



**Verified Carbon
Standard**

TUPPADAHALLI WIND ENERGY PROJECT



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Project Title	Tuppadahalli Wind Energy Project
Version	2
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Monitoring Period	01-April-2012 to 31-March-2018
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CONTENTS

1	PROJECT DETAILS.....	4
1.1	Summary Description of the Implementation Status of the Project	4
1.2	Sectoral Scope and Project Type	5
1.3	Project Proponent	5
1.4	Other Entities Involved in the Project	5
1.5	Project Start Date	5
1.6	Project Crediting Period	5
1.7	Project Location	6
1.8	Title and Reference of Methodology	8
1.9	Participation under other GHG Programs.....	8
1.10	Other Forms of Credit.....	9
1.11	Sustainable Development.....	9
2	SAFEGUARDS.....	9
2.3	AFOLU-Specific Safeguards	10
3	IMPLEMENTATION STATUS	10
3.1	Implementation Status of the Project Activity	10
3.2	Deviations.....	12
3.3	Grouped Projects	12
4	DATA AND PARAMETERS.....	12
4.1	Data and Parameters Available at Validation	12
4.2	Data and Parameters Monitored.....	13
4.3	Monitoring Plan.....	15
5	QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS	17
5.1	Baseline Emissions	17
5.2	Project Emissions	18
5.3	Leakage.....	19
5.4	Net GHG Emission Reductions and Removals.....	19

1 PROJECT DETAILS

1.1 Summary Description of the Implementation Status of the Project

The main purpose of this project activity is to generate clean form of electricity from renewable wind resources. This project activity is the installation of Wind Turbine Generators (WTG's) in Shimoga and Chitradurga Districts of Karnataka, India promoted by the project proponent, an Indian company that is a 100% subsidiary of the Spanish Acciona group of companies, i.e., Acciona Energía Internacional, S.A. and Acciona, S.A. The total installed capacity of this project activity is 56.1 MW from 34 WTGs and the capacity of each WTG is 1.65 MW. The entire power generated is exported to the state grid maintained by the Karnataka Power Transmission Corporation Limited (KPTCL). The electricity generated will be supplied to Mangalore Electricity Supply Company (MESCOM) under a long-term Power Purchase Agreement (PPA). MESCOM is a licensed electricity distribution company, owned and controlled by the State Government of Karnataka, and an integral part of the Indian National Grid.

The wind turbines in the project are commissioned in between 29th July 2011 and 22nd October 2011. The details of individual WTGs are as following:

WTG Nos	Capacity	Commissioning Date
TH-1, TH-2, TH-3, TH-4, TH-5, TH-6, TH-7, TH-8 & TH-12	14.85 MW	22-October-2011
TH-9, TH-10, TH-11, TH-13, TH-14, TH-15, TH-16, TH-17, TH-20 & TH-21	16.5 MW	28-September-2011
TH-18, TH-19, TH-22, TH-23, TH-24, TH-25, TH-26, TH-27, TH-28, TH-29, TH-30, TH-31, TH-32, TH-33 & TH-34	24.75 MW	29-July-2011

Since commissioning the project is running without any major breakdown.

The electricity generated by the project is exported to the Indian electricity grid. In the absence of the project activity the equivalent amount of electricity would have been generated from the grid connected/new power plants in the southern grid (which is now part of Indian grid) which are/will be predominately based on fossil fuels. The fossil fuel based power generation has been the mainstay of electricity generation in the Indian Power Sector.

There was no activity at the site prior to implementation of the project activity. Hence the scenario existing prior to the project activity is same as baseline scenario which is continual use of highly carbon intensive electricity in the regional grid.

The current monitoring period chosen is from 01-April-2012 to 31-March-2018 (inclusive of first & last date). Actual GHG emission reduction achieved during the monitoring period is 743,544 tCO₂

1.2 Sectoral Scope and Project Type

Sectoral Scope: 1 Energy Industries (Renewable/Non-Renewable Sources)

Methodology applied is ACM 0002 of version 12.2.0

The project is not a grouped project. It is a standalone wind power project by a single project developer.

