



Verified Carbon Standard

“WIND POWER PROJECT AT ANTHIYUR, TAMIL NADU”

Document Prepared by

Windage Power Company (P) LTD

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1 PROJECT DETAILS

1.1 Summary Description of the Implementation Status of the Project

The project activity is a 14.85 MW wind farm consisting of 9 WTGs of NM82/1650kW capacity each. The project activity is implemented in the Anthiyur Village of Udumalpet and Pollachi Talukas of Coimbatore District in state of Tamil Nadu. The project activity involves implementation of WTGs as a voluntary measure to strengthen the Indian grid system through exploitation of wind power generation potential available to India. The generated electricity is fed into the Tamil Nadu Electricity Board (TNEB) which contributes to the unified Indian Grid system. The electricity generation from the project activity is free of GHG emissions. In the baseline scenario, in the absence of the project activity, the electricity would have been generated from the power stations operating in the grid which is highly carbon intensive.

The commissioning date of each of the WTGs along with their H.T. Service Number is provided below:

Location Name	S.F. Nos	HT. Service Number ¹	Date of Commissioning
NSL 1	38&39/3	507	31-March-2005
NSL 2	150/3A2,150/3B,158/1	508	31-March-2005
NSL 3	104/1&109/1	510	31-March-2005
NSL 4	56/1C,47/8&56/1B	533	29-April-2005
NSL 5	431/3	509	31-March-2005
NSL 6	95/2,95/3&95/4	551	17-May-2005
NSL 7	17&18	497	30-March-2005
NSL 8	2/1	511	31-March-2005
NSL 9	254/A1,255/2B,255/2C	482	26-March-2005

The total emission reductions achieved in this monitoring period from **01-Sep-2021** to **30-Apr-2022** are **10,485 tCO₂e**. This is part of 2nd crediting period of the project; details are provided under the section 1.6.

¹ These are current HTSC nos. different from the ones at the time of validation. HTSC nos. are assigned by TNEB as per their internal practice which is not under the control of PP. The change in HTSC nos. was already reported under previous verifications.

The audit history of the project is provided below-

Audit Type	Period	Program	VVB Name	Number of years
Verification	01-Apr-2006 to 07-Feb-2010	VCS	Perry Johnson Registrars	3 years 10 months
Verification	08-Feb-2010 to 31-Mar-2016	VCS	LGAI Technological Center, S.A. (APPLUS)	6 years 2 month
Verification	01-Apr-2016 to 31-Oct-2017	VCS	LGAI Technological Center, S.A. (APPLUS)	1 year 7 months
Verification	01-Nov-2017 to 31-Aug-2018	VCS	Earthood Services Pvt. Ltd.	10 months
Verification	01-Sep-2018 to 31-Oct-2019	VCS	Earthood Services Pvt. Ltd.	1 year 2 months
Verification	01-Nov-2019 to 31-Oct-2020	VCS	LGAI Technological Center, S.A. (APPLUS)	1 year
Verification	01-Nov-2020 to 31-Aug-2021	VCS	4K EARTH SCIENCE PRIVATE LIMITED	10 months
Verification	01-Sep-2021 to 30-Apr-2022	VCS	VKU Certification Pvt. Ltd.	8 months
Total				16 years 1 month

1.2 Sectoral Scope and Project Type

Sectoral scope : 01, Energy Industries (renewable /non-renewable sources)

Project Type : I, Renewable energy projects

The project is not a grouped project activity.

1.3 Project Proponent

Organization name	Windage Power Company (P) LTD
Contact person	A. Rajnikant
Title	Head - Wind Projects & Operations
Address	#8-2-684/2/A, NSL ICON, Road No. 12, Banjara Hills, Hyderabad, Telangana, India,
Telephone	+91 40 3051 4444
Email	rajnikant.a@nslpower.com

1.4 Other Entities Involved in the Project

Organization name	WeAct Pty Ltd
Role in the Project	Authorized Representative#
Contact person	Satish Duvvuru
Title	Director
Address	5/663 Victoria Street, Victoria 3067, Australia.
Telephone	Ph: +61-409 135 580
Email	satish@weact.com.au

#WeAct is the authorized entity for communication with VVB and carbon credits transactions.

1.5 Project Start Date

26-March-2005 (Date on which the project began reducing or removing GHG emissions i.e., the commissioning date of the project).

1.6 Project Crediting Period

The ongoing crediting period under VCS is as follows:

Duration of the current crediting period	: 10 years (renewal).
Start date of the current crediting period	: 01-April-2016
End date of the current crediting period	: 31-March-2026

This is the 2nd crediting period for the project activity.

This is the 6th verification of the second crediting period and overall periodic 8th verification.

