RENEWABLE POWER PROJECT BY ANIMALA WIND POWER PRIVATE LIMITED

Document Prepared by Infinite Solutions

Project Title	Renewable Power Project by Animala Wind Power Private Limited
Version	3.0
Report ID	04
Date of Issue	03-August-2023
Project ID	VCS 1787
Monitoring Period	01-January -2021 to 31–December-2022 (Inclusive of both days)
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1 PROJECT DETAILS

1.1 Summary Description of the Implementation Status of the Project

The main purpose of this project activity is to generate clean form of electricity through renewable wind energy sources. The project activity involves installation of 42 WTGs of capacity 2 MW each. The project activity is 84 MW wind power project in Andhra Pradesh state of India.

Over the 10 years of first crediting period, the project is replacing anthropogenic emissions of greenhouse gases (GHG's) estimated to be approximately 163,843 tCO_2e per year, thereon displacing 172,922 MWh/year amount of electricity from the generation-mix of power plants connected to the Indian grid, which is mainly dominated by thermal/fossil fuel-based power plant.

The details of the project and their location of installation are mentioned in the table below: -

Name of Investor	Capacity in MW	COD	Connection with Grid	Location	Usage
Animala Wind Power Private Limited	84 MW	30-March-2017	Indian Grid	Village Animala, District: YSR Kadapa, Andhra Pradesh	Sale to State DISCOM (SOUTHERN POWER DISTRIBUTION COMPANY OF A.P. LIMITED)

Total emission reductions achieved in this monitoring period:

During the Current Monitoring Period from 01-January -2021 to 31–December-2022 (First and last date included), the project activity has supplied 313,062.51 MWh of electricity, and thus contributing to the GHG reductions 296,625 tCO_2e.

Audit Type	Period	Program	VVB Name	Number of years
Validation+ Verification	30-March-2017 to 03-August-2018 (First and last date included)	VCS	LGAI Technological Center S. A	01 Year 04 months 05 days
Verification	04-August-2018 to 03-October-2019 (First and last date included)	VCS	Earthood Services Private Limited	01 Year 02 months 00 days
Verification	04-October-2019 to 31-Decemeber-2020 (First and last date included)	VCS	TÜV SÜD South Asia Pvt Ltd	01 Year 02 months 28 days

Verification	01-January -2021 to 31–December-2022 (First and last date included)	VCS	VKU CERTIFICATION PVT. LTD.	02 Year 00 months 00 days
Total	30-March-2017 to 31–December-2022 (First and last date included)			05 Year 09 months 02 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

Project Category : Grid-connected electricity generation from renewable sources ACM0002- Version 18.1[1]

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

1.3 Project Proponent

Organization name	Animala Wind Power Private Limited
Contact person	Murali Krishnam Raju M
Title	AGM - Commercial
Address	PLOT NO. #1131/A, ROAD NO. 36 JUBILEE HILLS, HYDERABAD 500033.TELANGANA, INDIA.
Telephone	+91 40 40300100
Email	info@greenkogroup.com

1.4 Other Entities Involved in the Project

Organization name	Infinite Solutions
Role in the Project	Project Consultant

[1] http://cdm.unfccc.int/methodologies/DB/5725LCHYPYM4I1V8OD9SFYVAMFFWNP

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

1.5 Project Start Date

Start date of the project activity is the earliest date of interconnection with the grid i.e., 30-March-2017. This is the date of commissioning of 84 MW Wind Project activity by Animala Wind Power Private Limited.

1.6 Project Crediting Period

Crediting Period Start date : 30-March-2017

Crediting Period End date : 29-March-2027(First and last date included)

The project activity adopts renewable crediting period of 10 years period which can be renewed for maximum 2 times.

