# BUNDLED WIND POWER PROJECT IN KOPPAL KARNATAKA

Document Prepared by Infinite Solutions

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| Project Title | Bundled Wind Power Project in Koppal Karnataka |
| Version | 05 |
| Report ID | 03 |
| Date of Issue | 21-December- 2023 |
| Project ID | 1993 |
| Monitoring Period | 01-January-2021 to 31-December-2022 (first and last date included) |
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# 1 PROJECT DETAILS

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

The project activity involves installation of 64 WTGs of 2.1 MW each, totaling 134.4 $MW_{AC}$ Wind power project in Karnataka.

The project will replace anthropogenic emissions of greenhouse gases (GHG's) estimated to be approximately 335,085 $tCO_2e$ per annum, thereon displacing 357,692 MWh/year amount of electricity from the generation-mix of power plants connected to the Indian electricity grid, which is mainly dominated by thermal/ fossil fuel-based power plant. However, for already commissioned capacity in the project activity i.e., 107.1 MW and rest is yet to be commissioned, the project is replacing anthropogenic emissions of greenhouse gases (GHG's) estimated to be approximately 266,634 $tCO_2e$ per annum, thereon displacing 284,623 MWh/year amount of electricity.

The project activity is the installation of a new grid-connected renewable power plant/unit and this is not a CPA that has been excluded from a registered CDM PoA as a result of erroneous inclusion of CPAs.

The details of the project are mentioned in the table:

| Name of Project Developer | WTG Capacity | No. of WTGs | Project Capacity MW $_{AC}$ | No. of WTGs of commissioned plant | Commissioned Capacity MW $_{AC}$ | Location |
|---|---|---|---|---|---|---|
| Skeiron Renewable Energy Kushtagi Private Limited | 2.1 MW/WTG | 24 | 50.4 | 24 | 50.4 | Koppal District & Bagalkot district, Karnataka |
| Saroja Renewables Limited | 2.1 MW/WTG | 25 | 52.5 | 17 | 35.7 | Bagalkot district, Karnataka |
| Shanay Renewables Ltd. | 2.1 MW/WTG | 15 | 31.5 | 10 | 21 | Kushtagi, Koppal District, Karnataka |
| **Total** | | **64 WTGs** | **134.4** | | **107.1** | |

All the WTGs in this project activity were commissioned in phases in March 2018. The earliest commissioning date is 02-March-2018. The total capacity already commissioned is 107.1 MW and the details are as follows:

| **Shanay Renewables Ltd.** | | | **Electricity supply to** | **Total Capacity** |
|---|---|---|---|---|
| **Metering Loc.** | **WTG Loc. No.** | **Comm. Dates** | | 21 MW |
| KST -131 | 90, 131 | 28-March-2018 & 31-March-2018 | Gulbarga Electricity Supply Company Limited (GESCOM) | |
| KST-130 | 95, 97, 42, 75, 96, 128, 130, 72 | 28- March -2018 & 31- March -2018 | Gulbarga Electricity Supply Company Limited (GESCOM) | |
| **Saroja Renewables Limited** | | | | **Total Capacity** |
| **Metering Loc.** | **WTG Loc. No.** | **Comm. Dates** | | 35.7 MW |
| KST – 51 | 51 | 28-March-2018 | Hubli Electricity Supply Company Limited (HESCOM) | |
| KST – 71 | 47, 48, 70, 71, 124, 46, 49, 68 | | Gulbarga Electricity Supply Company Limited (GESCOM) | |
| KST – 67 | 65, 67, 105, 106, 122 | | Hubli Electricity Supply Company Limited (HESCOM) | |
| KST – 67 | 66, 103, 121 | 31-March-2018 | | |
| **Skeiron Renewable Energy and Kushtagi Private Limited** | | | | **Total Capacity** |
| **Metering Loc.no.** | **WTG Loc. No.** | **Comm. Dates** | | 50.4 MW |
| KST - 147 | 100, 126, 152, 153, 154, 155 | 02-March-2018 | Gulbarga Electricity Supply Company Limited (GESCOM) | |
| KST - 147 | 99, 147, 98, 123, 125 | 02-March-2018 | | |
| KST - 177 | 177, 148, 149, 188, 189, 233, 234, 235 | 02-March-2018 | Gulbarga Electricity Supply | |

| | | | |
|---|---|---|---|
| KST - 177 | 191, 236 | 31-March-2018 | Company Limited (GESCOM) |
| KST - 230 | 230 | 31-March-2018 | Hubli Electricity Supply Company Limited (HESCOM) |
| KST - 101 | 101, 102 | 31-March-2018 | Hubli Electricity Supply Company Limited (HESCOM) |

The monitoring period is from 01-January-2021 to 31-December-2022 (Inclusive of both the dates). The total generation during the current monitoring period is 550,148.81 MWh and GHG emission reductions generated in this monitoring period are 515,379 $tCO_2$ displacing thereon.

**Scenario existing prior to the implementation of project activity:**

The scenario existing prior to the implementation of the project activity, is electricity delivered to the grid by the project activity that would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources, as reflected in the combined margin (CM) calculations described in the "Tool to calculate the emission factor for an electricity system" Version 7.0 EB 100 Annex 4.

**Baseline Scenario**:

As per the applicable methodology, a Greenfield power plant is defined as "a new renewable energy power plant that is constructed and operated at a site where no renewable energy power plant was operated prior to the implementation of the project activity".

As the project activity falls under the definition of a Greenfield power plant, the baseline scenario as per paragraph 24 of Section 5.2.1 of applied methodology is the following:

If the project activity is the installation of a Greenfield power plant, the baseline scenario is electricity delivered to the grid by the project activity would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources, as reflected in the combined margin (CM) calculations described in the "Tool to calculate the emission factor for an electricity system".

Hence, pre-project scenario and baseline scenario are the same.

| Audit Type | Period | Program | VVB Name | Number of years |
|---|---|---|---|---|

| | | | | |
|---|---|---|---|---|
| Validation + Verification | 02-March-2018 to 30-September-2019 (Inclusive of both days) | VCS | LGAI Technological Center S.A. (Applus+ Certification) | 01 years 06 months 29 days |
| Verification | 01-October-2019 to 31-December-2020 (Inclusive of both days) | VCS | TÜV SÜD South Asia Pvt Ltd | 01 years 03 months 00 days |
| Verification | 01-January-2021 to 31-December-2022 (Inclusive of both days) current monitoring period | VCS | VKU CERTIFICATION PVT. LTD. | 02 years 00 months 00 days |
| Total | | | | 04 years 09 months 29 days |

## 1.2 Sectoral Scope and Project Type

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

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

**Project Type:** I - Renewable Energy Projects

**Methodology:** ACM0002: Grid-connected electricity generation from renewable sources (Version 19)[1]

The project is neither a grouped nor an AFOLU project activity.

## 1.3 Project Proponent

| | |
|---|---|
| **Organization name** | Skeiron Renewable Energy Kushtagi Private Limited |
| **Contact person** | Murali Krishnam Raju M |
| **Title** | Senior Manager - Commercial |
| **Address** | Plot No. #1131/A, Road no. 36 Jubilee Hills, Hyderabad – 500033. Telangana, India. |
| **Telephone** | +91 40 40301004 |

[1] https://cdm.unfccc.int/UserManagement/FileStorage/58IAGB7SZUDEO2VN6LYM30K41HFPRQ

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|---|---|
| Email | muraliraju.m@greenkogroup.com |

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|---|---|
| Organization name | Saroja Renewables Limited |
| Contact person | Murali Krishnam Raju M |
| Title | Senior Manager - Commercial |
| Address | Plot No. #1131/A, Road no. 36 Jubilee Hills, Hyderabad – Telangana, India.500033. |
| Telephone | +91 40 40301004 |
| Email | muraliraju.m@greenkogroup.com |

| | |
|---|---|
| Organization name | Shanay Renewables Ltd. |
| Contact person | Murali Krishnam Raju M |
| Title | Senior Manager - Commercial |
| Address | Plot No. #1131/A, Road no. 36 Jubilee Hills, Hyderabad – 500033 Telangana, India. |
| Telephone | +91 40 40301004 |
| Email | muraliraju.m@greenkogroup.com |

## 1.4 Other Entities Involved in the Project

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|---|---|
| Organization name | Infinite Solutions |
| Role in the Project | Project Consultant |
| Contact person | Mr. Jimmy Sah |
| Title | Head – Sustainability |
| Address | 214-215, Milinda Manor, Opp. Next Treasure Island, 2 RNT Marg, Indore, India - 452001 |

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| Telephone | +91-9644130430 |
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## 1.5 Project Start Date

Project Start Date: 02-March-2018;

The project start date is the earliest commissioning date amongst all the project WTGs which are part of this Large-Scale Wind power project.

