeholder meetings were carried out in each site of the project activity and the details of the same can be referred from the registered VCS PD. As a part of continuous feedback from stakeholders, along with the 3rd party O&M contractor, CLP has also appointed independent Asset Managers at every site. These assets managers are responsible for site supervision and continuous day-to-day interaction with the local stakeholders e.g. local villagers, local govt. authorities and others. Based on the local requirements, CLP has initiated several CSR/sustainable development activities in the project catchment area. Further, CLP has also 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, CLP has also placed a notice board on site to communicate any necessary information/updates to local stakeholders. CLP has found this two-

way communication with local stakeholders is very effective towards sustainability of the project in long run.

2.3 AFOLU-Specific Safeguards

This section is not applicable for this project activity

3 IMPLEMENTATION STATUS

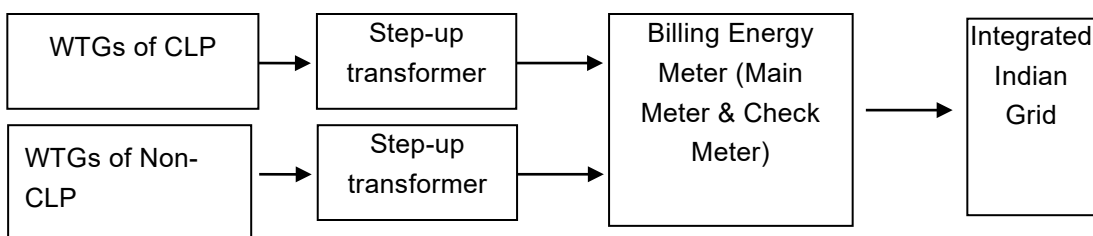
3.1 Implementation Status of the Project Activity

The first machine under the bundled project activity was commissioned on 29-03-2015 and last machine was commissioned on 29-12-2015. The combined capacity of the project is 192.8 MW wind power project which is using Suzlon make 2.1 MW S97 WTGs at Tejuva site and Gamesa make 2.0 MW G97 WTGs at Chandgadha site. The commissioning dates for all the machines installed in the project activity are given in section 1.7.

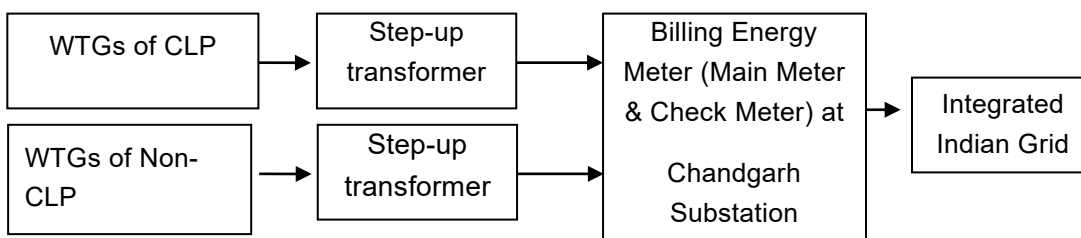
The Project activity is operated by respective O&M contractors at individual sites and managed by the CLP. The operational and maintenance contracts for the project activity are with Suzlon Infrastructure Services Limited and Gamesa Wind Turbines Pvt. Ltd, which are an ISO 9001 certified company. O&M contractors follow 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.

No major breakdown occurred during this monitoring period. The WTGs were operating normally. As per the requirement of O & M activities, WTGs were shut down for some time

Monitoring equipment line diagram in Tejuva Site is detailed as below: -



Monitoring equipment line diagram in Chandgarh Site is detailed as below: -



3.2 Deviations

3.2.1 Methodology Deviations

There are no deviations related to methodology.

3.2.2 Project Description Deviations

Below deviation considered in this monitoring period:

In this project, the meters installed at the project metering point are under the custody of state DISCOM. At Chandgarh site, Madhya Pradesh Power Transmission Company Limited has replaced both main and check meters of Feder-I and Feder-II of Chandgarh site with new meters on 05/03/2022 due to Time synchronization of ABT Meters through GPS for RE generators and open access consumers. There is no impacts in any applicability criteria of methodology, additionality or the appropriateness of the baseline scenario due to change in both these energy meters.