1.7 Project Location

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

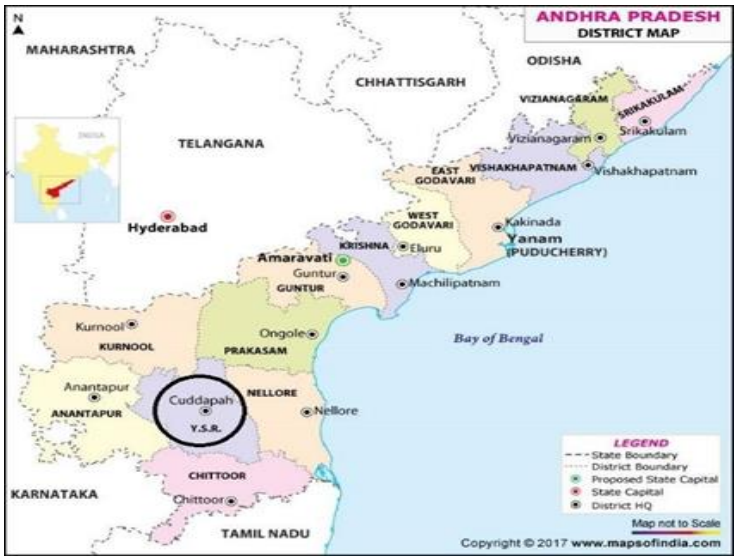
Name of Investor	Capacity (MW)	Village	District	State
Animala Wind Power Private Limited	84 MW	Animala	YSR Kadapa	Andhra Pradesh

Sr. No	WTG no	Latitude (N)	Longitude (E)	Commissioning date
1	T-01	14° 30' 43.6896"	78° 33' 51.8740"	30-March-2017
2	T-02	14° 30' 34.0092"	78° 33' 43.6337"	30-March-2017
3	T-03	14° 30' 26.7768"	78° 33' 32.8297"	30-March-2017
4	T-04	14° 30' 17.5572"	78° 33' 25.3193"	30-March-2017

5	T-05	14° 30' 10.0044"	78° 33' 15.0867"	30-March-2017
6	T-06	14° 30' 07.0884"	78° 31' 46.2534"	30-March-2017
7	T-07	14° 30' 02.2896"	78° 33' 05.1231"	30-March-2017
8	T-08	14° 29' 53.3796"	78° 32' 55.9407"	30-March-2017
9	T-09	14° 29' 51.1728"	78° 31' 26.5342"	30-March-2017
10	T-10	14° 29' 43.9872"	78° 32' 47.1977"	30-March-2017
11	T-11	14° 29' 42.1152"	78° 31' 18.7235"	30-March-2017
12	T-12	14° 29' 35.4660"	78° 32' 34.8735"	30-March-2017
13	T-13	14° 29' 33.6912"	78° 31' 09.4371"	30-March-2017
14	T-14	14° 29' 26.6028"	78° 32' 23.7552"	30-March-2017
15	T-15	14° 29' 24.5976"	78° 31' 01.5269"	30-March-2017
16	T-16	14° 29' 17.6640"	78° 32' 15.2081"	30-March-2017
17	T-17	14° 29' 04.6068"	78° 31' 30.3893"	30-March-2017
18	T-18	14° 29' 08.3328"	78° 32' 05.9647"	30-March-2017
19	T-19	14° 28' 57.0216"	78° 32' 03.7197"	30-March-2017
20	T-21	14° 28' 27.3576"	78° 31' 38.5797"	24-August-2017
21	T-22	14° 28' 15.6828"	78° 31' 32.6008"	24-August-2017
22	T-23	14° 28' 10.0560"	78° 31' 23.1172"	24-August-2017
23	T-24	14° 27' 32.0904"	78° 30' 35.7772"	24-August-2017
24	T-25	14° 27' 22.1940"	78° 30' 28.9788"	24-August-2017
25	T-26	14° 27' 12.8484"	78° 30' 21.8072"	24-August-2017

26	T-27	14° 27' 03.9204"	78° 30' 13.7969"	24-August-2017
27	T-28	14° 26' 53.6244"	78° 30' 09.1727"	24-August-2017
28	T-29	14° 26' 42.9216"	78° 29' 47.3992"	24-August-2017
29	T-34	14° 29' 59.4960"	78° 31' 35.6886"	30-March-2017
30	T-35	14° 31' 37.7472"	78° 35' 07.3721"	30-March-2017
31	T-36	14° 31' 05.0772"	78° 34' 24.9257"	30-March-2017
32	T-37	14° 30' 55.2564"	78° 34' 15.7850"	30-March-2017
33	T-38	14° 29' 12.1056"	78° 31' 38.3174"	24-August-2017
34	T-39	14° 31' 14.4696"	78° 34' 36.8090"	24-August-2017
35	T-41	14° 30' 48.9204"	78° 34' 03.8020"	24-August-2017
36	T-45	14° 22' 49.5120"	78° 26' 18.4832"	24-August-2017
37	T-46	14° 23' 47.9256"	78° 26' 10.2938"	24-August-2017
38	T-48	14° 23' 17.1996"	78° 26' 10.2938"	24-August-2017
39	T-49	14° 23' 01.7628"	78° 26' 11.4041"	24-August-2017
40	T-50	14° 23' 25.6992"	78° 26' 32.5505"	24-August-2017
41	T-51	14° 31' 23.1528"	78° 34' 46.3966"	30-March-2017
42	T-52	14° 31' 30.4860"	78° 34' 57.3680"	30-March-2017

The project locations have been shown in the map 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.

