



# 108 MW FATANPUR WIND POWER PROJECT IN MADHYA PRADESH



Document Prepared by: Kosher Climate India Private Limited

|                          |                                                                                                                                                                                                                                                            |
|--------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Project Title</b>     | 108 MW Fatanpur Wind Power Project in Madhya Pradesh                                                                                                                                                                                                       |
| <b>Version</b>           | Version 2                                                                                                                                                                                                                                                  |
| <b>Report ID</b>         | Fatanpur-MR-03                                                                                                                                                                                                                                             |
| <b>Date of Issue</b>     | 20-April-2022                                                                                                                                                                                                                                              |
| <b>Project ID</b>        | 1746                                                                                                                                                                                                                                                       |
| <b>Monitoring Period</b> | 01-December-2019 to 31-December 2021                                                                                                                                                                                                                       |
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# 1 PROJECT DETAILS

## 1.1 Summary Description of the Implementation Status of the Project

The project activity is installation of 108 MW wind power project, promoted by Energon RJ Wind Power Private Limited (It was renamed as Vena Energy Fatanpur Power Private Limited on 5 September 2018). The purpose of the project activity is to generate clean electricity with utilization of wind energy. The project consists of 54 numbers of Gamesa G97 Wind Turbine Generators (WTGs) of 2.0 MW capacities each. The project WTGs are installed in and around the villages in Taluk Dewas, Tonkhhurd of Dewas district and Tarana Taluk of Ujjain district of Madhya Pradesh in India.

The construction of the project has been started on 31<sup>st</sup> March 2015. The project has been commissioned between 11-March-2016 to 27-March-2016. The details of individual WTGs are as following:

| WTG Nos                                                                                                                                                                                   | Capacity | Commissioning Date |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|--------------------|
| GF-67N3, GF-17N2, GF-96N3, GF-83N2, GF-22N1, GF-25N1, GF-22N3, GF-24N2, GF-27N2, GF-08N2, GF-69N4, GF-37N2, GF-40N2, GF-53N, GF-10N, GF-123N, GF-125N, GF-129N, GF-36N2, GF-06N, GF-126N1 | 42 MW    | 11-March-2016      |
| GF-34N3, GF-42N, GF-68N6, GF-87N3, GF-01N2, GF-154N, GF-18N2, GF-41N, GF-35N2, GF-38N                                                                                                     | 20 MW    | 16-March-2016      |
| GF-28N2, GF-39N4, GF-127N, GF-132N4, GF-133N2, GF-54N2, GF-57N4, GF-110N5, GF-144N, GF-23N3                                                                                               | 20 MW    | 22-March-2016      |
| GF-80N3, GF-07N1, GF-26N2, GF-149N4, GF-03N3, GF-163N, GF-162N, GF-134N2, GF-165N, GF-44N4, GF-135N2, GF-161N, GF-82N                                                                     | 26 MW    | 27-March-2016      |

From the date of commissioning the WTGs are operating continuously without any major outages.

The electricity generated by the project is exported to the Indian electricity grid. The project activity will therefore displace an equivalent amount of electricity which would have otherwise been generated by fossil fuel dominant electricity grid. Since wind power is Greenhouse Gas (GHG) emissions free, the power generated will prevent the anthropogenic gas emissions generated by fossil fuel based thermal power stations comprising coal, diesel, furnace oil and gas.

There was no activity at the site prior to implementation of the project activity. Hence the scenario existing prior to the project activity is same as baseline scenario which is continual use of highly carbon intensive electricity in the regional grid.

The estimation of GHG reductions by this project is limited to carbon dioxide (CO<sub>2</sub>) only. Thus, the project activity leads to an emission reduction of 2,127,450 tCO<sub>2</sub> for the chosen crediting period of 10 years.

The current monitoring period chosen is from 01-December-2019 to 31-December 2021 (inclusive of first & last date) and the GHG emission reductions calculated are 386,626 tCO<sub>2</sub>.

## 1.2 Sectoral Scope and Project Type

Sectoral Scope : 1 Energy Industries (Renewable/Non-Renewable Sources)

Methodology applied is ACM 0002 of version 17.0

The project is not a grouped project, it is a standalone wind power project by a single project developer.

## 1.3 Project Proponent

|                   |                                                                                                   |
|-------------------|---------------------------------------------------------------------------------------------------|
| Organization name | Vena Energy Fatanpur Power Private Limited (Formerly Energon RJ Wind Power Private Limited)       |
| Contact person    | Rajesh Gathala                                                                                    |
| Title             | Managing Director                                                                                 |
| Address           | 1 <sup>st</sup> Floor, Embassy Icon Annexe, 2/1 Infantry Road, Bangalore-560001, Karnataka, India |
| Telephone         | 080-66454000                                                                                      |
| Email             | -                                                                                                 |

## 1.4 Other Entities Involved in the Project

|                     |                                      |
|---------------------|--------------------------------------|
| Organization name   | Kosher Climate India Private Limited |
| Role in the Project | Project Representative               |
| Contact person      | Vamsi Krishna M                      |
| Title               | CAB Head                             |

|           |                                                                                                     |
|-----------|-----------------------------------------------------------------------------------------------------|
| Address   | #109, 2 <sup>nd</sup> Floor, 27 <sup>th</sup> Main, Sector – 1, HSR Layout, Bangalore-560102, India |
| Telephone | 91- 80-49931177                                                                                     |
| Email     | vamsi@kosherclimate.com                                                                             |

## 1.5 Project Start Date

The project start date for this project is 11<sup>th</sup> March 2016. This is the day on which the first machine was commissioned.

