



BUNDLED WIND POWER PROJECT BY SEMBCORP GREEN INFRA LIMITED IN INDIA



Document Prepared by Infinite Solutions

Project Title	Bundled Wind Power Project by Sembcorp Green Infra Limited in India
Version	05
Report ID	VVER 104
Date of Issue	09-November-2022
Project ID	1856
Monitoring Period	01-August-2021 to 31-July-2022 (Including both the dates)
Prepared By	Infinite Solutions
Contact	214-215 Milinda Manor, Opp. Next Treasure Island, 2 RNT Marg, Indore – 452001. India Landline No.: 0731-4050174 Email: jimmy@infisolutions.org Website: www.infisolutions.org

CONTENTS

1	PROJECT DETAILS.....	4
1.1	Summary Description of the Implementation Status of the Project	4
1.2	Sectoral Scope and Project Type	4
1.3	Project Proponent	5
1.4	Other Entities Involved in the Project	5
1.5	Project Start Date	6
1.6	Project Crediting Period	6
1.7	Project Location	6
1.8	Title and Reference of Methodology	9
1.9	Participation under other GHG Programs.....	9
1.10	Other Forms of Credit.....	9
1.11	Sustainable Development Contributions	9
2	SAFEGUARDS	13
2.1	No Net Harm	13
2.2	Local Stakeholder Consultation	13
2.3	AFOLU-Specific Safeguards	14
3	IMPLEMENTATION STATUS	14
3.1	Implementation Status of the Project Activity	14
3.2	Deviations.....	15
3.3	Grouped Projects	16
4	DATA AND PARAMETERS.....	16
4.1	Data and Parameters Available at Validation	16
4.2	Data and Parameters Monitored.....	17
4.3	Monitoring Plan.....	19
5	QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS	27
5.1	Baseline Emissions	27
5.2	Project Emissions	27
5.3	Leakage.....	27
5.4	Net GHG Emission Reductions and Removals	27
	APPENDIX 1: CALIBRATION DETAILS	29

APPENDIX 2: EMPLOYEE DETAILS..... 30

1 PROJECT DETAILS

1.1 Summary Description of the Implementation Status of the Project

The purpose of the project activity is to generate clean electricity by harnessing the renewable wind energy. The project activity involves the installation of 56 Wind Turbine Generators (WTGs) for generating the electricity having aggregated capacity of 95.5 MW. This is a greenfield bundled project activity consists of 3 individual projects promoted by:

Project	Project Promoter	State	COD ¹	Cap of each WTG	No of WTGs	MW	Total MW
Project 1	Green Infra Wind Energy Limited	Gujarat	02-March-2017	2 MW	4	8	22
			22-March-2017	2 MW	2	4	
			24-March-2017	2 MW	2	4	
			25-March-2017	2 MW	1	2	
			29-March-2017	2 MW	1	2	
			28-June-2017	2 MW	1	2	
Project 2	Green Infra Wind Energy Limited	Gujarat	31-March-2017	2 MW	7	14	24
			30-May-2017	2 MW	3	6	
			30-June-2017	2 MW	2	4	
Project 3	Green Infra Wind Solutions Limited	Andhra Pradesh	30-March-2017	1.5 MW	33	49.5	49.5
				Total	56		95.5 MW

.The project activity leads to an estimated emission reduction of 1,910,060 tCO₂ for the chosen crediting period of 10 years. The total GHG emission reductions or removals generated in this monitoring period (01-August- 2021 to 31-July-2022) is 188,886 tCO₂e.

1.2 Sectoral Scope and Project Type

The project activity falls under the following Sectoral scope and Project Type:

¹ As per Commissioning Certificates.

Sectoral Scope : 01 - Energy industries (renewable-/non-renewable sources)

Methodology applied is ACM 0002 of version 19.0²

Project is neither an AFOLU project nor a grouped project. it consists of 3 independent wind power projects by 2 project promoters with combined capacity of 95.5 MW. The project promoters are as follows-

Project	Promoter	Capacity (MW)	Location
Project 1	Green Infra Wind Energy Limited	22	Amreli/Rajkot, Gujarat
Project 2	Green Infra Wind Energy Limited	24	Surendra Nagar, Gujarat
Project 3	Green Infra Wind Solutions Limited	49.5	Kurnool, Andhra Pradesh

1.3 Project Proponent

Organization name	Green Infra Wind Energy Limited
Contact person	Mr. GL Aditya
Title	Assistant Manager
Address	5th floor, Tower C, Building No. 8, DLF Cybercity, Gurgaon – 122002 Haryana, India
Telephone	+ 91 9739346313
Email	aditya.l@sembcorp.com

1.4 Other Entities Involved in the Project

Organization name	Infinite Solutions
Role in the Project	Project Consultant

²

https://cdm.unfccc.int/filestorage/5/8/1/58IAGB7SZUDEO2VN6LYM30K41HFPRQ/EB100_repan06_ACM0002.pdf?t=bG18cmhpczZzfDBnMQO1VOKflxAkG9KYOkAB

Contact person	Mr. Jimmy Sah
Title	Head – Sustainability
Address	214-215 Milinda Manor, Opp. Next Treasure Island, 2 RNT Marchg, Indore 452001
Telephone	+91-9644130430
Email	jimmy@infisolutions.org

1.5 Project Start Date

The project start date for this project is 02-March-2017.

This is the day on which the first WTG was commissioned.

1.6 Project Crediting Period

The project chooses a renewable crediting period of 10 years. After 10 years, the crediting period will be renewed twice.