1.3 Project Proponent

Organization name	Tuppadahalli Energy India Pvt. Ltd.
Contact person	Mr. Jagannath Sahoo
Title	Head of Finance
Address	C1-001, Tower C, The Millennia, No.1 &2, Murphy Road, Ulsoor, Bangalore- 560008, Karnataka, India
Telephone	+91-80-41557102
Email	jsahoo@acciona.com

1.4 Other Entities Involved in the Project

Organization name	Kosher Climate India Private Limited
Role in the Project	Project Representative
Contact person	Vamsi Krishna M
Title	CAB Head
Address	#109, 2 nd Floor, 27 th Main, Sector – 1, HSR Layout, Bangalore-560102, India
Telephone	011- 30501110-03
Email	vamsi@kosherclimate.com

1.5 Project Start Date

The project start date for this project is 29th July 2011. This is the day on which the first machine was commissioned.

1.6 Project Crediting Period

Start date of the crediting period is 29th July 2011

Length of crediting period is 10 years.

Hence, the first crediting period is 29th July 2011 to 28th July 2021

1.7 Project Location

The project site is located near Village of Tuppadahalli in the Hollalkere and Chennagiri Taluk in the district of Shimoga and Chitradurga in the Indian state of Karnataka, India. Tuppadahalli is approximately 55 km from Chitradurga town and approximately 260 km from Bangalore, the capital city of Karnataka. The nearest rail head from the project site is Ramgere Railway station which is about 12 km from the project site and the nearest airport is Bangalore airport which is about 260 km from the project site. The site of Tuppadahalli is located at a latitude and longitude of around 13° 50' 00" – 14° 00' 00" N and 76° 00' 00" – 76° 05' 00" E. The individual WTG coordinates within the project site are given in section 5 of this report.

The GPS coordinates of the wind turbine generators of the project activity is given in below:

Location No.	Easting(X)	Longitude	Northing(Y)	Latitude
TH-01	609405	76° 0' 44.99" E	1534027	13° 52' 26.52" N
TH-02	609027	76° 0' 32.44" E	1534293	13° 52' 46.13" N
TH-03	609282	76° 0' 40.96" E	1534470	13° 52' 40.95" N
TH-04	609501	76° 0' 48.28" E	1534630	13° 52' 46.13" N
TH-05	609497	76° 0' 48.18" E	1534848	13° 52' 53.22" N
TH-06	609704	76° 0' 55.10" E	1535054	13° 52' 59.90" N
TH-07	609718	76° 0' 55.60" E	1535315	13° 53' 8.39" N
TH-08	610277	76° 1' 14.26" E	1535583	13° 53' 17.04" N
TH-09	610530	76° 1' 22.71" E	1535717	13° 53' 21.36" N
TH-10	610573	76° 1' 24.22" E	1536254	13° 53' 38.84" N
TH-11	609875	76° 1' 0.98" E	1536351	13° 53' 42.09" N
TH-12	608947	76° 0' 15.12" E	1536700	13° 53' 53.64" N
TH-13	609865	76° 1' 0.70" E	1536746	13° 53' 54.95" N
TH-14	611105	76° 1' 42.02" E	1536762	13° 53' 55.29" N
TH-15	611169	76° 1' 44.19" E	1537003	13° 54' 3.13" N
TH-16	611243	76° 1' 46.69" E	1537261	13° 54' 11.52" N
TH-17	611388	76° 1' 51.55" E	1537489	13° 54' 18.92" N
TH-18	611598	76° 1' 58.58" E	1537685	13° 54' 25.26" N
TH-19	611339	76° 1' 49.97" E	1537838	13° 54' 30.28" N
TH-20	611310	76° 1' 49.04" E	1538103	13° 54' 38.91" N
TH-21	611212	76° 1' 45.83" E	1538500	13° 54' 51.84" N
TH-22	611150	76° 1' 43.81" E	1538812	13° 55' 2.01" N
TH-23	611358	76° 1' 50.80" E	1539217	13° 55' 15.16" N
TH-24	611626	76° 1' 59.75" E	1539342	13° 55' 19.19" N
TH-25	611763	76° 2' 4.30" E	1539627	13° 55' 28.45" N
TH-26	611887	76° 2' 8.52" E	1539842	13° 55' 35.43" N

