BUNDLED WIND POWER PROJECT IN GUJARAT AND TAMIL NADU

Document Prepared by (EKI Energy Services Limited)

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Project Title	Bundled Wind Power Project in Gujarat and Tamil Nadu
Version	02
Report ID	1862[1]
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Project ID	1862
Monitoring Period	01-March-2019 to 31-July-2021 (inclusive of both dates)
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[1] https://registry.verra.org/app/projectDetail/VCS/1862

CONTENTS

1 PROJECT DETAILS

1.1 Summary Description of the Implementation Status of the Project

The main purpose of this bundled project activity is to generate clean form of electricity through renewable wind energy sources. The project activity involves installation of combined capacity of 12.8 MW wind power projects in the states of Gujarat and Tamil Nadu India.

Over the current monitoring period from is 01-March-2019 to 31-July-2021 (inclusive of both days), the project is replacing anthropogenic emissions of greenhouse gases (GHG's) of 76,282 tCO_2e, thereon displacing 81,428 MWh 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.

No major breakdowns occurred during the current monitoring period apart from the scheduled maintenance shutdowns.

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

Name of Investor	Capacity in MW	Connection with Grid	State	Usage
M/s Venus Textile Service	1.50 MW	Indian Grid	Tamil Nadu	Sale to State Discom
	1.50 MW			
	1.50 MW			
	2.0 MW			Sale to Third Party[2]
M/s JB Ecotex LLP	2.10 MW	Indian Grid	Gujarat	Captive[3]
M/s J. Korin Spinning Private Limited	2.10 MW			
M/s Oriilion India Private Limited	2.10 MW			

[2] WTG is connected to the state grid and wheeling agreement is signed between PP & State Utility.

[3] All WTG are connected to the state grid and wheeling agreement is signed between PP & State Utility.

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 AMS-I.D (Version 18.0)[4]

The project is not a grouped project activity.

1.3 Project Proponent

Organization name	M/s Venus Textile Service
Contact person	Mr. Mathew Jose
Title	Proprietor
Address	48/B4, Maniam Kaliappan Street, K. K. Pudur, Coimbatore – 641038, Tamil Nadu, India
Telephone	+91-9873654312
Email	mjvts@gmail.com

Organization name	M/s JB Ecotex LLP
Contact person	Mr. Vishal Kejriwal
Title	Authorized Signatory
Address	Block No. 195, National Highway-8, Near Rose Garden Hotel, Dhamdod, Taluka: Mangrol, District Surat – 394125, Gujarat, India.
Telephone	+91-987365322
Email	Jbdp1@msn.com

Organization name	M/s J. Korin Spinning Private Limited

[4] https://cdm.unfccc.int/methodologies/DB/W3TINZ7KKWCK7L8WTXFQQOFQQH4SBK

Contact person	Mr. Vishal Kejriwal
Title	Authorized Signatory
Address	502, 5th Floor, Union Trade Center, Udhana Dawaraja, Ring Road, Surat – 395002, Gujarat, India
Telephone	+91-987365322
Email	Jbdp1@msn.com

Organization name	M/s Oriilion India Private Limited
Contact person	Mr. Vishal Kejriwal
Title	Authorized Signatory
Address	33/1, N.S. Road, Marshal House, 4th Floor, R. N. 444, Kolkata: - 700001, West Bengal.
Telephone	+91-987365322
Email	Jbdp1@msn.com

1.4 Other Entities Involved in the Project

Organization name	EKI Energy Services Limited
Role in the Project	Project Consultant
Contact person	Manish Dabkara
Title	CEO & MD
Address	Office no. 201, Plot 48, Scheme 78 Part 2 Vijay Nagar, Near Brilliant Convention Centre Indore - 452010 (M.P, India) Website www.enkingint.org
Telephone	+91-9907534900
Email	manish@enkingint.org

1.5 Project Start Date

Start date of the bundled project activity is the earliest date of interconnection with the grid i.e 30-March-2017. This is the date of commissioning of two WTGs of 1.50 MW each by M/s Venus Textile Service in Tamil Nadu.