Crediting period start date : 02 March-2017

Crediting period end date : 01-March-2027

1.7 Project Location

The project activity is located in two states of India. The table provides details of location of each project:

Project	Promoter	Capacity (MW)	Location
Project 1	Green Infra Wind Energy Limited	22	Amreli/Rajkot, Gujarat
Project 2	Green Infra Wind Energy Limited	24	Surendra Nagar, Gujarat
Project 3	Green Infra Wind Solutions Limited	49.5	Kurnool, Andhra Pradesh

Project 1: The below table provides details of location of individual WTGs (Latitude and Longitude in Degree Minutes Seconds format) of the project

S. No	WTG No	Village	Taluka	District	Latitude ³	Longitude
-------	--------	---------	--------	----------	-----------------------	-----------

³ Registered VCS PD MR <https://registry.terra.org/app/projectDetail/VCS/1856>

1	RJ9-T-094	Kalasar	Jasdan	Rajkot	N21° 56'	E71° 16' 0.516"
2	RJ9-T-099	Lilapur	Jasdan	Rajkot	N21° 50' 39.84"	E71° 26'
3	RJ9-T-076	Godladhar	Jasdan	Rajkot	N22° 3' 8.928"	E71° 19'
4	RJ9-T-096	Kalasar	Jasdan	Rajkot	N 21° 50'	E71° 25'
5	RJ9-T-078	Godladhar	Jasdan	Rajkot	N22° 6' 47.772"	E71° 19' 7.464"
6	RJ9-T-095	Kalasar	Jasdan	Rajkot	N21° 53' 26.7"	E71° 11'
7	RJ9-T-039	Hirana	Lathi	Amreli	N22° 6' 58.212"	E71° 19' 7.32"
8	RJ9-T-013	Miya Khijadiya	Babra	Amreli	N22° 6' 33.696"	E71° 19' 1.524"
9	RJ8-T-073	Sukavada	Babra	Amreli	N22° 6' 6.408"	E71° 17' 8.916"
10	RJ9-T-040	Hirana	Lathi	Amreli	N22° 3' 17.82"	E71° 20'
11	RJ-9T-075	Ambaradi	Jasdan	Rajkot	N22° 1' 50.232"	E71° 22' 26.04"

Project 2: The below table provides details of location of individual WTGs (Latitude and Longitude in Degree Minutes Seconds format) of the project

S. No	WTG No	Village	Taluka	District	Latitude ⁴	Longitude
1	SDL-T-30	Jepur (Ranipat)	Muli	Surendranager	N22° 42' 57.348"	E71° 13' 19.668"
2	SDL-T-33	Jepur (Ranipat)	Muli	Surendranager	N22° 43' 48.468"	E71° 13' 38.604"
3	SDL-T-38	Jepur (Ranipat)	Muli	Surendranager	N22° 43' 52.788"	E71° 12' 33.624"
4	SDL-T-168	Vadadhara	Muli	Surendranager	N22° 45' 16.74"	E71° 18' 1.332"
5	SDL-T-169	Vadadhara	Muli	Surendranager	N22° 45' 25.092"	E71° 17' 39.552"
6	SDL-T-170	Vadadhara	Muli	Surendranager	N22° 45' 43.38"	E71° 17' 32.496"
7	SDL-T-171	Vadadhara	Muli	Surendranager	N22° 45' 53.352"	E71° 16' 59.304"
8	SDL-T-172	Vadadhara	Muli	Surendranager	N22° 45' 4.824"	E71° 17' 23.244"
9	SDL-T-98	Asundrali	Muli	Surendranager	N22° 40' 27.372"	E71° 17' 32.028"
10	SDL-T-99	Asundrali	Muli	Surendranager	N22° 40' 19.488"	E71° 17' 40.992"
11	SDL-T-95	Palasa	Muli	Surendranager	N22° 37' 53.868"	E71° 19' 55.02"
12	SDL-T-96	Palasa	Muli	Surendranager	N22° 38' 7.836"	E71° 19' 41.232"

⁴ Registered VCS PD MR <https://registry.terra.org/app/projectDetail/VCS/1856>

Project 3: The below table provides details of location of individual WTGs (Latitude and Longitude in Degree Minutes Seconds format) of the project

S. No	WTG No	Village	Taluka	District	Latitude ⁵	Longitude
1	GISKK-01	Gundlakonda	Pattikonda	Kurnool	N15 ° 30'56.484"	E77 ° 37' 1.02"
2	GISKK-02	Gundlakonda	Pattikonda	Kurnool	N15 ° 31' 4.908"	E77 ° 37' 2.28"
3	GISKK-03	Gundlakonda	Pattikonda	Kurnool	N15 ° 31' 15.456"	E77 ° 36' 47.952"
4	GISKK-04	Gundlakonda	Pattikonda	Kurnool	N15 ° 31' 39.396"	E77 ° 35' 41.784"
5	GISKK-05	Kunkanuru	Pattikonda	Kurnool	N15 ° 31' 42.996"	E77 ° 36' 18.828"
6	GISKK-06	Kunkanuru	Pattikonda	Kurnool	N15 ° 32' 57.768"	E77 ° 36' 7.668"
7	GISKK-07	Jilledubudakala	Pattikonda	Kurnool	N15 ° 31' 45.732"	E77 ° 37' 38.964"
8	GISKK-08	Gundlakonda	Pattikonda	Kurnool	N15 ° 31' 51.492"	E77 ° 36' 18.072"
9	GISKK-09	Devanakonda	Pattikonda	Kurnool	N15 ° 31' 51.564"	E77 ° 35' 40.56"
10	GISKK-10	Jilledubudakala	Pattikonda	Kurnool	N15 ° 32' 8.412"	E77 ° 38' 59.244"
11	GISKK-11	Jilledubudakala	Pattikonda	Kurnool	N15 ° 32' 41.676"	E77 ° 37' 44.184"
12	GISKK-12	Kunkanuru	Pattikonda	Kurnool	N15 ° 31' 59.844"	E77 ° 36' 16.38"
13	GISKK-13	Kunkanuru	Pattikonda	Kurnool	N15 ° 32' 9.528"	E77 ° 36' 10.476"
14	GISKK-14	Jilledubudakala	Pattikonda	Kurnool	N15 ° 32' 23.172"	E77 ° 38' 53.52"
15	GISKK-15	Jilledubudakala	Pattikonda	Kurnool	N15 ° 32' 51.144"	E77 ° 37' 43.608"
16	GISKK-16	Jilledubudakala	Pattikonda	Kurnool	N15 ° 31' 55.128"	E77 ° 37' 37.848"
17	GISKK-17	Kunkanuru	Pattikonda	Kurnool	N15 ° 32' 19.536"	E77 ° 36' 7.272"
18	GISKK-18	Jilledubudakala	Pattikonda	Kurnool	N15 ° 32' 33.756"	E77 ° 38' 53.448"
19	GISKK-19	Jilledubudakala	Pattikonda	Kurnool	N15 ° 32' 6.936"	E77 ° 37' 32.592"
20	GISKK-20	Kunkanuru	Pattikonda	Kurnool	N15 ° 32' 28.284"	E77 ° 36' 5.364"
21	GISKK-21	Jilledubudakala	Pattikonda	Kurnool	N15 ° 32' 32.856"	E77 ° 37' 21.36"
22	GISKK-	Kunkanuru	Pattikonda	Kurnool	N15 ° 32' 35.052"	E77 ° 35' 59.964"
23	GISKK-23	Kunkanuru	Pattikonda	Kurnool	N15 ° 37' 35.364"	E77 ° 35' 53.052"
24	GISKK-24	Jilledubudakala	Pattikonda	Kurnool	N15 ° 32' 24.324"	E77 ° 37' 21.468"
25	GISKK-25	Jilledubudakala	Pattikonda	Kurnool	N15 ° 33' 21.996"	E77 ° 39' 3.636"
26	GISKK-26	Jilledubudakala	Pattikonda	Kurnool	N15 ° 32' 24.36"	E77 ° 37' 56.28"
27	GISKK-27	Jilledubudakala	Pattikonda	Kurnool	N15 ° 32' 58.344"	E77 ° 37' 42.816"
28	GISKK-28	Jilledubudakala	Pattikonda	Kurnool	N15 ° 32' 56.112"	E77 ° 38' 20.58"
29	GISKK-29	Kappatralla	Pattikonda	Kurnool	N15 ° 34' 26.688"	E77 ° 37' 43.032"
30	GISKK-30	Kappatralla	Pattikonda	Kurnool	N15 ° 34' 38.244"	E77 ° 37' 37.848"
31	GISKK-31	Jilledubudakala	Pattikonda	Kurnool	N15 ° 33' 37.404"	E77 ° 38' 48.012"
32	GISKK-32	Jilledubudakala	Pattikonda	Kurnool	N15 ° 34' 8.292"	E77 ° 37' 56.064"
33	GISKK-33	Kappatralla	Pattikonda	Kurnool	N15 ° 34' 19.092"	E77 ° 37' 53.688"