## 1.6 Project Crediting Period

Crediting Period Start date: 02-March-2018;

Crediting Period End date: 01-March-2028; (Inclusive of both days)

Estimated life time of the project: 25 years

The project activity adopts renewable crediting period with the first crediting period of 10 years and with an option to renew twice, considering the lifetime of the project activity to be 25 years. The current monitoring period is under first crediting period.

## 1.7 Project Location

The WTGs installed by the project proponent are distributed across the Bagalkot & Koppal District of Karnataka. The project geo-coordinates are given below-

**Skerion WTG Locations:**

| WTG ID | Degrees | Minutes | Seconds | | Degrees | Minutes | Seconds | |
|---|---|---|---|---|---|---|---|---|
| KST098 | 15.00 | 55.00 | 1.18 | N | 76.00 | 10.00 | 56.69 | E |
| KST099 | 15.00 | 55.00 | 18.07 | N | 76.00 | 10.00 | 55.78 | E |
| KST100 | 15.00 | 55.00 | 36.86 | N | 76.00 | 10.00 | 53.80 | E |
| KST101 | 15.00 | 54.00 | 40.72 | N | 76.00 | 15.00 | 42.32 | E |
| KST123 | 15.00 | 55.00 | 51.57 | N | 76.00 | 11.00 | 40.67 | E |
| KST125 | 15.00 | 54.00 | 45.33 | N | 76.00 | 12.00 | 36.97 | E |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| KST126 | 15.00 | 54.00 | 27.38 | N | 76.00 | 12.00 | 46.92 | E |
| KST147 | 15.00 | 53.00 | 42.58 | N | 76.00 | 13.00 | 36.41 | E |
| KST148 | 15.00 | 54.00 | 19.33 | N | 76.00 | 13.00 | 51.50 | E |
| KST149 | 15.00 | 54.00 | 23.17 | N | 76.00 | 13.00 | 18.10 | E |
| KST152 | 15.00 | 55.00 | 28.71 | N | 76.00 | 13.00 | 11.26 | E |
| KST153 | 15.00 | 55.00 | 38.44 | N | 76.00 | 12.00 | 48.45 | E |
| KST154 | 15.00 | 55.00 | 53.58 | N | 76.00 | 12.00 | 35.26 | E |
| KST155 | 15.00 | 56.00 | 14.49 | N | 76.00 | 12.00 | 18.97 | E |
| KST177 | 15.00 | 53.00 | 50.92 | N | 76.00 | 14.00 | 26.29 | E |
| KST188 | 15.00 | 53.00 | 15.44 | N | 76.00 | 15.00 | 19.90 | E |
| KST189 | 15.00 | 53.00 | 42.34 | N | 76.00 | 15.00 | 21.52 | E |
| KST191 | 15.00 | 52.00 | 55.13 | N | 76.00 | 15.00 | 43.78 | E |
| KST230 | 15.00 | 54.00 | 22.74 | N | 76.00 | 16.00 | 2.65 | E |
| KST233 | 15.00 | 54.00 | 2.66 | N | 76.00 | 17.00 | 4.56 | E |
| KST234 | 15.00 | 53.00 | 49.30 | N | 76.00 | 17.00 | 1.96 | E |
| KST235 | 15.00 | 53.00 | 31.31 | N | 76.00 | 17.00 | 6.69 | E |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| KST236 | 15.00 | 52.00 | 55.12 | N | 76.00 | 16.00 | 50.86 | E |
| KST102 | 15.00 | 55.00 | 2.48 | N | 76.00 | 15.00 | 50.43 | E |

SAROJA WTG Locations

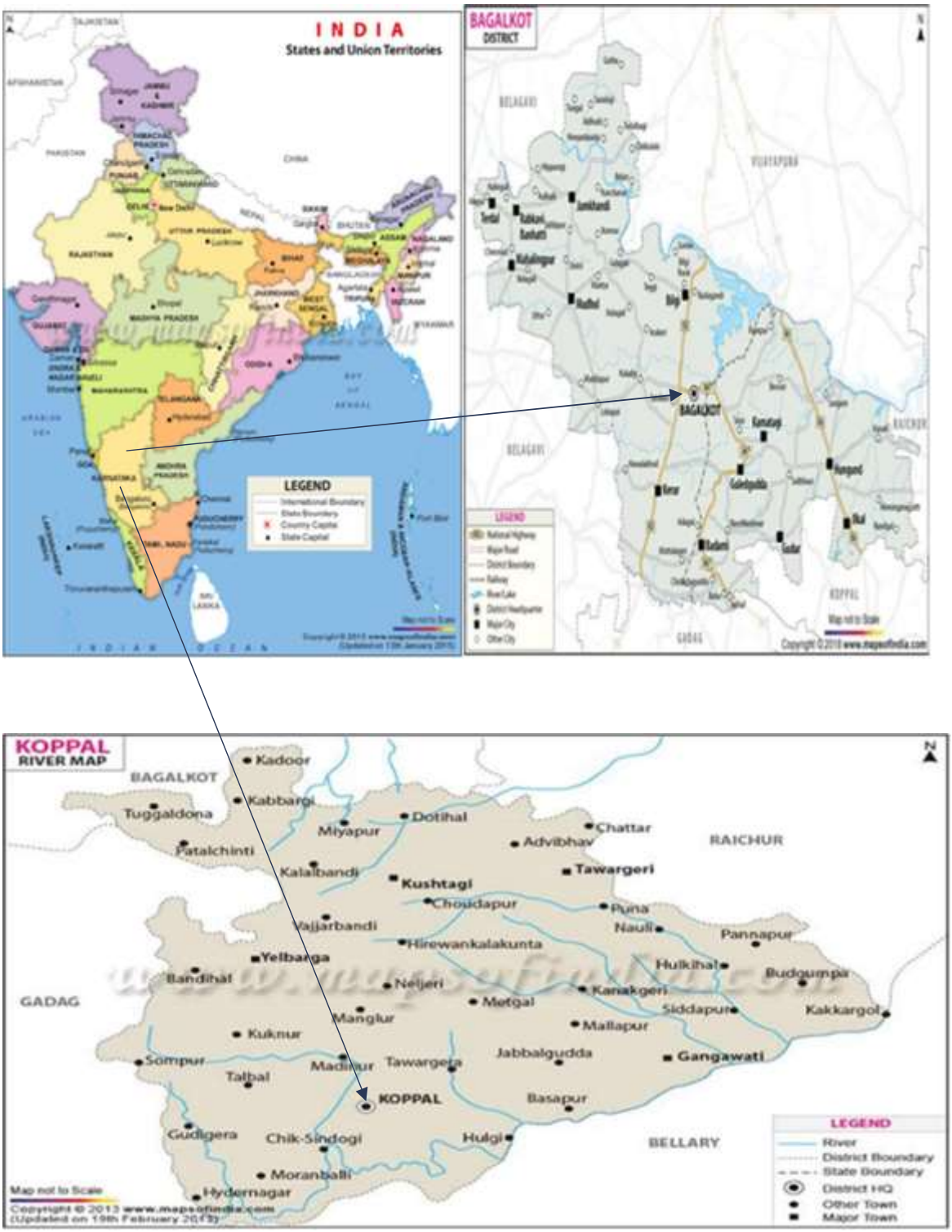
| WTG ID | Degrees | Minutes | Seconds | | Degrees | Minutes | Seconds | |
|---|---|---|---|---|---|---|---|---|
| KST071 | 15.00 | 54.00 | 47.93 | N | 76.00 | 10.00 | 33.47 | E |
| KST046 | 15.00 | 53.00 | 41.36 | N | 76.00 | 9.00 | 25.87 | E |
| KST047 | 15.00 | 52.00 | 56.68 | N | 76.00 | 9.00 | 33.35 | E |
| KST048 | 15.00 | 52.00 | 36.25 | N | 76.00 | 9.00 | 32.90 | E |
| KST049 | 15.00 | 52.00 | 9.93 | N | 76.00 | 8.00 | 59.73 | E |
| KST051 | 15.00 | 55.00 | 14.79 | N | 76.00 | 9.00 | 31.75 | E |
| KST065 | 15.00 | 56.00 | 27.83 | N | 76.00 | 9.00 | 45.29 | E |
| KST066 | 15.00 | 56.00 | 2.42 | N | 76.00 | 9.00 | 25.91 | E |
| KST067 | 15.00 | 55.00 | 27.17 | N | 76.00 | 10.00 | 5.39 | E |
| KST068 | 15.00 | 55.00 | 41.20 | N | 76.00 | 10.00 | 21.71 | E |
| KST070 | 15.00 | 55.00 | 1.33 | N | 76.00 | 10.00 | 5.98 | E |
| KST103 | 15.00 | 56.00 | 15.59 | N | 76.00 | 10.00 | 51.91 | E |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| KST105 | 15.00 | 57.00 | 28.11 | N | 76.00 | 11.00 | 24.32 | E |
| KST106 | 15.00 | 56.00 | 37.51 | N | 76.00 | 10.00 | 48.88 | E |
| KST121 | 15.00 | 56.00 | 0.96 | N | 76.00 | 10.00 | 50.24 | E |
| KST122 | 15.00 | 56.00 | 23.88 | N | 76.00 | 9.00 | 5.98 | E |