Methodology : ACM0002: Grid-connected electricity generation from renewable sources - Version 18.1[2].

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

Tools referred with above methodology and applicable for project activity are:

- TOOL07: Tool to calculate the emission factor for an electricity system[3] - Version 06.0 (EB 97, Annex 07)
- TOOL01: Methodological Tool- Tool for the demonstration and assessment of additionality[4] – Version 07.0.0 (EB 70, Annex 08)

[2] http://cdm.unfccc.int/methodologies/DB/5725LCHYPYM4I1V8OD9SFYVAMFFWNP
[3] http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-07-v6.pdf
[4] http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-01-v7.0.0.pdf

1.9 Participation under other GHG Programs

The project proponent hereby confirms that the project has not participated under 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 double counting. Furthermore, the project activity is not availing any benefits from CDM/GS/GCC/UCR/RECs mechanism which can be confirmed from the link 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

Contribution to sustainable development:

Ministry of Environment, Forests and Climate Change, GoI has stipulated economic, social, environment and technological well-being as the four indicators of sustainable development. The project contributes to sustainable development using the following ways.

- **Social well-being:** The project would help in generating employment opportunities during the construction and operation phases. The project activity will lead to

development in infrastructure in the region like development of roads and also may promote business with improved power generation.

- **Economic well-being:** The project is a clean technology investment in the region, which would not have been taken place in the absence of the VCS benefits the project activity will also help to reduce the demand supply gap in the state.

  The project activity will generate power using zero emissions wind energy-based power generation which helps to reduce GHG emissions and specific pollutants like SOx, NOx, and SPM associated with the conventional thermal power generation facilities.

- **Technological well-being:** The successful operation of project activity would lead to promotion of wind power generation and would encourage other entrepreneurs to participate in similar projects.

- **Environmental well-being:** Wind being a renewable source of energy, it reduces the dependence on fossil fuels and conserves natural resources which are on the verge of depletion. Due to its zero emission the Project activity also helps in avoiding significant amount of GHG emissions.

Renewable Power Project by Animala Wind Power Private Limited is located at YSR Kadapa district of State: Andhra Pradesh, Country: India.

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. This is a voluntary project activity doesn't contribute to achieving any nationally stated sustainable development priorities. There is no compliance for monitoring and reporting the emission reduction and SDG contribution from the project activity.

Project proponent monitors the carbon emission with help of the record of electricity generated.

Table 1: Sustainable Development Contributions

Row number	SDG Target	SDG Indicator	Net Impact on SDG Indicator	Current Project Contributions	Contributions Over Project Lifetime
1)	7.2	7.2.1: Renewable energy share in the total final energy consumption	Implemented activities to increase	About 313,062.51 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 880,051.41 MWh (189,856.20+ 234,351.70+ 142,781+313,062.51)[5] renewable electricity has supplied to Indian Grid that helps to increase the renewable energy share in the energy mix.
2)	13.0	13.2.2 Tonnes of greenhouse gas emissions avoided or removed	Implemented activities to increase	By installation of 84 MW wind Energy Power Plant, project has prevented the release of 296,625 tons of carbon into the atmosphere during the monitoring period	Prevented the release of 833,845 tons of carbon (179,889+ 222,047+ 135,284+296,625)[6] into the atmosphere.

[5] https://registry.verra.org/app/projectDetail/VCS/1787

[6] https://registry.verra.org/app/projectDetail/VCS/1787

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 power project activity operations do not result in direct air pollution, noise pollution. Please refer below web link for the same[7].

There are no negative environmental and/or socio-economic impacts due to the project.

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.

2.2 Local Stakeholder Consultation

The stakeholders of the project activity were invited to attend the stakeholder meeting on 04-November-2015. 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 12-November-2015 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. No negative comments received.

Nevertheless, PP is open for the continuous stakeholder interaction and formed a grievance/suggestion register and a grievance box placed at the project site for the comments at any point of time during the project crediting period. PP has explained this mechanism for on-going communication to the local stakeholders and transparently kept the notice mentioning the grievance register and box at the project site.

