RENEWABLE POWER PROJECT BY AXIS WIND FARMS (MPR DAM) PRIVATE LIMITED

Document Prepared by Infinite Solutions

Project Title	Renewable Power Project by Axis Wind Farms (MPR Dam) Private Limited
Version	03
Report ID	VCS1790 (4th Monitoring Period)
Date of Issue	21-August-2023
Project ID	VCS 1790
Monitoring Period	01-January-2021 to 31-December-2022 (First and last days included)
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CONTENTS

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 a 50 WTGs of capacity 2 MW each. The project capacity is 100 MW wind power project in Andhra Pradesh state of India.

Over the 10 years of first crediting period, the project will replace anthropogenic emissions of greenhouse gases (GHG's) estimated to be approximately 195,052 tCO_2e per year, thereon displacing 205,860 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	State	Usage
Axis Wind Farms (MPR Dam) Private Limited	100 MW	30-March-2017	Indian Grid	Village Ipperu, District Anantapuram, Andhra Pradesh	Sale to Andhra Pradesh Southern Power Distribution Company

The project was commissioned on 30-March-2017 and operating smoothly with schedule maintenance at regular intervals. There are approximately 3,848 hrs. of breakdown in Axis Wind Farms (MPR Dam) Private Limited which occurred during current monitoring period and the details of the same has been provided in appendix 2.

Total emission reductions achieved in this monitoring period:
During the Current Monitoring Period from 01-January-2021 to 31-December-2022 (Inclusive of both dates), the project activity has supplied 466,462.80 MWh of electricity, and thus contributing to the GHG reductions 441,973 tCO_2e.

Audit Type	Period	Program	VVB Name	Number of years

Validation/ Verification	(30-March-2017 to 01-August-2018) (First and last days included)	VCS	LGAI Technological Center S.A. (Applus+ Certification	1 year 04 months 03 days
Verification	(02-August-2018 to 01-October-2019) (First and last days included)	VCS	Earthood Services Private Limited	1 year 02 months 00 day
Verification	(02-October-2019 to 31-December-2020) (First and last days included)	VCS	TUV SUD South Asia Pvt. Ltd.	1 year 02 months 30 days
Verification	(01-January-2021 to 31-December-2022) (First and last days included)	VCS	VKU Certification Private Limited	2 years 00 months 00 day
Total	(30-March-2017 to 31-December-2022) (First and last days included)	VCS		5 years 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

Methodology: 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	Axis Wind Farms (MPR Dam) Private Limited
Contact person	Murali Krishnam Raju M
Title	AGM - Commercial
Address	PLOT NO. #1131/A, ROAD NO. 36JUBILEE HILLS, HYDERABAD – 5000 TELANGANA, INDIA
Telephone	+91 40 40300100

[1] 2L9KQXT6HGREJWO84VD0IPYB7U5SMA (unfccc.int)

Email	muraliraju.m@greenkogroup.com

1.4 Other Entities Involved in the Project

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 – 452001, India
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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 100 MW Wind Project activity by Axis Wind Farms (MPR Dam) Private Limited.

The details of the commissioning dates of the individual project activity are mentioned in the section 1.7 of this report.

1.6 Project Crediting Period

Crediting Period Start date: 30-March-2017

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

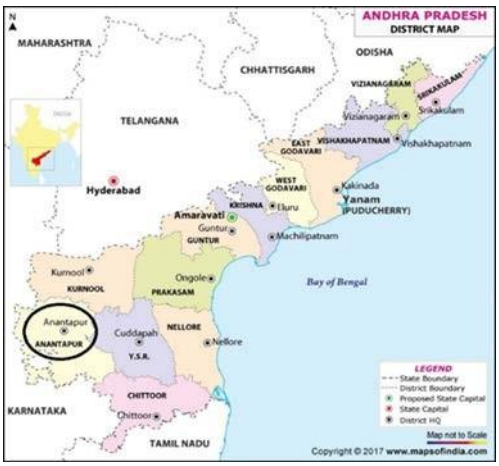
The project activity adopts renewable crediting period of 10 years period which can be renewed for maximum 2 times.