## 1.6 Project Crediting Period

11<sup>th</sup> March 2016 to 10<sup>th</sup> March 2026 and then for another period of 20 Years (10 years, renewable twice).

## 1.7 Project Location

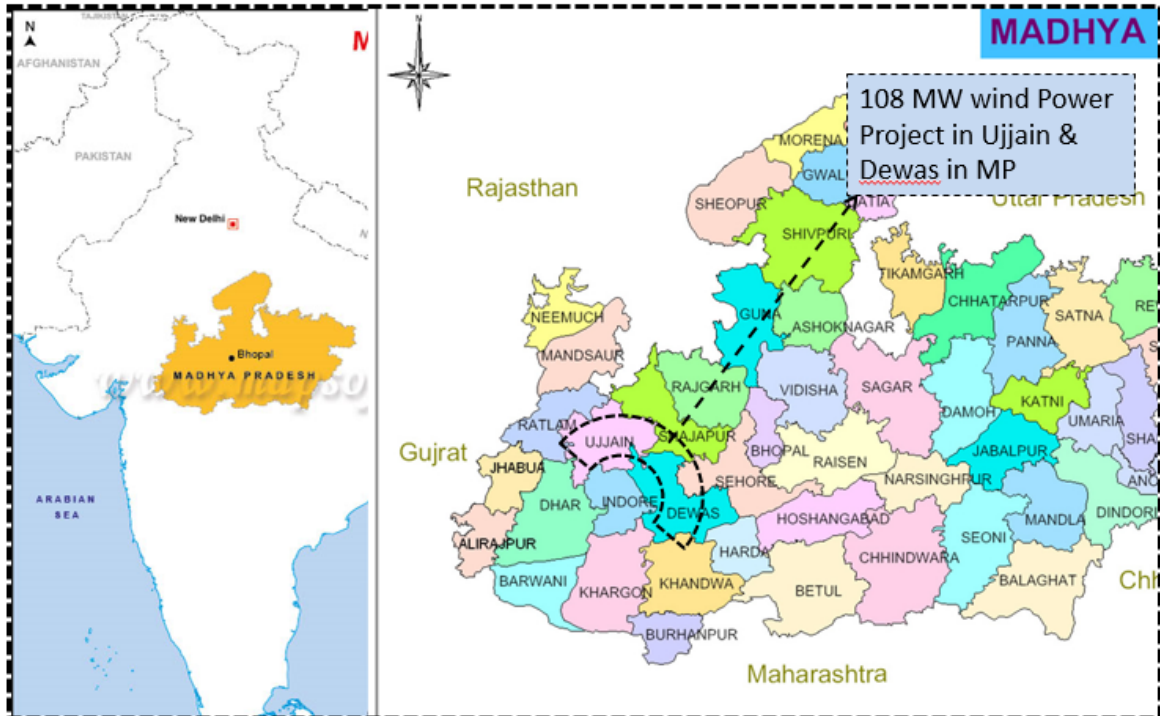
The project activity is located at Ujjain and Dewas district of Madhya Pradesh State, India. The geo-coordinates of the project location is as follows:

| S.No | WTG No   | Village    | Taluk      | District | Latitude | Longitude |
|------|----------|------------|------------|----------|----------|-----------|
| 1    | GF-01N2  | Tonk kalan | Tonk khurd | Dewas    | 23.11165 | 76.16163  |
| 2    | GF-03N3  | Tonk kalan | Tonk khurd | Dewas    | 23.09773 | 76.1649   |
| 3    | GF-06N   | Kalama     | Tonk khurd | Dewas    | 23.09149 | 76.16223  |
| 4    | GF-07N1  | Nandel     | Tonk khurd | Dewas    | 23.07842 | 76.17004  |
| 5    | GF-08N2  | Nandel     | Tonk khurd | Dewas    | 23.07517 | 76.16557  |
| 6    | GF-10N   | Nandel     | Tonk khurd | Dewas    | 23.06392 | 76.18173  |
| 7    | GF-110N5 | Khareli    | Tonk khurd | Dewas    | 23.21342 | 76.20812  |
| 8    | GF-122N3 | Upadi      | Tarana     | Ujjain   | 23.0769  | 76.11671  |
| 9    | GF-123N  | Jhajuria   | Tarana     | Ujjain   | 23.11701 | 76.08299  |
| 10   | GF-125N  | Kathbadoda | Tarana     | Ujjain   | 23.12293 | 76.08401  |
| 11   | GF-126N1 | Tonk kalan | Tonk khurd | Dewas    | 23.0959  | 76.11686  |
| 12   | GF-127N  | Tonk kalan | Tonk khurd | Dewas    | 23.10679 | 76.11251  |
| 13   | GF-129N  | Khajuriya  | Tarana     | Ujjain   | 23.10788 | 76.09603  |