SHANAY WTG Locations

| WTG ID | Degrees | Minutes | Seconds | | Degrees | Minutes | Seconds | |
|---|---|---|---|---|---|---|---|---|
| KST072 | 15.00 | 54.00 | 29.32 | N | 76.00 | 10.00 | 40.06 | E |
| KST075 | 15.00 | 52.00 | 6.47 | N | 76.00 | 11.00 | 21.12 | E |
| KST090 | 15.00 | 52.00 | 50.70 | N | 76.00 | 11.00 | 1.47 | E |
| KST095 | 15.00 | 54.00 | 7.41 | N | 76.00 | 11.00 | 22.30 | E |
| KST096 | 15.00 | 51.00 | 44.55 | N | 76.00 | 11.00 | 24.55 | E |
| KST097 | 15.00 | 54.00 | 34.51 | N | 76.00 | 11.00 | 18.52 | E |
| KST128 | 15.00 | 51.00 | 24.03 | N | 76.00 | 10.00 | 40.66 | E |
| KST130 | 15.00 | 53.00 | 44.67 | N | 76.00 | 11.00 | 16.62 | E |
| KST131 | 15.00 | 53.00 | 22.60 | N | 76.00 | 13.00 | 8.18 | E |
| KST042 | 15.00 | 51.00 | 25.02 | N | 76.00 | 11.00 | 32.37 | E |

The project location in the map is shown below-



## 1.8 Title and Reference of Methodology

**Title** : Grid-connected electricity generation from renewable sources

**Reference** : The project activity meets the eligibility criteria of large-scale project as it is more than 15 MW- CDM glossary[2].

**Type I** : Energy industries (renewable / non-renewable sources) Category: Approved Consolidated Methodology (ACM0002)

**Methodology:** ACM0002: Grid-connected electricity generation from renewable sources --- Version 19.0, Sectoral Scope: 01, EB 100, Annex 6
https://cdm.unfccc.int/methodologies/DB/VJI9AX539D9ML0PXN2AY9UR1N4IYGD

The project activity also takes reference from following Tools from the tools prescribed by applied methodology:

- Tool 01: Tool for the demonstration and assessment of additionality --- Version 07.0.0, EB 70, Annex 8.
  https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-01-v7.0.0.pdf
- Tool 07: Tool to calculate the emission factor for an electricity system --- Version 07.0, EB 100, Annex 4.
  https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-07-v7.0.pdf

## 1.9 Participation under other GHG Programs

The Project is not registered under any other GHG programs and neither has participated in any other GHG programs. The undertaking from PP has been submitted for no any double accounting for current monitoring period and project activity is not participated any other GHG program other than VCS.

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

- Emission Trading Programs and Other Binding Limits: The project is not a part of any emission trading program as confirmed by the project proponent through the declaration of no double counting certificate.
- Other Forms of Environmental Credit: The project activity has not availed any other form of environmental credit as confirmed by the project proponent through the declaration of no

[2] As per CDM glossary SSC CDM project activity means Renewable energy project activities which have an output capacity up to 15 megawatts (or an appropriate equivalent), in accordance with the CDM rules and requirements. The project activity of more than 15 MW are considered as large-scale CDM project activity.

double counting. Furthermore, the project activity is not availing any benefits from CDM/GS/GCC/UCR/RECs mechanism which can be confirmed from the links below:

https://www.recregistryindia.nic.in/index.php/publics/accredited_regens

CDM: CDM-Home (unfccc.int)

https://www.goldstandard.org/

https://projects.globalcarboncouncil.com/

https://www.ucarbonregistry.io/

Registries | I-REC Standard (irecstandard.org)

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

## 1.11 Sustainable Development Contributions

The wind Project is located at Bagalkot & Koppal District of Karnataka, India. The Wind power or wind energy describes the process by which the wind is used to electricity. Wind turbines convert the kinetic energy in the wind into mechanical power.

The project is contributing in sustainable development by generating electricity and reduction of $CO_2$ emissions due to implementation of project activity and generates employment to the local stakeholders. Through Project activity economic development has been achieved in the project location by creating opportunities of employment during the project lifetime. Project owner monitors the carbon emission with help of the record of electricity generated.

**Table 1: Sustainable Development Contributions**

The project is wind power project, it has generated 550,148.81MWh electricity and avoided 515,379 tonnes of greenhouse gas emissions in the atmosphere during the current monitoring period. So, the project will contribute to the sustainable development and it is fulfilling SDG 07 and SDG 13.

| Row number | SDG Target | SDG Indicator | Net Impact on SDG Indicator | Current Project Contributions | Contributions Over Project Lifetime |
|---|---|---|---|---|---|
| 1) | 7.2 | 7.2.1: Renewable energy share in the total final energy consumption | Implemented activities to increase | About 550,148.81 MWh, renewable electricity has supplied to Indian Grid during the reported period that helps to increase the renewable energy share in the energy mix | Since Commissioning, about 1,376,542.81 MWh (492,136+334,258+550,148.81)[3] renewable electricity has supplied to Indian Grid that helps to increase the renewable energy share in the energy mix. |
| 2) | 13.0 | Tonnes of greenhouse gas emissions avoided or removed | Implemented activities to increase | By installation of 107.1 MW wind Power Plant, project has prevented the release of 515,379 tons of carbon into the atmosphere during the monitoring period | Prevented the release of 1,289,542 $tCO_2e$ (461,033+313,130+515,379)[4] into the atmosphere. |

[3] https://registry.verra.org/app/projectDetail/VCS/1993

[4] https://registry.verra.org/app/projectDetail/VCS/1993

# 2 SAFEGUARDS

## 2.1 No Net Harm

The project activity does not involve any major construction activity. It primarily requires the installation of the WTGs, interfacing the generators with the State Electricity Board by setting up HT transmission lines and installation of other accessories.

The report on "Developmental Impacts and Sustainable Governance Aspects of Renewable Energy Projects" prepared by MNRE dated September 2013. This report clearly mentioned that wind project activity operations do not result in direct air pollution, noise pollution. Please refer below web link for the same[5].