[7] http://164.100.94.214/sites/default/files/uploads/report-on-developmental-impacts-of-RE.pdf

Grievances should be necessarily acknowledged, with an interim reply within one week of receipt and shared with concern department and redressed within one month of receipt in the Organisation if found genuine.

2.3 AFOLU-Specific Safeguards

Not applicable to this as this is not an AFOLU project activity.

3 IMPLEMENTATION STATUS

3.1 Implementation Status of the Project Activity

The project activity involves the installation of Wind project and it consist of 42 WTGs of 2 MW capacity of each WTG so the total installed capacity of the project is 84 MW Wind project located at YSR Kadapa district in Andhra Pradesh state, India. The project is promoted by Animala Wind Power Private Limited which is part of Greenko Group and O&M is also done by Greenko.The project activity implemented in two phases of 54 MW and 30 MW. There are no changes compared to the project design.

The Project activity is a new facility (Greenfield) and the electricity generated by the project is exported to the Indian electricity grid. The project is therefore displacing 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.

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.

The nearest WGT from PSS is at approx. 1 KM, and the longest distance from PSS is approx. 26 KM. A total of 05 dedicated Feeders are Present in the substation.

The details are feeders are connected WTGs are as follows:

Feeder Number	WTG number
1	T-6, T-9, T-11, T-13, T-15, T-16, T-18, T-19, T-34 (Total 9 WTGs are connected to feeder no. 1)
2	T-1, T-2, T-3, T-4, T-5, T-7, T-8, T-10, T-12, T-14 (Total 10 WTGs are connected to feeder no. 2)

3	T-21, T-22, T-23, T-24, T-25, T-26, T-27, T-28 (Total 8 WTGs are connected to feeder no. 3)
4	T-17, T-35, T-36, T-37, T-38, T-39, T-41, T-51, T-52 (Total 9 WTGs are connected to feeder no. 4)
5	T-29, T-45 T-,46, T-48, T-49, T-50 (Total 6 WTGs are connected to feeder no. 5)

The Voltage generated at the generator is stepped up to 33 kV, and the same is connected to PSS. From PSS again, the 33 kV is stepped up to 220 kV and synchronized to the grid.

The project is replacing anthropogenic emissions of greenhouse gases (GHG's) estimated to be approximately 163,843 tCO_2e per year, thereon displacing 172,922 MWh/year amount of electricity from the gird over the 10 years crediting period.

The technical specification for 84 MW (42 * 2 MW) Wind project are provided below:

Technical specification WTG	
WTG Make and Model No.	Gamesa G97[8]
Generator Type & Rating	Doubly-Fed Induction generator, 2000 kW
WTG configuration	42 X 2000 kW
Rotor Diameter	97 m
Hub Height	92
Tower Type & Shape	Conical Tubular Steel
Cut-in-wind speed	3.0 m/s
Rated wind speed	11.0 m/s
Cut-out wind speed	25.0 m/s
Voltage generated at the hub	690 Volts
Technical specification WTG Transformers	
Make	ABB
Voltage	33KV/690 V
Rated Power	2350 KVA
Frequency	50 Hz
Technical specification Power Transformers	
Make	Prime Medin
Voltage	220KV/33KV
Rated Power	80/100 MVA
Frequency	50 Hz

[8] https://en.wind-turbine-models.com/turbines/764-gamesa-g97

3.2 Deviations

3.2.1 Methodology Deviations

No methodology deviation is applied during the monitoring period.

3.2.2 Project Description Deviations

Project deviation applicable:

The formula mentioned in the registered PD for the quantity of net electricity generation supplied by the project plant to the grid was not correct, so it has been corrected in line with JMR. This correction is considered a project deviation for the current monitoring period but it does not impact the previous verifications.

Net electricity supplied is calculated based on the difference between the calculated values of "export", "import" and "transmission loss" on the EB energy meter and at the substation". Transmission loss is calculated on a pro-rata basis as per the readings of the 220 KV substation and "primary metering Point".

Net Electricity = Export – Import – Transmission Loss

The net electricity is calculated by the state electricity board and provided in the monthly generation statement (JMR). Hence, the net electricity reading is directly sourced from the monthly generation statement/JMR which is in line with the actual monitoring process.

The deviation is in line with the guidelines provided in VCS Standard Version 4.4[9] Section 3.20; however, it doesn't impact existing applicability conditions, methodology, baseline, and additionality.

