VAJRAKARUR WIND POWER PROJECT IN ANDHRA PRADESH

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1 PROJECT DETAILS

1.1 Summary Description of the Implementation Status of the Project

Mytrah Vayu (Pennar) Private Limited (MVPPL) has set up 63 MW wind power project in the state of Andhra Pradesh in India. The project activity comprises of 30 number Wind Turbine Generators (WTG's) with a capacity of 2.1 MW each.

The project activity helped to reduce the supply demand gap in the state and also helped in contributing to the sustainable development by using wind energy as the source of power generation and reduction of GHG Emissions. The power (electricity) thus produced by the project activity would be transmitted to the Andhra Pradesh grid. The project activity therefore displaced an equivalent amount of electricity which would have otherwise been generated in fossil fuel dominant electricity grid.

The start date of current monitoring period is 31st March 2012. This is because the first WTG was commissioned as on the said date and last WTG under the project activity was commissioned on 20th December 2012.

The total GHG emission reductions or removals generated in this monitoring period is 68,771 tCO_{2e}.

1.2 Sectoral Scope and Project Type

As per the categorization by UNFCCC, the project activity falls under 'Scope 1, Sectoral Scope: Energy industries (renewable/non-renewable).

Methodology applied is ACM 0002, version 13.0.0.

The project is not a grouped project activity.

1.3 Project Proponent

Organization name	Mytrah Vayu (Pennar) Private Limited (MVPPL)
Contact person	Mr. Vikram Kailas
Title	Managing Director
Address	8001, Q-City, S.No:109, Gachibowli, Hyderabad- 500 032, India.
Telephone	+9140 33760 100
Email	Vikram.kailas@mytrah.com

1.4 Other Entities Involved in the Project

Not Applicable

1.5 Project Start Date

The project start date is 31st March 2012, first WTG was commissioned as on the said date.

1.6 Project Crediting Period

The crediting period for the project activity is considered from 31st March 2012 to 30th March 2022, for 10 years.

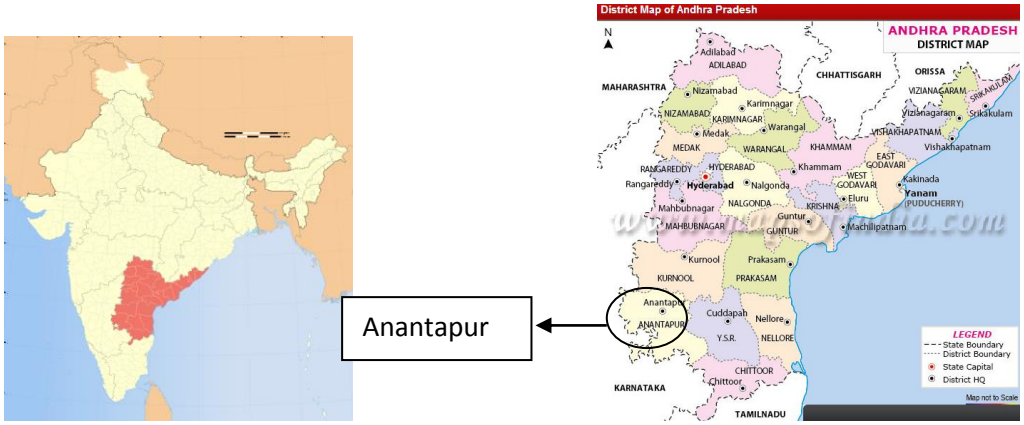
1.7 Project Location

The project activity is located in Vajrakarur village, Anantapur district of Andhra Pradesh state, India. The geo-coordinates of location of the project activity are as follows:-

Si. No	Location	Latitude (N)	Longitude (E)
1	VAR 010	15^0 1' 7.68"	77^0 14' 37.18"
2	VAR 015	15^0 0' 27.99"	77^0 15' 14.58"
3	VAR 016	15^0 0' 27.88"	77^0 16' 1.56"
4	VAR 018	15^0 0' 4.79"	77^0 15' 44.45"
5	VAR 019	14^0 59' 52.17"	77^0 16' 1.02"
6	VAR 022	14^0 59' 6.44"	77^0 15' 44.64"
7	VAR 023	14^0 58' 56.84"	77^0 15' 55.01"
8	VAR 024	14^0 59' 23.72"	77^0 16' 35.89"
9	VAR 026	15^0 0' 43.37"	77^0 16' 46.07"
10	VAR 027	15^0 0' 16.94"	77^0 17' 36.85"
11	VAR 028	$15^0$0' 4.62"	77^0 17' 29.05"
12	VAR 029	14^0 59' 42.71"	77^0 17' 18.65"
13	VAR 030	14^0 59' 30.30"	77^0 17' 13.80"
14	VAR 037	14^0 58' 42.71"	77^0 18' 35.17"
15	VAR-038	14^0 58' 21.07"	77^0 17' 57.63"
16	VAR-039	14^0 58' 6.25"	77^0 17' 56.50"
17	VAR-040	14^0 57' 44.42"	77^0 18' 3.20"
18	VAR 050	14^0 59' 58.87"	77^0 19'4.90"