TH-27	612043	76° 2' 13.74" E	1540027	13° 55' 41.42" N
TH-28	612134	76° 2' 16.82" E	1540357	13° 55' 52.15" N
TH-29	612160	76° 2' 17.73" E	1540628	13° 56' 0.09" N
TH-30	612539	76° 2' 30.40" E	1540911	13° 56' 10.12" N
TH-31	612857	76° 2' 41.10" E	1541623	13° 56' 33.25" N
TH-32	613062	76° 2' 47.97" E	1541896	13° 56' 42.11" N
TH-33	613154	76° 2' 51.07" E	1542117	13° 56' 49.29" N
TH-34	613303	76° 2' 56.09" E	1542494	13° 57' 1.50" N

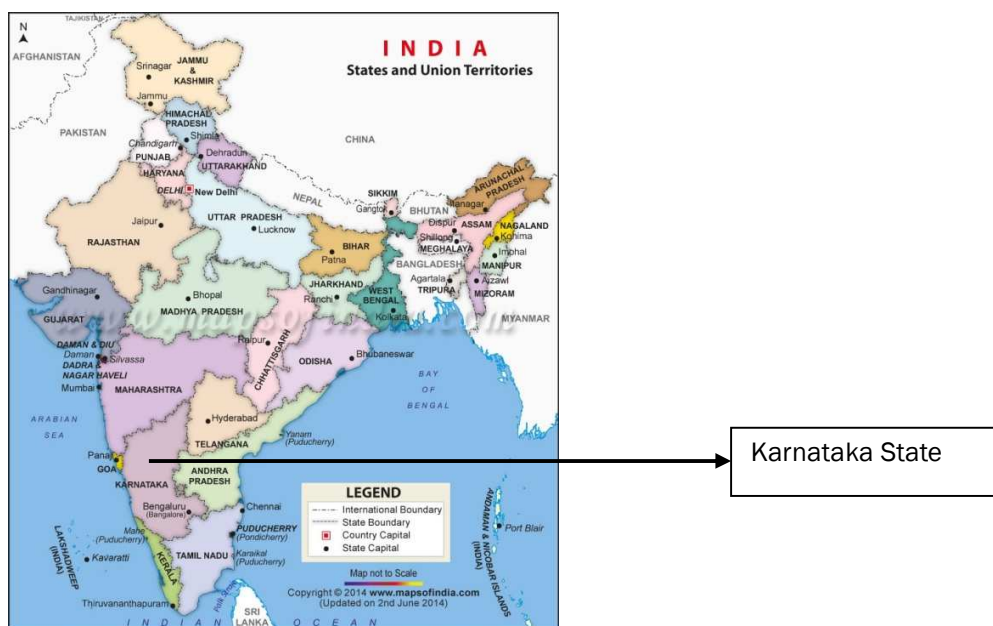


Fig 1: Location of Karnataka State in India Map

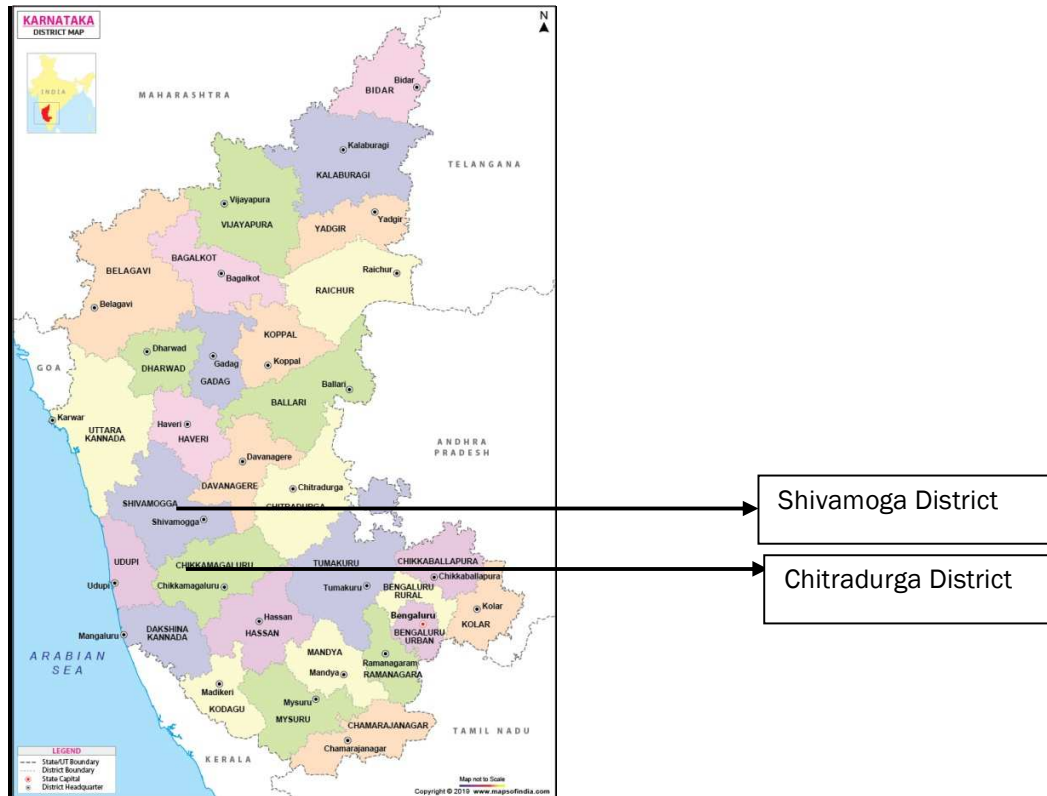


Fig 2: Location of Districts in Karnataka State Map

1.8 Title and Reference of Methodology

Approved consolidated baseline methodology ACM0002“Consolidated baseline methodology for grid connected electricity generation from renewable sources”; Version 12.2.0.

<https://cdm.unfccc.int/methodologies/DB/C505BVV9P8VSNNV3LTK1BP3OR24Y5L>

1.9 Participation under other GHG Programs

Project is registered under Clean Development Mechanism (CDM) with UNFCCC on 26-March-2012. Project reference number is 5198¹

The project CDM 1st crediting period is from 01-April 2012 to 31-March-2019 and the 2nd crediting period is from 01-April-2019 – 31-March-2026.

Under this report, the VCS issuance is requested only for period of 01-April-2012 to 31-March-2018. During the period no CERs are issued under CDM mechanism and PP will not claim CER for the period in the future also. Hence there is no double counting of carbon credits.

¹ <https://cdm.unfccc.int/Projects/projsearch.html>

1.10 Other Forms of Credit

The GHG emission reduction from the project is not included in any other emissions trading program or any other mechanism that includes GHG allowance trading.

The project has not sought or received another form of GHG-related environmental credit, including renewable energy certificates, during this monitoring period.

1.11 Sustainable Development

Social and Economic well-being: The project activity lead to direct and indirect benefits to the region through the generation of local employment in areas in and around the project activity, and the improved conditions for developing economic activities, which may result from the empowerment of vulnerable sections of society dwelling near the project area due to the creation of employment opportunities. The project activity supplies electricity to the grid and this may ultimately benefit the local communities with improved power supply and in this case this power supply is renewable, hence assisting in the quest for energy security of the current and future generations.

Environmental well-being:

Wind energy is one of the cleanest, most sustainable ways of generating electricity, which produces no emissions such as SO_x, NO_x, or particulates. Because wind energy is a renewable resource, the project will also contribute to resource conservation, of coal, diesel and other non-renewable energy resources

Technological well being:

The development of the proposed project activity is important now, in that it acts as a stimulus and an accelerant to the wind and renewable energy sector in India. This will also assist in further encouraging R&D efforts by technology providers, which will lead to the development of better and more efficient equipment.