1.7 Project Location

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

Name of Investor	Capacity (MW)	Village(s)	Tehsil / Mandal	District	State
Axis Wind Farms (MPR Dam) Private Limited	100 MW	Ipperu	Kuderu	Anantapuram	Andhra Pradesh

The project locations have been shown in the map below:



The Geo-Coordinates of all the WTGs involved in the project activity is provided in the table below:

WTG no	COD	Latitude (N)	Longitude (E)
MPR 01	30-March-2017	14° 50' 10.7556"	77° 23' 12.1804
MPR 02	30-March-2017	14° 50' 02.0256"	77° 23' 29.2367"
MPR 03	30-March-2017	14° 49' 54.7248"	77° 23' 40.2233"
MPR 04	30-March-2017	14° 44' 46.7376"	77° 21' 28.7729"
MPR 05	30-March-2017	14° 44' 41.3556"	77° 20' 58.3010"
MPR 06	30-March-2017	14° 46' 45.4332"	77° 20' 42.9873"
MPR 07	30-March-2017	14° 49' 12.3204"	77° 24' 38.6315"
MPR 08	30-March-2017	14° 50' 41.5572"	77° 24' 29.9906"
MPR 09	30-March-2017	14° 50' 28.7772"	77° 24' 36.2687"
MPR 10	30-March-2017	14° 50' 04.9128"	77° 25' 03.2868"
MPR 11	30-March-2017	14° 49' 49.7208"	77° 25' 06.6286"
MPR 12	30-March-2017	14° 46' 32.5956"	77° 20' 19.4172"
MPR 13	30-March-2017	14° 46' 16.2048"	77° 20' 22.3838"
MPR 15	30-March-2017	14° 45' 14.2776"	77° 19' 27.8421"
MPR 14	30-March-2017	14° 46' 08.4612"	77° 20' 38.6797"
MPR 16	30-March-2017	14° 45' 45.4680"	77° 19' 27.9395"
MPR 17	30-March-2017	14° 44' 51.4212"	77° 20' 34.3447"
MPR 18	30-March-2017	14° 44' 38.4648"	77° 21' 48.8706"
MPR 19	30-March-2017	14° 45' 54.9468"	77° 19' 23.3941"
MPR 21	30-March-2017	14° 45' 01.7460"	77° 21' 36.9895"
MPR 23	30-March-2017	14° 45' 14.2884"	77° 21' 50.7949"
MPR 24	30-March-2017	14° 51' 06.8940"	77° 22' 02.9782"
MPR 25	30-March-2017	14° 50' 57.6816"	77° 22' 19.6636"
MPR 26	30-March-2017	14° 50' 47.1156"	77° 22' 28.4760"
MPR 27	30-March-2017	14° 50' 34.8792"	77° 22' 29.2786"

MPR 30	30-March-2017	14° 48' 44.0208"	77° 21' 52.7650"
MPR 31	30-March-2017	14° 48' 36.4716"	77° 22' 02.6457"
MPR 32	30-March-2017	14° 48' 31.5504"	77° 22' 35.3550"
MPR 33	30-March-2017	14° 48' 22.0212"	77° 22' 35.0172"
MPR 34	30-March-2017	14° 48' 12.6108"	77° 22' 36.1515"
MPR_20	30-March-2017	14° 46' 59.0556"	77° 21' 12.2493"
MPR_22	30-March-2017	14° 46' 47.4708"	77° 21' 09.6843"
MPR_28	30-March-2017	14° 46' 53.7924"	77° 21' 40.3386"
MPR_29	30-March-2017	14° 46' 31.4040"	77° 21' 22.3136"
MPR 35	30-March-2017	14° 44' 23.2440"	77° 21' 58.4986"
MPR 36	30-March-2017	14° 44' 09.8052"	77° 21' 43.0135"
MPR_37	30-March-2017	14° 45' 01.5120"	77° 20' 04.7061"
MPR_38	30-March-2017	14° 45' 11.8044"	77° 20' 03.1448"
MPR_39	30-March-2017	14° 45' 20.9268"	77° 19' 55.3874"
MPR_40	30-March-2017	14° 45' 30.2148"	77° 19' 59.9987"
MPR_41	30-March-2017	14° 46' 21.7416"	77° 21' 19.4351"
MPR_42	30-March-2017	14° 45' 03.8016"	77° 20' 54.6314"
MPR_43	30-March-2017	14° 45' 28.9944"	77° 21' 21.8416"
MPR_44	30-March-2017	14° 45' 16.8480"	77° 21' 16.8978"
MPR_45	30-March-2017	14° 45' 37.8216"	77° 21' 07.6310"
MPR_46	30-March-2017	14° 46' 30.3060"	77° 20' 52.9532"
MPR_47	30-March-2017	14° 49' 01.3512"	77° 21' 40.6498"
MPR_48	30-March-2017	14° 49' 12.5040"	77° 21' 41.1050"
MPR_49	30-March-2017	14° 48' 50.7708"	77° 24' 46.6506"
MPR_50	30-March-2017	14° 45' 50.022"	77° 20' 38.7168"