Thus, there are no any significant impacts due to implementation of project activity on air, water, soil quality and ambience are envisaged due to the project activity. There were no socio-economic impacts identified from the project and hence no mitigations measures are applicable.

## 2.2 Local Stakeholder Consultation

The project has already been registered under VCS mechanism.

The stakeholders of the project activity were invited to attend the stakeholder meeting on 20-January- 2018. Personal invitations were also sent to the prominent members of the regions in the vicinity along with public display of invitation letters.

A stakeholder meeting was held on 25-January- 2018 involving the local stakeholders at the project site. The meeting was attended by local villagers, panchayat members, shopkeepers, suppliers, vendors and representatives of PPs. The stakeholders were explained about the project activity and the various benefits arising out of the project activity. A discussion was held in which the views of the local stakeholders were addressed.

In the introductory speech, the representative of PP welcomed the gathering and given a brief about the climate mitigation project activity. Subsequent to the introductory speech, stakeholders were explained about the electricity generation from wind project is an environmentally friendly power generation technology contributing to reduction in GHG emissions. They were also explained about the benefits of the wind power projects like, increasing energy availability and improving quality of

[5] https://smartnet.niua.org/sites/default/files/resources/report-on-developmental-impacts-of-RE.pdf

power and its assistance to the local population by providing employment opportunities to both skilled & unskilled labors.

Nevertheless, PP is open for the continuous stakeholder interaction and formed a grievance/suggestion register and a grievance box placed at the entrance of project site and is being continuously monitored and all the grievances should be necessarily addressed through the grievances cell and shared with concerned department and redressed as soon as possible in the Organisation if found genuine on regular basis and maintained the records. PP has explained this mechanism to the local stakeholders transparently and kept the notice that PP is mentioning the grievance register and box at the entrance of project site. No issues and grievance for the project activity has been identified during the current monitoring period.

## 2.3 AFOLU-Specific Safeguards

Not Applicable to the project activity

# 3 IMPLEMENTATION STATUS

## 3.1 Implementation Status of the Project Activity

The project activity involves the installation of Wind project. The total registered capacity is 134.7 MW and installed capacity of the project is 107.1 MW and rest is yet to be commissioned. The project located in Karnataka state in India.

The Project activity is a new facility (Greenfield) and the electricity generated by the project will be exported to the Indian electricity grid. The project will therefore displace an equivalent amount of electricity which would have otherwise been generated by fossil fuel dominant electricity grid. The Project Proponent plans to avail the VCS benefits for the project. The plant was commissioned on 02-March-2018 and it running smoothly with specific schedule maintenance works. In the Pre-project scenario, the entire electricity, delivered to the grid by the project activity, would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources. No any changes occurred during the current monitoring activity which can alter the design of the project activity. No change in project proponent or other entity. The details are same as the registered joint PD & MR.

The voltage generated at the generator is 690 V and stepped up to 33 kV, the 33 kV is stepped up to 220 kV, and the same is connected to the PSS. From PSS, it is transmitted to GSS and synchronized to the grid.

The project installs Suzlon make WTGs of individual capacity 2.1 MW. The salient Features of Suzlon S- S111-2.1 MW WTG are as Follows: -

| Parameter | Specifications |
|---|---|
| Rotor | 2.1 MW -Suzlon |
| Installed electrical output | 2100 kW |
| Diameter | 111.8 m |
| Cut-in wind speed | 3 m/s |
| Rated wind speed | 12.5 m/s |
| Cut-out wind speed | 30 m/s |
| Rotor swept area | 9852 m2 |
| Regulation | Pitch |
| Type | Asynchronous, 3 Phase Induction |
| Rated output | 2100 kW |
| Operating voltage | 690 V |
| Frequency | 50 Hz / 60 Hz |
| **GENERATOR** | |
| Frequency | 50Hz |
| Asynchronous | Slip ring |
| Rated voltage | 690 / 600V |
| Cooling system | Air cooled |
| **Technical specification Power Transformers** | |
| Make | Prime Medin |
| Voltage | 220KV/33KV |
| Rated Power | 80/100 MVA |
| Frequency | 50 Hz |

Further, there are no changes to the project participant or the project activity during the monitoring period.

The project has undergone continuous operation and there is no major incident observed for the monitoring period. “The plant underwent some maintenance and some breakdowns”. The breakdowns details are provided in appendix 2 of MR. The actual emission reductions are 23.10% lower as compared to the estimated emission reductions.

The WTGs are under operation including scheduled shutdowns during the current monitoring period. The breakdown occurred is for a total of 3.19% of total hours of all WTGs and is beyond the control of PP. Therefore, due to this percentage variations of breakdown identified in the current monitoring period also it has no impact in the GHG emissions reductions. The summary of breakdown details

in the current monitoring period has been described in the below table and detailed analysis of the same has been provided in Appendix 2 of this monitoring report.

| S.No. | Plant Site | Total Hours | Net operational Hours | Breakdown Hours |
|---|---|---|---|---|
| 1 | Skeiron Renewable Energy Kushtagi Private Limited | 893,520 hours[6] | 883,609 hours/ 98.89% of total hours | 9,911 hours/1.10% of total hours |
| 2 | Saroja Renewables Limited | | 878,611 hours/ 98.33% of total hours | 14,909 hours/1.66% of total hours |
| 3 | Shanay Renewables Ltd | | 889,768 hours/ 99.58% of total hours | 3,752 hours/0.41% of total hours |
| **Total** | | | **864,948 hours/ 96.80% of total hours** | **28,572 hours/3.19% of total hours** |

## 3.2 Deviations

### 3.2.1 Methodology Deviations

There are no methodology deviations in the current or previous monitoring period as per registered VCS PDMR.

### 3.2.2 Project Description Deviations

Project deviation applicable:

**Deviation 1:** In the registered VCS joint PD & MR, there was no formula used for the calculation of data adjustment of the net electricity supplied to the grid in case the dates of a particular monitoring period do not match with the dates of the billing period. This correction is considered as project description deviation in the current monitoring period.

The net electricity supplied to the grid would be reported as the difference between the net export and import from the wind plant. The electricity export and import data are monitored via main and check meters connected to the sub-station.

[6] Total hours = 17520 (i.e.,730*24) *Number of WTGs (i.e., 51). So, 17520*51 = 893,520

**Data Adjustment in case of monitoring period different from billing period:**

The apportioning is not applied in the current monitoring period as the billing months cover the complete dates mentioned in the monitoring period and there is no mismatch with the dates of the billing period.

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

D = (A/B) *C

Where:

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

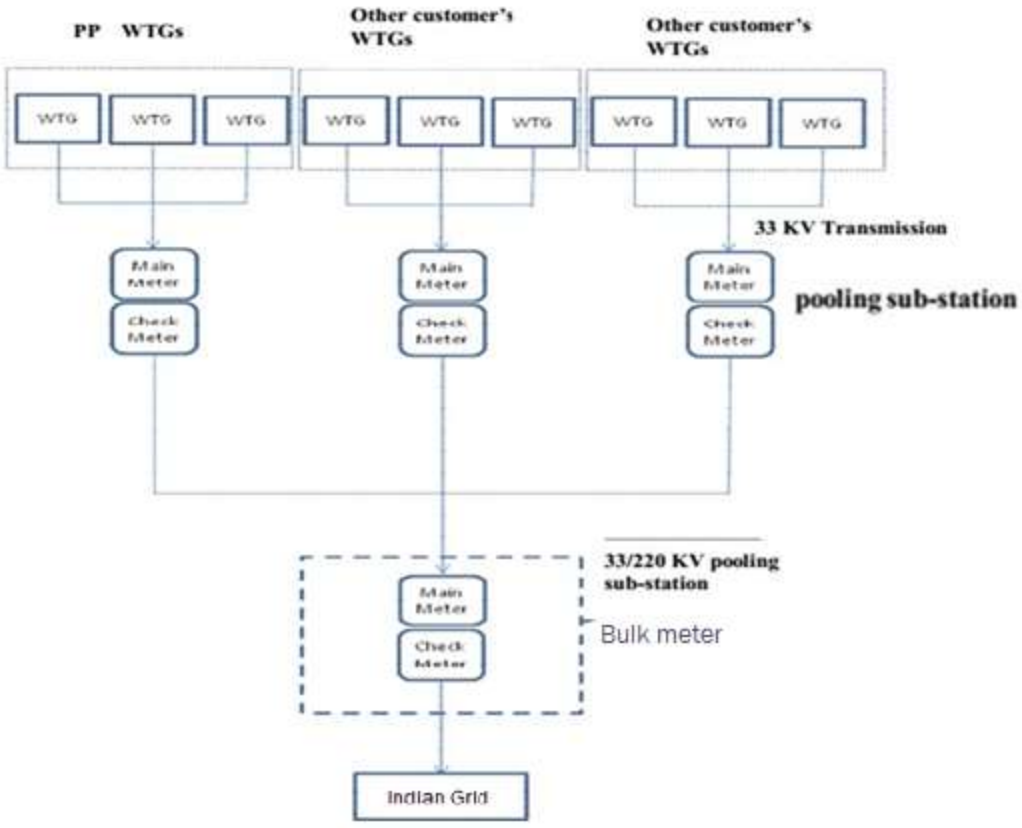
B = Number of days of the billing period/ month which was not matched with the monitoring period.

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

The calculated value after apportioning would be used for calculation of emission reductions during that period.

The project deviation is in line with the guidelines provided in VCS Standard Version 4.5 Section 3.21; however, it does not impact the existing applicability conditions of the methodology, additionality or the appropriateness of the baseline scenario.

**Deviation 2:** The Line diagram with metering arrangement for the wind project activity is different from the registered joint PDMR and previously it was a typo error and now has been corrected as per actual practice followed at site. In actual scenario other non-VCS WTGs are connected to this feeder and the same has been corrected and described below in detail in the monitoring section 4.3




The project deviations are in line with the guidelines provided in VCS Standard Version 4.5 Section 3.21; however, it does not impact the existing applicability conditions of the methodology, additionality or the appropriateness of the baseline scenario.

And all above mentioned deviations are applicable from current monitoring period.

## 3.3 Grouped Projects

The project is not a grouped project thus this is not applicable.

# 4 DATA AND PARAMETERS

## 4.1 Data and Parameters Available at Validation

| Data / Parameter | $EF_{grid,OM,y}$ |
|---|---|
| Data unit | $tCO_2/MWh$ |
| Description | Operating Margin $CO_2$ emission factor in year y |

| | |
|---|---|
| Source of data | Calculated from CEA database, Version 14, December 2018 |
| Value applied | 0.9610(Indian Grid) |
| Justification of choice of data or description of measurement methods and procedures applied | Calculated as per "Tool to calculate the emission factor for an electricity system, version 07.0.0" as 3-year generation weighted average using data for the years 2015-16, 2016-17 & 2017-18. The data are obtained from "$CO_2$ Baseline Database for Indian Power Sector" version 14.0, published by the Central Electricity Authority, Ministry of Power, Government of India. |
| Purpose of Data | For the calculation of the Baseline Emission |
| Comments | This parameter is fixed ex-ante for the entire crediting period. |

| | |
|---|---|
| Data / Parameter | $EF_{grid,BM,y}$ |
| Data unit | $tCO_2/MWh$ |
| Description | Build Margin $CO_2$ emission factor in year y |
| Source of data | Calculated from CEA database, Version 14, December 2018 |
| Value applied | 0.8644 (Indian Grid) |
| Justification of choice of data or description of measurement methods and procedures applied | Calculated as per "Tool to calculate the emission factor for an electricity system, version 07.0.0" as 3-year generation weighted average using data for the years 2017-18. The data are obtained from "$CO_2$ Baseline Database for Indian Power Sector" version 14.0, published by the Central Electricity Authority, Ministry of Power, Government of India. |
| Purpose of Data | For the calculation of the Baseline Emission |
| Comments | This parameter is fixed ex-ante for the entire crediting period. |

| | |
|---|---|
| Data / Parameter | $EF_{grid,CM,y}$ |
| Data unit | $tCO_2/MWh$ |
| Description | Combined Margin $CO_2$ emission factor in year y |
| Source of data | Calculated from CEA database, Version 14, December 2018 |
| Value applied | 0.9368 (Indian Grid) |
| Justification of choice of data or description of measurement methods and procedures applied | The combined margin emissions factor is calculated as follows: $EF_{grid,CM,y} = EF_{grid,OM,y} * W_{OM} + EF_{grid,\ BM,y} * W_{BM}$ Where: $EF_{grid,BM,y}$ = Build margin $CO_2$ emission factor in year y ($tCO_2/MWh$) $EF_{grid,OM,y}$ = Operating margin $CO_2$ emission factor in year y ($tCO_2/MWh$) |

| | |
|---|---|
| | WOM = Weighting of operating margin emissions factor (%) = 75%<br>WBM= Weighting of build margin emissions factor (%) = 25% |
| Purpose of Data | For the calculation of the Baseline Emission |
| Comments | This parameter is fixed ex-ante for the entire crediting period. |

## 4.2 Data and Parameters Monitored

| | |
|---|---|
| Data / Parameter | $EG_{PJ, y}$ |
| Data unit | MWh |
| Description | Electricity supplied to Grid |
| Source of data | Form B (JMR) electricity generated sheet from State Electricity Board |
| Description of measurement methods and procedures to be applied | Net electricity generated is calculated at the main meter connected to the pooling Substation.<br>The procedures for metering are as per the provisions of the power purchase agreement.<br>The electricity exported / supplied by the plant to pooling substation is measured by energy meters at 33kV pooling substation end (PSS). These meters measure electricity imported by the plant from the grid. Bulk meter is installed at 220kV at GSS end and it is used to calculate transmission loss only.<br><br>Data monitoring takes place at the metering yard and Main meter at the pooling substation. The electricity metered at the main meter is proportionally divided based on the control meter reading among the customers connected to the meter on the basis of the pro-rata readings taken at the individual WTGs. The emission reduction calculations are done on the basis of the Main meter reading (net electricity exported to the grid) after deducting imports from the grid as mentioned in the share certificate issued on monthly basis.<br>Net electricity exported= Export-115%Import- Transmission loss<br>The electricity measurements at main meter are continuous and recorded on monthly basis. |
| Frequency of monitoring/recording | Continuous measurement and at least monthly recording |
| Value monitored | |

| Vintage | $EG_{facility, y}$ |
|---|---|
| 2021 | 293,385.157 |
| 2022 | 256,763.657 |
| Total | 550,148.81 MWh |

| | |
|---|---|
| Monitoring equipment | Electricity Meters of 0.2s Class<br>The details including Meter serial number, Make, accuracy class and the calibration dates are mentioned in APPENDIX 1: Calibration Records |
| QA/QC procedures to be applied | Calibration of all the meters will be undertaken at required intervals and faulty meters will be duly replaced immediately based on CEA guidelines which specifies calibration once in 5 years[7] as per the registered joint PD&MR.<br>The data will be cross checked with sales receipts. |
| Purpose of the data | Calculation of Baseline emissions |
| Calculation method | N/A |
| Comments | The data will be archived electronically for two years after the end of the last crediting period or the last issuance of VCUs for this project activity, whichever occurs later. |