The Monitoring period started from first day of month and generation report (JMR) dated from third day of month so for calculation of generation from first day of month, apportion is used and it can be reflected in ER sheet the formula of apportioning is mentioned in section 4.3 Monitoring Plan (Mismatch in Monitoring Period and the Billing 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 for the project electricity system in year y

[9] https://verra.org/wp-content/uploads/2022/12/VCS-Standard-v4.4-FINAL.pdf

Source of data	Calculated from CEA database, Version 13-June-2018[10]
Value applied	0.9726
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 06" as 3-year generation weighted average using data for the years 2014-15, 2015-16 & 2016-17. The data are obtained from "CO2 Baseline Database for Indian Power Sector" version 13, 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 for the project electricity system in year y
Source of data	Calculated from CEA database, Version 13-June-2018[11]
Value applied	0.8723
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 06" as per the latest data available for the most recent year 2015-16. The data is obtained from "CO_2 Baseline Database for Indian Power Sector" version 13, 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 for the project electricity system in year y
Source of data	Calculated from CEA database, Version 13-June-2018
Value applied	0.9475
Justification of choice of data or description of	The combined margin emissions factor is calculated as follows: $EF_{grid,CM,y} = EF_{grid,OM,y} * W_{OM} + EF_{grid, BM,y} * W_{BM}$

[10] http://www.cea.nic.in/reports/others/thermal/tpece/cdm_co2/user_guide_ver13.pdf

[11] http://www.cea.nic.in/reports/others/thermal/tpece/cdm_co2/user_guide_ver13.pdf

measurement methods and procedures applied	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) W_{OM} = Weighting of operating margin emissions factor (%) = 75% W_{BM} = 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/y
Description	Quantity of net electricity generation supplied by the project plant/unit to the grid in year y (MWh)
Source of data	Monthly joint meter reading reports
Description of measurement methods and procedures to be applied	The difference of final value of export and import is used for monthly values of net electricity supplied to the grid by the project activity and same value is considered for ER calculations and bulk meter is installed at 220 KV, and it is used to calculate transmission loss.
Frequency of monitoring/recording	Continuous measurement & monthly recording
Value monitored	313,062.51 MWh
Monitoring equipment	The electricity exported / supplied by the plant to pooling substation is measured by net meters at 33 kv PSS This meter also measures electricity imported by the plant from the grid. Bulk meter is installed at 220 KV, and it is used to calculate transmission loss. The details of meters including Meter serial number, Make, accuracy class and the calibration dates are mentioned APPENDIX 1: Calibration Records.
QA/QC procedures to be applied	The meters are approved, tested & sealed by the State Utility. The meters are in the custody of State Utility. The frequency of calibration is once in 5 years.[12] The monthly electricity supplied/exported by the project activity in the JMR report is cross checked with the monthly invoices of sale. In the absence or delay

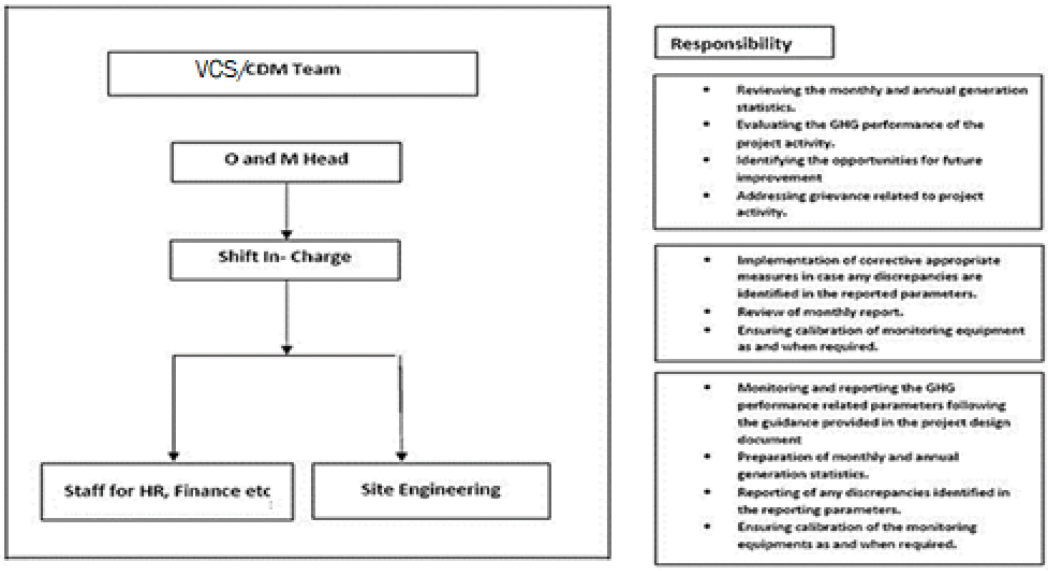
12 http://www.aegcl.co.in/Metering_Regulations_Of_CEA_17_03_2006.pdf