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 project standard for project activities Clause 7.12.2. Para 119.

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:

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

- Tool 7 to calculate the emission factor for an electricity system[3] - Version 07.0 (EB 100, Annex 04)
- Methodological Tool 1- Tool for the demonstration and assessment of additionality[4]- Version 07.0.0 (EB 70, Annex 08)

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 emission are not applicable in this project activity.

[3] http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-07-v7.0.pdf

[4] http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-01-v7.0.0.pdf

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 duringthe construction and operation phases. The project activity will lead to development in infrastructure in the region like development of roads and 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.

The wind Project is located at villages Ipperu district of Anantapuram, Andhra Pradesh. 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 a 100 MW wind power project in Andhra Pradesh state of India.

The project is contributing to 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 owner monitors the carbon emission with help of the record of electricity generated.

The project is wind power project, it has generated 466,462.80 MWh electricity and avoided 441,973 tons 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, SDG 13 and SDG 08.

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 466,462.80 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 1,255,938.9 MWh (303,197.60+271,852.50+214,426+466,462.80)[5] renewable electricity has supplied to INDIAN Grid that helps to increase the renewable energy share in the energy mix.
2)	8.5	8.5.1 Average hourly earnings of employees, by sex, age, occupation and persons with disabilities	The project activity will result in temporary and primary employment opportunity during the construction and operation phase.	Project has contributed directly to achieve the SDG target, because the project activity has created jobs in the renewable energy sector.	Which will also upgrade employee's knowledge and capacity over and above the commonly used technology in the energy sector of India.

[5] https://registry.verra.org/app/projectDetail/VCS/1790

3)	13.0	13.2.2 Tonnes of greenhouse gas emissions avoided or removed	Implemented activities to increase		By installation of 100 MW wind Energy Power Plant, project has prevented the release of 441,973 tons of carbon into the atmosphere during the monitoring period	Prevented the release of 1,189,999 tons of carbon (287,279+257,579+203,168+441,973)[6] into the atmosphere.

[6] https://registry.verra.org/app/projectDetail/VCS/1790

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. Pleaserefer 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 05-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 13-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] https://smartnet.niua.org/sites/default/files/resources/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 consists of 50 WTGs of capacity 2 MW each. The total installed capacity of the project is 100 MW Wind project located at Andhra Pradesh state in India. The project is promoted by Axis Wind Farms (MPR Dam) Private Limited which is part of Greenko Group. The O&M was earlier done by Gamesa but now it is done by Greenko itself. There are no changes compared to the project design.

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.

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. Hence baseline scenario of the project activity is the grid-based electricity system.

The electricity generated by the project activity is being supplied to the grid. The major contributor of electricity to the INDIAN grids is fossil fuel based thermal power plants. Fossil fuel-based electricity generation contributes to GHG emissions of carbon dioxide into the atmosphere. The project activity is wind energy generation which is a clean source of energy. In addition to contributing to the electricity generation to the state of Andhra Pradesh, the project activity also helps to displace electricity generated from fossil fuel based thermal power plants into the grid thereby reducing GHG emissions. Prior to the project activity the same amount of electricity would be supplied from the connected grid system.

The nearest WGT (MRP-49) from PSS is at approx. 4.5 km, and the longest distance of WTG (MRP-36) from PSS is approx. 19.5 km. A total of 05 dedicated Feeders are Present in the substation

and the energy generation is measured in respective feeder by use of Tri vector meters. No internal available automatic metering system installed.