However, below deviation considered in previous verification:

In this project, the meters installed at the project metering point are under the custody of state DISCOM. At Chandgarh site, Madhya Pradesh Power Transmission Company Limited has replaced the billing meters on 18/06/2018 for feeder-2 and check meter on 08/12/2017 for feeder-1 to maintain the appropriateness in electricity monitoring in line with section 4.3 of registered PD.

Thus, same change in project proponent have been accounted as Project Description deviations in line with VCS standard version 4.2. However, this project deviation doesn't have an adverse impact in the applicability of the methodology, additionally or the appropriateness of the baseline scenario.

In this project, the meters installed at the project metering point are under the custody of state DISCOM. At Chandgarh site, Madhya Pradesh Power Transmission Company Limited has replaced the billing meter (check meter) on 15/12/2020.

3.3 Grouped Projects

The project is not a grouped project.

4 DATA AND PARAMETERS

4.1 Data and Parameters Available at Validation

Data / Parameter	EF _{grid,OM,y}
Data unit	tCO ₂ /MWh

Description	Operating margin CO ₂ emission factor of NEWNE Grid
Source of data	Central Electricity Authority: CO ₂ Emission Database CEA CO ₂ Baseline database Version 10 (http://cea.nic.in/reports/others/thermal/tpece/cdm_co2/user_guide_ver10.pdf)
Value applied	1.00
Justification of choice of data or description of measurement methods and procedures applied	Calculated as per “Tool to calculate the emission factor for an electricity system, version 05.0” as 3-year generation weighted average using data for the years 2011-2012, 2012-2013 and 2013-14. The data are obtained from “CO ₂ Baseline Database for Indian Power Sector” version 10.0, published by the Central Electricity Authority, Ministry of Power, Government of India.
Purpose of Data	Baseline Emission calculation
Comments	This database is an official publication of Government of India for the purpose of baseline emission calculation. 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 be remain fixed for the entire crediting period.

Data / Parameter	EF _{grid,BM,y}
Data unit	tCO ₂ /MWh
Description	Build margin CO ₂ emission factor of NEWNE grid
Source of data	Central Electricity Authority: CO ₂ Emission Database CEA CO ₂ Baseline database Version 10 (http://cea.nic.in/reports/others/thermal/tpece/cdm_co2/user_guide_ver10.pdf)
Value applied	0.95
Justification of choice of data or description of measurement methods and procedures applied	CEA has Calculated it as per ‘Tool to calculate the emission factor for an electricity system’, version 05.0 for the year 2013-14. The build margin is calculated in this database as the average emissions intensity of the 20% most recent capacity additions in the grid based on net generation and option of ex ante calculation.
Purpose of Data	Baseline Emission calculation
Comments	This database is an official publication of Government of India for the purpose of baseline emission calculation. 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 _{grid,CM,y}								
Data unit	tCO ₂ /MWh								
Description	Combined margin CO ₂ emission factor of NEWNE grid								
Source of data	Calculated from Central Electricity Authority: CO ₂ Emission Database CEA CO ₂ Baseline database Version 10 (http://cea.nic.in/reports/others/thermal/tpece/cdm_co2/user_guide_ver10.pdf)								
Value applied	0.99								
Justification of choice of data or description of measurement methods and procedures applied	Calculation based on 75% of OM and 25% of BM values approach as directed by 'Tool to calculate the emission factor for an electricity system', version 05.0.0. <table border="1"> <thead> <tr> <th colspan="2">Combined Margin Estimation for NEWNE Grid (tCO₂/MWh)</th></tr> </thead> <tbody> <tr> <td>Generation Weighted Average OM (EF_{grid, OM,y})</td><td>1.00</td></tr> <tr> <td>BM (EF_{grid, BM, y})</td><td>0.95</td></tr> <tr> <td>Combined Margin (EF_{grid,CM,y})</td><td>0.99</td></tr> </tbody> </table>	Combined Margin Estimation for NEWNE Grid (tCO ₂ /MWh)		Generation Weighted Average OM (EF _{grid, OM,y})	1.00	BM (EF _{grid, BM, y})	0.95	Combined Margin (EF _{grid,CM,y})	0.99
Combined Margin Estimation for NEWNE Grid (tCO ₂ /MWh)									
Generation Weighted Average OM (EF _{grid, OM,y})	1.00								
BM (EF _{grid, BM, y})	0.95								
Combined Margin (EF _{grid,CM,y})	0.99								
Purpose of Data	Baseline Emission calculation								
Comments	This database is an official publication of Government of India for the purpose of CDM baseline. It is based on the 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 _{BL,Tejuva,y}
Data unit	MWh
Description	Quantity of net electricity supplied to the grid by phase-1 (Tejuva) site to the grid in year y
Source of data	Credit subdivision of Energy issued by the O&M contractor
Description of measurement methods and procedures to be applied	As the project WTGs in phase-1 (Tejuva) in Rajasthan are connected to a common feeder (a common pool where project developers under this project activity and other project developers feed electricity), O&M contractor apportioned the electricity export and import data based on individual WTGs controller reading, summation of all controller reading of WTGs connected under the common feeder and joint meter reading (based on billing meter) and provide month wise "Credit subdivision of Energy" which contains electricity export, import and net export by the project