|    |          |                |            |        |          |          |
|----|----------|----------------|------------|--------|----------|----------|
| 14 | GF-132N4 | Barkheda       | Tarana     | Ujjain | 23.0731  | 76.11162 |
| 15 | GF-133N2 | Barkheda       | Tarana     | Ujjain | 23.06762 | 76.10838 |
| 16 | GF-134N2 | Barkheda       | Tarana     | Ujjain | 23.05925 | 76.10921 |
| 17 | GF-135N2 | Barkheda       | Tarana     | Ujjain | 23.05371 | 76.10084 |
| 18 | GF-144N  | Bhirwakhedi    | Tonkikhurd | Dewas  | 23.13373 | 76.1641  |
| 19 | GF-149N4 | Banarasi       | Tonkikhurd | Dewas  | 23.13412 | 76.08225 |
| 20 | GF-154N  | Khajuria       | Tarana     | Ujjain | 23.1129  | 76.09178 |
| 21 | GF-161N  | Upadi          | Tarana     | Ujjain | 23.10144 | 76.0985  |
| 22 | GF-162N  | Khajuria       | Tarana     | Ujjain | 23.10665 | 76.07376 |
| 23 | GF-163N  | Banarsi        | Tonkikhurd | Dewas  | 23.144   | 76.07643 |
| 24 | GF-165N  | Banarsi        | Tonkikhurd | Dewas  | 23.13702 | 76.07503 |
| 25 | GF-17N2  | Nandel         | Tonkikhurd | Dewas  | 23.05493 | 76.16877 |
| 26 | GF-18N2  | Janolibujung   | Tonkikhurd | Dewas  | 23.03759 | 76.16923 |
| 27 | GF-22N1  | Nipaniya       | Tonkikhurd | Dewas  | 23.11878 | 76.19369 |
| 28 | GF-23N3  | Polay          | Tonkikhurd | Dewas  | 23.10386 | 76.19617 |
| 29 | GF-24N2  | Nipaniya       | Tonkikhurd | Dewas  | 23.12257 | 76.19533 |
| 30 | GF-25N1  | Nipaniya       | Tonkikhurd | Dewas  | 23.13025 | 76.18838 |
| 31 | GF-26N2  | Nipaniya       | Tonkikhurd | Dewas  | 23.12691 | 76.19547 |
| 32 | GF-27N2  | Dehriya        | Tonkikhurd | Dewas  | 23.07294 | 76.22128 |
| 33 | GF-28N2  | Dehriya        | Tonkikhurd | Dewas  | 23.08212 | 76.22137 |
| 34 | GF-34N3  | Nandel         | Tonkikhurd | Dewas  | 23.06981 | 76.18637 |
| 35 | GF-35N2  | Durgapura      | Dewas      | Dewas  | 23.02136 | 76.14209 |
| 36 | GF-36N2  | Sindni         | Tonkikhurd | Dewas  | 23.02675 | 76.14465 |
| 37 | GF-37N2  | Jasodgarh      | Dewas      | Dewas  | 23.03168 | 76.1422  |
| 38 | GF-38N   | Fatehpur Kheda | Tonkikhurd | Dewas  | 23.03798 | 76.14307 |
| 39 | GF-39N4  | Jirway         | Tonkikhurd | Dewas  | 23.06387 | 76.23739 |
| 40 | GF-40N2  | Nawda          | Tonkikhurd | Dewas  | 23.04294 | 76.14288 |

|    |         |             |           |        |          |          |
|----|---------|-------------|-----------|--------|----------|----------|
| 41 | GF-41N  | Nawda       | Tonkkhurd | Dewas  | 23.04872 | 76.14041 |
| 42 | GF-42N  | Jasodgarh   | Dewas     | Dewas  | 23.05351 | 76.1326  |
| 43 | GF-44N4 | Banarsi     | Tonkkhurd | Dewas  | 23.13051 | 76.08451 |
| 44 | GF-53N  | Upadi       | Tarana    | Ujjain | 23.09503 | 76.09964 |
| 45 | GF-54N2 | Devli       | Tonkkhurd | Dewas  | 23.08233 | 76.27071 |
| 46 | GF-57N4 | Devli       | Tonkkhurd | Dewas  | 23.08357 | 76.28342 |
| 47 | GF-67N3 | Khareli     | Tonkkhurd | Dewas  | 23.1963  | 76.22195 |
| 48 | GF-68N6 | Panda       | Tonkkhurd | Dewas  | 23.18884 | 76.22579 |
| 49 | GF-69N4 | Panda       | Tonkkhurd | Dewas  | 23.1926  | 76.2256  |
| 50 | GF80N3  | Gir lakhedi | Tonkkhurd | Dewas  | 23.0767  | 76.26505 |
| 51 | GF-82N  | Nandel      | Tonkkhurd | Dewas  | 23.04887 | 76.1876  |
| 52 | GF-83N2 | Nandel      | Tonkkhurd | Dewas  | 23.05341 | 76.18985 |
| 53 | GF-87N3 | Nandel      | Tonkkhurd | Dewas  | 23.06029 | 76.18456 |
| 54 | GF-96N3 | Nandel      | Tonkkhurd | Dewas  | 23.05866 | 76.16897 |

The geographical location of the project site is as shown below:



## 1.8 Title and Reference of Methodology

The methodology applied for the project is Approved Large Scale Consolidated Methodology: ACM0002 “Grid-connected electricity generation from renewable sources” (Version 17.0)<sup>1</sup>

ACM0002 draws upon the following tools which have been used in the registered PD:

- Methodological Tool: Tool to calculate the emission factor for an electricity system - Version 6.0, EB 97, Annex 7<sup>2</sup>.
- Methodological Tool: Tool for the demonstration and assessment of additionality - Version 07.0.0, EB 70 Annex 8<sup>3</sup>.

## 1.9 Participation under other GHG Programs

The project is not registered under any other GHG programs

## 1.10 Other Forms of Credit

The project is not included in any emissions trading program or any other mechanism that includes GHG allowance trading. Hence the net GHG emission reductions or removals generated during this monitoring period have not been used for compliance under programs or mechanisms.

The project has sought or received another form of GHG-related environmental credit, including renewable energy certificates, during this monitoring period.