	in the meter calibration appropriate Guidelines will be applied appropriately to confirm the conservativeness of metering. The metering arrangement, accuracy class of meters, calibration frequency is under control of state electricity board and PP does not have any control on it. PP is getting value of net electricity supplied to grid and the same is considered the monitoring parameter. The billing is raised based on substation meters.
Purpose of the data	Calculation of baseline emissions
Calculation method	Net electricity supplied is calculated based on the difference between calculated values of "export", "import" and "transmission loss" on the EB (Electricity Board) energy meter and at substation". Transmission loss is calculated on pro-rata basis as per the readings of 220KV substation & "primary metering Point". (Net Electricity = Export – Import – Transmission Loss) The net electricity is calculated by State electricity board and provided in the monthly generation statement/JMR. Hence, the net electricity reading is directly sourced from the monthly generation statement/JMR.
Comments	Data will be archived in paper & electronic form for two years after the end of crediting period or of the last issuance of VCUs for this project activity, whichever occurs later.

4.3 Monitoring Plan

The monitoring plan is developed in accordance with the modalities and procedures for VCS project activities and is proposed for grid-connected wind power project being implemented. The monitoring plan, which is implemented by the project participant describes about the monitoring organisation, 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 equipments for this project activity. The team comprises of the following members:



Data Measurement

The export and import energy are measured continuously using above mentioned Main and Check meters located at the substations. Readings of meters are taken on monthly basis by authorized officer of SEB in the presence of PP or representative of PP. Based on the Meter Reading Statement to PP, invoices are raised. These invoices can be used for cross checking the meter readings taken for the respective project activity.

Mismatch in Monitoring Period and 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 from:

D = (A/B) x C

Were,

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.

Data collection and archiving

Readings from meters is collected in the presence of the plant in-charge. Export and Import data would be recorded and stored in logs as well as in electronic form on a daily basis. The records are checked periodically by the Plant Manager and discussed thoroughly with the plant supervisor. The period of storage of the monitored data will be 2 years after the end of crediting period or till the last issuance of VCUs for the project activity whichever occurs later.

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 and in the event that the Main meter and check meter both are not in service as a result of maintenance, repairs or testing, the Standby meter will be used for readings. 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.

Personnel training

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

Metering Arrangement

The project activity includes metering at the substation managed by Animala & other customers. The electricity exported & imported are measured by Energy meter installed at substation. The reading is recorded and the difference from last month reading gives the number of units imported/exported.

The project activity metering is done at the GSS {input (33kV) and output (220kV)}.

There are total of 2 input meters for this project activity at the 33kV end of GSS (X1 for 54 MW and X2 for 30 MW). Projects from other developers join the same GSS through another meters (Meter X3) at the 33kV input end.

All the electricity received at the GSS through input 33kV meters is stepped up to 220kV and recorded at the output meter means bulk meter (Meter Y). While stepping up the power from 33kV to 220kV, there is some transformation/transmission loss. For record purpose it is termed as “Transmission loss”.

The Export, Import & Transmission Losses are as below:

Export = Export (Net meter) – (Export (Net meter) *Transmission Loss %)

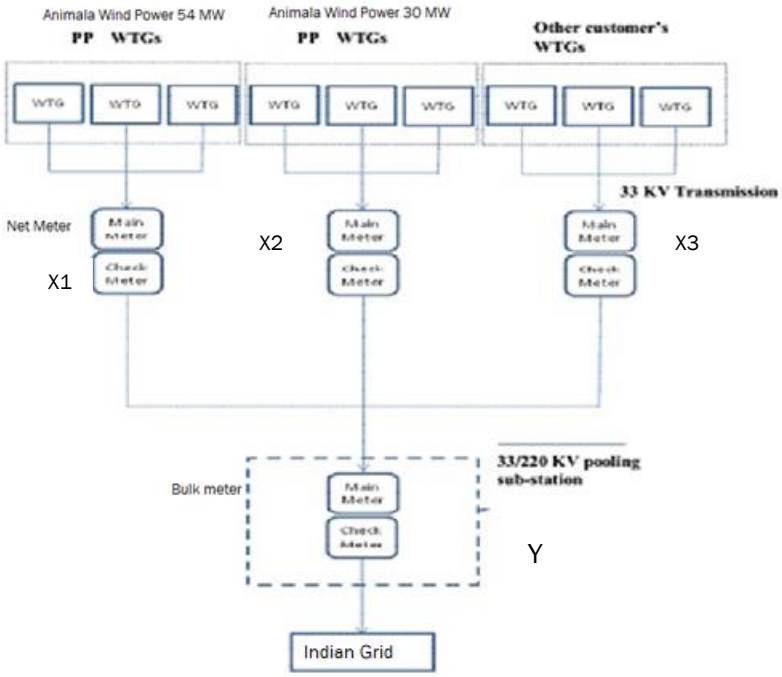
Import = Import (Meter X)