⁵ Registered VCS PD MR <https://registry.terra.org/app/projectDetail/VCS/1856>

1.8 Title and Reference of Methodology

Type: ACM0002,

Title: “Grid-connected electricity generation from renewable sources”

Sectoral Scope: 01

Version: 19

EB: 100

Reference: <http://cdm.unfccc.int/methodologies/DB/VJI9AX539D9MLOPXN2AY9UR1N4IYGD>

In line with the applied methodology, following tools and guidelines are referred:

- Tool to calculate the emission factor for an electricity system, Version 7, EB 100 annex 6
- Tool for the demonstration and assessment of additionality - Version 7, EB 70 Annex 8⁶

1.9 Participation under other GHG Programs

PP has submitted the undertaking confirming that project has not participated in any other binding and/or non-binding GHG program and any national REC scheme to the DOE. Hence, there is no double accounting of emission reduction has happened.

Participation under Other GHG Programs:

The project activity has never participated in any other GHG programs.

1.10 Other Forms of Credit

Emission Trading Programs and Other Binding Limits:

The project proponent is not part of any other emission trading program. PP also does not have any binding GHG emission limits. The net GHG emission reductions from the project will not be used for compliance with emission trading programs or to meet binding limits on GHG emissions. A letter of this effect from the project proponent shall be submitted to the VVB.

The project activity has not participated under any other GHG programs. A letter of this effect from the project proponent shall be submitted to the validator during verification.

1.11 Sustainable Development Contributions

Ministry of Environment, Forests & Climate Change, Government of India has stipulated following indicators for sustainable development in the interim approval guidelines for GHG projects.

1.Social well-being

⁶ <http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-01-v7.0.0.pdf>

2.Economic well-being

3.Environmental well-being

4.Technological well-being

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 199,355 MWh, renewable electricity has supplied to Indian grid during the reported period that helps to increase the renewable energy share in the energy mix.	Project has generated about 199,355 ⁷ MWh renewable electricity has supplied to Indian grid that helps to increase the renewable energy share in the energy mix The electricity generated as follows-		
					S.No	Monitoring Period	Contribution
					1	01-August-2021 to 31-July-2022	199,355 MWh
					Total		199,355M Wh

⁷ <https://registry.verra.org/app/projectDetail/VCS/1856>

2)	8.6	8.6.1 Proportion of youth (aged 15-24) not in education, employment or training	Implemented activities to increase	3 peoples are employed during the current monitoring period and 91 training was provided during the current monitoring period.	The 38 peoples are employed since the project has commissioned <table><tr><td>S.No</td><td>Monitoring Period</td><td>Contribution</td></tr><tr><td>1</td><td>01-August-2021 to 31-July-2022</td><td>3 jobs and 91 Trainings</td></tr></table>	S.No	Monitoring Period	Contribution	1	01-August-2021 to 31-July-2022	3 jobs and 91 Trainings			
S.No	Monitoring Period	Contribution												
1	01-August-2021 to 31-July-2022	3 jobs and 91 Trainings												
3)	13.0	Tonnes of greenhouse gas emissions avoided or removed	Implemented activities to increase	By supplying 199,355 MWh clean electricity to Indian grid, the project avoided release of 188,886 tCO ₂ in to the atmosphere during the reporting period.	Prevented the release of 188,886tCO ₂ ⁸ in the atmosphere. <table><tr><td>S.No</td><td>Monitoring Period</td><td>Contribution</td></tr><tr><td>1</td><td>01-August-2021 to 31-July-2022</td><td>188,886 tCO₂</td></tr><tr><td colspan="2">Total</td><td>188,886tCO₂</td></tr></table>	S.No	Monitoring Period	Contribution	1	01-August-2021 to 31-July-2022	188,886 tCO ₂	Total		188,886tCO ₂
S.No	Monitoring Period	Contribution												
1	01-August-2021 to 31-July-2022	188,886 tCO ₂												
Total		188,886tCO ₂												

⁸ <https://registry.verra.org/app/projectDetail/VCS/1856>

2 SAFEGUARDS

2.1 No Net Harm

There is no net harm from the project activity as the wind project does not have any negative environmental and socio-economic impacts.