## 1.11 Sustainable Development Contributions

The proposed project activity involves the installation of Wind Power Projects in Madhya Pradesh State of India. The purpose of the project activity is to generate clean electricity with utilization of wind energy.

The project supplies clean electricity from the wind power plant to the Indian National Grid hence displacing the electricity generated from grid connected fossil fuel power plants and thereby avoiding the equivalent Carbon dioxide which is a green house gas. In the absence of the project activity, there won't be any avoidance of carbon dioxide

During the construction and operation and maintenance of the wind power plant, the project created many direct and indirect new job opportunities mostly to the local people in the project region. In the absence of the project activity, there would be no new jobs created in the project area.

As a part of regional development efforts associated with the project, PP has supported many education, health & infrastructure related needs for local people. These are funded from the

<sup>1</sup> <http://cdm.unfccc.int/methodologies/DB/VJ19AX539D9MLOPXN2AY9UR1N4IYGD>

<sup>2</sup> [https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-07-v6.pdf/history\\_view](https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-07-v6.pdf/history_view)

<sup>3</sup> <http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-01-v7.0.0.pdf>

revenue generated from the operation of the project activity. In the absence of project activity, there would be no revenue generated from the project and hence the activity would have not occurred in the absence of the project activity.

Projects contributions to UN's SDG are given in the below table:

Table 1: Sustainable Development Contributions

| Row number | SDG Target | SDG Indicator                                                      | Net Impact on SDG Indicator        | Current Project Contributions                                                                                                                                                                                                 | Contributions Over Project Lifetime                                                                                                                                                           |
|------------|------------|--------------------------------------------------------------------|------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1          | 3.b        | Healthcare services                                                | Implemented activities to increase | PP conducted free health camps in the local villages. About 9,921 people benefitted from this. Out of total budget, 25% is contributed from the project revenue. Hence, effectively 2,480 people benefitted from this project | About 7,719 people benefitted from free health camps and medical essential distribution since commissioning of this project                                                                   |
| 2          | 4.a        | Improving school infrastructures                                   | Implemented activities to increase | Distributed tables to local schools that benefitted 25 students                                                                                                                                                               | 3 School is provided with basic infrastructure since commissioning of the project. 175 students benefitted from this project till this monitoring period.                                     |
| 3          | 7.2        | 7.2.1 Renewable energy share in the total final energy consumption | Implemented activities to increase | About 3,95,446 MWh renewable electricity has supplied to Indian National grid during the reported period that helps to increase the renewable energy share in the energy mix.                                                 | Since commissioning, about 1,176,908 MWh renewable electricity has supplied to Indian National grid till this monitoring that helps to increase the renewable energy share in the energy mix. |
| 4          | 8.5        | Number of employments created                                      | Implemented activities to increase | About 48 employment opportunities s has been created during the current reporting period.                                                                                                                                     | The project has created about 48 employment opportunities since commissioning.                                                                                                                |
| 5          | 8.8        | Number of trainings conducted to O&M staff                         | Implemented activities to increase | About 74 trainings conducted to O&M staffs during the current monitoring period                                                                                                                                               | About 242 trainings conducted to O&M staffs from the commissioning of this project.                                                                                                           |

|   |      |                                                       |                                    |                                                                                                                                                                                                                               |                                                                                                  |
|---|------|-------------------------------------------------------|------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|
| 5 | 13.0 | Tonnes of greenhouse gas emissions avoided or removed | Implemented activities to increase | By supplying 3,95,446 MWh clean electricity to national grid, the project avoided release of 383,585 tCO <sub>2</sub> into the atmosphere during the reporting period and contributed to the sustainable development goal 13. | Prevented the release of 1,147,606 tCO <sub>2</sub> into the atmosphere since its commissioning. |
|---|------|-------------------------------------------------------|------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|

## 2 SAFEGUARDS

### 2.1 No Net Harm

There were no harm identified from the project and hence no mitigations measures are applicable.

### 2.2 Local Stakeholder Consultation

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. The consultation meeting took place on 02-Januray-2016.

Post consultations the project proponent has also devised an Grievance mechanism to address any concerns of the villagers. A grievance Register with the details of site contact person, Head office HSE person are available at all the panchayat offices in the project location.

No grievances received during the monitoring period.

### 2.3 AFOLU-Specific Safeguards

Not applicable.

## 3 IMPLEMENTATION STATUS

### 3.1 Implementation Status of the Project Activity

The project has been commissioned between 11-March-2016 to 27-March-2016. The details of individual WTGs are as following:

| WTG Nos | Capacity | Commissioning Date |
|---------|----------|--------------------|
|         |          |                    |

|                                                                                                                                                                                           |       |               |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|---------------|
| GF-67N3, GF-17N2, GF-96N3, GF-83N2, GF-22N1, GF-25N1, GF-22N3, GF-24N2, GF-27N2, GF-08N2, GF-69N4, GF-37N2, GF-40N2, GF-53N, GF-10N, GF-123N, GF-125N, GF-129N, GF-36N2, GF-06N, GF-126N1 | 42 MW | 11-March-2016 |
| GF-34N3, GF-42N, GF-68N6, GF-87N3, GF-01N2, GF-154N, GF-18N2, GF-41N, GF-35N2, GF-38N                                                                                                     | 20 MW | 16-March-2016 |
| GF-28N2, GF-39N4, GF-127N, GF-132N4, GF-133N2, GF-54N2, GF-57N4, GF-110N5, GF-144N, GF-23N3                                                                                               | 20 MW | 22-March-2016 |
| GF-80N3, GF-07N1, GF-26N2, GF-149N4, GF-03N3, GF-163N, GF-162N, GF-134N2, GF-165N, GF-44N4, GF-135N2, GF-161N, GF-82N                                                                     | 26 MW | 27-March-2016 |

There is no changes in the project design occurred since the commissioning of the project.