Transmission Loss % =

$$\frac{\{X1 + X2 + X3 - Y\}}{(X1 + X2 + X3)} \times 100$$

The source of above data is JMR.

Line diagram with metering arrangement for the wind project activity is shown below.



The wind plants have their own dedicated metering arrangement at the substation end. The metering arrangement is under control of state electricity board and may change in future.

QA/QC procedures

The meters are approved, tested & sealed by the State Utility. The meters are in the custody of

State Utility. Calibration of all the meters is undertaken at required intervals and faulty meters are duly replaced immediately based on CEA guidelines which specifies calibration and the frequency of calibration is once in 5 years[13]. The monthly electricity supplied/exported by the project activity in the JMR report is cross checked with the monthly invoices of sale. In the absence or delay in the meter calibration appropriate Guidelines is applied appropriately to confirm the conservativeness of metering.

The metering arrangement, accuracy class of meters, calibration frequency is under control of state electricity board and PP does not have any control on it. PP is getting value of net electricity supplied to grid and the same is considered in the monitoring parameter. The billing is raised based on substation meters.

All the data items monitored under the monitoring plan will be kept for 2 years after the end of crediting period or till the last issuance of VCUs for this project activity, whichever occurs later. The data is archived both electronically and manually, and kept in safe storage by PP.

5 QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS

5.1 Baseline Emissions

As per the approved consolidated Methodology ACM0002 (Version 18.1) 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/yr)

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

$EF_{grid, CM,y}$ = Combined margin 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" ($t\ CO_2/MWh$)

[13] http://www.aegcl.co.in/Metering_Regulations_Of_CEA_17_03_2006.pdf

Therefore,

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

= 313,062.51 x 0.9475

= 296,625 tCO_2e (vintage wise Round down values)

5.2 Project Emissions

Not Applicable, since emissions from the project activity is zero as per ACM0002 (Version 18.1) methodology. Hence, $PE_y = 0$.

5.3 Leakage

Not Applicable, since leakage emissions from the project activity is zero as per ACM0002 (Version 18.1) methodology. Hence, $LE_y = 0$.

5.4 Net GHG Emission Reductions and Removals

The Formula used to calculate the net emission reduction for the project activity

$$ER_Y = BE_y - PE_y$$

Where:

ER_y = Emission Reduction in tCO_2/year
BE_y = Baseline emission in tCO_2/year
PE_y = Project emissions in tCO_2/year
LE_y = Leakage Emissions in tCO_2/year

For the project activity during the current monitoring period, as per section 5.1

BE_y = 296,625 tCO_2e
PE_y = 0 tCO_2e
LE_y = 0 tCO_2e

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	144,242	0	0	144,242
01-January - 2022 to 31– December-2022	152,383	0	0	152,383
Total	296,625	0	0	296,625

Ex-ante emissions reductions /removals	Achieved emissions reductions /removals	Percent difference	Justification for the difference
327,686 tCO_2e.	296,625 tCO_2e	-9.48 %	It is to be noted here that as per the estimated emission reduction to be achieved from the project activity for the current monitoring period is 327,686 tCO_2e., whereas actual emission reductions achieved are 296,625 tCO_2e., which is approximately 9.48% lower than the estimated emission reductions. The lower generation achieved during current verification period is due to certain natural conditions hence it is acceptable.