Further, as per the prevailing Ministry of Environment and Forest laws, the Schedule 1 of MoEF&CC (Government of India) notification dated 14-September-2006, 38 activities are required to undertake environmental impact assessment studies. Environmental Impact Assessment study is not required for windmill project as there is no negative environmental impact due to the project activity and wind energy is one of the cleanest sources of energy.

2.2 Local Stakeholder Consultation

Local stakeholder consultation has already done during registration of project activity. The stakeholder consultation meeting was conducted during the social survey as a part of the ESIA study. The consultations were done by identifying the right stakeholders, including, local farmers, villagers, school teachers, government officials, panchayat officials, local NGOs.

The purpose of the consultation was to account for the views of the people impacted either directly or indirectly due to the project activity. The objective of the SHC meetings was to inform the stakeholders on the environmental and social impact of the project activity and to discuss their concerns regarding it. Notices were put up in the local panchayats at least a week in advance of the consultations.

Also, as a part of continual improvement process, feedback from the associated stakeholders is vital, therefore a dedicated Visitor register cum grievance register has been placed at the project site which is accessible to stakeholders to provide their feedback on the project. It is appropriate publicly accessible location at which local stakeholders can provide their feedback on the project. This location is also conducive to continuous and regular checks for stakeholder comments. During the current monitoring period, positive feedbacks had been received regarding site operation. No any grievances received during the current monitoring period; therefore, no any mitigation measures were required. During previous monitoring periods also continuous on-going communication with the local stakeholders was done by maintaining on-site grievance register. There were no negative feedback received during previous monitoring periods, However, grievance register goes nil during this monitoring period.

2.3 AFOLU-Specific Safeguards

This is not applicable to the project activity as for non-AFOLU projects, this section is not required..

3 IMPLEMENTATION STATUS

3.1 Implementation Status of the Project Activity

The project activity has been successfully commissioned by project promoters and was registered by VCS Board subsequently (Project ID: Ref No 1856).

The project is a bundled Wind Power project, consists of 3 individual projects which involves installation of total 56 numbers of WTGs (11 WTGs x 2MW = 22MW, 12 WTGs X 2MW = 24MW, 33 WTGs X 1.5MW = 49.5MW) aggregated capacity of project is 95.5 MW. The generated electricity is delivered to grid i.e. Sale to Grid.

The detailed specifications of the WTGs are as below

Project	Project Promoter	Capacity	No of WTGs	Capacity & Make
Project 1	Green Infra Wind Energy Limited	22 MW	11	2MW, INOX make (DF100-92 M) ⁹
Project 2	Green Infra Wind Energy Limited	24 MW	12	2MW, INOX make (DF113 - 92M) ¹⁰
Project 3	GreenInfra Wind Solutions Limited	49.5 MW	33	1.5 MW each of ReGen make(V87) ¹¹

As described above Project 1 and Project 2 are promoted by the SPV ‘Green Infra Wind Energy Limited” and Project 3 is promoted by the SPV “Green Infra Wind Solutions Limited” of which **“Green Infra Wind Energy Limited”** is the representative of promoters of this bundled project

⁹ <https://en.wind-turbine-models.com/turbines/1098-inox-df-100>

¹⁰ <https://en.wind-turbine-models.com/turbines/1846-inox-df-113>

¹¹ <https://www.regenpowertech.com/104/wind-turbine>

The electricity generated by the project is exported to the Indian electricity grid. The project activity will therefore displacing an equivalent amount of electricity which would have otherwise been generated by fossil fuel dominant electricity grid.

The project activity has been in operation continuously since its commissioning. There have been no emergencies happened to the monitoring system. There are no events or situation that occurred during the monitoring period which may impact the applicability of the methodology. Also, there were no major breakdowns occurred during current monitoring period.

3.2 Deviations

3.2.1 Methodology Deviations

There has been no methodology deviation applied during this monitoring period of the project activity.

3.2.2 Project Description Deviations

Deviation during previous monitoring period:

Deviation 1:

1. Typo Error Correction in Reporting the Make of Energy Meters for project 1.

Reason: The Make of Energy Meters for the project 1 is “EDMI” but inadvertently reported as Secure. Hence, PP is correcting the typo error in reporting the “Make” of Energy meters. Please refer Appendix-1 for details of Energy Meters.

The above deviations do not impact the applicability of the methodology, additionality or the appropriateness of the baseline scenario, and the project remains in compliance with the applied methodology. This deviation was approved in monitoring period of 01-January-2019 to 31-July-2020

Deviation during current monitoring period

Deviation 2

Data Adjustment in case of monitoring period different from billing period.

As the billing cycle differs from monitoring period, therefore In case the dates of a particular monitoring period do not match with the dates of the billing period, the net electricity exported to the grid would be calculated as follows:

$$D = (A/B)*C$$

Where:

A = Difference of number of days which are not matching of billing period and monitoring period.

B = Number of days of the billing period/ month which was not matched with the monitoring period.

C = Net Electricity supplied to the grid for that given billing period/ month.

The calculated value after apportioning would be used for calculation of emission reductions during that period. Based on the above procedure, the Monthly Certificate for Share of Electricity Generated shall be provided to the project participant. This is to be noted that the detail procedure of monitoring is illustrated here for the sake of understanding; for the preparation of monitoring report during periodic verifications, only the net electricity generation value mentioned in monthly wind energy certificates shall be directly used for emission reduction calculation. No other parameters as explained above shall be used and presented in the monitoring report.

3.3 Grouped Projects

The project is not a grouped project hence this section is not applicable.