The details are feeders are connected WTGs are as follows:

Feeder Number	WTG number
1	MPR-07, MPR-08, MPR-09, MPR-10, MPR-11, MPR-24, MPR-25, MPR-26, MPR-27, MPR-49 (Total 10 WTGs are connected to feeder no. 1)
2	MPR-01, MPR-02, MPR-03, MPR-30, MPR-31, MPR-32, MPR-33, MPR-34, MPR-47, MPR-48 (Total 10 WTGs are connected to feeder no. 2)
3	MPR-20, MPR-22, MPR-28, MPR-29, MPR-41, MPR-46, MPR-05, MPR-06, MPR-12, MPR-13 (Total 10 WTGs are connected to feeder no. 3)
4	MPR-37, MPR-38, MPR-39, MPR-40, MPR-42, MPR-45, MPR-50, MPR-14, MPR-16, MPR-18, MPR-19 (Total 11 WTGs are connected to feeder no. 4)
5	MPR-43, MPR-44, MPR-04, MPR-15, MPR-17, MPR-21, MPR-23, MPR-35, MPR-36 (Total 9 WTGs are connected to feeder no. 5)

The Voltage generated at the generator is 690V and it is stepped up to 33 kV voltage and the same is connected to PSS. From PSS again, the 33 kV is stepped up to 220 kV and synchronized to the grid. ABT meters are available on 220kV side in PSS for Billing purpose.

The project results in replacing anthropogenic emissions of greenhouse gases (GHG's) estimated to be approximately 195,052 tCO_2e per year, thereon displacing 205,860 MWh/year amount of electricity from the gird over the 10 years crediting period.

The technical specification for 100 MW Wind project having 50 unit of the Gamesa WTG is provided below.

Technical specifications WTG	
WTG Make and Model No.	Gamesa, G114[8]
Generator Type & Rating	Doubly-Fed Induction generator
Generator Rating	2000 kW
WTG configuration	50 X 2000 kW
Rotor Diameter	114 m
Swept Area	10,207.0 m^2

[8] Gamesa G114-2.0MW - 2,00 MW - Wind turbine (wind-turbine-models.com)

Hub Height	93
Tower Type & Shape	Conical Tubular Steel
Cut-in-wind speed	2.5 m/s
Rated wind speed	10.0 m/s
Cut-out wind speed	25.0 m/s
Voltage generated at hub	690 volts
Survival wind speed	60.0 m/s
Technical specification WTG Transformers	
Make	ABB
Voltage	33KV/690 V
Rated Power	2350 KVA
Technical specifications Power Transformers	
Make	Prime Meiden
Voltage	220/33kV
Rated Power	1 X 80/100/110 MVA

3.2 Deviations

3.2.1 Methodology Deviations

No methodology deviation is applied during the monitoring period.

3.2.2 Project Description Deviations

No deviation has taken place in project description during the 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_2e emission factor for the project electricity system in year y
Source of data	Calculated from CEA database, Version 13, June 2018[9]
Value applied	0.9726

[9] https://cea.nic.in/old/reports/others/thermal/tpece/cdm_co2/user_guide_ver13.pdf

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" as 3-year generation weighted average using data for the years 2014-15, 2015-16 & 2016-17. The data are 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	$EF_{grid, BM, y}$
Data unit	tCO_2/MWh
Description	Build margin CO_2 emission factor for the project electricity system in year y
Source of data	Central Electricity Authority (CEA) of India Database Version 07[10]
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 07" as per the latest data available for the most recent year 2016-17. 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	Calculation of baseline emissions
Comments	The above value is fixed and it is same for the entire crediting period

Data / Parameter	$EF_{grid, CM, y}$
Data unit	tCO_2/MWh
Description	Combined margin CO_2e emission factor for the project electricity system in yearly
Source of data	Calculated from CEA database, Version 13, June 2018[11]
Value applied	0.9475
Justification of choice of data or description of	The combined margin emissions factor is calculated as follows: $EF_{grid,CM,y} = EF_{grid,OM,y} * W_{OM} + EF_{grid, BM,y} * W_{BM}$ Where:

10 https://cea.nic.in/old/reports/others/thermal/tpece/cdm_co2/user_guide_ver13.pdf