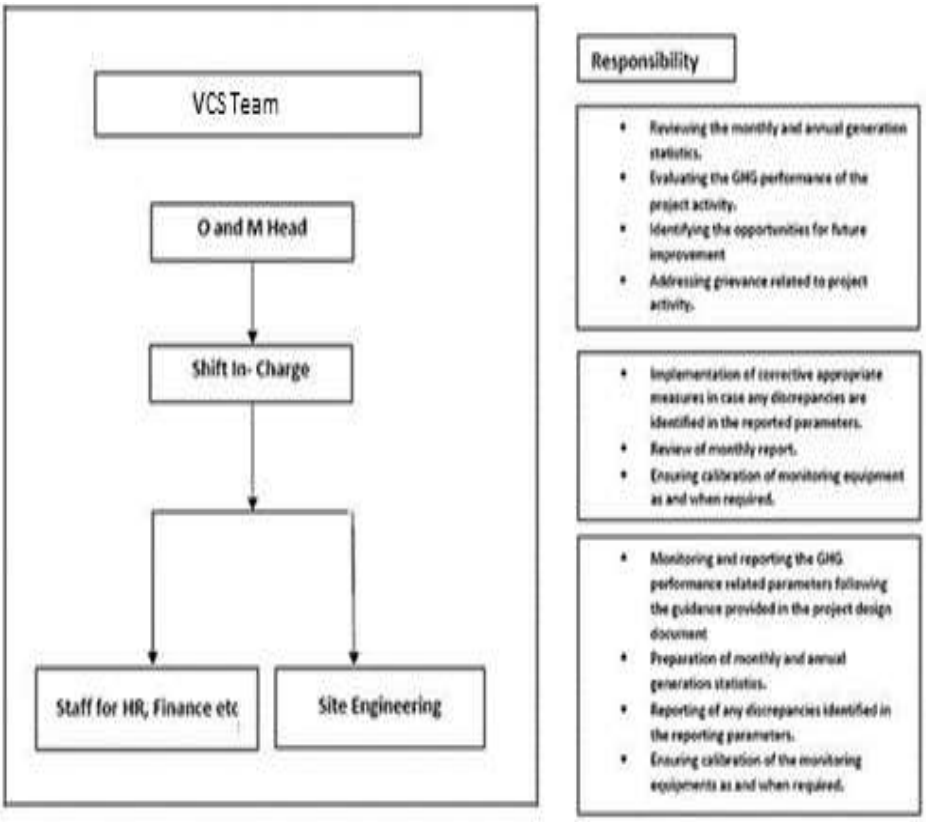
## 4.3 Monitoring Plan

The project proponents at the power station have a procedure to ensure proper monitoring of the VCS project activity. The project activity has installed monitoring and control equipment that measure, record, report, monitor and control various key parameters.

The monitoring plan, implemented by the project participant describes about the monitoring organization, parameters to be monitored, monitoring practices, quality assurance, quality control procedures, data storage and archiving.

The authority and responsibility for registration, monitoring, measurement, reporting and reviewing of the data rests with the project participant. PP proposed the following structure for data monitoring, collection, data archiving and calibration of equipment for this project activity. The team comprises of the following members:

[7] https://www.cbip.org/cearegulations/CEA%20DATA/MeteringRegulations/Jan2020/CEA%20Metering%20Regulations_Summarydocx.pdf




The methodology requires monitoring of the net electricity supplied from the project activity.

The proponent shall maintain complete and accurate records and all other data required for the purpose of proper administration and operation of the wind power project. The data will be kept for at least 2 years after the end of the crediting period.

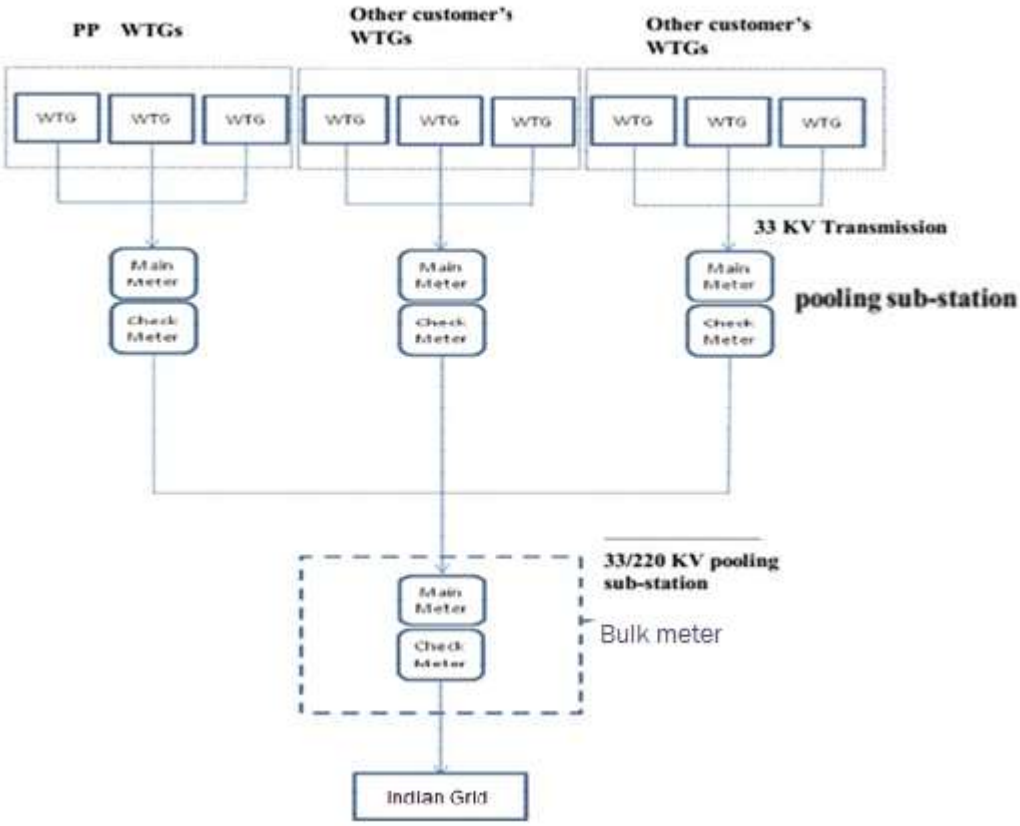
1. **Purpose** - The purpose of monitoring the project is to assess the annual emission reductions in tones of $CO_2$ that the project activity has achieved.

2. **Data to be reported** - $EG_{PJ,y}$ in MWh and periodical calibrations of monitoring equipment's.

3. **Monitoring times and periods** - The data will be monitored on a continuous basis but will be recorded on a monthly basis with the energy meters installed at the site.

4. **Data Accuracy** - Metering Arrangement of the Power Purchase Agreement (PPA) the metering arrangement including its installation, testing, maintenance and collection transportation and processing of data required for energy exchange shall be governed as per the notification/ directives issued/or to be issued by Central Electricity Regulatory Commission and as per relevant provisions contained in IEGC as amended from time to time. The Central Electricity Authority (CEA) notification regarding Installation and Operation of meters'

regulations, 2006, says that meters are required to be tested once in 5 years (refer clause 18 of the guideline)[8]. Thus, the meters recording the electricity exported will be calibrated at least once 5 years.




Net electricity generated is calculated at the main meter connected to the pooling Substation.

The procedures for metering are as per the provisions of the power purchase agreement.

The electricity exported / supplied by the plant to pooling substation is measured by energy meters at 33kV pooling substation end (PSS). These meters measures electricity imported by the plant from the grid. Bulk meter is installed at 220kV at GSS end and it is used to calculate transmission loss only.

Data monitoring takes place at the metering yard and Main meter at the pooling substation. The electricity metered at the main meter is proportionally divided based on the control meter reading among the customers connected to the meter on the basis of the pro-rata readings taken at the individual WTGs. The emission reduction calculations are done on the basis of the

[8] https://cea.nic.in/wp-content/uploads/2020/04/review_regulation.pdf

Main meter reading (net electricity exported to the grid) after deducting imports from the grid as mentioned in the share certificate issued on monthly basis.

5. **Emission Reduction Calculation Approach** - The emission reductions are calculated as a product of the net electricity generated from the project activity and the combined margin emission factor. The calculation approach is explained in detail under section 3 of registered joint PD&MR version 2.0.

6. **Approach to be followed in following cases:** In case monitoring period is between the billing cycles, pro rata calculation for the number of days in the monitoring period shall be estimated for emissions reduction calculation.