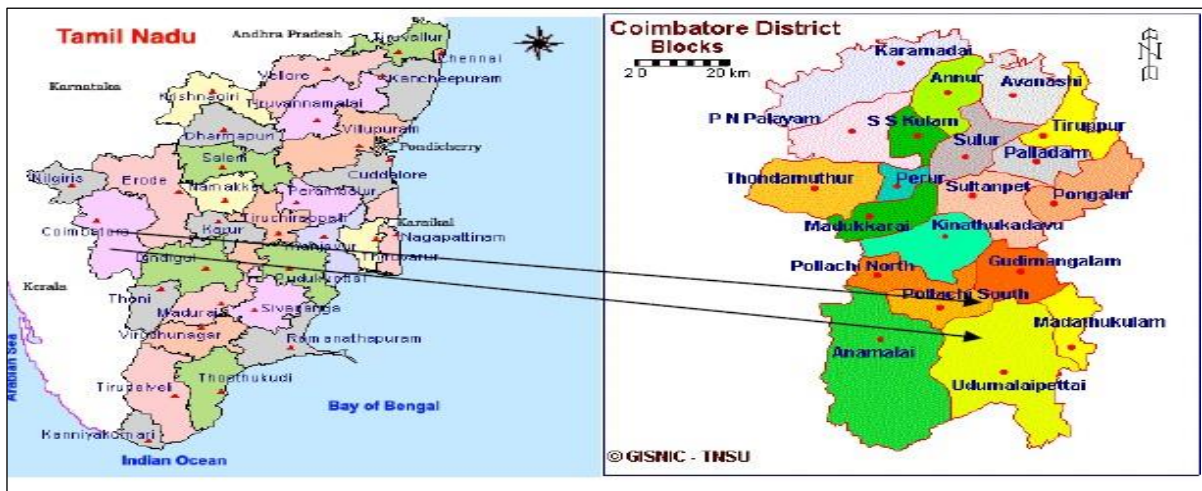
As per VCS Standard (v3.6, 19-October-2016), section 3.8.1 the crediting period (for non-AFOLU projects and ALM projects) will be renewed twice for the duration of ten year each. The first crediting period of the project activity was considered from 01-April-2006 to 31-March-2016, both

days including. Hence, the project has been applied for Renewal Crediting period for a period of 10 years.

Also as per latest VCS standard version 4.4 where Appendix 1 states that “Registered VCS projects and projects that request registration with the VCS Program on or before 31-December-2019 remain eligible under the VCS Program for the entirety of their crediting periods” The Project completed validation before 31-December-2019 i.e. on 29-August-2018 and chose to use the crediting period requirements under VCS version 3.

1.7 Project Location

The 14.85 MW wind farm is located near Anthiyur Village of Udumalpet and Pollachi Talukas of Coimbatore District in Tamil Nadu. This wind farm is located 60 Km south – east of Coimbatore, Tamil Nadu.



Location of Project:

S. No	Location Name	S.F. No	Village Name	Taluk Name	Co-ordinates			HT
					North	East	Altitude in meters	Service Number
1	NSL1	38&39/3	Koolanayakan Patti	Pollachi	10° 36' 49.6"	77° 09' 15.3"	385	507
2	NSL2	150/3A2,150/3B,158/1	Gomangalam Puthoor	Pollachi	10° 37' 21.4"	77° 09' 30.0"	380	508
3	NSL3	104/1&109/1	Gomangalam Puthoor	Pollachi	10° 36' 48.2"	77° 09' 51.0"	386	510
4	NSL4	56/1C,47/8	Gomangalam Puthoor	Pollachi	10° 37' 01.2"	77° 09' 45.6"	383	533

S. No	Location Name	S.F. No	Village Name	Taluk Name	Co-ordinates			HT
					North	East	Altitude in meters	Service Number
		& 56/1B						
5	NSL5	431/3	Gomangalam	Pollachi	10° 37' 15.5"	77° 09' 52.9"	379	509
6	NSL6	95/2,95/3 & 95/4	Gomangalam Puthoor	Pollachi	10° 36' 39.6"	77° 10' 07.7"	385	551
7	NSL7	17&18	Venasa Patti	Udumalpet	10° 37' 11.7"	77° 11' 25.2"	383	497
8	NSL8	2/1	Venasa Patti	Udumalpet	10° 37' 27.5"	77° 11' 21.0"	379	511
9	NSL9	254/A1, 255/2B,255/2C	Pannai Kinaru	Udumalpet	10° 38' 33.8"	77° 11' 02.9"	364	482

1.8 Title and Reference of Methodology

Title: Grid connected Renewable Electricity Generation

Reference: AMS I.D., Version 18.0²

Reference to tools:

'Tool to calculate the emission factor for an electricity system' (Version 06.0)³

1.9 Participation under other GHG Programs

The project is not registered under any other GHG programs.

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

- Emission Trading Programs and Other Binding Limits:**

Not Applicable. The GHG emissions generated from the project activity are not included in any other emissions trading program or any other mechanism that includes GHG allowance trading or other binding limits.

- Other Forms of Environmental Credit:**

² <https://cdm.unfccc.int/UserManagement/FileStorage/2P7FS6ZQAR84LG3NMKYUH50WI90DBC>

³ <https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-07-v6.pdf>

The project activity has not been applied under any other GHG or any related programs. Also, the project activity has not sought or received another form of GHG-related environmental credit, including renewable energy certificates, during this monitoring period. Further, this is to be stated that project is not eligible under other GHG-related environmental credits due to start date definition, mode of power sale, etc, and is solely operational under VCS mechanism only. Hence no separate of list of other programs is applicable.

- **Supply Chain (Scope 3) Emissions:**

The project does not affect emissions associated with any good or service, hence the scope-3 emission associated with the supply chain.

1.11 Sustainable Development Contributions

Project's contribution to sustainable development:

The project primarily assists the region as a whole in stimulating and accelerating the commercialization of grid connected renewable energy technologies. The implemented activities under the project are same as it was designed and developed at the time of commissioning of the project. The technology implemented under the project is renewable energy technology in the form of Wind and main measure of the project is green power being supplied to grid, located in the state of Tamil Nadu. The project falls under the category of "registered before 20 Jan 2023", hence a summary of the overall contributions is included below and explanation of how project activities result in the SD contributions described in Table 1 of this report below.