11 https://cea.nic.in/old/reports/others/thermal/tpece/cdm_co2/user_guide_ver13.pdf

measurement methods and procedures applied	$EF_{grid, BM,y}$ = Build margin CO_2 emission factor in year y (tCO_2e/MWh) $EF_{grid,OM,y}$ = Operating margin CO_2 emission factor in year y (tCO_2e/MWh) W_{OM} = Weighting of operating margin emissions factor (%) = 75% W_{BM}= Weighting of build margin emissions factor (%) = 25%
Purpose of Data	Calculation of baseline emissions
Comments	The above value is fixed and it is same 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 values are considered for ER calculations. Monthly readings are recorded in the presence of the site personnel and APTRANSCO representative.
Frequency of monitoring/recording	Continuous measurement & monthly recording
Value monitored	466,462.80 MWh
Monitoring equipment	The electricity exported / supplied by the plant to pooling substation and further to substation. This meter also measures electricity imported by the plant from the grid. There are numerous meters used in this project activity and the details 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

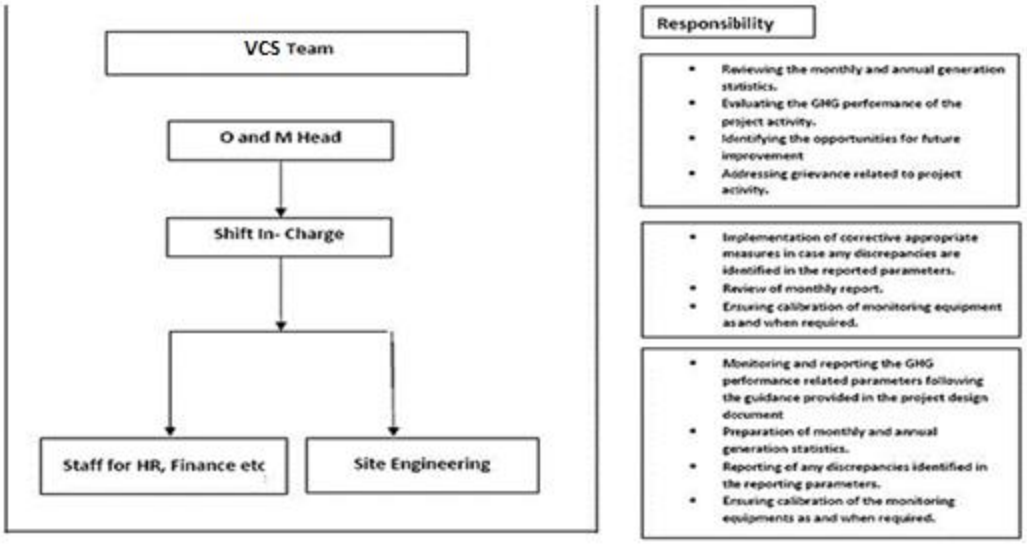
[12] http://www.aegcl.co.in/Metering_Regulations_Of_CEA_17_03_2006.pdf

	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 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	Thus, Net electricity supplied to the grid by the project plant in a given month = Export, kWh– Import, kWh
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 for grid-connected wind power project which has been implemented. 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 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 are used for cross checking the meter readings taken for the respective project activity. The Net electricity supplied to the grid by the project plant in a given month = Export (kWh) – Import (kWh)

Data collection and archiving

Readings from meters are collected in the presence of the plant in-charge. Export and Import data are 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 does 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 approximately 3848 hours of breakdown identified of all the WTGs during the monitoring period and the details have been described in annexure 2 of monitoring report.

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 are trained in equipment operation, data recording, reports writing, operation and maintenance and emergency procedures in compliance with the monitoring plan.