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 INDIAN Grid
Source of data	Central Electricity Authority: CO ₂ Emission Database CEA CO ₂ Baseline database Version 13
Value applied	0.9726
Justification of choice of data or description of measurement methods and procedures applied	Calculated using "Tool to calculate the emission factor for an electricity system" using data from Central Electricity Authority of India's (CEA) "Baseline Carbon Dioxide Emission Database Version 13".
Purpose of Data	Calculation of baseline emissions
Comments	The operating margin emission factor is a 3-year generation weighted average (2014-17). The operating Margin is calculated ex ante and fixed during the crediting period

Data / Parameter	EF _{grid,BM,y}
Data unit	tCO ₂ /MWh
Description	Build margin CO ₂ emission factor of INDIAN Grid
Source of data	Central Electricity Authority: CO ₂ Emission Database CEA CO ₂ Baseline database Version 13
Value applied	0.8723
Justification of choice of data or description of measurement methods and procedures applied	Calculated using “Tool to calculate the emission factor for an electricity system” using data from Central Electricity Authority of India’s (CEA) “Baseline Carbon Dioxide Emission Database Version 13”. The value is calculated ex-ante as most recent build margin provided by the CEA
Purpose of Data	Calculation of baseline emissions
Comments	The emission factor is fixed ex-ante and will not be monitoring throughout the crediting period

Data / Parameter	EF _{grid,CM,y}
Data unit	tCO ₂ /MWh
Description	Combined margin emission factor of the Indian grid
Source of data	Central Electricity Authority: CO ₂ Emission Database CEA CO ₂ Baseline database Version 13
Value applied	0.9475
Justification of choice of data or description of measurement methods and procedures applied	The data has been considered in accordance to the Tool to calculate emission factor of an electricity system. The tool guides to take 75% weightage of EF _{grid,OMsimple} , & 25% weightage of EF _{grid,BM,y} .
Purpose of Data	Calculation of baseline emissions
Comments	The emission factor is fixed ex-ante and will not be monitoring throughout the crediting period

4.2 Data and Parameters Monitored

Data / Parameter	EG _{facility,y}
Data unit	MWh/year

Description	Quantity of net electricity generation supplied by the project plant/unit to the grid in year y. Calculated (based on the measured values of electricity exported and imported)
Source of data	Project 1 & Project 2: Monthly “Certificate for Share of Electricity Generated by Wind Farm” issued by GETCO Project 3: JMR (Joint Meter Reading) issued by EB
Description of measurement methods and procedures to be applied	<u>Project 1 & Project 2:</u> <u>Data Type:</u> Measured & Calculated. <u>Monitoring equipment:</u> a) At WTG yard: Secure make Meters of accuracy class 0.2s. b) At substation: Secure make Meters accuracy class 0.2s. Archiving Policy: Paper & Electronic. The Net electricity supplied to the grid by the project activity will be calculated as a difference of electricity exported to the grid, electricity imported from the grid obtained from Monthly Meter reading reports provided by GETCO/ SLDC as per below equation: Calculation of $EG_{\text{facility},y}$: Net Electricity = Export – Import The net electricity exported by the project activity is taken directly from the share certificate issued by GETCO on monthly basis. The apportioning procedure is performed by GEDA personnel on monthly basis and the PP has no role in it. Net electricity supplied to the grid by the project activity will be cross checked with invoices raised by PP. Responsibility: a) At WTG yard: The O&M shift-in-charge shall be responsible for the regular recording of data. b) At substation: The representatives of the PP/GETCO/GEDA are responsible for taking monthly joint meter reading at the substation. <u>Project 3:</u> Data Type: Measured & Calculated. Monitoring equipment: Substation: All Secure Make Meters accuracy class 0.2s. Archiving Policy: Paper & Electronic.

	Net electricity supplied will be calculated based on the difference between calculated values of “export” and “import” and transmission losses on the EB energy meter at the “evacuation point”. (Net Electricity = Export – Import – Transmission loss) The Export and import are referred from JMR. Currently, DISCOM ¹² has considered the Transmission Losses while preparing the Joint Meter Reading. Hence same has been considered and deducted from the Export value to arrive at the Net Electricity delivered to the grid. <u>Calibration Frequency:</u> Once in five years
Frequency of monitoring/recording	Continuous monitoring with monthly recording
Value monitored	199,355
Monitoring equipment	Energy meter
QA/QC procedures to be applied	Accuracy class: 0.2s Net electricity supplied to the grid by the project activity will be cross checked with invoices raised by PP. The meter(s) shall be calibrated and maintained by the state utility as per their own schedule, and this frequency of meter calibration is not within the control of the Project Proponent. Calibration of electricity meters is carried out in-line with the Nation standard which recommends at least once in 5-year calibration or whenever abnormal difference/inconsistency is observed between main meter and check meter. Meter Details has been provided under Appendix-1 of the MR.
Purpose of the data	Calculation of Baseline Emissions
Calculation method	-
Comments	-

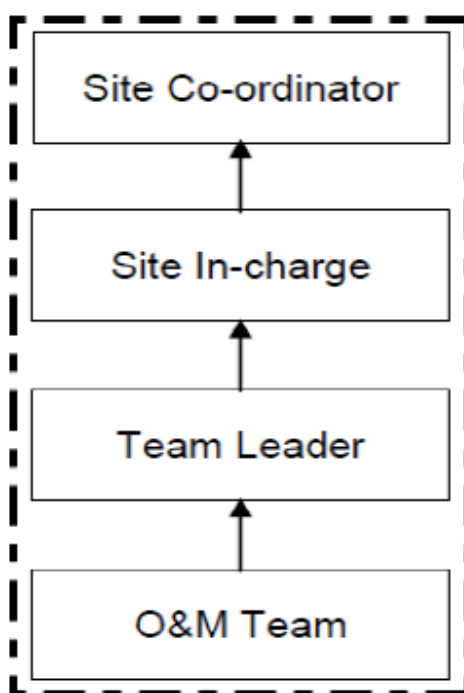
4.3 Monitoring Plan

¹² JMR preparation and calculation procedure is solely under the purview of State DISCOM which is a govt authority. PP has no control over the same. Hence, deducted the transmission losses as per the JMR.

All the three projects in the bundle have entered into agreement with the WTG Suppliers for the operation and maintenance of WTGs. The WTG supplier has dedicated and technically well-equipped O&M team for day-to-day Operation and maintenance of each WTG. O&M contractor will provide a monthly report, which includes generation data, major breakdown events and machine availability. Project manager is responsible for recording of monthly meter readings of export and import. Monthly power export and import data will be sent regularly to site in charge of each project separately.

Monitoring roles and responsibilities:

The data for the project is compiled by the O&M Contractor and subsequently stored by the PP, the reporting and 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 reporting responsibilities for the project are described as below;



The Site In-charge will be responsible for carrying out internal auditing and QA/QC. All the values from generation record will be checked with JMR and invoices for consistency. In case there are any non conformances identified. The Site In-charge will investigate the error and revise the

record to correct it. In any case where values have slightest of variation in different records the most conservative value will be taken in the project monitoring report.