19	VAR 051	15^0 0’ 10.25”	77^0 18’ 55.68”
20	VAR 203	15^0 1’ 6.13”	77^0 15’ 21.67”
21	VAR 204	15^0 0’ 48.04”	77^0 15’ 22.42”
22	VAR 205	15^0 0’ 2.22”	77^0 15’ 8.52”
23	VAR 208	14^0 58’ 13.90”	77^0 16’ 27.42”
24	VAR 209	14^0 58’ 38.57”	77^0 17’34.36”
25	VAR 216	15^0 1’ 29.917”	77^0 16’ 26.95”
26	VAR 217	15^0 1’ 16.78”	77^0 16’ 42.34”
27	VAR 300	15^0 1’ 23.81”	77^0 15’ 24.03”
28	VK 108	15^0 2’ 21.62”	77^0 16’ 27.63”
29	VK 109	15^0 2’ 30.00”	77^0 16’ 16.30”
30	VK 110	15^0 2’ 38.23”	77^0 16’ 5.95”

The geographical location of the project site is as shown below:



1.8 Title and Reference of Methodology

Title: “Consolidated baseline methodology for Grid-Connected electricity generation from renewable source”.

Reference: ACM0002, (Version 13.0.0)

Other tools referenced in this methodology are:

· Tool for the demonstration and assessment of additionally, Version 07.0.0 (EB70 Annex 08)

· Tool to calculate the emission factor for an electricity system, Version 03.0.0 (EB70 Annex 22)

1.9 Other Programs

The project is registered under Clean Development Mechanism (CDM) of UNFCCC with 10 years crediting period (UNFCCC Reference No: 9650)[1].

Crediting period of the project under CDM starts on 11th June 2013 and ends on 10th June 2023

2 IMPLEMENTATION STATUS

2.1 Implementation Status of the Project Activity

The first machine under the project activity was commissioned on 31-March-2012 and the last machine under the project activity was commissioned on 20-December-2012. The Project activity consist of 30 machines (2.1MW each) of Suzlon make S-88.Total capacity of 63MW.

The commissioning schedule of the project activity is shown below.

Si.No	Make	Location No	Date of Commissioning
1	Suzlon	VAR209	March 31, 2012
2	Suzlon	VAR38	March 31, 2012
3	Suzlon	VAR39	March 31, 2012
4	Suzlon	VAR40	March 31, 2012
5	Suzlon	VAR18	June 18, 2012
6	Suzlon	VAR208	June 18, 2012
7	Suzlon	VAR23	June 18, 2012
8	Suzlon	VAR24	June 18, 2012
9	Suzlon	VAR204	October 29, 2012
10	Suzlon	VAR15	October 29, 2012
11	Suzlon	VAR16	October 29, 2012
12	Suzlon	VAR205	October 29, 2012
13	Suzlon	VAR10	October 29, 2012
14	Suzlon	VK108	October 29, 2012
15	Suzlon	VK109	October 29, 2012
16	Suzlon	VK110	October 29, 2012
17	Suzlon	VAR203	October 29, 2012
18	Suzlon	VAR300	October 29, 2012
19	Suzlon	VAR217	October 30, 2012
20	Suzlon	VAR216	October 30, 2012
21	Suzlon	VAR26	October 30, 2012
22	Suzlon	VAR30	October 30, 2012
23	Suzlon	VAR28	October 30, 2012
24	Suzlon	VAR27	October 30, 2012
25	Suzlon	VAR22	October 30, 2012
26	Suzlon	VAR29	October 30, 2012
27	Suzlon	VAR19	October 30, 2012

[1] http://cdm.unfccc.int/Projects/DB/SGS-UKL1369989385.4/view

28	Suzlon	VAR37	October 30, 2012
29	Suzlon	VAR50	December 20, 2012
30	Suzlon	VAR51	December 20, 2012

Some of the other salient features are as mentioned below:

MODEL	**S88- 2.1 MW**
Operating Data	
Rated power	2.1MW
Cut-in wind speed	4 m/s
Rated wind speed	14m/s
Cut-out wind speed	25 m/s
50 years gust wind speed	59.5 m/s
Wind Class	IEC-IIA
Rotor	
Diameter	88 m
Swept area	6082 m^2
Generator	
Type	Asynchronous slip ring type induction generator
Frequency	50/60 Hz
Braking System	
Aerodynamic brake	3 independent systems with blade pitching mechanism
Mechanical brake	Hydraulic fail safe disc brake system
Gearbox	
Type	3 stages
Yaw System	
Type	Driven by 3 electrical driven planetary drives
Bearings	Polyamide slide
Tower	
Type	Tubular Tower (4 Sections)

The project has supplied 76,665.46 MWh of electricity to the grid in the monitoring period, which indicates that the project has performed reasonably well during the monitoring period. Referring to the data available, it can be inferred that there has not been any major event that may impact the GHG emission reductions or removals and monitoring of the project activity. There is no other changes in the project activity.

As a part of regular maintenance, the machines are stopped for mechanical and electrical maintenance and for visual inspection in the current monitoring period. The shutdown details have been included under Appendix 1.

2.2 Deviations

2.2.1 Methodology Deviations

There is no methodology deviation for the project activity.

2.2.2 Project Description Deviations

There have been no deviations from the description of the project activity

2.3 Grouped Project

Not Applicable.

3 DATA AND PARAMETERS

3.1 Data and Parameters Available at Validation

Data / Parameter	$EF_{grid,OMsimple,y}$
Data unit	tCO_2/MWh
Description	Operating margin CO2 emission factor of Southern Grid
Source of data	Central Electricity Authority:CO2 Emission Database CEA CO_2 Baseline database Version 07
Value applied:	0. 9515
Justification of choice of data or description of measurement methods and procedures applied	The operating margin emission factor data has been deduced from CO_2 database.
Purpose of the data	Calculation of combined margin emission factor of grid.
Comments	The operating margin emission factor is a 3-year generation-weighted average data calculated to be 0.9515. The operating Margin is calculated ex ante and fixed during the crediting period.

Data Unit / Parameter:	$EF_{grid,BM,y}$
Data unit:	tCO_2/MWh
Description:	Build margin CO2 emission factor of Southern grid
Source of data:	Central Electricity Authority:CO2 Emission Database CEA CO2 Baseline database Version 07
Value applied:	0.7339
Justification of choice of data or description of measurement methods and procedures applied	The Build margin emission factor data has been deduced from CO_2 database.
Purpose of the data:	Calculation of combined margin emission factor of grid.
Comments:	The Build Margin would be calculated ex ante and fixed during the crediting period. For ex ante calculation the most recent data available has been used and the build

	margin thus calculated is 0.7339.

Data Unit / Parameter:	$EF_{grid,CM,y}$
Data unit:	tCO_2/MWh
Description:	Combined margin CO2 emission factor of Southern grid
Source of data:	Central Electricity Authority:CO2 Emission Database CEA CO2 Baseline database Version 07
Value applied:	0.8971
Justification of choice of data or description of measurement methods and procedures applied	Calculated as per the procedures in "Tool to calculate the emission factor for an electricity system" based on CEA data.
Purpose of the data:	Calculation of baseline emission.
Comments:	The combined margin would be calculated ex-ante and fixed for the entire crediting period and the combined margin thus calculated is 0.8971.

3.2 Data and Parameters Monitored

Data / Parameter	$\mathbf{EG_{PJ,y}}$
Data unit	MWh/year
Description	Net Electricity Supplied to the grid by the project activity.
Source of data	Calculated
Description of measurement methods and procedures to be applied	Metering system for the project activity consists of cluster metering system at 33kV. Each Cluster point have one main and one check meter (33kV metering point) All the clusters of the project activity is exclusively connected to WEGs of the project activity i.e. no WEGs of other project owners that are connected to these clusters. Summation of meter reading for all the clusters (connecting 30 machines) provide total electricity Generated by the project activity. In addition to cluster meters there is one set of main & check meter at Suzlon pooling sub-station (220kV metering point/Bulk metering point) where all the WEGs of project activity and non-project activity are connected. All main and check meters are two way tri-vector meters capable of recording import and export of electricity under the control of state electricity utility.