The project was operational continuously during the monitoring period without any major breakdown.

## 3.2 Deviations

### 2.1.1 Methodology Deviations

There is no methodology deviation applied.

### 2.1.2 Project Description Deviations

There is no project description deviation applied.

## 3.3 Grouped Projects

The project is not a grouped project. Hence, not applicable.

# 4 DATA AND PARAMETERS

## 4.1 Data and Parameters Available at Validation

|                  |                                                                 |
|------------------|-----------------------------------------------------------------|
| Data / Parameter | EF <sub>om, y</sub>                                             |
| Data unit        | tCO <sub>2</sub> /MWh                                           |
| Description      | Operating margin CO <sub>2</sub> emission factor of INDIAN Grid |
| Source of data   | Central Electricity Authority:CO <sub>2</sub> Emission Database |

|                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|----------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                              | CEA CO2 Baseline database Version 11 <sup>4</sup>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Value applied                                                                                | 0.9941                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Justification of choice of data or description of measurement methods and procedures applied | <p>Calculated in line with “<i>Tool to calculate the emission factor for an electricity system (Version 06.0.0)</i>” using data from Central Electricity Authority of India’s (CEA) “<i>Baseline Carbon Dioxide Emission Database Version 11.0</i>”.</p> <p>The value used is calculated ex-ante as generation based weighted average of last three years of the operating margin provided in the CEA database.</p> <p>Weighted average</p> $= \frac{\sum_{i=1 \text{ to } n} (\text{Net generation in operating margin in year } i) * \text{Simple operating margin in year } i)}{\sum_{i=1 \text{ to } n} (\text{Net generation in operating margin of year } i)}$ |
| Purpose of Data                                                                              | Baseline Emission calculation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Comments                                                                                     | The operating margin emission factor is a 3-year generation-weighted average (2012-15). The operating Margin is calculated ex ante and fixed during the crediting period                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |

|                                                                                              |                                                                                                                                                                                                                                                                                                                                                 |
|----------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Data / Parameter                                                                             | EF <sub>BM,y</sub>                                                                                                                                                                                                                                                                                                                              |
| Data unit                                                                                    | tCO2/MWh                                                                                                                                                                                                                                                                                                                                        |
| Description                                                                                  | Build margin CO2 emission factor of INDIAN grid                                                                                                                                                                                                                                                                                                 |
| Source of data                                                                               | Central Electricity Authority:CO2 Emission Database<br>CEA CO2 Baseline database Version 11 <sup>5</sup>                                                                                                                                                                                                                                        |
| Value applied                                                                                | 0.9285                                                                                                                                                                                                                                                                                                                                          |
| Justification of choice of data or description of measurement methods and procedures applied | <p>Calculated in line with “<i>Tool to calculate the emission factor for an electricity system (Version 06.0.0)</i>” using data from Central Electricity Authority of India’s (CEA) “<i>Baseline Carbon Dioxide Emission Database Version 11.0</i>”.</p> <p>The value is calculated ex-ante as most recent build margin provided by the CEA</p> |
| Purpose of Data                                                                              | Baseline Emission calculation                                                                                                                                                                                                                                                                                                                   |
| Comments                                                                                     | The Build Margin would be calculated ex ante and fixed during the crediting period. For ex ante calculation the most recent data (2014-15) available has been used and the build margin is thus calculated.                                                                                                                                     |

|                  |                         |
|------------------|-------------------------|
| Data / Parameter | EF <sub>grid,CM,y</sub> |
|------------------|-------------------------|

<sup>4</sup> [http://www.cea.nic.in/reports/others/thermal/tpece/cdm\\_co2/user\\_guide\\_ver11.pdf](http://www.cea.nic.in/reports/others/thermal/tpece/cdm_co2/user_guide_ver11.pdf)
<sup>5</sup> [http://www.cea.nic.in/reports/others/thermal/tpece/cdm\\_co2/user\\_guide\\_ver11.pdf](http://www.cea.nic.in/reports/others/thermal/tpece/cdm_co2/user_guide_ver11.pdf)

|                                                                                              |                                                                                                                                                                                                                                   |
|----------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Data unit                                                                                    | tCO <sub>2</sub> /MWh                                                                                                                                                                                                             |
| Description                                                                                  | Combined margin CO <sub>2</sub> emission factor of INDIAN grid                                                                                                                                                                    |
| Source of data                                                                               | Central Electricity Authority:CO <sub>2</sub> Emission Database<br>CEA CO <sub>2</sub> Baseline database Version 11 <sup>6</sup>                                                                                                  |
| Value applied                                                                                | 0.9777                                                                                                                                                                                                                            |
| 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 <sub>grid,OMsimple</sub> , & 25% weightage of EF <sub>grid,BM,y</sub> . |
| Purpose of Data                                                                              | Baseline Emission calculation                                                                                                                                                                                                     |
| Comments                                                                                     | The combined margin would be calculated ex-ante and fixed for the entire crediting period and the combined margin thus calculated is 0.9777.                                                                                      |