	WTGs under phase-1 (Tejuva site). These values are the main source to calculate the baseline emission by this project activity. As the controller reading of WTGs belongs to other project developers are confidential information, hence, O&M contractor is not disclosing the same. Thus, summation of controller readings (including other project developer connected to the same feeder) is not available to CLP. The detailed apportioning procedure followed by the O&M contractor has been provided below in section 3.3. On receipt of the “Credit subdivision of Energy” sheet, CLP raises the invoice for the electricity export to the grid and same have been cross checked with records of invoices.
Frequency of monitoring/recording	Continuous monitoring, hourly measurement and monthly recording
Value monitored	314,541.10 MWh
Monitoring equipment	Energy meters Type: electronic tri-vector meters Accuracy class: 0.2s Serial Number: RJB85058 (Main Meter), RJB85059 (Check Meter)
QA/QC procedures to be applied	• The energy meter reading are taken on monthly basis • Energy meters will be calibrated once in a five year in line with guidance stipulated by Central Regulatory Authority, Govt. of India and faulty meters will be duly replaced immediately. • All the energy meters are under the control of state utility and calibration/testing of energy meters is also under the jurisdiction of state utility. • The Net electricity exported to the grid has been cross checked against the invoice raised by CLP towards the DISCOM
Purpose of the data	Calculation of Baseline emissions
Calculation method	O&M contractor apportioned the electricity export and import data based on individual WTGs controller reading, summation of all controller reading of WTGs connected under the common feeder and joint meter reading (based on billing meter) and provide month wise “Credit subdivision of Energy “which contains electricity export, import and net export by the project WTGs under phase-1 (Tejuva site). Detailed calculation procedure is mentioned in section 3.3.
Comments	The data will be archived both in electronic and paper format for crediting period + 2 years.

Data / Parameter	EG BL,Chadgadhy
Data unit	MWh
Description	Quantity of net electricity supplied to the grid by phase-2 (Chandgarh) site to the grid in year y
Source of data	Credit report issued by the O&M contractor
Description of measurement methods and procedures to be applied	As the project WTGs in phase-2 (Chandgarh) in Madhya Pradesh are connected to common feeder (common pool where project developers under this project activity and other project developers feed electricity), O&M contractor apportioned the electricity export and import data based on individual WTGs controller reading, summation of all controller reading of WTGs connected under the common feeder and joint meter reading (based on billing meter) and provide month wise “Credit report “which contains electricity export, import and net export by the project WTGs under phase-2 (Chandgarh site). These values are the main source to calculate the baseline emission by this project activity. As the controller reading of WTGs belongs to other project developers are confidential information, hence, O&M contractor is not disclosing the same. Thus, summation of controller readings (including other project developer connected to the same feeder) is not available to the CLP. The detailed apportioning procedure followed by the O&M contractor has been provided below in section 3.3. On receipt of the “Credit report”, CLP raises the invoice for the electricity export to the grid and same have been cross checked with records of invoices.
Frequency of monitoring/recording	Continuous monitoring, hourly measurement and monthly recording
Value monitored	189,179.82 MWh
Monitoring equipment	Energy meters Type: electronic tri-vector meters Accuracy class: 0.2s Serial Number: For Feeder-I: Q0555708 (New Main Meter), Q0555709 (New Check Meter) For Feeder-II: Q0555710 (New Main Meter), Q0555711 (New Check Meter)
QA/QC procedures to be applied	• The energy meter reading are taken on monthly basis • Energy meters will be calibrated once in a five year in line with guidance stipulated by Central Regulatory Authority, Govt. of India and faulty meters will be duly replaced immediately. • All the energy meters are under the control of state utility and calibration/testing of energy meters is also under the