Summary: the project activity contributes to the sustainable development in the following way:

Social well-being:

- Enhancing local employment in the rural area around the project.
- Capacity- building and empowerment of vulnerable sections of the rural community dwelling in the project area.

Economic well-being: During the construction and operation phases, the project activity generated small business opportunities for local stakeholders such as bankers, suppliers, manufacturers and contractors.

Environmental well-being: This project activity contributes to sustainable development through generation of eco-friendly power resulting in the increase of the share of renewable energy power generation in the regional and national grid. It aids in strengthening India's rural electrification coverage. Wind power projects also aid in reducing GHG emissions and other pollutants (SO_x, NO_x, PM, etc.).

Technological well-being: The project activity helps in increasing the share of renewable energy power generation in the regional and national grid. The project activity also, encourages clean, renewable and efficient technologies.

Table 1: Sustainable Development Contributions

Row number	SDG Target	SDG Indicator	Net Impact on SDG Indicator	Current Project Contributions	Contributions Over Project Lifetime ⁴
7	7.2	7.2.1: Renewable energy share in the total final energy consumption	Implemented Renewable Energy grid connected Project to increase the RE share in total grid mix.	10,725.355 MWh delivered to the Indian grid during the current monitoring period.	About 10,725.355 ⁵ MWh renewable electricity has supplied to Indian grid throughout the project lifetime that helps to increase the renewable energy share in the energy mix
8	8.5	8.5.1: Employment Generation from the project Activity	Implemented Renewable Energy power generation project activity has generated direct & Indirect employment	More than 10 numbers of people got direct employment.	Project is eligible to generate this SDG benefits. However, project is not claiming this SDG benefit. Hence, not quantifying the same here.
13	13.2	13.2.1: Tonnes of greenhouse gas emissions avoided or removed	Implemented activities to decrease Greenhouse Gas emission	10,485 tCO ₂ has been prevented by the project activity during the current Monitoring Period.	Prevented the release of total 10,485 ⁶ tCO ₂ into the atmosphere during the lifetime of the project during current monitoring period.

⁴ Since this is the 6th Verification of this project and it is registered before 20-January-2023, the PP will demonstrate contribution to at least three SDGs by 20- January-2025. Also, as per point 4 of the Quarter 1 VCS Program Update released in 20-January-2022, a project activity is required to demonstrate contributions to a minimum of three SDGs by 20-January-2025 for the projects registered with VERRA before 20-January-2023. For the present monitoring period the PP is voluntarily demonstrating contributions to 2 SDGs and SD contributions by minimum 3 SDGs for the project activity will be demonstrated by 20-January-2025.

⁵ Contribution to the current monitoring period 01-September-2021 to 30-April-2022 (Inclusive of both the days)

⁶ Contribution to the current monitoring period 01-September-2021 to 30-April-2022 (Inclusive of both the days)

2 SAFEGUARDS

2.1 No Net Harm

Being renewable wind power generation project there is no negative environmental and socio-economic impacts. In fact, project activity contributes positively by providing environment friendly power generation leading to sustainable development of the region. Also, the generation of employment supports potential upliftment of socio-economic status of region.

As demonstrated in the registered VCS PD, as per the Schedule 1 of the EIA notification dated 14-September-2006 (<http://www.environmentwb.gov.in/pdf/EIA%20Notification,%202006.pdf>) given by the Ministry of Environment and Forests (Government of India) under the Environment (Protection) Act 1986, EIA is not a regulatory requirement in India for wind energy projects. Thus, the project activity doesn't fall under the list of activities requiring EIA. Also, the project has been successfully running from the date of its commissioning and regular monitoring and verification have been conducted. There is no any event observed that indicates negative environmental impacts due to the project activity.

2.2 Local Stakeholder Consultation

The Project is already registered with VCS and registered VCS Project Description; sections 5.3 & 5.4 provide the reference for the Local Stakeholder Consultation Process as in-line with VCS requirement. Also, for the purpose of ongoing communications with stakeholders a grievance register mechanism has been included. This process is considered as "Grievance Register", kept at project site office accessible to all stakeholders.

However, for ongoing communication with the local stakeholders, the community members can go to the project site and share their complain/feedback/comments etc. in a dedicated grievance register. The comments if found genuine will be addressed immediately and necessary actions shall be taken. The copy of the grievance register is kept at the project site. However, there was no feedback/grievance has been reported within this monitoring period. Hence, there is no applicable or relevant outcome from this ongoing communication with local stakeholders.

2.3 AFOLU-Specific Safeguards

Not applicable to the project activity.

3 IMPLEMENTATION STATUS

3.1 Implementation Status of the Project Activity

The implementation status of the project activity includes the following information:

The project activity has been in operation since its date of commissioning. No events have happened that may impact the GHG emission reductions or removals and monitoring during this monitoring period. There are no changes related to the project proponent or project observed. Project is implemented and operational as per the VCS Project description submitted.

During the current monitoring period, all the WTGs were operational. However, breakdown of 21,080 hours have occurred in this monitoring period due to non-availability of wind and some scheduled shutdown for the maintenance and the PP has provided in appendix 2 of MR and evidences for the same to VVB. The project activity has supplied 10,725.355 MWh of electricity, and thus contributing to 10,485 tCO_{2e} GHG reductions.

For the current monitoring period estimated emission reduction is 20,505 tCO_{2e}, whereas actual emission reductions achieved are 10,485 tCO₂ (round down value), which is approximately 48.87% lower than the estimated emission reductions.