1.6 Project Crediting Period

Crediting Period Start date: 30-March-2017

Crediting Period End date: 29-March-2027

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	Latitude (N)	Longitude (E)
M/s Venus Textile Service	1 X1.5 MW	Seepala--kottai;	Uthama--palayam	Theni	Tamil Nadu	9.849219 ° N	77.460520 ° E
	1 X1.5 MW					9.846994 ° N	77.465597 ° E
	1 X1.5 MW	Odaipatti	Oddan--chatram	Dindigul		9.838719 ° N	77.457333 ° E
	1 X 2.0 MW	Venjamangudalur		Karur		10.79345 ° N	78.031596° E
M/s JB Ecotex LLP	1 X 2.10 MW	Hadiyana	Jodiya	Jamnagar	Gujarat	22.601056 ° N	70.244152° E
M/s J. Korin Spinning Private Limited	1 X 2.10 MW	Karmata	Abdasa	Kutch		23.39665 ° N	68.629127° E
M/s Oriilion India Private Limited	1 X 2.10 MW	Baradi	Jodiya	Jamnagar		22.560829° N	70.252549° E

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 small scale project as it is less than 15 MW

Methodology: Grid-connected electricity generation from renewable sources AMS-I.D (Version 18.0)[5]

Type I: Energy industries (renewable / non-renewable sources)
Category: Approved Consolidated Methodology (AMS-I.D.: Grid connected renewable electricity generation --- Version 18.0)

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

- Tool to calculate the emission factor for an electricity system[6] - Version 07.0 (EB 100, Annex 04)

1.9 Participation under other GHG Programs

The project has neither been registered nor seeking registration under any other GHG programs. The project is seeking registration only in VCS program.

1.10 Other Forms of Credit

Include the following information, as applicable:

- Emission Trading Programs and Other Binding Limits: The PP has not applied this project in any Emission Trading Programs and other Binding Limits.
- Other Forms of Environmental Credit: The PP has not applied this project in any other form of environmental credits.

1.11 Sustainable Development

Contribution to sustainable development:

Ministry of Environment and Forests, 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 has helped in generating employment opportunities during the construction and operation phases. The project activity has 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 has also helped to reduce the demand supply gap in the state.

[5] https://cdm.unfccc.int/methodologies/DB/W3TINZ7KKWCK7L8WTXFQQOFQQH4SBK

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

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 energy 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 and specific pollutants like SOx, NOx, and SPM associated with the conventional thermal power generation facilities.

2 SAFEGUARDS

2.1 No Net Harm

The project activity does not involve any major construction activity. It primarily requires the installation of the wind turbines, 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.[7] 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.

Thus there are no any significant impacts due to implementation of project activity on environment and socio economic impact and ambience are envisaged due to the project activity.

2.2 Local Stakeholder Consultation

The local stakeholder meeting was carried out for the project activity and the details of the same can be referred from the registered VCS PD. (section – 6.0)

Ref. web link - https://registry.verra.org/app/projectDetail/VCS/1862

The stakeholders identified for the project were: the usual occupants of villages around and the local communities, NGOs, governmental agencies, employees, contractors. Local population is considered to be a major stakeholder with respect to the project activity.

The PP also placed a grievance register onsite in order to ensure ongoing communication with relevant stakeholders where they can put down his/her complain and the same if found genuine will be addressed immediately. During the current monitoring period, no negative comments are received from the local stakeholders. Thus, no any mitigations has been applied.

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

2.3 AFOLU-Specific Safeguards

Not Applicable

3 IMPLEMENTATION STATUS

3.1 Implementation Status of the Project Activity

The bundled project activity involves the installation of Wind project. The total installed capacity of the project is 12.80 MW Wind project located in the states Gujarat and Tamil Nadu in India. The details of the investors are mentioned in Section 1.1.

The Project activity is a new facility (Greenfield) and the electricity generated by the project has been 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.

Over the 7 years of first crediting period, the project will replace anthropogenic emissions of greenhouse gases (GHG's) estimated to be approximately 29,987 tCO_2e per year, thereon displacing 32,012 MWh/year amount of electricity.