Personal Training:

The training for operating and maintaining the plant will be provided to the O&M team whenever there would be necessity or any technological up gradation. The trainings provided for O and M are mentioned below-

For Karikonda site-

S.no	Date	Topic
1.	16-February-2022	GWO: Work at Height
2.	18 February-2022	GWO: First Aid
3.	20- February-2022	Fire Awareness GWO
4.	20- February-2022	GWO: Manual Material Handling
5.	24- February-2022	HSE Training Disaster Management
6.	24-March-2022	HSE Alert: Grinding Wheel Safety
7.	20-June-2022	Emergency Response Plan: Roles and Responsibilities
8.	25-June-2022	Covid-19 Precautions
9.	03-August-2022	Chemical Handling/MSDS
10.	03- August-2022	Code of Conduct
11.	03- August-2022	Emergency Response Plan
12.	03- August-2022	Heat Stroke: HSE Communication

For Rojmal site

S,no	Date	Topic
1.	06-January-2022	Importance of wearing reflective jackets
2.	08-January-2022	HSE Communication: Struck by moving objects
3.	08-January-2022	MSRA Review- PSS Incoming OH line inspection troubleshooting maintaince
4.	08-January-2022	SOP Review-PTW Review
5.	08-January-2022	Near miss communication-Dec 2021
6.	08-January-2022	Covid-19 (Omicron) Awareness, Hygiene Practice and Emergency Response
7.	12-January-2022	Covid-19 (Omicron) Awareness, Hygiene Practice and Emergency Response
8.	17-January-2022	Road Safer- Defensive Driving
9.	19-January-2022	Road Safer- Defensive Driving
10.	21-January-2022	Mockdrill: Vehicular incident and rescue of injured person

11.	22-January-2022	Road Safter- Defensive Driving
12.	22-January-2022	Road Safter- Defensive Driving
13.	24-January-2022	Mock Drill: Covid 19 Safe evacutaion and response of shifting affected person
14.	09-February-2022	Life Saving Rules and Awarness
15.	12-February-2022	Coach the driver on Vehicle inspection checks
16.	12-February-2022	Life Saving Rules and Awarness
17.	14-February-2022	MSRA Review- Up tower equipment/system
18.	14-February-2022	WTG Climbing Rules (SOP Review)
19.	14-February-2022	All site near miss communication
20.	14-February-2022	HSE Communication: Coach the driver on Vehicle inspection checks
21.	24-February-2022	Disaster Management/ Emergency Prepeardness and response training
22.	24-February-2022	Mock Drill: Covid 19 Safe evacutaion and response of shifting affected person
23.	25-February-2022	Disaster Management/ Emergency Prepeardness and response training
24.	16-March-2022	Ergonomics: A future physiotherapy apporach
25.	17-March-2022	Household Fires and Saftey Awarness
26.	19-March-2022	Ergonomics Awarness Training
27.	23-March-2022	Mockdrill: Bushfire in surrounding of USS yard
28.	24-March-2022	Stress Management Awarness Training
29.	09-April-2022	Fire and Saftey Awarness
30.	16-April-2022	Hot work awarness
31.	21-April-2022	HSE Communication: Ozone Layer Depletion
32.	21-April-2022	Mock Drill: Heat Sroke (Rescue of Person)
33.	18-May-2022	HSE Communication: Heat stroke, Heat Exhaustion and Heat Camp
34.	18-May-2022	SOP: Procedure for hazard identification and risk management
35.	18-May-2022	HIRA: Service Maintaince Tasks
36.	18-May-2022	HSE Communication: Heat stroke, Heat Exhaustion and Heat Camp
37.	20-May-2022	Mockdrill: Heat Stroke
38.	23-May-2022	Mockdrill: Fire at USS yard
39.	25-May-2022	Mockdrill: Fire at USS yard
40.	15-June-2022	Material Storage and Handling
41.	15-June-2022	Material Storage and Handling
42.	15-June-2022	Restriction for Unauthorized Access
43.	15-June-2022	Restriction for Unauthorized Access
44.	16-June-2022	Use of chain blocks and saftey precautions

45.	17-June-2022	Choking while eating oil spillage and control by using chem kit
46.	24-June-2022	Safety Community Meeting

For Sadla site

S.No	Date	Topic
1.	3-July-2022	June month all weakness, Root cause
2.	14-July-2022	Permit to work awareness training
3.	20-July-2022	Confined Space Awareness Training
4.	24-July-2022	HSE Communication: Snake and Scorpoion sting bite awareness week
5.	26-July-2022	Confined Space Awareness Training
6.	29-July-2022	Permit to work awareness training
7.	11-August-2022	HSE Communication: Slips Trips and Fall
8.	11-August-2022	PPEs Usage and Maintaince training and awareness
9.	12-August-2022	PPEs Usage and Maintaince training and awareness
10.	17-August-2022	Ergonomics and Safe Material/ Manual Handling
11.	19-August-2022	PPEs Usage and Maintaince training and awareness
12.	21-August-2022	Ergonomics and Safe Material/ Manual Handling
13.	6-September-2022	HSE Alert: Fingure Injury on Torque Machine
14.	20-September-2022	Basic Safety while working in USS, PSS
15.	24-September-2022	HSE Communication: Slips Trips and Fall
16.	7-October-2022	HSE Communication: Dropped Equipment
17.	8-October-2022	Safety Induction Training
18.	12-October-2022	Clinical Handling and Storage Training Awareness
19.	16-October-2022	Chemical Handling and Storage awareness training
20.	18-October-2022	Haist and Riggging Safety Awareness
21.	19-October-2022	Haist and Riggging Safety Awareness
22.	10-November-2022	Safe Material/ Maual Material Handling
23.	11-November-2022	Portable Hand Power Tool
24.	13-November-2022	Manuel material handling and dropped objects
25.	24-November-2022	HSC Communications: Last Month Spill Sites
26.	8-December-2022	Ladder climbing safety awareness training
27.	11-December-2022	Ladder climbing safety awareness training
28.	12-December-2022	Ladder climbing safety awareness training
29.	15-December-2022	Work at height awareness training
30.	24-December-2022	Work at height awareness training
31.	27-December-2022	Work at height rescue awareness training
32.	28-December-2022	Basic Safety Training Session
33.	28-December-2022	Work at height rescue awareness training

Emergency preparedness:

In case Main meter or Check meter is found to be outside the acceptable limits of accuracy or faulty or not functioning properly, it will be repaired, recalibrated or replaced as soon as possible. In the event that the Main meter is not in service as a result of maintenance, repairs or testing, the Check meter will be used for readings.