## 4.2 Data and Parameters Monitored

|                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                             |
|-----------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Data / Parameter                                                | EG <sub>facility,y</sub> <sup>7</sup>                                                                                                                                                                                                                                                                                                                                                                       |
| Data unit                                                       | MWh                                                                                                                                                                                                                                                                                                                                                                                                         |
| Description                                                     | Calculated (based on the measured values of electricity exported and imported)                                                                                                                                                                                                                                                                                                                              |
| Source of data                                                  | Share Certificate Issued by Gamesa and JMR (Joint Meter Reading) by EB                                                                                                                                                                                                                                                                                                                                      |
| Description of measurement methods and procedures to be applied | Net electricity supplied will be calculated based on the difference between calculated values of “export”, “import” and “transmission loss” on the EB energy meter at the “evacuation point” and at Government Substation”. Transmission loss is calculated on pro-rata basis as per the readings of “substation & “primary metering Point”.<br><br>(Net Electricity = Export – Import – Transmission Loss) |
| Frequency of monitoring/recording                               | Measurement: Continuous<br>Recording: Monthly<br>Monitoring Method: recording in JMR (Joining Meter Reading)<br><br>The JMR includes, monthly recording of electricity export, import & transmission loss.                                                                                                                                                                                                  |
| Value monitored                                                 | 395,446                                                                                                                                                                                                                                                                                                                                                                                                     |
| Monitoring equipment                                            | Energy meters of accuracy class 0.5 or better.                                                                                                                                                                                                                                                                                                                                                              |

<sup>6</sup> [http://www.cea.nic.in/reports/others/thermal/tpece/cdm\\_co2/user\\_guide\\_ver11.pdf](http://www.cea.nic.in/reports/others/thermal/tpece/cdm_co2/user_guide_ver11.pdf)

<sup>7</sup> If the project activity is the installation of a Greenfield power plant, then:  $EGPJ,y = EG_{facility,y}$