The basic technical details of the WTGs are as follows: -

Name of Investor	Capacity in MW	Details
M/s Venus Textile Service	3 X1.50 MW	WEC type Vensys make V87-1500 KW
	1 X 2.0 MW	G-114/T106 2.00 MW Siemens Gamesa make
M/s JB Ecotex LLP	1 X2.10 MW	Suzlon make, 2100 kW
M/s J. Korin Spinning Private Limited	1 X2.10 MW	Suzlon make, 2100 kW
M/s Oriilion India Private Limited	1X2.1 MW	Suzlon make, 2100 kW

Name of Investor	Capacity in MW	COD

M/s Venus Textile Service	1.50 MW	30-March-2017
	1.50 MW	30-March-2017
	1.50 MW	31-March-2017
	2.0 MW	31-March-2019
M/s JB Ecotex LLP	2.10 MW	17-October-2017

The detailed technical specifications for the respective WTGs are as follows: -

M/s Venus Textile Service: 3 X1.50 MW, WEC type Vensys make V87-1500 KW

Wind Energy Convertor with 1500 kW rating, Upwind, Horizontal Axis with active yawing, three bladed Direct Drive permanent Magnet excited, grid connected.

Main Characteristics: -

Model	ReGen make Vensys 87
Hub Height	85 m
GL Wind Turbine Class	IIIB
Type	Direct drive horizontal axis wind turbine with variable rotor speed
Survival wind speed	52.5 m/s
Power Regulation	Independent Electromechanical pitch system for each blade
Rated Power	1500 kW
Rated Speed	9 to 17.3 rpm
Design Lifetime	20 years
Output Voltage of WEC	620 V, 50 Hz
Output Voltage of Power Transformer	33 kV, 50 Hz

M/s Venus Textile Service: 1 X 2.0 MW G-114/T106 2.00 MW Siemens Gamesa make Wind Turbine Generator[8]

Power:

Rated Power:	2,000.0 kW
Cut-In Wind Speed:	2.5 m/s
Rated Wind Speed:	10.0 m/s
Cut-Out Wind Speed:	25.0 m/s
Survival Wind Speed:	60.0 m/s

[8] https://en.wind-turbine-models.com/turbines/428-gamesa-g114-2.0mw

Rotor: -

Diameter:	114.0 m
Swept area:	10,207.0 m²
Number of blades:	3
Rotor speed, max:	16.0 U/min
Tipspeed:	96 m/s
Type:	55.5
Material:	GFK
Manufacturer:	Gamesa
Power density 1:	195.9 W/m²
Power density 2:	5.1 m²/kW

Gear Box:

Type:	spur/planetary
Stages:	3.0
Ratio:	1:80
Manufacturer:	Echesa (Gamesa Group)/Hansen/Bosch Rexroth/Winergy

Generator:

Type:	Double Fed Asyn
Number:	1
Speed, max:	1,280.0 U/min
Voltage:	690.0 V
Grid connection:	IGBT
Grid frequency:	50/60 Hz
Hersteller:	Cantarey (Gamesa Group)/ABB/Indar

Tower:

Hub height:	93/120/140 m
Type:	Steel tube/ concrete
Shape:	conical
Corrosion protection:	painted
Manufacturer:	Gamesa

The technical specifications of Suzlon make S111-90m WTG installed by M/s JB Ecotex LLP, M/s J Korin and M/s Oriilion India are as follows: [9]

OPERATING DATA

Wind class - IEC IIIA / IEC S
Rated power - 2.1 MW
Cut-in wind speed - 3.0 m/s

[9] https://www.suzlon.com/in-en/energy-solutions/s111-wind-turbine-generator

Rated wind speed - 12.5m/s
Cut-out wind speed - 30.0m/s (3-second average); 21.0m/s (10-minute average)

ROTOR

Rotor diameter - 111.8m
Swept area - 9,852m^2

GENERATOR

Frequency - 50Hz/60Hz

Type Asynchronous - 3 phase induction generator with slip rings operated with rotor circuit inverter system (DFIG)

TOWER

Hub heights - 90m
Type - Steel Tubular

BLADE

Make - Suzlon SB54

No any events has occurred during the current monitoring period that may impact the GHG emission reductions or removals and monitoring.