2 SAFEGUARDS

2.1 No Net Harm

The project is renewable energy project. There were no harm identified from the project and hence no mitigations measures are applicable. Wind power projects are not included in the Schedule I of the EIA notification S.O.1533 (E) dated 14th September 2006² and thus an EIA is not required. As per the report 'Developmental Impacts and Sustainable Governance Aspects of

²<http://parivesh.nic.in/writereaddata/ENV/EnvironmentalClearance-General/18.pdf>

Renewable Energy Projects” prepared by MNRE³, the environmental and social impacts of the wind power projects are mostly positive. The minimal impact on the environmental and social impacts of wind projects are mitigated through different laws in India.

2.2 Local Stakeholder Consultation

PP has conducted stakeholder consultation on 20th October 2010 at the project location as a part of CDM registration process. The stakeholder process has been described in CDM PDD.

PP has effective grievance mechanism. Stakeholders can any time visit the site/contact the site in-charge and provide their grievances. The site in-charge is responsible for addressing the grievances received from stakeholders. During the monitoring period there is no grievances received from any stakeholders.

2.3 AFOLU-Specific Safeguards

Not applicable

3 IMPLEMENTATION STATUS

3.1 Implementation Status of the Project Activity

The wind turbines in the project are commissioned in between 29th July 2011 and 22nd October 2011. The details of individual WTGs are as following:

WTG Nos	Capacity	Commissioning Date
TH-1, TH-2, TH-3, TH-4, TH-5, TH-6, TH-7, TH-8 & TH-12	14.85 MW	22-October-2011
TH-9, TH-10, TH-11, TH-13, TH-14, TH-15, TH-16, TH-17, TH-20 & TH-21	16.5 MW	28-September-2011
TH-18, TH-19, TH-22, TH-23, TH-24, TH-25, TH-26, TH-27, TH-28, TH-29, TH-30, TH-31, TH-32, TH-33 & TH-34	24.75 MW	29-July-2011

The project activity consists of Vestas Wind Technology India private Limited make WTGs of 1650 kW respectively. The Wind Turbine Generators (WTGs) are Vestas V82 Class IIA turbines. The technical specifications of the turbine are given below.

³ <https://smarnet.niua.org/sites/default/files/resources/report-on-developmental-impacts-of-RE.pdf>

Description	Specifications
Rated capacity	1.65 MW
Tower/rotor height	78 Meter
Rotor Diameter	82 Meter
Cut-in wind speed	3.5 m/s
Rated wind speed	7.5 m/s
Cut-out wind speed	20 m/s (10 minute average)
Rotor swept area	5,281 sq. meters
Rotational speed	14.4 rpm
Rotor material and blades material	Epoxy/balsa wood/glass fiber, steel Regulation Active Stall
Generator	1-speed, water cooled
Rated output	1,650 kW
Rotational speed at rated power	1,012 rpm
Operating voltage	3 x 690 V
Frequency	50 Hz
Insulation class	F/B
Cooling system	Oil cooler/Radiator: Cooling capacity 37.5 kW Water cooler/Radiator: Cooling capacity 46.2 kW
Gear Box	1. Step planet, 2. Step helical
Manufacturer	Vestas
Gear ratio	1:70,2
Nominal load Gearbox Mechanical power	1,800 kW
Yaw Drive System	Planetary gear motor
Yaw bearing	Ball bearing, internal gearing
Aerodynamic brake	Hydraulic disk brake

There is no changes in the project design occurred since the commissioning of the project.

Since commissioning the project is running without any major breakdown. There is no major incident taken place during the monitoring period that impact GHG emission reduction or monitoring.

There is no change in project owner or any party involved in the project during the monitoring period.

3.2 Deviations

2.3.1 Methodology Deviations

There is no methodology deviation applied during the current monitoring period.

2.3.2 Project Description Deviations

There is no project description deviation applied in current or previous monitoring period.

3.3 Grouped Projects

This project is not a grouped project.