Data recording & archiving: The project proponent shall maintain data both in electronic form and hard copies. The monitored data shall be archived till 2 years after the completion of crediting period.

Monitoring Process at project site

Project 1 & Project 2 (Same Procedure):

- Joint monthly meter reading shall be taken from pooling substation (PSS) meter by representative of GEDA/GETCO and O&M team/service provider (on behalf of individual wind mill owners). Let the total generation recorded for particular month is 'X' units in sub-station meter.
- Joint daily meter reading shall be taken at Local Meter (transformer yard meter of each WTG) by representative of GEDA/GETCO on a monthly basis. Let us assume total approved generation recorded for particular month is 'Y1' units.
- Similarly, joint meter reading for other wind farm owners connected to the sub-station shall also be taken. Let the generation of individual owner recorded for particular month are 'Y2, Y3, ...Yn' units.
- The GEDA/GETCO apportions 'X' to individual wind farm owners using following formula and issues monthly certificates. Net units calculated for billing = $X * Y_i / \sum Y_n$
- For PP, net units calculated for billing = $X * Y_1 / \sum Y_n$

The net electricity generated by the project owners is being provided by GETCO in the share certificate of electricity generated. The value of the net electricity generated by the project activity has been taken directly by the project proponent from the share certificate provided by GETCO for calculation of emission reductions. The share certificate provides the value of export and import by the project.

Calculation of $EG_{facility,y}$:

Net Electricity = Export – Import

Hence, the net electricity supplied to the grid by the project activity is taken directly from the share certificate issued by GETCO on monthly basis by simply taking export & import. The

apportioning procedure is performed by GEDA personnel on monthly basis and the PP has no role in it. Hence the PP does not have any apportioning data available.

Data Adjustment in case of monitoring period different from billing period.

As the billing cycle differs from monitoring period, therefore In case the dates of a particular monitoring period do not match with the dates of the billing period, the net electricity exported to the grid would be calculated as follows:

$$D = (A/B)*C$$

Where:

A = Difference of number of days which are not matching of billing period and monitoring period.

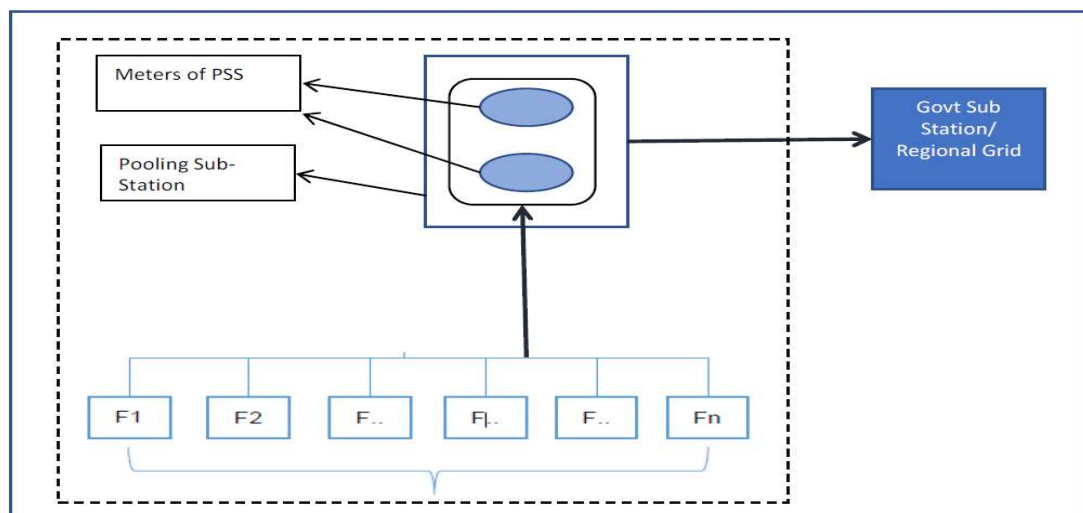
B = Number of days of the billing period/ month which was not matched with the monitoring period.

C = Net Electricity supplied to the grid for that given billing period/ month.

The calculated value after apportioning would be used for calculation of emission reductions during that period. Based on the above procedure, the Monthly Certificate for Share of Electricity Generated shall be provided to the project participant. This is to be noted that the detail procedure of monitoring is illustrated here for the sake of understanding; for the preparation of monitoring report during periodic verifications, only the net electricity generation value mentioned in monthly wind energy certificates shall be directly used for emission reduction calculation. No other parameters as explained above shall be used and presented in the monitoring report.

A schematic diagram indicating the metering system is provided below:

Metering System



Project 3:

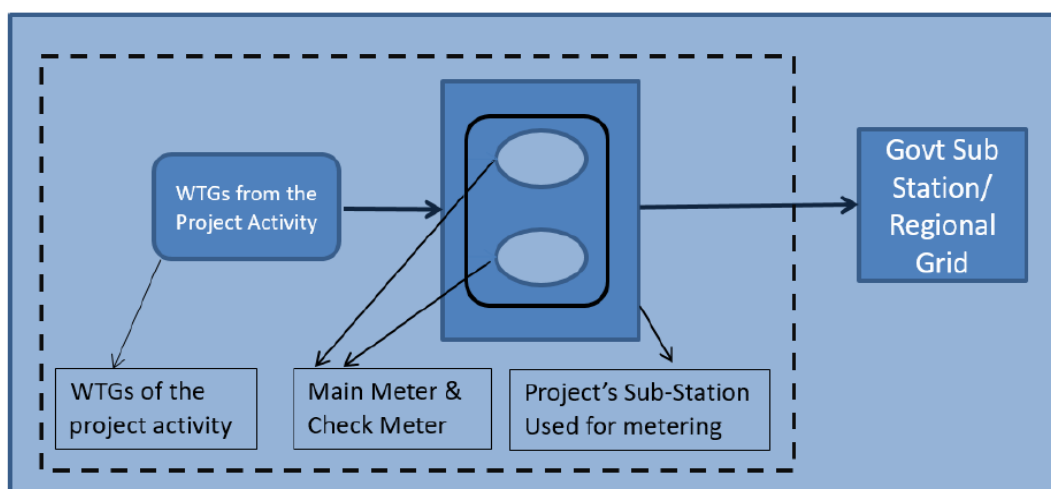
Joint monthly meter reading is taken at the Pooling substation (PSS) meters by representative of DISCOM and O&M team/service provider (on behalf of the project proponent). It must be noted here that the meter readings as mentioned above shall be calculated as the product of meter multiplication factor and the difference of the current and previous meter readings and transmission losses are also deducted to prepare the JMR.