3.2 Deviations

2.3.1 Methodology Deviations

The project activity has been implemented as described in the VCS-PD and there was no methodological deviation applied during the monitoring period.

2.3.2 Project Description Deviations

As per the section 5.3 of the registered PD there were both main meter and check meter mentioned for Theni and Gujarat site, however as per actual onsite practice there are only main meter installed in the site. Therefore deviation has been taken in this monitoring report and the same has been updated in section 4.2 and 4.3 of the monitoring report.
The above-mentioned deviation is of permanent nature and does not have any impact on the project applicability, baseline scenario and additionality.

In both the site the project metering is being done at 2 places at Substation end and at Controller end where SCADA System is in place to record the daily generation, in case of main meter failure or malfunction, controller reading will be considered after application of 1% Line Losses to get the values of power generated for that particular period.

3.3 Grouped Projects

Not applicable as the project is non-grouped project.

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
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 2015-16, 2016-17 & 2017-18. The data are obtained from "CO_2 Baseline Database for Indian Power Sector" version 14, 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
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 2017-18. The data is obtained from "CO_2 Baseline Database for Indian Power Sector" version 14, 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
Justification of choice of data or description of measurement methods and procedures applied	The combined margin emissions factor is calculated as follows: $\mathbf{EF_{grid,CM,y} = EF_{grid,OM,y} * W_{OM} + EF_{grid,BM,y} * W_{BM}}$ 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) 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

For Gujarat Site

Data / Parameter	$EG_{PJ,\ y,Gujarat}$
Data unit	MWh
Description	Quantity of net electricity generation supplied by the project plant/unit to the grid in year y in MWh
Source of data	Monthly Share Certificate issued by GETCO
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 being considered for ER calculations.
Frequency of monitoring/recording	Continuous measurement & monthly recording
Value monitored	45,233.28
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.

QA/QC procedures to be applied

The meters is 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[10]. The monthly electricity supplied/exported by the project activity in the Share Certificate is cross checked with the monthly electricity bills being a captive project. In the absence or delay in the meter calibration appropriate Guidelines are being 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 do 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.

1. 1x2.1 MW WTG of M/s J B Ecotex LLP

S. No.	WTG No.	Meter No.	Make	Initial Calibration Date	Validity
1.	SEL/2100/17-18/4938	GJ-3896-B	EDMI Accuracy Class: 0.2 s	30-August-2017	29-August-2022

2. 1x2.1 MW WTG of M/s J Korin Spinning Mills Private Limited

S. No.	WTG No.	Meter No.	Make	Initial Calibration Date	Validity
1.	SEL/2100/17-18/4868	GJ-3947-B	EDMI Accuracy Class: 0.2 s	30-July-2017	29-July-2022

3. 1x2.1 MW WTG of M/s Oriilion India Private Limited

S. No.	WTG No.	Meter No.	Make	Initial Calibration Date	Validity

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

	1.	SEL/2100/17-18/4973	GJ-3893-B	EDMI Accuracy Class: 0.2 s	28-February-2018	25-February-2023
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 would be archived during the whole crediting period + 2 years					

For Tamilnadu Site

Data / Parameter	**$EG_{PJ, y\ Tamil\ Nadu}$**
Data unit	MWh
Description	Quantity of net electricity generation supplied by the project plant/unit to the grid in year y in MWh
Source of data	Monthly joint meter reading reports
Description of measurement methods and procedures 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 being considered for ER calculations.
Frequency of monitoring/recording	Continuous measurement & monthly recording
Value applied:	36,195.56
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.
QA/QC procedures applied	The meters is 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.[11] 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 are being 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 do 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. For Theni site:-