	All main and check meters are of 0.2% of accuracy class The procedures for metering and meter reading is as per the provisions of the power purchase agreement except or otherwise explicitly stated in the PDD Monthly Joint Meter Reading recorded at all the meters is done by Discom utility in the presence of PP's representative (Suzlon) Joint meter reading recorded at cluster metering point indicates the values of export & import by the WEGs of project activity connected to 33 kV metering point. There is individual Joint meter reading for individual cluster metering point. Joint meter reading recorded at 220kV metering point at Suzlon pooling sub-station indicates the values of export and import by all the WTG's of the project activity and WTG's of non-project activity connected to 220kV metering point Net electricity supplied to the grid is used in calculation of emission reduction of the project activity
Frequency of monitoring/recording	Recording : Monthly Monitoring :Not Applicable since it is a calculated parameter
Value monitored:	76,665.46
Monitoring equipment	The details of energy meters used have been included on section 3.3.
QA/QC procedures to be applied	QA/QC procedures is implemented by Discom/State utility pursuant to the provisions of the power purchase agreement except or otherwise explicitly stated in the PDD. Net electricity supplied (EGPJ,y) to the grid by the project activity is cross checked with invoices submitted by the PP to the state utility. All the main meter and check meters are calibrated by state utility once a year and records are available with PP.
Purpose of the data	Baseline emissions calculation
Calculation method	Net quantity of electricity exported by the project is calculated as the net of sum of export from individual meters, sum of import from individual meters and line losses
Comments	The data will be archived for two years after the end of the last crediting period or till the last issuance of CERs for the project activity, whichever is later The meter readings at the substation are recorded by APCPDCL representative every month. The meters are fully under

	the jurisdiction of APCPDCL. The readings of net electricity supplied to the grid by each customer are made

Data Unit / Parameter:	EGexport,y
Data unit:	MWh/y
Description:	Electricity exported by project activity to grid after apportioning of transmission losses between 33kV metering point (cluster meter) and 220kV metering point(Bulk metering point).
Source of data:	Electricity exported by project activity is a calculated Parameter.
Description of measurement methods and procedures to be applied:	The electricity export from each WEG in the wind farm is recorded by an energy meter installed at metering point at 33kv. The energy meter provides monthly electricity import data from individual WEG.
Frequency of monitoring/recording:	Not Applicable since it is a calculated parameter
Value applied:	77,045.49
Monitoring equipment:	The details of energy meters used have been included on section 3.3 Monitoring Report.
QA/QC procedures to be applied:	Value of EGexport,y is cross checked from certified statement given by state utility showing cost of export and import. It may be noted that energy export by the project activity is imported by the grid from the project activity and therefore electricity export by the project activity is denoted as import by the grid in the certified statement by the state utility. QA/QC procedures is as implemented by Discom/State utility pursuant to the provisions of the power purchase agreement except. All the main meter and check meters are calibrated by state utility once a year and records are available with PP.
Purpose of the data	Baseline emissions calculation
Calculation method:	Electricity exported by the project is calculated as the net of sum of export from each metering point at 33KV.
Comments:	-

Data Unit / Parameter:	EGimp
Data unit:	MWh/y
Description:	Electricity imported recorded at 33kV (JMR at 33kV metering point) cluster metering points connecting a total of 30 machines of the project activity.

Source of data:	Electricity import from grid as per the joint meter reading recorded at cluster metering points.
Description of measurement methods and procedures to be applied:	Electricity import form grid is recorded by cluster meters (main and check) connecting 30 turbines at 33kV level.
Frequency of monitoring/recording:	Continuous measurement and at least monthly recording
Value applied:	38**0.03**
Monitoring equipment:	The details of energy meters used have been included on section 3.3 Monitoring Report.
QA/QC procedures to be applied:	Value of EGimp is cross checked from certified statement given by state utility showing cost of export and import. It may be noted that energy import by the project activity is exported by the grid from the project activity and therefore electricity import by the project activity is denoted as export by the grid in the certified statement by the state utility. QA/QC procedures is implemented by Discom/State utility pursuant to the provisions of the power purchase agreement except or otherwise explicitly stated in the PDD.
Purpose of the data	Baseline emissions calculation
Calculation method:	Not applicable
Comments:	-