The Project is in continued operation for 6th periodic verification of 2nd crediting period for which the monitoring period is from 01-September-2021 to 30-April-2022 (Inclusive of both the days). There has been downtime of equipment's, overhaul times or exchange of equipment's in the project activity during the current monitoring period. Scheduled and Unscheduled Breakdowns have occurred which have led to a shutdown of 21,080 hours in this monitoring period. The details have been clearly described in the [Appendix 2](#) of the monitoring report.

This variation is majorly due to low plant load factor (PLF⁷). Some other reasons for this are the variations in the wind flow pattern, grid availability, shutdown due to various reasons, and other parameters which are not in the control of the project proponent.

More details about the commissioning status and the [Technical details](#) of the project WTGs are referred under the [Appendix 1](#).

3.2 Deviations

3.2.1 Methodology Deviations

No methodological deviation is applied to the project activity during previous or current monitoring period.

⁷ The estimated PLF as per registered PD is 24.32% and as per renewal PD is 23.78%, whereas actual PLF achieved during this MP is 12.86%. Calculation can be referred under the ER sheet.

3.2.2 Project Description Deviations

There are no Project description deviations applied during current monitoring period

However, as per section 3.18.2 Para 2 of VCS standard v.4.4 “Where the deviation does not impact the applicability of the methodology, additionality or the appropriateness of the baseline scenario, and the project remains in compliance with the applied methodology, the deviation shall be described and justified in the monitoring report.” Same has been explained and justified below.

01 Deviation related to energy meter replacement with accuracy class 0.2s

During the monitoring period, (01-April-2016 to 31-October-2017, inclusive of both the days) energy meters installed at HTSC No-751, 752, 754, 788, 753, 808, 728, 755, 690 was replaced with new meters with accuracy class of 0.2s on 08/05/2017, respectively. The calibration and maintenance of energy meters is beyond the control of project participant and is sole responsibility of state utility. Replacement of existing energy meter has been considered as project deviation in line with the guidance provided under section 3.6.1 of VCS standard v.3.7. However, it does not impact the existing applicability conditions of the methodology, additionality or the appropriateness of the baseline scenario.

02 Deviation related to meter calibration frequency:

In previous Monitoring Period (i.e., 01-September-2018 to 31-October-2019 (Inclusive of both the days) deviation had been taken on account of delay in meter calibration. As per VCS PD “The project adheres to all the mandatory regulatory and statutory requirements at the state as well as national level.” This applies to current monitoring period too.

It was proposed that meters will be calibrated annually; however as per prevailing practice in the project region there is no dedicated interval for meter calibration. Therefore, PP has referred to - national practice as per CEA order⁸ dated 17-March-2016; which prescribes in the para 18(b) that “all the meters shall be tested once in five years” (this can also be referred under the CEA Gazette released dated 23rd-December-2019). Details of calibration of energy meters are provided in Section 3.3 of the MR. The validity of calibration from the previous date is still within the five years period. However, as a conservative approach PP has considered the delay in calibration of existing energy meters and appropriate error factor has been applied. Therefore, this delay has been considered as project deviation in line with the guidance provided under section 3.18.2 para 2 of VCS standard v.4.1.

However, it does not impact the existing applicability conditions of the methodology, additionality or the appropriateness of the baseline scenario.

03 Deviation related to number reference of the location numbering system:

In monitoring period (01-November-2019 to 31-October-2020, (Inclusive of both the days) Another deviation was requested for HTSC numbers. The state authority TNEB has assigned different HTSC numbers as per their internal practice and revision. However, there is no other material change to the project activity except the numbers. These updated HTSC numbers are reported under the ER sheet and also included under the Appendix 1.

04 Deviations related to the name change of the project proponent:

⁸ https://cea.nic.in/wp-content/uploads/2020/02/CEA_metering_regulation_amendment_2019.pdf

The project activity was initially undertaken by Nuziveedu Seeds Limited but in 2011 the assets were sold to Windage Power Company (P) LTD and they became the rightful owner of the project. During last monitoring period (01-November-2020 to 31-August-2021 (Inclusive of both the days) the deviation was requested and the same was approved.

3.3 Grouped Projects

Not applicable as the project is not a grouped project.

4 DATA AND PARAMETERS

4.1 Data and Parameters Available at Validation

Data / Parameter	EF _{Grid,y}
Data unit	tCO ₂ /MWh
Description	Combined margin CO ₂ Emission Factor of Indian Grid
Source of data	Calculated from operating and built margin, using 75%-25% weights ⁹
Value applied	0.9777
Justification of choice of data or description of measurement methods and procedures applied	CEA has estimated the simple operating margin and build margin emission factors for the regional grids. For calculating the CO ₂ emission factor as per combined margin method for the second crediting period, the weights of 0.75 for operating margin and 0.25 for build margin for Indian grid are considered as per 'Tool to calculate the emission factor for an electricity system (Version 06.0).
Purpose of Data	Calculation of baseline emissions
Comments	The Combined Margin would be calculated ex ante and fixed during the crediting period. Please refer to the VCS PD of Renewal of Crediting Period, version 1 (Dated: 20/03/2017)

Data / Parameter	EF _{OM,y}
Data unit	tCO ₂ /MWh
Description	Simple operating margin emission factor of Indian Grid
Source of data	Calculated from CEA database, Version 11, April 2016 (http://www.cea.nic.in/reports/others/thermal/tpece/cdm_co2/user_guide_ver11.pdf)
Value applied	0.9941
Justification of choice of data or description of measurement methods and procedures applied	CEA has estimated the simple operating margin and build margin emission factors for the regional grids. For calculating the CO ₂ emission factor as per combined margin method for the second crediting period, the weighted average value of simple operating