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

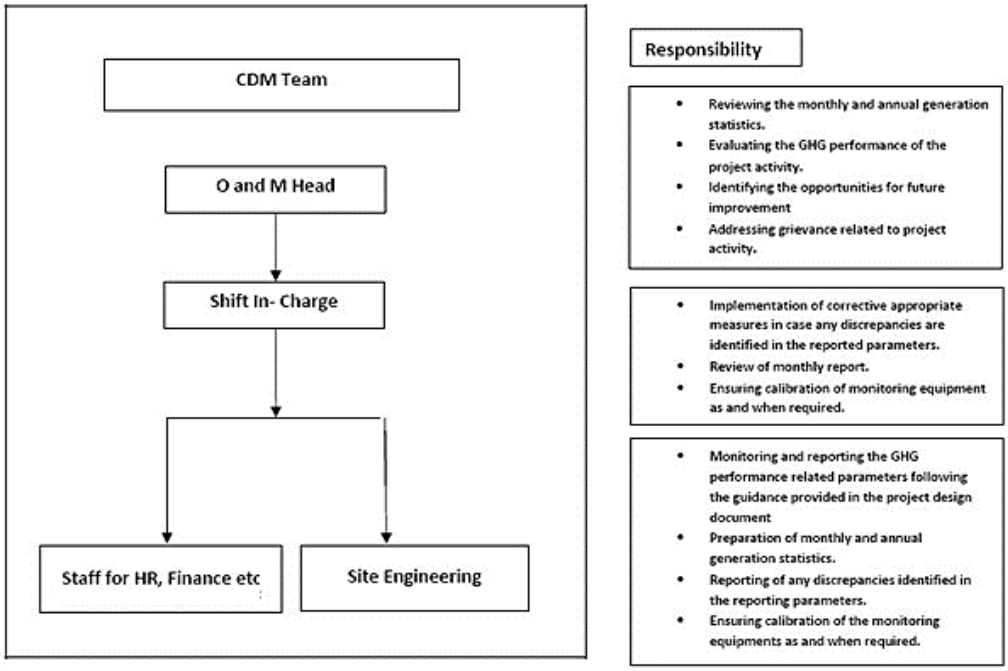
	<table><tr><th>S. No.</th><th>WTG No.</th><th>Meter No.</th><th>Make</th><th>Initial Calibration Date</th><th>Validity</th></tr><tr><td>1.</td><td>T-62</td><td>TNW00877</td><td>Secure Accuracy Class: 0.2 s</td><td>30-March-2017</td><td>29-March-2022</td></tr><tr><td>2.</td><td>T-48</td><td>TNW00762</td><td>Secure Accuracy Class: 0.2 s</td><td>30-March -2017</td><td>29-March-2022</td></tr><tr><td>3.</td><td>T-49</td><td>TNW00755</td><td>Secure Accuracy Class: 0.2 s</td><td>30-March-2017</td><td>29-March-2022</td></tr></table> For Palayam Site:- <table><tr><th>S. No.</th><th>WTG No.</th><th>Main Meter No.</th><th>Make</th><th>Initial Calibration Date</th><th>Validity</th></tr><tr><td>1</td><td></td><td>TNW02182</td><td>Secure Accuracy Class 0.2s</td><td>31-March-2019</td><td>30-March-2024</td></tr></table> <table><tr><th>S. No.</th><th>WTG No.</th><th>Check Meter No.</th><th>Make</th><th>Initial Calibration Date</th><th>Validity</th></tr><tr><td>1</td><td></td><td>TNW02183</td><td>Secure Accuracy Class 0.2s</td><td>31-March-2019</td><td>30-March-2024</td></tr></table>
Purpose of 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 would be archived during the whole crediting period + 2 years

4.3 Monitoring Plan

The monitoring plan is developed in accordance with the modalities and procedures for CDM project activities and is proposed for grid-connected wind power project being implemented. The monitoring plan, which has been 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 has been measured continuously using above mentioned Main meter located at the substations. Readings of meters are being 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 being raised. These invoices can be used for cross checking the meter readings taken for the respective project activity.

QA/QC Procedures for WTG's operational in Tamilnadu State:

Data Archiving: The metering equipment has been maintained in accordance with electricity standards and have the capability of recording daily and monthly readings. Records of joint meter reading is maintained at site and a copy is kept with the project owner. Necessary records of calibration is maintained by both State Electricity Board and project proponent. The Generation Data and other related documents will be kept for 2 years after the whole crediting period. All monitored data is stored / archived under safe custody of the project executor and controller for a period of crediting period + 2 years.