4 DATA AND PARAMETERS

4.1 Data and Parameters Available at Validation

Data / Parameter	EF _{OM}
Data unit	tCO ₂ eq/MWh
Description	Operating Margin emission factor of the Southern Regional Grid
Source of data	Central Electricity Authority (CEA) CO ₂ Baseline Database values have been used for calculation
Value applied	0.9867
Justification of choice of data or description of measurement methods and procedures applied	Derived from Central Electricity Authority (CEA) CO ₂ Baseline Database, Version: 5, Dated Nov 2009
Purpose of Data	Calculation of baseline emissions
Comments	This value is fixed and it is same for the entire crediting period

Data / Parameter	EF _{BM}
Data unit	tCO ₂ eq/MWh
Description	Build Margin emission factor of the Southern Regional Grid
Source of data	Central Electricity Authority (CEA) CO ₂ Baseline Database values have been used for calculation
Value applied	0.8179
Justification of choice of data or description of measurement methods and procedures applied	Derived from Central Electricity Authority (CEA) CO ₂ Baseline Database, Version: 5, Dated Nov 2009

Purpose of Data	Calculation of baseline emissions
Comments	This value is fixed and it is same for the entire crediting period

Data / Parameter	EF _{CM}
Data unit	tCO ₂ eq/MWh
Description	Combined Margin emission factor of the Southern Regional Grid
Source of data	Central Electricity Authority (CEA). CO ₂ EF _{OM} and EF _{BM} values have been used for calculation.
Value applied	0.9445
Justification of choice of data or description of measurement methods and procedures applied	Central Electricity Authority (CEA)CO ₂ Baseline Database values have been used for calculation.
Purpose of Data	Calculation of baseline emissions
Comments	This value is fixed and it is same for the entire crediting period

4.2 Data and Parameters Monitored

Data / Parameter	EGy
Data unit	MWh
Description	Net quantity of electricity exported to the grid by the project activity during the year y
Source of data	1. Form-B for which values are determined Joint meter statements 2. Invoices raised by PP to MESCOM.
Description of measurement methods and procedures to be applied	This is based on the joint meter reading carried out by site personnel and MESCOM and/or KPTCL representatives. Monthly generation data is directly measured from the installed main meter readings. The same will form the basis for raising invoice and receiving payments for net electricity sold. Data integrity between main and check meters reading will be performed. If there is any discrepancy, a report explaining the problem detected and the corrective actions to be taken will be created and documented. The calibration of the energy meters is sole responsibility of the State Electricity Utility or an entity authorized by the State Electricity Utility. In case the Main and Check meters are found to be faulty, the correction factor as per the requirements stated in PPA would be applied to determine the electricity generation for that period. Measurement methods and procedures: Data Type: Measured and Calculated (Export - Import) Monitoring: Energy Meter is used for monitoring Calibration Frequency: Annually Archiving Policy: Paper and / or Electronic Monitoring Frequency: Continuously
Frequency of monitoring/recording	Recording Frequency: Monthly from Energy Meter, summarized annually