| QA/QC procedures to be applied                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Details                                                   | Line I     |                    |       |                  |          |                    |                   |            |            |        |            |            |        |                    |            |            |        |            |            |        |                    |            |            |        |            |            |        |                     |            |            |        |            |            |        |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------|------------|--------------------|-------|------------------|----------|--------------------|-------------------|------------|------------|--------|------------|------------|--------|--------------------|------------|------------|--------|------------|------------|--------|--------------------|------------|------------|--------|------------|------------|--------|---------------------|------------|------------|--------|------------|------------|--------|
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                           | Main meter | Check meter        |       |                  |          |                    |                   |            |            |        |            |            |        |                    |            |            |        |            |            |        |                    |            |            |        |            |            |        |                     |            |            |        |            |            |        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Meter Number                                              | XC548500   | XC548501           |       |                  |          |                    |                   |            |            |        |            |            |        |                    |            |            |        |            |            |        |                    |            |            |        |            |            |        |                     |            |            |        |            |            |        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Make                                                      | Secure     | Secure             |       |                  |          |                    |                   |            |            |        |            |            |        |                    |            |            |        |            |            |        |                    |            |            |        |            |            |        |                     |            |            |        |            |            |        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Accuracy                                                  | 0.2S       | 0.2S               |       |                  |          |                    |                   |            |            |        |            |            |        |                    |            |            |        |            |            |        |                    |            |            |        |            |            |        |                     |            |            |        |            |            |        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Location                                                  | GSS        | GSS                |       |                  |          |                    |                   |            |            |        |            |            |        |                    |            |            |        |            |            |        |                    |            |            |        |            |            |        |                     |            |            |        |            |            |        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Details                                                   | Line II    |                    |       |                  |          |                    |                   |            |            |        |            |            |        |                    |            |            |        |            |            |        |                    |            |            |        |            |            |        |                     |            |            |        |            |            |        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                           | Main meter | Check meter        |       |                  |          |                    |                   |            |            |        |            |            |        |                    |            |            |        |            |            |        |                    |            |            |        |            |            |        |                     |            |            |        |            |            |        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Meter Number                                              | XC548502   | XC548503           |       |                  |          |                    |                   |            |            |        |            |            |        |                    |            |            |        |            |            |        |                    |            |            |        |            |            |        |                     |            |            |        |            |            |        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Make                                                      | Secure     | Secure             |       |                  |          |                    |                   |            |            |        |            |            |        |                    |            |            |        |            |            |        |                    |            |            |        |            |            |        |                     |            |            |        |            |            |        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Accuracy                                                  | 0.2S       | 0.2S               |       |                  |          |                    |                   |            |            |        |            |            |        |                    |            |            |        |            |            |        |                    |            |            |        |            |            |        |                     |            |            |        |            |            |        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Location                                                  | GSS        | GSS                |       |                  |          |                    |                   |            |            |        |            |            |        |                    |            |            |        |            |            |        |                    |            |            |        |            |            |        |                     |            |            |        |            |            |        |
| <p>Net electricity supplied to the grid by the project activity will be cross checked with invoices submitted to EB. 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.</p> <p>Calibration of electricity meters is carried out in-line with the Nation standard<sup>8</sup> which recommends at least once in 5 year calibration or whenever abnormal difference/inconsistency is observed between main meter and check meter.</p> <p>Meter Calibration Dates:</p> <table> <tr> <th>Meter</th><th>Calibration Date</th><th>Due date</th><th>Calibration agency</th></tr> <tr> <td rowspan="2">Main meter Line I</td><td>18/06/2019</td><td>17/06/2024</td><td>MPPTCL</td></tr> <tr> <td>20/02/2020</td><td>19/02/2025</td><td>MPPTCL</td></tr> <tr> <td rowspan="2">Check meter Line I</td><td>18/06/2019</td><td>17/06/2024</td><td>MPPTCL</td></tr> <tr> <td>20/02/2020</td><td>19/02/2025</td><td>MPPTCL</td></tr> <tr> <td rowspan="2">Main meter Line II</td><td>18/06/2019</td><td>17/06/2024</td><td>MPPTCL</td></tr> <tr> <td>20/02/2020</td><td>19/02/2025</td><td>MPPTCL</td></tr> <tr> <td rowspan="2">Check meter Line II</td><td>18/06/2019</td><td>17/06/2024</td><td>MPPTCL</td></tr> <tr> <td>20/02/2020</td><td>19/02/2025</td><td>MPPTCL</td></tr> </table> |                                                           |            |                    | Meter | Calibration Date | Due date | Calibration agency | Main meter Line I | 18/06/2019 | 17/06/2024 | MPPTCL | 20/02/2020 | 19/02/2025 | MPPTCL | Check meter Line I | 18/06/2019 | 17/06/2024 | MPPTCL | 20/02/2020 | 19/02/2025 | MPPTCL | Main meter Line II | 18/06/2019 | 17/06/2024 | MPPTCL | 20/02/2020 | 19/02/2025 | MPPTCL | Check meter Line II | 18/06/2019 | 17/06/2024 | MPPTCL | 20/02/2020 | 19/02/2025 | MPPTCL |
| Meter                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Calibration Date                                          | Due date   | Calibration agency |       |                  |          |                    |                   |            |            |        |            |            |        |                    |            |            |        |            |            |        |                    |            |            |        |            |            |        |                     |            |            |        |            |            |        |
| Main meter Line I                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 18/06/2019                                                | 17/06/2024 | MPPTCL             |       |                  |          |                    |                   |            |            |        |            |            |        |                    |            |            |        |            |            |        |                    |            |            |        |            |            |        |                     |            |            |        |            |            |        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 20/02/2020                                                | 19/02/2025 | MPPTCL             |       |                  |          |                    |                   |            |            |        |            |            |        |                    |            |            |        |            |            |        |                    |            |            |        |            |            |        |                     |            |            |        |            |            |        |
| Check meter Line I                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 18/06/2019                                                | 17/06/2024 | MPPTCL             |       |                  |          |                    |                   |            |            |        |            |            |        |                    |            |            |        |            |            |        |                    |            |            |        |            |            |        |                     |            |            |        |            |            |        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 20/02/2020                                                | 19/02/2025 | MPPTCL             |       |                  |          |                    |                   |            |            |        |            |            |        |                    |            |            |        |            |            |        |                    |            |            |        |            |            |        |                     |            |            |        |            |            |        |
| Main meter Line II                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 18/06/2019                                                | 17/06/2024 | MPPTCL             |       |                  |          |                    |                   |            |            |        |            |            |        |                    |            |            |        |            |            |        |                    |            |            |        |            |            |        |                     |            |            |        |            |            |        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 20/02/2020                                                | 19/02/2025 | MPPTCL             |       |                  |          |                    |                   |            |            |        |            |            |        |                    |            |            |        |            |            |        |                    |            |            |        |            |            |        |                     |            |            |        |            |            |        |
| Check meter Line II                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 18/06/2019                                                | 17/06/2024 | MPPTCL             |       |                  |          |                    |                   |            |            |        |            |            |        |                    |            |            |        |            |            |        |                    |            |            |        |            |            |        |                     |            |            |        |            |            |        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 20/02/2020                                                | 19/02/2025 | MPPTCL             |       |                  |          |                    |                   |            |            |        |            |            |        |                    |            |            |        |            |            |        |                    |            |            |        |            |            |        |                     |            |            |        |            |            |        |
| Purpose of the data                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Calculation of baseline emissions                         |            |                    |       |                  |          |                    |                   |            |            |        |            |            |        |                    |            |            |        |            |            |        |                    |            |            |        |            |            |        |                     |            |            |        |            |            |        |
| Calculation method                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Net electricity = Electricity export – Electricity import |            |                    |       |                  |          |                    |                   |            |            |        |            |            |        |                    |            |            |        |            |            |        |                    |            |            |        |            |            |        |                     |            |            |        |            |            |        |
| Comments                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | -                                                         |            |                    |       |                  |          |                    |                   |            |            |        |            |            |        |                    |            |            |        |            |            |        |                    |            |            |        |            |            |        |                     |            |            |        |            |            |        |

### 4.3 Monitoring Plan

The project proponent has entered into agreement with the WTG Suppliers (Gamesa) 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

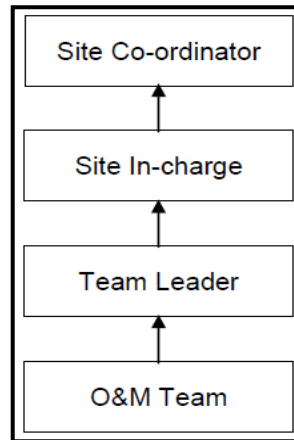
<sup>8</sup> (Page number 12 of ) [http://www.aegcl.co.in/Metering\\_Regulations\\_Of\\_CEA\\_17\\_03\\_2006.pdf](http://www.aegcl.co.in/Metering_Regulations_Of_CEA_17_03_2006.pdf)

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 roles and responsibilities for the project are described as below;

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 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. All the verified data are sent to site co-coordinator of the PP and it will be stored at HQ.

#### 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

#### Monitoring Process at project site

Joint monthly meter reading is taken at the Gamesa 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.

Currently, the PSS has only the project WTGs and hence there is no need to calculate transmission losses.