QA/QC procedures

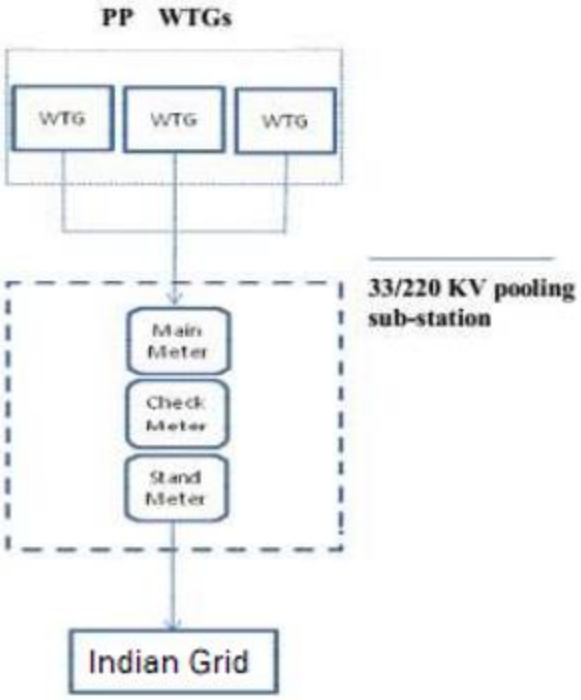
The meters are approved, tested & sealed by the State Utility. The meters are in the custody of State Utility. Calibration of all the meters is undertaken at required intervals and faulty meters are duly replaced immediately based on CEA guidelines which specifies calibration and the frequency of calibration is once in 5 years. 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 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 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 will be archived both electronically and manually, and kept in safe storage by PP.

Metering Arrangement

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



The wind plants have their own dedicated metering arrangement at the Axis MPR Dam substation end. There are three meters main, check and standby meters of ABT Meter, ER 300P type installed at 220Kv at the Axis MPR Dam substation. The energy supplied to APTRANSCO Grid from our 100 MW Wind Power Project at Ipperu Village, Kuderu Mandal, Anantapuram District. The metering arrangement is under control of state electricity board and may change in future and the same details of the calibration has been added in appendix 1 of MR.

Apportioning Procedure for (Wind) Power Project

The net electricity supplied to the grid would be reported as the difference between the net export and import from the WTG. The electricity export and import data are monitored via main, check and standby meters connected to feeders at the respective 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.

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_2e/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" ($t\,CO_2/MWh$)

Calculation of $EG_{PJ,y}$

If the project activity is the installation of a Greenfield power plant, then:

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

Where:

$EG_{PJ,y}$ = 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)

$EG_{facility,\ y}$ = Quantity of net electricity generation supplied by the project plant/unit to the grid in year y (MWh/yr).

Vintage-wise calculation Year	Axis Wind Farms (MPR Dam) Private Limited (MWH)
2021	229,849.40
2022	236,613.40
Total	466,462.80

Thus, $EG_{PJ,\ y}$ = 466,462.80 MWh

Grid Emission Factor

The GEF is fixed ex-ante in the PD as given below:

Parameter	Value
OM	0.9726
BM	0.8723
CM	0.9475

Therefore,

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

= 466,462.80 x 0.9475

= 441,973 tCO_2e (Rounded Down)

5.2 Project Emissions

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

$PE_y = 0$

5.3 Leakage

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

$LE_y = 0$

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 = 441,973 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	217,782	0	0	217,782
01-January-2022 to 31-December-2022	224,191	0	0	224,191
Total	441,973	0	0	441,973

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 390,104 tCO_2e, whereas actual emission reductions achieved are 441,973 tCO_2e, which is approximately 13.30 % higher than the estimated emission reductions. The higher generation during the current verification period is due to certain natural conditions and hence acceptable.

Ex-ante emissions	Achieved emissions	Percent difference	Justification for the difference

reductions /removals	reductions /removals		
390,104 tCO_2e	441,973 tCO_2e	13.30%	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 390,104 tCO_2e, whereas actual emission reductions achieved are 441,973 tCO_2e, which is approximately 13.30 % higher than the estimated emission reductions. The higher generation during the current verification period is due to certain natural conditions as this monitoring period includes winter and summer season only which are most favorable time in terms of wind energy. The actual PLF for the generated energy in this monitoring period is 26.62% whereas as per the PDMR with breaching value of 14.74% PLF would be 26.96% which is still higher than actual PLF hence project is additional. Refer tab PLF analysis in ER sheet.

APPENDIX 1: CALIBRATION DETAILS

Meter and Calibration details[13] of 100 MW Wind power project by Axis Wind Farms (MPR Dam) Private Limited:

Meter Details	Main Meter	Check Meter	Standby Meter
Meter Serial No	16400232	16400234	16400235
Meter Make	L & T		
Type of meter	ABT Meter, ER 300P		
Accuracy Class	0.2s		
Date of Calibration 2019	21-Feburary-2019	21-Feburary-2019	21-Feburary-2019
Due Date of Calibration	21-Feburary -2024	21-Feburary -2024	21-Feburary -2024

[13] As per registered PD & CEA guideline the calibration frequency is once in 5 years however APSPDCL is carrying out calibration once in a year which is not under the control of PP.