	jurisdiction of state utility. The Net electricity exported to the grid has been cross checked against the invoice raised by the PP towards the DISCOM
Purpose of the data	Calculation of Baseline emissions
Calculation method	O&M contractor apportioned the electricity export and import data based on individual WTGs controller reading, summation of all controller reading of WTGs connected under the common feeder and joint meter reading (based on billing meter) and provide month wise "Credit report "which contains electricity export, import and net export by the project WTGs under phase-2 (Chandgarh site). Detailed calculation procedure is mentioned in section 3.3
Comments	The data will be archived both in electronic and paper format for crediting period + 2 years.

4.3 Monitoring Plan

Suzlon Infrastructure Services Limited and Gamesa Wind Turbines Pvt. Ltd are the O&M contactors for Tejuva and Chandgarh site respectively. Respective O&M contractors are responsible for the maintaining all the monitoring data on behalf of state utility in respect of the project activity. O&M contractors have 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 O&M contractor for the project activity and managed by the CLP. The operational and maintenance contracts for the project activity are with Suzlon Infrastructure Services Limited and Gamesa Wind Turbines Pvt. Ltd, which are an ISO 9001 certified company. O&M contractors follow 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.

Monitoring Procedure:

WTGs installed under this project activity are connected to common feeders at respective sites. A particular feeder comprises of WTGs belonging to owners other than CLP but belonging to the same O&M service provider. At the respective DISCOM's sub-station, the total export & import to

this feeder is monitored using the main meter & the backup meter, which are electronic tri-vector meters. The total export at this meter is generally arrived at by multiplying the monthly meter reading to the multiplying factor of the meter concerned. The monthly meter reading is arrived at as the difference between the current meter reading and the previous meter reading. The period between these two readings is usually a period of 30 days. In a similar fashion, total import at this meter is also calculated. In Tejeva, Rajasthan, all the WTGs are connected to a single feeder where as in Chandgarh, WTGs are connected to two feeders. Details of the feeders are mentioned in Appendix-1. Additionally, O&M contractors are monitoring electricity generation by each WTG at the WTG controller by their Central Monitoring System. With the help of WTG controller readings and JMR reading, respective O&M contractor calculates the electricity export by each WTG (by apportioning procedure) and generate the “Credit report” (in Chandgarh, Madhya Pradesh) or “Credit Sub-division of energy” (in Tejuva, Rajasthan). Based on the same, all the project investors raise the invoice for the electricity export to the grid. The allocation of electricity or apportion procedure is executed as per the following procedure:

Calculation of the net export² of electricity from project activity:

Time duration for calculation = 30 days

X = Electricity generation at controller of the WTG for 30 days in MWh

Y = Electricity generation by all WTG attached to the common feeder in MWh

R = % allocation for each of the WTG on the common feeder = $X \times 100\% / Y$

E = Electricity supplied by the common feeder to the grid monitored at main meter in MWh

I = Electricity imported by the common feeder from the grid monitored at main meter in MWh

Thus,

Apportioned electricity exported by the each WTG = $R\% \times E$ in MWh

Apportioned electricity imported by the each WTG = $R\% \times I$ in MWh

Net electricity generation = $EG_{BLy} = (R\% \times E) - (R\% \times I)$ in MWh

Baseline emission = $EG_{BL,y} \times EF_{CM,y}$ tCO₂

Based on the above procedure, O&M contractor apportioned the electricity export and import and CLP received the “Credit Report” (consists of electricity exported and imported by CLP). This documents are the main source of information for the emission reduction calculation.