(Net Electricity = Export – Import)

However, in future if there are other WTGs connected to the same feeder in PSS with the project WTGs then O&M contractor (Gamesa) shall be responsible for calculation of net electricity and arriving at transmission loss. In such a scenario:

(Net Electricity = Export – Import – Transmission Loss)

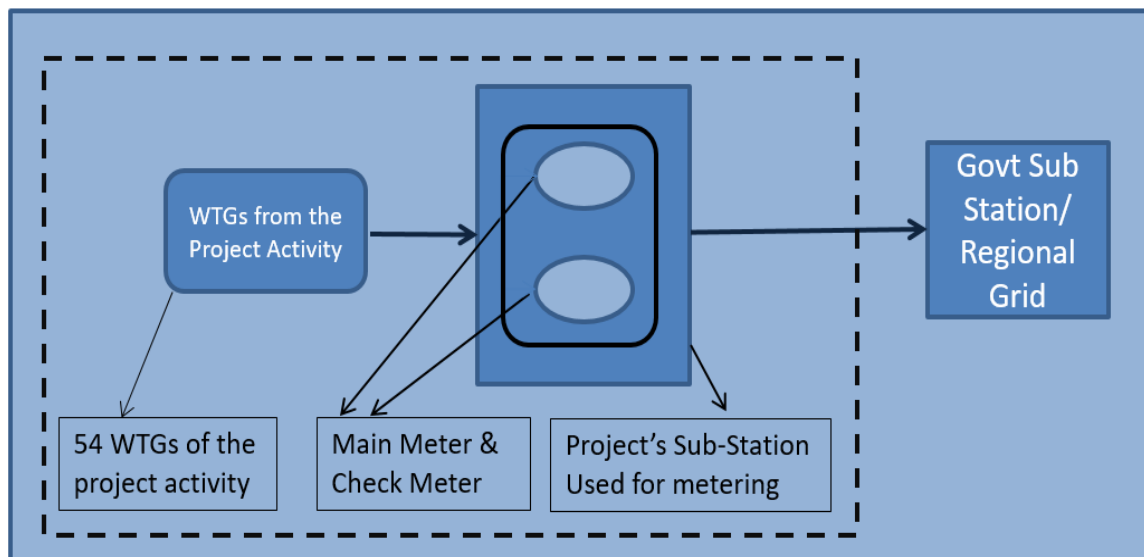
Based on the above procedure, the Monthly JMRs shall be provided to the project proponent. This is to be noted that the detail procedure of monitoring is illustrated here for the sake of understanding; for the preparation of monitoring report during periodic verifications, only the net electricity generation value shall be directly used for emission reduction calculation. No other parameters as explained above shall be used and presented in the monitoring report.

#### 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.

A schematic diagram indicating the metering system is provided below:



## 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, 0.9777 tCO2/MWh).

and;

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

Here,

$$BE_y = 395,446 \text{ MWh} * 0.9777 \text{ tCO}_2/\text{MWh} = 386,626 \text{ tCO}_2\text{e (Rounded down value)}$$

#### Year wise summary

| Vintage      | Baseline Emission (tCO <sub>2</sub> e) |
|--------------|----------------------------------------|
| 2019*        | 9,356                                  |
| 2020         | 181,363                                |
| 2021         | 195,907                                |
| <b>Total</b> | <b>386,626</b>                         |

\*From 01-December-2019 to 31-December-2019

### 5.2 Project Emissions

The project activity involves in harnessing wind power. So, the emissions from the project are zero.

### 5.3 Leakage

No leakage emissions have been considered and hence the leakage emission is zero.

### 5.4 Net GHG Emission Reductions and Removals

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

$$ER_y = BE_y - PE_y - LE_y$$

Where,

$ER_y$  = Emission Reduction in tCO<sub>2</sub>e/year

$BE_y$  = Baseline emission in tCO<sub>2</sub>/year

$PE_y$  = Project emissions in tCO<sub>2</sub>e/year

$LE_y$  = Leakage emission in tCO<sub>2</sub>e/year

| Year                                                | Baseline emissions or removals (tCO <sub>2</sub> e) | Project emissions or removals (tCO <sub>2</sub> e) | Leakage emissions (tCO <sub>2</sub> e) | Net GHG emission reductions or removals (tCO <sub>2</sub> e) |
|-----------------------------------------------------|-----------------------------------------------------|----------------------------------------------------|----------------------------------------|--------------------------------------------------------------|
| Year 2019<br>(01-December-2019 to 31-December-2019) | 9,356                                               | 0                                                  | 0                                      | 9,356                                                        |
| Year 2020<br>(01-January-2020 to 31-December-2020)  | 181,363                                             | 0                                                  | 0                                      | 181,363                                                      |
| Year 2021<br>(01-January-2021 to 31-December-2021)  | 195,907                                             | 0                                                  | 0                                      | 195,907                                                      |
| <b>Total</b>                                        | <b>386,626</b>                                      | <b>0</b>                                           | <b>0</b>                               | <b>386,626</b>                                               |

Comparison between actual emission reduction & estimated emission reduction:

|                                      |           |                      |
|--------------------------------------|-----------|----------------------|
| Monitoring period start date         | 1-Dec-19  |                      |
| Monitoring period end date           | 31-Dec-21 |                      |
| Number of days                       | 762       | Days                 |
| Annual estimated emission reduction  | 212,745   | tCO <sub>2</sub> /yr |
| Estimation for the monitoring period | 444,142   | tCO <sub>2</sub> e   |
| Actual Emission Reduction            | 386,626   | tCO <sub>2</sub> e   |
| Difference                           | -12.9%    |                      |

Since, the actual emission reduction lesser than the estimated emission reduction, no further justification is required.