(i.e. Net Electricity = Export – Import -Transmission Losses)

Based on the above procedure, the Monthly JMRs shall be provided to the project proponent.

A schematic diagram indicating the metering system is provided below:

Metering System



For all the projects in the bundle this is to be noted that the detail procedure of monitoring is illustrated here for the sake of understanding; for the preparation of subsequent monitoring report during periodic verifications, only the net electricity generation value shall be directly used for emission reduction calculation. No other parameters as explained above shall be used and presented in the monitoring

5 QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS

5.1 Baseline Emissions

As per description earlier under this document:

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

$EF_{grid,CM,y}$ is 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” (tCO₂/MWh) (i.e, 0.9475 tCO₂/MWh).

and;

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

Here,

$$BE_y = 199,355 \text{ MWh} * 0.9475 \text{ tCO}_2/\text{MWh}$$

$$= 188,886 \text{ tCO}_2\text{e (Round down values)}$$

5.2 Project Emissions

The project activity involves in harnessing wind power. So, the emissions from the project are zero as per methodology ACM0002 of version 19.0.

5.3 Leakage

No leakage emissions have been considered and hence the leakage emission is zero as per methodology ACM0002 of version 19.0.

5.4 Net GHG Emission Reductions and Removals

As per the applied methodology, emission reductions are calculated as follows:

$$ER_y = BE_y - PE_y$$

Where,

ER_y = Emission Reduction in tCO₂e/year

BE_y = Baseline emission in tCO₂e/year

PE_y = Project emissions in tCO₂e/year:

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-August-2021 to 31-December-2021)	67,153	0	0	67,153
2022 (01-January-2022 to 31-July-2022)	121,733	0	0	121,733
Total	188,886	0	0	188,886

It is to be noted here that as per the estimated emission reduction to be achieved from the project activity for the current monitoring period is 191,006 tCO₂e, whereas actual emission reductions achieved are 188,886 tCO₂e, which is approximately 1.11 % lower than the estimated emission reductions. The lower generation in the current verification period is hence due to certain natural conditions and hence acceptable

APPENDIX 1: CALIBRATION DETAILS

Project wise - Meter & Calibration Details:

Project 1:		
Meter & Calibration Details:		
Details	Line 1	Line 2
Meter Number	GJ-3057-A	GJ-3058-A
Make	EDMI	EDMI
Accuracy	0.2s	0.2s
Previous Calibration	20-February-2017	20-February-2017
Validity Date	19-February-2022	19-February-2022
Calibration date	22-November-2021	22-November-2021
Validity Date	21-November-2026	21-November-2026

Project 2:		
Meter & Calibration Details:		
Details	Line 1	Line 2
Meter Number	GJ3819A	GJ3820A
Make	Secure	Secure
Accuracy	0.2s	0.2s
Previous Calibration	25- February -2017	25- February -2017
Validity Date	24- February -2022	24- February -2022
Calibration date	22-April-2022	22-April-2022
Validity Date	21-April-2026	21-April-2026

Calibration is delayed by 2 months hence, error factor of 0.2s is applied in month of February 2022, March 2022 and April 2022.

Project 3:		
Meter & Calibration Details:		
Details	Line 1	Line 2
Meter Number	APX01475	APX01476
Make	Secure	Secure
Accuracy	0.2s	0.2s
Location	33 kV/220 kV Karidikonda Pooling Substation	33 kV/220 kV Karidikonda Pooling Substation
Previous Calibration	31-March-2017	31-March-2017
Validity Date	30-March-2022	30-March-2022
Calibration date	16-November-2021	16-November-2021
Validity Date	15-November-2026	15-November-2026

APPENDIX 2: EMPLOYEE DETAILS



Green Infra Wind Energy Limited
 CIN: U23200HR2005PLC078211
 Regd. Office: 5th Floor, Tower C, Building No. 8,
 DLF Cybercity, Gurugram – 122 002, Haryana, India
 Tel (91) 124 3896700, Fax (91) 124 3896710
sgil.complianceofficer@sembcorp.com
www.sembcorpenergyindia.com/GIWEL

TO WHOMSOEVER IT MAY CONCERN

Date: 21-07-2022

This declaration is in reference to the VCS Project activity i.e. **"Bundled Wind Power Project by Sembcorp Green Infra Limited in India"** which is undergoing VCS Verification for the period of 1-Aug-2021 to 31-July-2022. The Project activity involves the installation of Wind Power with the total installed capacity of 95.5 MW.

Project Name	Project Promoters	Capacity	No of WTGs	Capacity & Make	Location
Project 1	Green Infra Wind Energy Limited	22 MW	11	2MW, INOX make (DF100-92M)	Amreli/Rajkot, Gujarat
Project 2	Green Infra Wind Energy Limited	24MW	12	2 MW each of INOX make	Surendra Nagar, Gujarat
Project 3	Green Infra Wind Solutions Limited	49.5MW	33	1.5 MW each of ReGen make (V87)	Kurnool, Andhra Pradesh

The project activity employed 3 employees during the monitoring period (01/08/2021 to 31/07/2022). The total employees since commissioning in the project activity has 38 Employees (On role).

For Green Infra Wind Energy Limited



For Green Infra Wind Energy Limited
 G. L. Anil Hage
 Authorized Signatory