² Same calculation procedure is adopted in both the sites

As the controller reading of WTGs belongs to other project developers are confidential information, hence, O&M contractor is not disclosing the same. Thus, controller readings of other project developer connected to the same feeder are not available to CLP.

Upon receipt of these reports, CLP generates invoices on sale of electricity and sends to respective DISCOMs. Thereafter respective DISCOM makes payments against the invoices.

QA/QC Procedure

All the meters are calibrated/ tested once in five years. The calibration is done by the officials of the state utility. The accuracy of monitoring parameter is ensured by adhering to the calibration and testing of the metering equipment once in five years. QA/QC procedures have been as implemented by Discom/ State utility pursuant to the provisions of the power purchase agreement. Suzlon Infrastructure Services Limited and Gamesa Wind Turbines Pvt. Ltd provides the daily generation report to the Project participant. In case the main meter(s) is found to operate outside the permissible limits, the main meter will be either replaced or calibrated immediately. Whenever a main meter goes defective, the consumption recorded by the Check meter will be referred. The project participant, is monitoring the data for electricity generation and calibration reports post project implementation. Suzlon Infrastructure Services Limited and Gamesa Wind Turbines Pvt. Ltd is O&M contractor who has responsibility of maintaining electricity generation records, calibration records and maintenance of the WTGs (Wind Turbine Generators). The project participant also maintains the records of daily generation report and joint meter report.

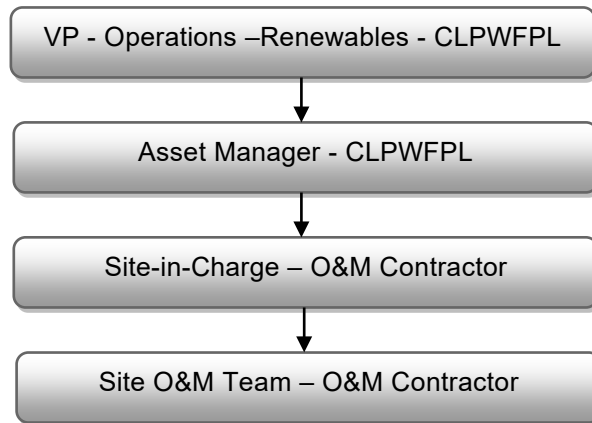
Training and maintenance requirements:

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 turbine, it is extremely essential, that the engineers and technicians understand the machines and keep them in good health. In order to ensure, that O&M contractor'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 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

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

The Project activity is operated by O&M contractor for the project activity and managed by the CLP. O&M contractor 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 CLP. The roles and responsibilities for the project are described as below;



Data Recording

The state utility and representative of CLP shall jointly read the metering system every month at the delivery point.

Meter readings taken jointly has been 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.

Calibration Frequency

The main and backup meters shall be calibrated once in a five year in line with notification issued by Central Electricity Authority, Govt of India dated the 17th March, 2006. The meters installed at both the sites were tested by any accredited laboratory in the presence of the parties (State Electricity Board, Project investor and the O&M Contractor) involved. Both parties shall seal main and backup meters. Defective meters shall be replaced immediately. As per the schedule, calibration of all energy meter, instruments and equipment will be carried out once in five year and recorded in calibration reports.

Description of calibration of WTG Controller

The controller used for the WTGs which is an LCS Controller is a micro-processor based intelligent controller which has been specially designed for control of wind turbines. In case there is any mismatch in the energy values recorded by the controller panel meter and the energy values calculated by the inverting system; the WTG machine will stop working and generate the error report automatically. Then the O&M team at the project site will replace the controller panel meter immediately. Hence calibration of the controller panel meter is not required.