Data Unit / Parameter:	EGpe
Data unit:	MWh/y
Description:	Electricity Export recorded at 33 kv(JMR at 33kV metering point) cluster points connecting total 30 machines of the project activity.
Source of data:	Electricity export to the grid as per the joint meter reading recorded at cluster metering points
Description of measurement methods and procedures to be applied:	Electricity export to the grid is recorded by the cluster meters (main and check) connecting 30 turbines at 33kV level.
Frequency of monitoring/recording:	Continuous measurement and at least monthly recording
Value applied:	78,045.19
Monitoring equipment:	The details of energy meters used have been included on section 3.3 Monitoring Report.
QA/QC procedures to be applied:	The value of (EGpe) transmission loss is cross checked from the transmission loss calculation sheet of Suzlon and Discom. QA/QC procedures is implemented by discom/State utility pursuant to the provisions of the power purchase agreement except or otherwise explicitly stated in the PDD.
Purpose of the data	Baseline emissions calculation
Calculation method:	Not applicable
Any Comments:	All the data items monitored under the monitoring plan will be archived for 2 years after the end of crediting period or till the last issuance of CERs for this project activity whichever occurs later.

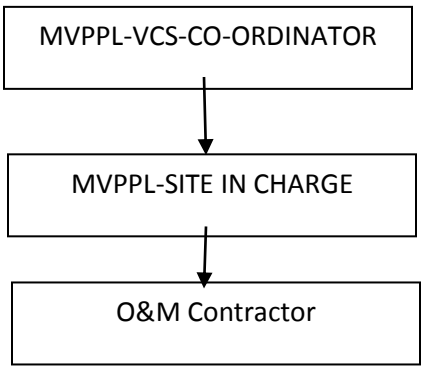
Data Unit / Parameter:	EGe
Data unit:	MWh
Description:	Electricity export recorded at 220 kV meters (main and check) at Suzlon pooling station connecting machines of the project activity and the machines commissioned by other project developers.
Source of data:	Electricity export to the grid as per joint Meter Readings recorded at 220kV of Suzlon pooling sub -station.
Description of measurement methods and procedures to be applied:	Electricity export to the grid is recorded by the 220 kV (main and check) at Suzlon pooling sub- station connecting machines of the project activity and machines of other project developers.
Frequency of monitoring/recording:	Continuous measurement and at least monthly recording
Value applied:	149,461.70 Mwh
Monitoring equipment:	The details of energy meters used have been included on section 3.3 Monitoring Report.
QA/QC procedures to be applied:	The value of EGe is cross checked from the transmission loss calculation sheet signed by the representatives of suzlon and discom. QA/QC procedures is implemented by Discom/State utility pursuant to the provisions of the power purchase agreement except or otherwise explicitly stated in the PDD. The energy meters (main & check) is calibrated by state utility annually.
Purpose of the data	Baseline emissions calculation
Calculation method:	Not applicable
Any Comments:	All the data items monitored under the monitoring plan will be archived for 2 years after the end of crediting period or till the last issuance of CERs for this project activity whichever occurs later.

Data Unit / Parameter:	Lep
Data unit:	MWh/y
Description:	Total percentage of transmission loss for export between the metering point at 33 kV (sum of all the WEGs connected to Bulk metering point including non-project activity as well as project activity WTG's) metering points and the metering point at 220kV at Suzlon pooling substation.
Source of data:	Transmission Loss is directly applied from the monthly generation report for the project activity.
Description of measurement methods and procedures to be applied:	Transmission loss between metering point at 33kV and at metering point of 220kV at Suzlon Sub-station is applied to meter reading taken at meters connected at 33kV for the project activity. Suzlon pooling sub-station is connected to the machines of the project activity and the machines commissioned by the other project owners. Therefore transmission loss is applied to the project activity by the state utility as reflected in the JMR taken at 33kV level. The JMR is signed by the representatives of Suzlon and the state utility.
Frequency of Monitoring/recording:	Recording : Monthly Monitoring: Not Applicable since it is calculated

	parameter.
Value applied:	1.34 %
Monitoring equipment:	The details of energy meters used have been included on section 3.3 Monitoring Report.
QA/QC procedures to be applied:	QA/QC procedures is implemented by Discom/State utility pursuant to the provisions of the power purchase agreement except or otherwise explicitly stated in the PDD.
Purpose of the data	Baseline emissions calculation
Calculation method:	Not applicable
Any Comments:	All the data items monitored under the monitoring plan will be archived for 2 years after the end of crediting period or till the last issuance of CERs for this project activity whichever occurs later.

3.3 Monitoring Plan

The organizational structure of this CDM project activity is as follows:-



The project participant has entered into an agreement with the WTG- Supplier for the operation and maintenance of WTGs. The WTG supplier has dedicated and technically well-equipped O&M team for day to day Operation and maintenance of each WTG. O&M contractor provides a monthly report, which includes generation data, major breakdown events and machine availability. Project Manager is responsible for recording of monthly Joint Meter Readings of export and import. Monthly power export and import data is sent regularly to CDM coordinator of MVPPL.