APPENDIX 2: BREAKDOWN DETAILS

The breakdown details of Axis Wind Farms (MPR Dam) Private Limited has been described in the below table.

S. No.	Month	Hrs. of breakdown	Reason
1	8-September-2021	45.85 hrs	Accelerometer vibration alarm
2	11-September-2021	85.38 hrs	Low level hydraulic group refrigeration oil
3	12-October-2021	186.58 hrs	MV Switch trip from Arc detector
4	20-May-2022	3290.5 hrs	Stopped on account of Trailing edge damaged in Blade-A
5	12-August-2022	100.93 hrs	MV Switch trip from CCU
6	10-September-2022	97.08 hrs	Low pressure on hydraulic group
7	1-August-2022	41.67 hrs	Tripped on account of over current (Y & B-Ph)

Therefore, the total breakdown is approx. 3848 hrs.

APPENDIX 3: SDG CONTRIBUTION

Months	Total Net Generation (MWh)	Emission Factor(tCO_2/MWh)	Emission Reductions(tCO_2)
	SGD 7		SGD 13
January-2021	11,997.20	0.9475	11,367.35
February-2021	11,320.60	0.9475	10,726.27
March-2021	13,780.70	0.9475	13,057.21
April-2021	11,392.00	0.9475	10,793.92
May-2021	19,799.40	0.9475	18,759.93
June-2021	37,312.60	0.9475	35,353.69
July-2021	33,525.20	0.9475	31,765.13
August-2021	33,446.90	0.9475	31,690.94
September-2021	31,741.40	0.9475	30,074.98
October-2021	6,584.50	0.9475	6,238.81
November-2021	8,889.00	0.9475	8,422.33
December-2021	10,059.90	0.9475	9,531.76
Vintage 2021	**229,849.40**	**0.9475**	**217,782**
January-2022	10,591.40	0.9475	10,035.35
February-2022	12,257.80	0.9475	11,614.27
March-2022	13,189.76	0.9475	12,497.30
April-2022	12,679.60	0.9475	12,013.92
May-2022	30,249.70	0.9475	28,661.59
June-2022	31,933.80	0.9475	30,257.28
July-2022	41,542.10	0.9475	39,361.14
August-2022	33,952.00	0.9475	32,169.52
September-2022	24,581.40	0.9475	23,290.88
October-2022	7,922.00	0.9475	7,506.10
November-2022	6,534.30	0.9475	6,191.25
December-2022	11,179.60	0.9475	10,592.67
Vintage 2022	**236,613.46**	**0.9475**	**224,191**
Total	**466,462.80**		**441,973**

GREENKO RAYALA WIND POWER PVT LIMITED
(A GREENKO GROUP COMPANY)
PAYSLIP FOR THE MONTH OF JUNE,2021

Employee Code	:	00006430	Bank Name	:	Stata Bank of India
Employee Name	:	S.C.V Bala Raju	Bank A/C No	:	30994853737
Designation	:	Assistant Manager	PAN	:	FJSPS4063K
Location	:	RayalaWindPlant	PF No	:	AP/HYD/81418/29
Date of Joining	:	13.09.2013	UAN No	:	100323566872
Loss of Pay(if any)	:	0.00	Days Paid	:	30.00

MONTH EARNINGS (Rs.)		MONTH DEDUCTIONS (Rs.)	
Basic Salary	20,957.00	Ee PF contribution	1,800.00
House Rent Allowance	8,383.00	Prof Tax - split period	200.00
Special Allowance	9,027.00		
Statutory Bonus	1,746.00		
GROSS	**40,113.00**		
Total Earnings	**40,113.00**	**Total Deductions**	**2,000.00**

NET SALARY: Rs.38,113.00/- (Rupees thirty-eight thousand one hundred thirteen only)

LEAVE BALANCE: CL: 5 SL: 8 EL: 60

This is a system generated payslip and doesn't require a signature for authentication.