⁹ Source: https://cea.nic.in/wp-content/uploads/baseline/2020/07/database_11.zip

	margin pertaining to Indian grid has been considered, as per 'Tool to calculate the emission factor for an electricity system (Version 06.0)
Purpose of Data	Calculation of baseline emissions
Comments	This value is calculated ex-ante and fixed during the crediting period. Please refer to the renewal of crediting period PD version 1 (Dated: 20/03/2017)

Data / Parameter	$EF_{BM,y}$
Data unit	tCO ₂ /MWh
Description	Build margin emission factor of Indian Grid
Source of data	Calculated from CEA database, Version 11, April 2016 (http://www.cea.nic.in/reports/others/thermal/tpece/cdm_co2/user_guide_ver11.pdf)
Value applied	0.9285
Justification of choice of data or description of measurement methods and procedures applied	CEA has estimated the build margin emission factors for the regional grids. For calculating the CO ₂ emission factor as per combined margin method for the second crediting period, the build margin value for the most recent year (i.e., 2014-15) pertaining to the Indian grid has been considered, as per 'Tool to calculate the emission factor for an electricity system (Version 06.0)
Purpose of Data	Calculation of baseline emissions
Comments	This value is calculated ex-ante and fixed during the crediting period. Please refer to the renewal of crediting period PD version 1 (Dated: 20-March-2017)

4.2 Data and Parameters Monitored

For the project activity, the following parameters are being monitored on continuous basis:

Data / Parameter	EG _{Gross,y}
Data unit	kWh
Description	Gross Electricity export to the grid by the project during the year y
Source of data	From the certified joint meter readings
Description of measurement methods and procedures to be applied	Gross electricity generated by each WTG is recorded with the aid of energy meter for that WTG. The procedures for metering and meter reading will be as per the provisions of the power purchase agreement.
Frequency of monitoring/recording	The parameter will be monitored continuously and recorded at least monthly.
Value monitored	11066530.58
Monitoring equipment	Energy Meter
QA/QC procedures to be applied	QA/QC procedures are as implemented by TNEB–state government utility. It was proposed that the meters used are calibrated by TNEB once in a year to ensure accuracy of data. However, as per prevailing practice in the region such frequency is not addressed. But the consumption by equipment/electricity exported to the grid registered by main meters hold good for purpose of billing as long as errors in main meters are within the permissible limits. Therefore, as per the provision of CEA Order 2016, Hence, PP has considered testing of energy meters once in five years ¹⁰ .
Purpose of the data	Used to calculate baseline emissions
Calculation method	Same as mentioned under the description of measurement methods
Comments	All records relating to the project are kept in a secure and retrievable manner for at least two years after the end of the project crediting period.

Data / Parameter	EG _{Net,y}
Data unit	MWh
Description	Net electricity supplied to the grid

¹⁰ Refer Section 4.3 on Monitoring Plan for details where Data Monitoring has been described

Source of data	Monthly joint Energy Meter Reading Reports of 9 energy meters covering 9 numbers of WTG
Description of measurement methods and procedures to be applied	Continuous measurement and monthly recording. The monitoring of 'Net Electricity supplied to the grid' would be as per the details provided in Power Purchase Agreement signed between the TNEB and project owner. The HTSC No. for the individual or group of turbines represents the unique identification of the joint meter. The net electricity supplied to the grid is calculated by the summation of the net electricity export figures of individual WTGs.
Frequency of monitoring/recording	The parameter will be monitored continuously and recorded at least monthly.
Value monitored	10725.355
Monitoring equipment	Energy Meter
QA/QC procedures to be applied	Every month these meter readings will be recorded by TNEB representative and plant personnel. The meters at the substation will be two-way meters and will be in the custody of TNEB. The quantity of net electricity supplied is cross-verified from the invoice raised on TNEB by the project proponent
Purpose of the data	Used to calculate baseline emissions
Calculation method	Same as mentioned under the description of measurement methods
Comments	All records relating to the project are kept in a secure and retrievable manner for at least two years after the end of the project crediting period.

Data / Parameter	EG _{import,y}
Data unit	kWh
Description	Electricity imported from the grid by the project during the year y
Source of data	From the certified joint meter readings
Description of measurement methods and procedures to be applied	Calculated as measurement from the energy meters available at the generation points.
Frequency of monitoring/recording	The parameter is monitored continuously and recorded at least monthly.
Value monitored	341175.99
Monitoring equipment	Energy Meter
QA/QC procedures to be applied	The electricity imported by the individual WTG is recorded. The electricity imported is adjusted against the gross export by the project activity to the grid. To be cross-checked with monthly

	invoices or receipts of payments.
Purpose of the data	Used to calculate baseline emissions
Calculation method	Same as mentioned under the description of measurement methods
Comments	All records relating to the project are kept in a secure and retrievable manner for at least two years after the end of the project crediting period.

4.3 Monitoring Plan

Purpose of monitoring

The purpose of monitoring is to measure the gross electricity exported, net electricity supplied to the grid and the electricity imported from the project activity to verify the emission reductions.

Types of data and information to be reported, including units of measurement

The approved monitoring methodology (AMS-I.D. version 18) requires monitoring of the gross electricity exported, net electricity supplied to the grid and the electricity imported from the project activity.

Origin of the data

The source of the data on monitoring parameters is certified joint meter readings.

Metering Equipment

Metering system-Energy Meter for each WTG for metering the exported electricity to the grid and imported electricity from grid system

Data Monitoring:

The data is monitored at the main meter of each WTG.