Metering system for the project activity consists of cluster metering system at 33kV. Each Cluster point have one main and one check meter (33kV metering point) All the clusters of the project activity is exclusively connected to WEGs of the project activity i.e. there is no WEGs of other project owners that are connected to these clusters. Summation of meter reading for all the clusters (connecting 30 machines) provides total electricity generated by the project activity. In addition to cluster meters there is one set of main & check meter at Suzlon pooling sub-station (220kV metering point/Bulk metering point) where all the WEGs of project activity and non-project activity are connected. All main and check meters are two way tri-vector meters capable of recording import and export of electricity under the control of state electricity utility.

All main and check meters are of 0.2% of accuracy class. Monthly Joint Meter Reading recorded at all the meters is done by Discom utility in the presence of PP's representative (Suzlon). Joint meter reading recorded at cluster metering point indicates the values of export & import by the WEGs of project activity connected to 33 kV metering point. There is individual Joint meter

reading for individual cluster metering point. Joint meter reading recorded at 220kV metering point at Suzlon pooling sub-station indicates the values of export and import by all the WTG's of the project activity and WTG's of non-project activity connected to 220kV metering point
Net electricity supplied to the grid is used in calculation of emission reduction of the project activity.

Metering and Monitoring Plan details: The general conditions set out for metering, recording, meter readings, meter inspections, Test & Checking and communication shall be applicable as per the PPA (Power purchase agreement) with the State electricity board except or otherwise explicitly mentioned in the PDD.

Metering: The electricity generated by the WTGs are monitored through energy meters connected to a set of WTGs of the PP at the project site. The electricity generated is stepped up by 33 kV transmission lines and fed to the metering point which has main meter and check meter. The electricity is fed from this metering point to 33/220 kV pooling sub-station where the bulk meter (main meter and check meter) has been installed and the same has been presented in the diagram below. The bulk meter at the sub-station measures total electricity exported by the different project participants located at the site.

The PP has made clusters of WTGs at the project site for the purpose of metering. Each cluster main and the check meter. All the clusters of the project activity is exclusively connected to WTGs of the project activity i.e. there is no WTGs of other project owners that are connected to these clusters.

It is clear that the clusters meters (dedicated meters/ individual meters) of project activity and other customers are connected to the Suzlon pooling sub- station at bulk metering point at 220 kV. Since the main and check meters at 220 kV metering point at the Suzlon Pooling station is connected to the machines of the project activity and the machines commissioned by other project developers, therefore in order to determine the net electricity supplied to the grid at 220kV at Suzlon sub-station, the state utility apply the apportioning of transmission loss to the meter reading recorded at 33kV.

The total % of transmission loss for the export between 220KV metering point at Suzlon sub-station and all WTGs connected to the sub-station is calculated by the state utility is endorsed / confirmed jointly by the representatives of Suzlon and the state utility. The transmission the state utility is reflected in transmission loss calculation sheet signed by the representatives of Suzlon and Discom. Net Electricity exported to the grid is calculated by applying transmission loss to the meter readings taken at 33 kV metering point of the project activity.

The procedure for calculation of Transmission loss is as follows:

Each project developer has dedicated individual metering system at 33kV. Energy export (EGexport,y) and energy import (Eimp) is recorded for the individual developers at 33 KV metering point; Where N is number of project developers connected to 220kV metering point of Suzlon substation.
Total % of transmission losses for export (Lep) are calculated as using the following formula:
Where,
EGe = Electricity export to the grid recorded at Suzlon substation.

Value of Lep is calculated by state utility and would be sourced directly from the transmission loss calculation sheet.

$$Lep(\%)= \frac{(XExport,1+\ XExport,2+\ldots\ldots\ XExport,N)-\ EGe}{(XExport,1+\ XExport,2+\ldots\ldots\ XExport,N)} *100$$

Hence,

Electricity exported by project activity to grid after apportioning of transmission losses between 33kV metering point (Cluster meter) & 220kV metering point (Bulk meter)

$$EGexport,\ y = EGpe * (1- Lep(\%))$$

The Joint meter reading noted at 33 KV metering location contains the following data:

1. Electricity Export
2. Electricity Import

The net electricity supplied to the grid is calculated as follows.

$$EGPJ,y = EGexport,\ y - EGimp$$

Electricity exported by the project activity (EGPJ,y)will be used for CER computation.