APPENDIX 1: CALIBRATION RECORDS

Meter and Calibration details of 84 MW Wind power project by Animala Wind Power Private Limited:

Meter and Calibration details of 84 MW Wind power project by Animala Wind Power Private Limited:			
84 MW - 220 KV			
Meter Details	Main Meter	Check Meter	Standby Meter
Meter Serial No	16400222	16400223	16400224
Meter Make	L & T	L & T	L & T
Accuracy Class	0.2s	0.2s	0.2s
Date of Calibration 2018	28-February-2018	28-February-2018	28-March-2018
Date of Calibration 2020	24-November-2020	24-November-2020	24-November-2020
Date of Calibration 2021	20-December-2021	20-December-2021	20-December-2021
Due Date of Calibration	19-December-2026	19-December-2026	19-December-2026

APPENDIX 2: BREAKDOWNS

Grid Breakdowns:

Date	Duration (Hours)
01-February-21	1:25
24-March-21	1:20
24-March-21	1:21
24-March-21	23:59
24-March-21	3:05
21-April-21	1:25
21-April-21	4:03
21-April-21	2:24
22-April-21	1:06
03-June-21	5:29
03-June-21	5:24
14-June-21	17:25
28-June-21	3:28
28-June-21	10:09
02-November-21	1:06
03-November-21	2:02
31-May-22	2:45
06-June-22	4:32
15-June-22	3:05
20-July-22	2:41
29-September-22	1:33
29-September-22	1:00
12-October-22	6:16
12-October-22	1:11
09-December-22	6:00
Total	114:14

WTG Breakdowns:

Month	Duration (Hours)
January-21	534:49:00
February-21	1369:45:00
March-21	1289:18:00
April-21	330:09:00
May-21	88:02:00

June-21	91:33:00
July-21	389:33:00
August-21	162:08:00
September-21	240:05:00
October-21	711:10:00
November-21	739:58:00
December-21	13:59
January-22	21:02
February-22	9:34
March-22	0:00:00
April-22	607:24:00
May-22	763:24:00
June-22	884:16:00
July-22	852:08:00
August-22	767:32:00
September-22	99:04:00
October-22	9:11
November-22	0:00:00
December-22	0:00:00
Total	**9,974:04:00**

APPENDIX 3: SDG CONTRIBUTION

Months	Total Net Generation (Mwh)	Emission Factor(tCO2/MWh)	Emission Reductions(tCO2)
	SGD 7		SGD 13
01-January-2021 to 02-January-2021	490.35	0.9475	464.00
03-January-2021 to 03-February-2021	8,799.10	0.9475	8,337.00
03-February-2021 to 03-March-2021	10,576.20	0.9475	10,020.00
03-March-2021 to 03-April-2021	11,152.80	0.9475	10,567.00
03-April-2021 to 03-May-2021	7,400.60	0.9475	7,012.00
03-May-2021 to 03-June-2021	12,608.70	0.9475	11,946.00
03-June-2021 to 03-July-2021	25,223.00	0.9475	23,898.00
03-July-2021 to 03-August-2021	22,697.10	0.9475	21,505.00
03-August-2021 to 03-September-2021	19,935.70	0.9475	18,889.00
03-September-2021 to 03-October-2021	17,867.40	0.9475	16,929.00
03-October-2021 to 03-November-2021	3,812.30	0.9475	3,612.00
03-November-2021 to 03-December-2021	5,131.50	0.9475	4,862.00
Vintage 2021	**145,694.74**	**0.9475**	**138,045.00**
03-December-2021 to 03-January-2022	6,540.50	0.9475	6,197.00
03-January-2022 to 03-February-2022	8,328.40	0.9475	7,891.00
03-February-2022 to 03-March-2022	11,042.70	0.9475	10,462.00
03-March-2022 to 03-April-2022	8,182.40	0.9475	7,752.00
03-April-2022 to 03-May-2022	8,366.50	0.9475	7,927.00
03-May-2022 to 03-June-2022	19,163.49	0.9475	18,157.00
03-June-2022 to 03-July-2022	21,235.00	0.9475	20,120.00
03-July-2022 to 03-August-2022	28,010.59	0.9475	26,540.00
03-August-2022 to 03-September-2022	23,207.20	0.9475	21,988.00
03-September-2022 to 03-October-2022	17,877.99	0.9475	16,939.00
03-October-2022 to 03-November-2022	4,643.80	0.9475	4,399.00
03-November-2022 to 03-December-2022	4,212.40	0.9475	3,991.00
03-December-2022 to 31-December-2022	6,556.80	0.9475	6,212.00
Vintage 2022	**167,367.77**	**0.9475**	**158,580.00**
Total	**313,062.51**		**296,625.00**