1. Equipment:

The main meter is an Energy Meter of accuracy class 0.2s. The meters will have capability of recording half-hourly and monthly readings.

2. Meter readings:

The monthly meter readings at the project site and receiving station are taken simultaneously by the site personnel and electricity board personnel every month. A document indicating number of kilo-watt-hours indicated by meter will be prepared and signed by officials of the electricity board and operating Office.

a) Accuracy:

All meters installed at the project site are of 0.2s accuracy class. Each meter is jointly inspected and sealed in the presence of both the parties. The accuracy of monitoring parameter is ensured

by adhering to the calibration and testing procedure as described in the QA/QC procedures described for each parameter in Section 4.1. The project will adhere to all the mandatory regulatory and statutory requirements at the state as well as national level. The data will be archived for a period of 2 years after the end of the crediting period in the hard copy format.

b) Testing:

All meters were supposed to be tested for accuracy every year in accordance with the registered VCS PD. However, the calibration and maintenance of energy meters is beyond the control of project participant and is sole responsibility of TNEB. The consumption by equipment/ electricity exported to the grid registered by main meters hold good for purpose of billing as long as errors in main meters are within the permissible limits. Therefore, as per the provision of CEA Order 2016, PP has considered testing of energy meters once in five years.

Energy Meter Calibration Details (Please refer ER sheet for detailed information):

Location Name	Current HTSC. No	Energy Meter - Sl. No	Make	Accuracy Class	Type	Date of Calibration /Installation	Due date of Calibration*
NSL-1	507	4321904	Genus	0.2s	03D-183 (DLMS)	08-May-2017	07-May-2022
NSL-2	508	4321911	Genus	0.2s	03D-183 (DLMS)	08-May-2017	07-May-2022
NSL-3	510	4321912	Genus	0.2s	03D-183 (DLMS)	08-May-2017	07-May-2022
NSL-4	533	4321910	Genus	0.2s	03D-183 (DLMS)	08-May-2017	07-May-2022
NSL-5	509	5839987	Genus	0.2s	03D-183 (DLMS)	11-November-2020	10-November-2025
NSL-6	551	4321909	Genus	0.2s	03D-183 (DLMS)	08-May-2017	07-May-2022
NSL-7	497	HT2180075	EDMI	0.2s	MK6E DLMS	06-December-2019	05-December-2024
NSL-8	511	4321905	Genus	0.2s	03D-183 (DLMS)	08-May-2017	07-May-2022
NSL-9	482	4322619	Genus	0.2s	03D-183 (DLMS)	08-May-2017	07-May-2022

As compared to the provision of calibration/testing frequency, prescribed under the VCS-PD, the meters are supposed to undergo testing/calibration once in a year. Therefore, delay in meter calibration can be considered for the monitoring period.

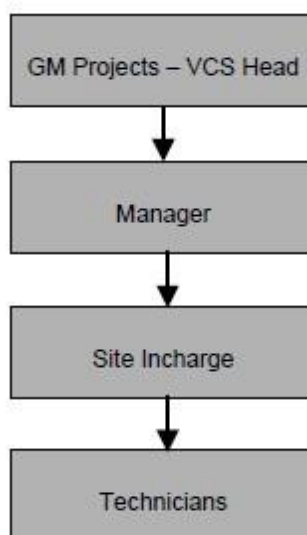
Accordingly, PP has applied maximum permissible error (i.e., 0.2%¹¹) for the whole monitoring period. The meter calibration is not under the purview of PP. TNEB is the sole authority to conduct the meter calibration and in absence of annual practice of calibration, PP has considered CEA order dated 17-March-2016; which prescribes under the para 18(b) that "all the meters shall be tested once in five years." Thus, validity of the calibration is considered for five years, whereas error factor has been considered to estimate a conservative ER value.

3. Billing:

A daily generation report is prepared by site personnel. As discussed, the meters are capable of storing readings, which is submitted to the state electricity board along with the cumulative meter reading for the wind farm. This is maintained by the state authorities. These readings are used to determine line losses as well as power exported to the grid.

Monitoring roles and responsibilities

The operational and management structure implemented by Windage Power Company (P) LTD (previously known as NSL) is as follows:



The General Manager (GM) manager is the head of the VCS team and would be responsible for coordinating with the manager and ensures that the monitoring is carried out in a transparent

¹¹ As compared to the provision of calibration/testing frequency, prescribed under the VCS-PD, the meters are supposed to undergo testing/calibration once in a year. Therefore, delay in meter calibration can be considered for the monitoring period. Accordingly, PP has applied maximum permissible error (i.e. 0.2 %) for the whole monitoring period as there was no error physically observed or highlighted by the authority. The meter calibration is not under the purview of PP. TNEB is the sole authority to conduct the meter calibration and in absence of annual practice of calibration, PP has considered CEA order dated 17 March-2016; which prescribes under the para 18(b) that "all the meters shall be tested once in five years." Thus, validity of the calibration is considered for five years, whereas error factor has been considered to estimate a conservative ER value.

and accurate manner. The manager coordinates with the site in charge and the technicians and takes care of all the day to day activities of the plant and is responsible for testing the equipment, billing and archiving the data. The site in charge and the technicians are responsible for recording the operation and downtime hours of the project activity.