QA/QC Procedure: All the meters are calibrated/ tested once in a year. In case of the failure of the main meter, readings was obtained from the check meter, in case of the check meter failure also, there is a standby meter that is operational from which readings is taken.

The calibration is done by the officials of the state utility. Copy of calibration/testing certificate is kept as record by the PP and presented to the DoE for verification.

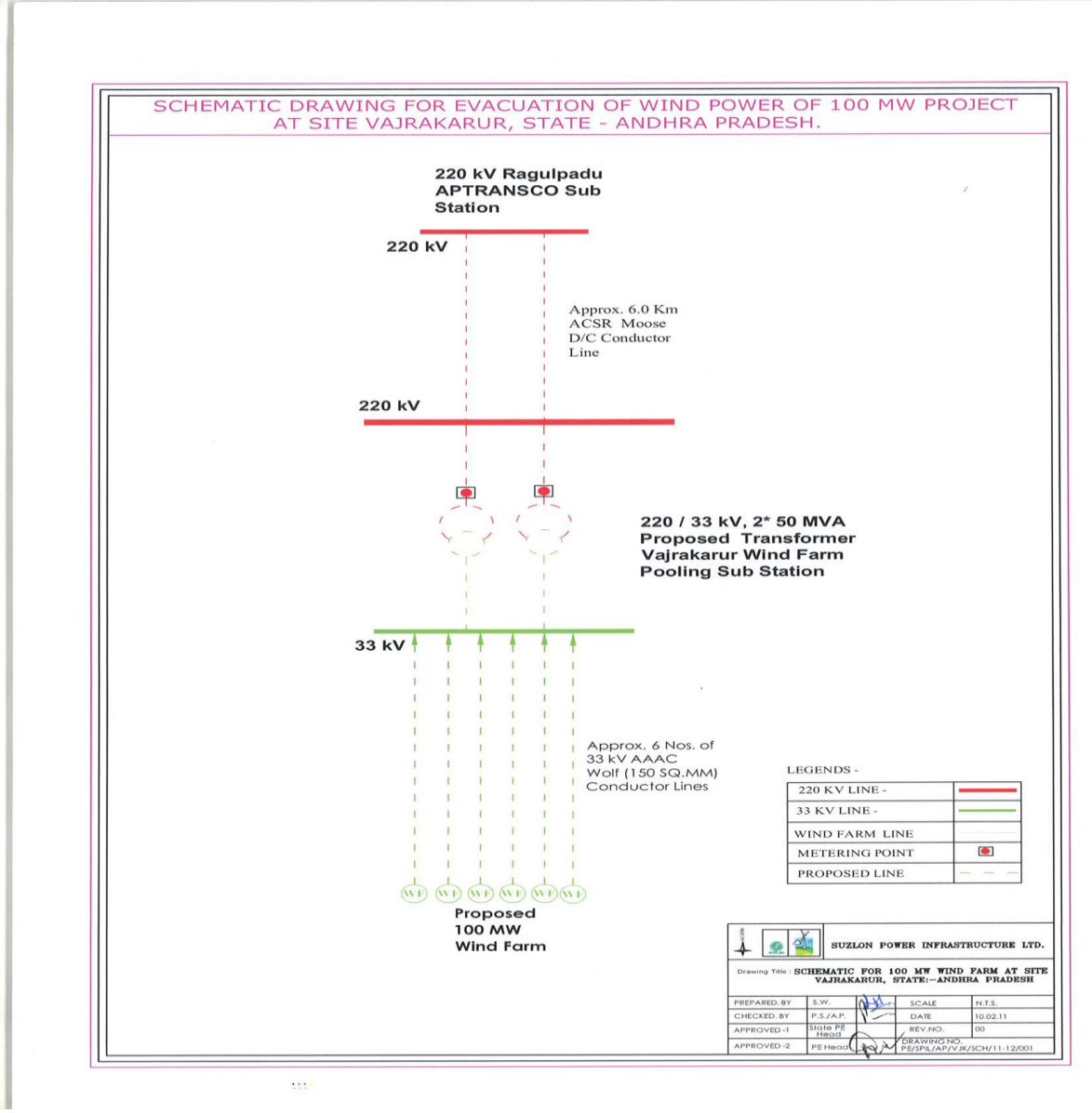
The project participant is Mytrah Vayu (Pennar) India Private Limited is keeping and monitoring the data for electricity generation and calibration reports post project implementation.