7. **Emergency preparedness**: The project activity will not result in any unidentified activity that can result in substantial emissions from the project activity. No need for emergency preparedness in data monitoring is visualized.

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. In case both the meters not function properly than in that case error factor of 0.2% will be used. During the monitoring period the main meter and check meter were operating in the acceptable limits of accuracy and there were no issues identified during the monitoring period.

8. **Personnel training**: In order to ensure a proper functioning of the project activity and a properly monitoring of emission reductions, the staff were trained. The plant helpers are trained in equipment operation, data recording, reports writing, operation and maintenance and emergency procedures in compliance with the monitoring plan.

9. **Date adjustment in case of monitoring period different from billing period:**

The net electricity supplied to the grid would be reported as the difference between the net export and import from the wind plant. The electricity export and import data are monitored via main, and check meters connected to the sub-station.

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

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

$D = (A/B) * C$

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

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

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

The calculated value after apportioning would be used for calculation of emission reductions during that period. The apportioning is not applied in the current monitoring period as the billing months cover the complete dates mentioned in the monitoring period and there is no mismatch with the dates of the billing period. But the process of apportioning is added to just explain the point no.6 pro rata calculation of this section.

# 5 QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS

## 5.1 Baseline Emissions

As per the approved consolidated Methodology ACM0002 (Version 19) para 42: Baseline emissions include only $CO_2$ emissions from electricity generation in fossil fuel fired power plants that are displaced due to the project activity. The methodology assumes that all project electricity generation above baseline levels would have been generated by existing grid- connected power plants and the addition of new grid- connected power plants. The baseline emissions are to be calculated as follows:

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

Where:

| | | |
|---|---|---|
| $BE_y$ | = | Baseline emissions in year *y* ($tCO_2$/year) |
| $EG_{PJ,\,y}$ | = | Quantity of net electricity generation that is produced and fed into the grid as a result of the implementation of the project activity in year *y* (MWh/year) |
| $EF_{grid,CM,\,y}$ | = | Combined margin $CO_2$ 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" (t $CO_2$/MWh) |

**Calculation of $EG_{PJ,y}$**

As per applicable methodology, ACM0002 Version 19.0. If the project activity is the installation of a Greenfield power plant, then:

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

| | | |
|---|---|---|
| $EG_{PJ,y}$ | = | Quantity of net electricity generation that is produced and fed into the grid as a result of the implementation of theproject activity in year *y* (MWh/year) |
| $EG_{facility,y}$ | = | Quantity of net electricity generation supplied by the project plant/unit to the grid in year y (MWh/year). |

$BE_y$ : Baseline emissions in year y ($tCO_2e$/year)

Here,

$EF_{grid,CM,y}$ = **0.9368**

$EG_{PJ,facility,y}$ = **550,148.81**

**$BE_y$=550,148.81 * 0.9368= 515,379 $tCO_2e$ (Vintage wise Round down)**

| Vintage | | Net Electricity (MWh) | Emission Factor (tCO2/MWh) | Emission reduction ($tCO_2$) |
|---|---|---|---|---|
| 1-January-21 | 31-December-21 | 293,385.157 | 0.9368 | 274,843 |
| 1-January-22 | 31-December-22 | 256,763.657 | 0.9368 | 240,536 |
| Total | | 550,148.81 | | 515,379 (Vintage wise Round down) |

## 5.2 Project Emissions

As per Applied Methodology: ACM0002, v19.0, the project activity is the installation of a new grid-connected Wind Power plant and does not involve any project emissions from fossil fuel, operation of dry, flash steam or binary geothermal power plants, and from water reservoirs of hydro power plants. Therefore $PE_{FF,y}$, $PE_{GP,y}$, $PE_{HP,y}$ are equal to zero and thus,

$PE_y$ = 0 $tCO_2e$.

## 5.3 Leakage

No other leakage emissions are considered. The emissions potentially arising due to activities such as power plant construction and upstream emissions from fossil fuel use (e.g., extraction, processing, transport etc.) are neglected.

$LE_y$ = 0 $tCO_2e$.

## 5.4 Net GHG Emission Reductions and Removals

**Emission reductions:**

Emission reductions are calculated as follows:

$ER_y = BE_y - PE_y$

Where:

$ER_y$ = Emission reductions in year y ($tCO_2e$/year)

$BE_y$ = Baseline emissions in year y ($tCO_2e$ /year)

$PE_y$ = Project emissions in year y ($tCO_2e$/year)

| Year | Baseline emissions or removals ($tCO_2e$) | Project emissions or removals ($tCO_2e$) | Leakage emissions ($tCO_2e$) | Net GHG emission reductions or removals ($tCO_2e$) |
|---|---|---|---|---|
| 01- January-2021 to 31-December -2021 (Inclusive of both days) | 274,843 | 0 | 0 | 274,843 |
| 01- January-2022 to 31-December -2022 (Inclusive of both days) | 240,536 | 0 | 0 | 240,536 |
| **Total** | **515,379** | **0** | **0** | **515,379 (Round down)** |

| Ex-ante emissions reductions/removals | Achieved emissions reductions/removals | Percent difference | Justification for the difference |
|---|---|---|---|
| 670,170 $tCO_2e$ (as per registered capacity 134.5 MW) | 515,379 $tCO_2e$ | -23.10% | As per the registered capacity of 134.4 MW it is to be noted here that the estimated emission reduction estimated from the project activity for |

| | | | |
|---|---|---|---|
| 534,041.72 $tCO_2e$ (as per installed capacity 107.1 MW) | 515,379 $tCO_2e$ | -3.49% | the current monitoring period is 670,170 $tCO_2e$, whereas actual emission reductions achieved are 515,379 $tCO_2e$, which is -23.10 % lower than the estimated emission reductions. Similarly, as per the installed capacity of 107.1 MW the estimated emission reduction estimated from the project activity for the current monitoring period is 534,041.72 $tCO_2e$, whereas actual emission reductions achieved are 515,379 $tCO_2e$, which is approximately 3.49% lower than the estimated emission reductions. The generation of electricity depends upon many other climatic conditions, and not within the control of the project participant.<br><br>The reductions in actual emission reduction are majorly due to non-commissioning of 27.3 MW and during the current monitoring period, the plant underwent some maintenance and some minor breakdowns (details given in annexure 2 with percentage difference with total breakdown hours). The generation is also less due to variation in climate conditions such as wind pattern and flow rate throughout the year which are beyond the control of the Project Proponent. Hence the actual emission reductions are 23.10% lower as compared to the estimated emission reductions. However, it does not exceed the breaching value and the project IRR remain within the benchmark with the said decrease. Therefore, the decrease GHG accounting is acceptable. |

# APPENDIX 1 CALIBRATION RECORDS

| Skeiron Renewable Energy Kushtagi Private Limited | | | | | | |
|---|---|---|---|---|---|---|
| Location | Main | Check | Calibration Date | Due Date of calibration* | Accuracy Class | Make and Type |
| KST147 | 16112943 | 16112944 | 20-July-2018 | 19-July-2023 | 0.2s | L&T ER 300P |
| KST177 | 16112934 | 16112937 | 20-July-2018 | 19-July-2023 | 0.2s | L&T ER 300P |
| KST101 | 18015394 | 18015396 | 20-July-2018 | 19-July-2023 | 0.2s | L&T ER 300P |
| KST230 | 18015386 | 18015387 | 20-July-2018 | 19-July-2023 | 0.2s | L&T ER 300P |

| Saroja Renewables Limited | | | | | | |
|---|---|---|---|---|---|---|
| Location | Main | Check | Calibration Date | Due Date of calibration* | Accuracy Class | Make and Type |
| KST51 | 18015411 | 18015426 | 20-July-2018 | 19- July-2023 | 0.2s | L&T ER 300P |
| KST67 | 18015412 | 18015416 | 20-July-2018 | 19- July-2023 | 0.2s | L&T ER 300P |
| KST71 | 15015440 | 15015441 | 20-July-2018 | 19- July-2023 | 0.2s | L&T ER 300P |

| Shanay Renewables Ltd. | | | | | | |
|---|---|---|---|---|---|---|
| Location | Main | Check | Calibration Date | Due Date of calibration* | Accuracy Class | Make and Type |
| KST130 | 18015383 | 18015384 | 20- July-2018 | 19- July-2023 | 0.2s | L&T ER 300P |
| KST131 | 18015438 | 18015379 | 20- July-2018 | 19- July-2023 | 0.2s | L&T ER 300P |

* As per the registered joint PD&MR, Calibration of all the meters will be undertaken at least once in 5 years.