The monitoring team is also responsible for the following:

- Overall maintenance of the WTGs
- Calculation of actual creditable emission reduction in the most transparent and relevant manner
- For claims and settlement of electricity payment from the state utility every month
- Renewal of contracts with OEMs, insurance etc.
- Periodical meter checking, calibration etc.
- Meet the training needs of the personnel other than from the O&M contract at site
- Extracting, checking and Maintenance of data both manual and electronic form and preservation for the entire crediting period
- The authority and responsibility of project overall project coordination in relation to the VCS validation would be with the project proponent.

Procedures for internal audit and Management review:

An internal audit of the project activity would be done on an annual basis by a special audit team. The audit team would comprise competitive persons who would be appointed by the General Manager in charge.

The audit team after the audit would submit their observations to the Manager for his review and necessary action. The Manager would instruct the VCS team to take the required corrective action if any, suggested by the audit team.

Procedures for corrective actions for better future monitoring and reporting:

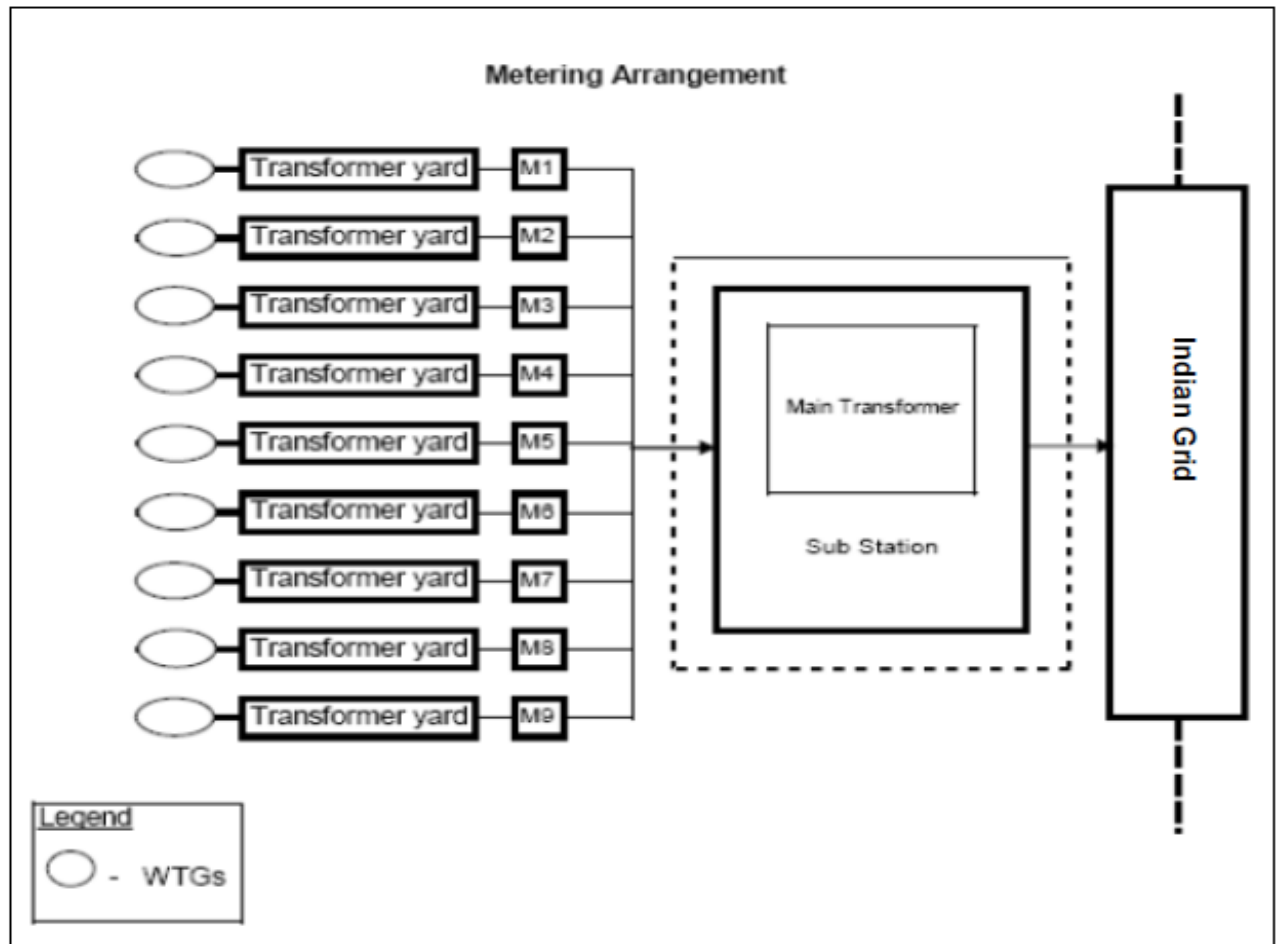
Errors or deviations will be identified during the annual internal audits. The VCS team Head (i.e., General Manager in charge) would take up these matters during the annual VCS team meetings (that normally would happen a few days after internal audit reports are prepared and submitted). The root cause of these errors would be discussed and appropriate action would be taken for better future monitoring and reporting. The corrective actions may include:

- Training of monitoring personnel where ever required
- Replacement or repair of equipment

Procedures for maintenance of monitoring equipment:

- The Site Engineer would conduct a physical inspection of all the energy meters once a month
- Any maintenance requirements would be immediately attended
- The energy meters will undergo a preventive maintenance one a year
- The responsibility of maintenance will be with the Site Engineer
- Maintenance history card would be maintained for all energy meters

The schematic diagram of the project activity is as given below:



5 QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS

5.1 Baseline Emissions

Baseline emissions include only CO₂ emissions from electricity generation in fossil fuel fired power plants connected to the Southern Grid, which is currently considered as unified Indian Grid system, that are displaced by the project activity. The Baseline Emissions would be calculated using the formula

$$BE_y = EG_{BL,y} \times EF_{CO_2}$$

Where,

BE_y is Baseline Emissions in year y (tCO₂/y)

EG_{BL,y} is Energy Baseline in year y, kWh

EF_{CO₂} is CO₂ Emission Factor in year y; tCO_{2e} / kWh

$$\begin{aligned} \text{Baseline Emissions} &= 10,725.355 \text{ MWh} \times 0.9777 \text{ tCO}_{2e}/\text{MWh} \\ &= 10,485 \text{ tCO}_{2e} \text{ (rounded down value considered)} \end{aligned}$$

5.2 Project Emissions

As per para 39 of methodology i.e., AMS-I.D. version 18, This project activity is grid connected wind power generation. Hence there is no project emission from the project activity. PE_y = 0 tCO_{2e}¹².

5.3 Leakage

As per the methodology i.e., AMS-I.D. version 18, no leakage is considered from the project activity.¹³

¹² https://cdm.unfccc.int/filestorage/2/P/7/2P7FS6ZQAR84LG3NMKYUH50WI90DBC/EB81_repan24_AMS-I.D_ver18.pdf?t=SDJ8cnNwcXAzfDDAZ3JgCEaETqDis7PA_p1i

¹³ https://cdm.unfccc.int/filestorage/2/P/7/2P7FS6ZQAR84LG3NMKYUH50WI90DBC/EB81_repan24_AMS-I.D_ver18.pdf?t=SDJ8cnNwcXAzfDDAZ3JgCEaETqDis7PA_p1i

5.4 Net GHG Emission Reductions and Removals

Year	Baseline emissions or removals (tCO ₂ e)	Project emissions or removals (tCO ₂ e)	Leakage emissions (tCO ₂ e)	Net GHG emission reductions or removals (tCO ₂ e)
Year 2021 (1-Sep-2021 to 31-Dec-2021)	7,205	0	0	7,205
Year 2022 (1-Jan-2022 to 30-Apr-2022)	3,280	0	0	3,280
Total	10,485	0	0	10,485

The comparison of actual ER with estimated ERs as per registered PD has been included under the ER sheet and also provided justification based on facts and information.

<u>Ex-ante emissions reductions/removals</u>	<u>Achieved emissions reductions/removals</u>	<u>Percent difference</u>	<u>Justification for the difference</u>
20,505	10,485	-48.87%	The actual ER achieved is lower than the PD estimated ER for the comparable period. This is mainly due to low PLF and higher shutdown periods during the monitoring period.

APPENDIX 1: HTSC NUMBERS & TECHNICAL DETAILS

The changes in HTSC nos. are reported below:

Local Ref.	Old HTSC Numbers	New HTSC Numbers ¹⁴
NSL-1	751	507
NSL-2	752	508
NSL-3	754	510
NSL-4	788	533
NSL-5	753	509
NSL-6	808	551
NSL-7	728	497
NSL-8	755	511
NSL-9	690	482

More details related to WTG locations and commissioning dates:

Location Name	S.F. Nos	HT. Service Number	Date of Commissioning
NSL 1	38&39/3	507	31.03.2005
NSL 2	150/3A2,150/3B,158/1	508	31.03.2005
NSL 3	104/1&109/1	510	31.03.2005
NSL 4	56/1C,47/8&56/1B	533	29.04.2005
NSL 5	431/3	509	31.03.2005
NSL 6	95/2,95/3&95/4	551	17.05.2005
NSL 7	17&18	497	30.03.2005
NSL 8	2/1	511	31.03.2005
NSL 9	254/A1,255/2B,255/2C	482	26.03.2005

¹⁴ These are current HTSC nos. different from the ones at the time of validation. HTSC nos. are assigned by TNEB as per their internal practice which is not under the control of PP. The change in HTSC nos. was already reported under previous verifications.

Technical details of the WTGs reported below:

Operational conditions	
Calculated lifetime	20 years
Cut in wind speed	3.5 m/s
Cut out wind speed	20m/s
Maximum rotational speed	14.4 rpm
Main specification	
Rotor Diameter	82 m
Number of Blades	3
Rotational speed (synchronous)	14.4 rpm
Rotor	
Rotor Diameter	82 m
Tilt angle	5°
Swept area	5281 m ²
Generator	
Nominal Power	1650 kW
Rotational Speed	1012 rpm at rated power
Control system	
Manufacture	VESTAS control systems
Type	Microprocessor based

APPENDIX 2: BREAKDOWN DETAILS

MONITORING PERIOD 01-September-2021 to 30-April-2022	TOTAL HOURS FOR THE MONTH	TOTAL HOURS	PRODUCTION HOURS	BREAKDOWN HOURS	SCHEDULED HOURS	UNSCHEDULED HOURS
SEPTEMBER	720	6480	5933.1	546.9	381.6	165.3
OCTOBER	744	6696	3559.8	3136.2	85.3	3050.9
NOVEMBER	720	6480	3091.2	3388.8	112.6	3276.2
DECEMBER	744	6696	3700	2996	716.4	2279.6
JANUARY	744	6696	3642.8	3053.2	29.5	3023.7
FEBRUARY	672	6048	3518.6	2529.4	5.3	2524.1
MARCH	744	6696	4377.9	2318.1	248.1	2070
APRIL	720	6480	3368.6	3111.4	260.2	2851.2
TOTAL		52272	31192	21080	1839	19241