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

As per the equation 6 of the methodology ACM 0002 (Version 17.0),

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

Where:

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

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

$EF_{grid, CM, y}$: Combined margin CO₂ emission factor for grid connected power generation in year y calculated using the latest version of the “Tool to calculate the emission factor for an electricity system” (tCO₂e/MWh)

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

Baseline emissions (BE_y) are calculated as follows:

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

Baseline emissions for Project:

Vintage Period	Net Electricity Export (MWh)	Emission Factor (tCO ₂ /MWh)	Baseline Emissions (tCO ₂)
2021 (01/06/2021 to 31/12/2021)	226,817.89	0.99	224,549
2022 (01/01/2022 to 30/09/2022)	276,903.03	0.99	274,134
	503,720.92		498,683

5.2 Project Emissions

The project activity is a renewable energy project which generates electricity using wind power and hence does not result in project emissions as per the applicable methodology ACM0002, version 17.

$$PE_y = 0$$

5.3 Leakage

As per ACM0002 Version 17.0.0, no leakage has been considered for the calculation of emission factor.

5.4 Net GHG Emission Reductions and Removals

According to the approved methodology ACM0002 (Version 17) Emission Reductions are calculated as

$$ER_y = BE_y - PE_y$$

Where:

ER_y Emission reductions in year y (tCO₂e/yr)

BE_y Baseline Emissions in year y (tCO₂e/yr)

PE_y Project Emissions in year y (tCO₂e/yr)

Thus,

$$\begin{aligned} ER_y &= 498,683 - 0 \text{ tCO}_2\text{e} \\ &= 4,98,683 \text{ tCO}_2\text{e} \end{aligned}$$

Year	Baseline emissions or removals (tCO ₂ e)	Project emissions or removals (tCO ₂ e)	Leakage emissions (tCO ₂ e)	Net GHG emission reductions or removals (tCO ₂ e)
2021 (01-06-2021 to 31-12-2021)	224,549	0.00	0.00	224,549
2022 (01-01-2022 to 30-09-2022)	274,134	0.00	0.00	274,134
Total	498,683	0.00	0.00	498,683

The actual emission reductions for the current monitoring period are 2.61% higher than estimated emission reductions which are mainly due to inclusion of two high wind season during current monitoring period and higher availability of PLF at site. Availability of wind is a natural phenomenon which is beyond the control of CLP.

<u>Ex-ante emissions reductions /removals</u>	<u>Achieved emissions reductions /removals</u>	<u>Percent difference</u>	<u>Justification for the difference</u>
485,991	498,683	2.61%	Inclusion of two high wind season during current monitoring period and higher availability of PLF at site. Availability of wind is a natural phenomenon which is beyond the control of project proponent.

APPENDIX 1: METER CALIBRATION DETAILS

A) Tejuva Location:

Sl. No.	Meter Identification No	Meter Make	Accuracy Class	Calibration Date	Calibration Validity Date
1	RJB85058 (Main Meter)	Secure Meter	0.2s	24/04/2018	23/04/2023
2	RJB85059 (Check Meter)	Secure Meter	0.2s	24/04/2018	23/04/2023

B) Chandgarh Location:

Both main and check meters of Feder-I and Feder-II of Chandgarh site were replaced with new meters on 05/03/2022 due to Time synchronization of ABT Meters through GPS for RE generators and open access consumers. The letter from state utility has been submitted to DOE for verification.

Sl. No.	Feeder No	Meter Identification No	Meter Make	Accuracy Class	Calibration Date	Calibration Validity Date
1	Feeder-I	XB587800 (Old Main Meter)	Secure Meter	0.2s	19/06/2018	18/06/2023
		Q0555708 (New Main Meter)	Secure Meter	0.2s	05/03/2022	04/03/2027
		XD528043 (Old Check Meter)	Secure Meter	0.2s	19/06/2018	18/06/2023
		Q0555709 (New Check Meter)	Secure Meter	0.2s	05/03/2022	04/03/2027
2	Feeder-II	XE565677 (Old Main Meter)	Secure Meter	0.2s	15/12/2020	14/12/2025
		Q0555710 (New Main Meter)	Secure Meter	0.2s	05/03/2022	04/03/2027
		XB587799 (Old Check Meter)	Secure Meter	0.2s	15/12/2020	14/12/2025
		Q0555711 (New Check Meter)	Secure Meter	0.2s	05/03/2022	04/03/2027

Calibration frequency of the meter is once in five years. There was not any significant period of shut-down or break-down period during this monitoring period.