QA/QC Procedure: - The main meter has been tested for accuracy, with a portable standard meter, by the SEB or authorized Testing Laboratories at the cost of PP. The TANGENCO is carrying out the calibration, periodical testing, sealing & maintenance of meters once in 5 years in the presence of authorized representative(s) of PP sign on the result thereof. The frequency of meter testing has been done once in 5 years, as per CEA Guidelines. All meters are usually tested only at the metering point. If during testing, the main meter are found within the permissible limits of error i.e. 0.2%, the energy computation is as per the main meter. The main meter shall be calibrated & the energy for the period thereafter shall be as per the calibrated main meter. During any point of time if the main meter turns faulty, the reading for that period will be considered as nil. The correction required as per result of testing will be applied to generation & consumption of energy for the period from last meter reading to the time of such test checks. Energy from the period there after shall be in accordance with calibrated main meter. The net electricity supplied to the grid can be cross checked with the invoices raised / sales receipts by project investor to State Electricity Board or Third Party.

QA/QC Procedures for WTG's operational in Gujarat State:

Data Archiving: The metering equipment has been maintained in accordance with electricity standards and have the capability of recording daily and monthly readings. Records of Monthly Share Certificates is being maintained at site and a copy also kept with the project owner. Necessary records of calibration is maintained by both State Electricity Board and project proponent. The Generation Data and other related documents will be kept for 2 years after the whole crediting period. All monitored data is stored / archived under safe custody of the project executor and owner for a period of crediting period + 2 years.

QA/QC Procedure: - The main meter are being tested for accuracy, with a portable standard meter, by the SEB or authorized Testing Laboratories at the cost of PP. GETCO carry out the calibration, periodical testing, sealing & maintenance of meters once in 5 years in the presence of authorized representative(s) of PP shall sign on the result thereof. The frequency of meter testing is done once in 5 years, as per CEA Guidelines. All meters are being tested only at the metering point. The SEB provide a copy of the test reports to the PP. The energy computation is as per the main meter. The main meter is calibrated immediately & the energy for the period thereafter is as per the calibrated main meter. During any of the monthly meter readings, if the main meter is faulty the value for that period will be considered as nil. Correction required as per result of testing will be applied to generation & consumption of energy for the period from last meter reading to the time of such test checks. Energy from the period there after shall be in accordance with calibrated main meter. The net electricity supplied to the grid can be cross checked with the monthly electricity bills.

Emergency preparedness

The project activity has not been resulting in any unidentified activity that can result in substantial emissions from the project activity. No need for emergency preparedness in data monitoring is visualized.

Personnel training

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

5 QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS

5.1 Baseline Emissions

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

Where:

BE_y: Baseline emissions in year y (tCO_2e)

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

$EF_{grid,CM,y}$: 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" (tCO_2e/MWh)

Parameter	Unit	Value
$EG_{PJ,y}$ (Gujarat + Tamil Nadu)	MWh	45,233.28+ 25,910.89+10,284.68 = 81,428.84
$EF_{grid,CM,y}$	tCO_2e	0.9368
BE_y	=	76,282.53 76,282 (Round down)

5.2 Project Emissions

Not Applicable.

5.3 Leakage

Not Applicable, since emissions from the project activity is zero as per AMS I.D. methodology.

5.4 Net GHG Emission Reductions and Removals

01-March-2019 to 31-July-2021	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-March-2019 to 31-December-2019	29,334	0	0	29,334
01-January-2020 to 31-December-2020	28,837	0	0	28,837
01-January-2021 to 31-July-2021	18,112	0	0	18,112
Total	**76,282**	**0**	**0**	**76,282**

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 72,626 tCO_2e, whereas actual emission reductions achieved are 76 282 tCO_2e, which is 5% higher than the estimated emission reductions. The generation of electricity depends upon many other climatic conditions, and not within the control of the project participant. The higher generation during the current verification period is hence due to certain natural conditions and hence acceptable.