Suzlon India is O&M contractor is having the responsibility of activities such as Maintaining electricity generation records, calibration records and maintenance of the WEGs (Wind Energy Generators).

The details of energy meters is as follow:-

Location No	Main Meter No.	Check Meter No.	Standby Meter No.	Calibration Date	Calibration Due Date
VAR204, VAR15, VAR16, VAR205,VAR10,VK108, VK09, VK110	12091057	12091058	12091063	29/10/2012	29/10/2013
VAR203, VAR300	12091085	12091086	12091087	29/10/2012	29/10/2013
VAR217, VAR216,VAR26	12091064	12091065	12091067	30/10/2012	30/10/2013
VAR30, VAR28, VAR27	12091066	12091072	12092890	30/10/2012	30/10/2013
VAR22, VAR29, VAR19	12091069	12091070	12091071	30/10/2012	30/10/2013
VAR 37	12091080	12091081	12091082	30/10/2012	30/10/2013
VAR50, VAR51	12091075	12091076	12091084	20/12/2012	20/12/2013
VAR 38, VAR39, VAR 40, VAR209, VAR 18, VAR 208, VAR 023, VAR 024	12091060	12091061	12091059	31/03/2012 & 23/04/2014	23/04/2014
220 kv Suzlon pooling sub-station	0012091073	0012091074	-	23/04/2014	25/04/2014

Single Line Diagram:-



4 QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS

4.1 Baseline Emissions

The baseline emissions are the product of electrical energy baseline EGBL, y expressed in MWh of electricity produced by the renewable generating unit multiplied by the grid emission factor. Baseline emission factor is calculated as combined margin, consisting of a combination of operating margin (OM) and build margin (BM) factors.

$BE_y = EG_{BL,y} * EF\ CO_{2,grid,y}$

Where:

BE_y: Baseline Emissions in year y; t CO_2

$EG_{BL,y}$: Energy baseline in year y; kWh

EF_{CO2}: Emission Factor in year y; t CO_2e/kWh

As per the registered PDD, combined margin emission factor is 0.8971 tCO_2 /MWh. Hence the baseline emissions for the project activity for the current monitoring period are as follows.

$BE_y = EG_{BL,y} * EF_{CO2} = 76665.46 * 0.8971 = 68771$ tCO2.

4.2 Project Emissions

The proposed project activity is a wind power project and there are no emissions associated with the project. Hence the Project Emissions for the project activity is zero.

4.3 Leakage

The project activity is a Greenfield wind power project and there is no technology transfer with respect to this project activity. Hence the Leakage emissions for the project are zero.

4.4 Net GHG Emission Reductions and Removals

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)
2012	29759	0	0	29759
2013	39012	0	0	39012
Total	68771	0	0	68771

Year Wise VCUs details are as follow:-

Vintage Period	VCUs
31st March 2012 to 31st Dec 2012	29759.00
1st Jan 2013 to 10th June 2013	39012.00

There will be no double accounting of emission reduction despite of end date of previous month is the start date of consequent month. The reason for the same is that meter reading is taken at a particular time of the day (e.g. 11:30 AM). Hence the period 23/12/2012 to 23/01/2013 would denote reading till that time of 23/01/2013. These dates are also reflected in the Joint Meter Reading prepared by State Utility based on which ER calculation is done. Hence, it is clear that there would not be any double accounting of emission reduction.

Billing cycle date for the project activity starts from 23th of the month and ends on 23rd of next month i.e. billing cycle for the month of June is from 23/05/13 to 23/06/2013 and current monitoring period ends on 10/06/2013. Therefore, generation for 18 days (i.e from 23/05/2013 to 10/06/2013) is considered.

APPENDIX 1: SHUTDOWN DETAILS.

S.no	Location No.	Total shutdown hours
1	VAR10	476.66
2	VAR15	515.48
3	VAR16	386.39
4	VAR18	279.05
5	VAR19	253.79
6	VAR203	359.9
7	VAR204	506.8
8	VAR205	523.49
9	VAR208	340.49
10	VAR209	1126.62
11	VAR216	448.75
12	VAR217	329.85
13	VAR22	341.5
14	VAR23	276.1
15	VAR24	310.7
16	VAR26	405.34
17	VAR27	287.1
18	VAR28	319.8
19	VAR29	231.95
20	VAR30	480.4
21	VAR300	426.2
22	VAR37	185.34
23	VAR38	770.33
24	VAR39	820.16
25	VAR40	853.73
26	VAR50	174.2
27	VAR51	255
28	VK108	468.81
29	VK109	478.5
30	VK110	382.9