# APPENDIX 2 BREAKDOWN DETAILS[9]

| Saroja site | | | |
|---|---|---|---|
| WTG location | Total Duration of breakdowns (HH:MM: SS) | | |
| | JAN 22- DEC 22 | JAN 21-DEC 21 | Total |
| KST046 | 871:04:00 | 124:30:00 | 995:34:00 |
| KST047 | 381:20:00 | 128:24:00 | 509:44:00 |
| KST048 | 1,201:04:00 | 228:56:00 | 1,430:00:00 |
| KST049 | 668:16:00 | 101:06:00 | 769:22:00 |
| KST051 | 108:06:00 | 1,748:10:00 | 1,856:16:00 |
| KST065 | 500:48:00 | 143:06:00 | 643:54:00 |
| KST066 | 394:24:00 | 289:10:00 | 683:34:00 |
| KST067 | 353:42:00 | 465:11:00 | 818:53:00 |
| KST068 | 1,093:56:00 | 133:55:00 | 1,227:51:00 |
| KST070 | 342:24:00 | 363:13:00 | 705:37:00 |
| KST071 | 397:18:00 | 117:04:00 | 514:22:00 |
| KST103 | 222:18:00 | 81:14:00 | 303:32:00 |
| KST105 | 86:12:00 | 397:56:00 | 484:08:00 |
| KST106 | 521:40:00 | 339:41:00 | 861:21:00 |
| KST121 | 397:30:00 | 241:23:00 | 638:53:00 |
| KST122 | 453:48:00 | 163:51:00 | 617:39:00 |
| KST124 | 1,663:27:00 | 185:06:00 | 1,848:33:00 |
| Total breakdown for complete MP | | | 14,909:13:00 |

| Skeiron site | | | |
|---|---|---|---|
| WTG location | Total Duration of breakdowns (HH:MM: SS) | | |
| | JAN 22- DEC 22 | JAN 21-DEC 21 | Total |
| KST098 | 97:00:00 | 77:00:00 | 174:00:00 |
| KST099 | 101:38:00 | 198:41:00 | 300:19:00 |
| KST100 | 238:24:00 | 210:58:00 | 449:22:00 |
| KST101 | 362:00:00 | 119:12:00 | 481:12:00 |
| KST102 | 92:24:00 | 89:54:00 | 182:18:00 |
| KST123 | 242:18:00 | 109:09:00 | 351:27:00 |
| KST125 | 93:06:00 | 125:14:00 | 218:20:00 |
| KST126 | 381:34:00 | 201:04:00 | 582:38:00 |

[9] The detailed breakdowns sheet is provided to VVB.

| | | | |
|---|---|---|---|
| KST147 | 358:18:00 | 111:56:00 | 470:14:00 |
| KST148 | 380:40:00 | 134:09:00 | 514:49:00 |
| KST149 | 114:48:00 | 414:48:00 | 529:36:00 |
| KST152 | 127:48:00 | 442:46:00 | 570:34:00 |
| KST153 | 304:12:00 | 186:58:00 | 491:10:00 |
| KST154 | 543:48:00 | 195:42:00 | 739:30:00 |
| KST155 | 164:24:00 | 216:02:00 | 380:26:00 |
| KST177 | 125:54:00 | 447:50:00 | 573:44:00 |
| KST188 | 101:57:00 | 138:52:00 | 240:49:00 |
| KST189 | 93:54:00 | 136:54:00 | 230:48:00 |
| KST191 | 559:30:00 | 113:36:00 | 673:06:00 |
| KST230 | 67:12:00 | 158:50:00 | 226:02:00 |
| KST233 | 53:24:00 | 261:18:00 | 314:42:00 |
| KST234 | 95:48:00 | 169:42:00 | 265:30:00 |
| KST235 | 397:30:00 | 144:10:00 | 541:40:00 |
| KST236 | 305:30:00 | 103:18:00 | 408:48:00 |
| **Total breakdown for complete MP** | | | **9911:04:00** |

| **Shanay site** | | | |
|---|---|---|---|
| **WTG location** | **Total Duration of breakdowns (HH:MM: SS)** | | |
| | **JAN 22- DEC 22** | **JAN 21-DEC 21** | **Total** |
| KST042 | 334:33:00 | 383:22:00 | 717:55:00 |
| KST072 | 120:04:00 | 149:30:00 | 269:34:00 |
| KST075 | 169:24:00 | 214:07:00 | 383:31:00 |
| KST090 | 348:18:00 | 153:04:00 | 501:22:00 |
| KST095 | 72:30:00 | 226:42:00 | 299:12:00 |
| KST096 | 159:30:00 | 248:25:00 | 407:55:00 |
| KST097 | 108:30:00 | 214:32:00 | 323:02:00 |
| KST128 | 151:48:00 | 161:06:00 | 312:54:00 |
| KST130 | 127:06:00 | 161:40:00 | 288:46:00 |
| KST131 | 63:30:00 | 184:40:00 | 248:10:00 |
| **Total breakdown for complete MP** | | | **3,752:21:00** |

The total breakdown of all the 3 plants for the current monitoring period is approx. 28,572 hrs and 3.19% of total hours of all WTGs.

# APPENDIX 3: SDG CONTRIBUTION

| Months | | Total Net Electricity Generation (MWh) | Emission reduction (tCO2) |
|---|---|---|---|
| 1-January-2021 | 31-January-2021 | 20,425.49 | 19,134.60 |
| 1-February-2021 | 28-February-2021 | 18,513.74 | 17,343.67 |
| 1-March-2021 | 31-March-2021 | 20,901.67 | 19,580.68 |
| 1-April-2021 | 30-April-2021 | 14,690.63 | 13,762.18 |
| 1-May-2021 | 31-May-2021 | 27,695.81 | 25,945.43 |
| 1-June-2021 | 30-June-2021 | 40,212.17 | 37,670.76 |
| 1-July-2021 | 31-July-2021 | 44,947.36 | 42,106.69 |
| 1-August-2021 | 31-August-2021 | 32,828.86 | 30,754.08 |
| 1-September-2021 | 30-September-2021 | 34,078.71 | 31,924.93 |
| 1-October-2021 | 31-October-2021 | 10,371.26 | 9,715.79 |
| 1-November-2021 | 30-November-2021 | 14,063.72 | 13,174.89 |
| 1-December-2021 | 31-December-2021 | 14,655.75 | 13,729.51 |
| 1-January-2022 | 31-January-2022 | 12,238.80 | 11,465.31 |
| 1-February-2022 | 28-February-2022 | 12,029.65 | 11,269.38 |
| 1-March-2022 | 31-March-2022 | 14,254.99 | 13,354.07 |
| 1-April-2022 | 30-April-2022 | 11,590.15 | 10,857.66 |
| 1-May-2022 | 31-May-2022 | 33,109.19 | 31,016.68 |
| 1-June-2022 | 30-June-2022 | 35,907.59 | 33,638.23 |
| 1-July-2022 | 31-July-2022 | 38,062.15 | 35,656.62 |
| 1-August-2022 | 31-August-2022 | 35,904.90 | 33,635.71 |
| 1-September-2022 | 30-September-2022 | 24,812.51 | 23,244.36 |
| 1-October-2022 | 31-October-2022 | 10,925.45 | 10,234.96 |
| 1-November-2022 | 30-November-2022 | 11,705.21 | 10,965.44 |
| 1-December-2022 | 31-December-2022 | 16,223.06 | 15,197.76 |
| **Total** | | **550,148.81** | **515,379.00** |