Value monitored	787,238																																										
Monitoring equipment	Regulatory number for meters in Shivani substation: - Line 1 - RR No.IPP/SHIV-01 - Line 2 - RR No.IPP/SHIV-02 Serial number for meters Shivani substation: - Main: Line 1 - 09142619 (L&T Make & 0.2s Accuracy class) Line 2 - 09142471 (L&T Make & 0.2s Accuracy class) - Check: Line 1 - 09142591 (L&T Make & 0.2s Accuracy class) Line 2 - 09142447 (L&T Make & 0.2s Accuracy class) Main and check meters are 0.2 accuracy class.																																										
QA/QC procedures to be applied	Energy meters record export and import of energy. The Project Participant would raise bill to the MESCOM on monthly basis for the energy fed into the grid after deducting the energy imported from the grid. Energy meters will be tested for accuracy every year and will be calibrated in case of an error beyond permissible limits. Sales record to the grid and the invoice raised for receiving payment from state electricity board are used to cross check this data and hence ensure consistency. In the invoice, the net electricity is calculated as below: Net electricity = Export – 115% of import This is as per the KERC order. Due to this reason the net electricity in the invoice is lesser than the net electricity calculated in the B-Form. As conservative option PP considered the net electricity calculated in the invoice. The energy meters are calibrated as per minimum calibration frequency mentioned in the PDD. The calibration dates are given below: <table><tr><th>Meter</th><th>Calibration date</th><th>Validity</th></tr><tr><td rowspan="2">Main: Line 1 - 09142619</td><td>14/03/2012</td><td>13/03/2013</td></tr><tr><td>Line 2 - 09142471</td><td>01/06/2012</td><td>31/05/2013</td></tr><tr><td rowspan="2">Check: Line 1 - 09142591</td><td>07/09/2012</td><td>06/09/2013</td></tr><tr><td>Line2 - 09142447</td><td>14/12/2012</td><td>13/12/2013</td></tr><tr><td></td><td>02/04/2013</td><td>01/04/2014</td></tr><tr><td></td><td>10/07/2013</td><td>09/07/2014</td></tr><tr><td></td><td>18/11/2013</td><td>17/11/2014</td></tr><tr><td></td><td>14/03/2014</td><td>13/03/2015</td></tr><tr><td></td><td>23/05/2014</td><td>22/05/2015</td></tr><tr><td></td><td>08/08/2014</td><td>07/08/2015</td></tr><tr><td></td><td>13/11/2014</td><td>12/11/2015</td></tr><tr><td></td><td>10/02/2015</td><td>09/02/2016</td></tr><tr><td></td><td>25/05/2015</td><td>24/05/2016</td></tr></table>	Meter	Calibration date	Validity	Main: Line 1 - 09142619	14/03/2012	13/03/2013	Line 2 - 09142471	01/06/2012	31/05/2013	Check: Line 1 - 09142591	07/09/2012	06/09/2013	Line2 - 09142447	14/12/2012	13/12/2013		02/04/2013	01/04/2014		10/07/2013	09/07/2014		18/11/2013	17/11/2014		14/03/2014	13/03/2015		23/05/2014	22/05/2015		08/08/2014	07/08/2015		13/11/2014	12/11/2015		10/02/2015	09/02/2016		25/05/2015	24/05/2016
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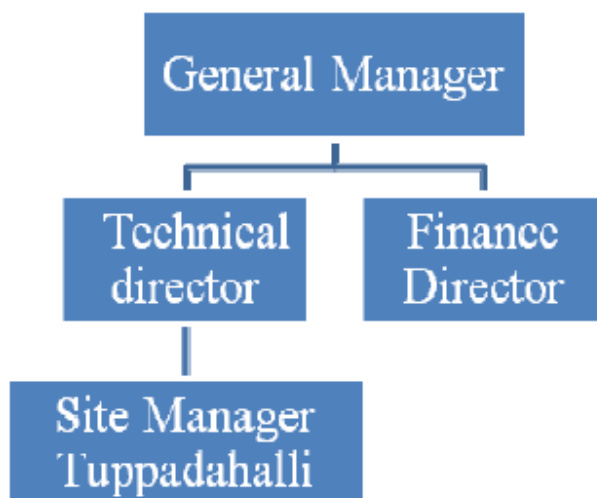
	01/09/2015	31/08/2016
	28/12/2015	27/12/2016
	05/04/2016	04/04/2017
	06/07/2016	05/07/2017
	27/09/2016	26/09/2017
	15/12/2016	14/12/2017
	01/03/2017	28/02/2018
	29/06/2017	28/06/2018
	28/10/2017	27/10/2018
	19/01/2018	18/01/2019
Purpose of the data	Calculation of baseline emissions	
Calculation method	Net quantity of electricity exported to the grid by the project activity is directly obtained from the meters and is multiplied by 3,50,000 which is the multiplying constant for 0.2 class accuracy.	
Comments	The Monitored Data to be kept for a minimum of two years after the end of the crediting period or the last issuance whichever is later.	

4.3 Monitoring Plan

According to approved monitoring methodology ACM0002 Version 12.2.0, Sectoral Scope 1, “Consolidated Monitoring Methodology for Zero Emissions grid connected electricity generation sources” is proposed to be used to monitor the emission reductions.

Important information on monitoring is provided below:

Organisational structure: Following management structure is proposed to be implemented at site for the monitoring of project activity. There might be changes in this structure in terms of roles however the responsibilities undertaken by the roles would always be maintained.



Role	Responsibility
General Manager	Overall responsible for the management of project activity
Technical Director	Ensure correctness of data and compliance of monitoring methodology
Finance Director	Generation of invoices and CER calculation
Site Manager	Ensuring proper data recording and calibration of relevant meters as per the defined frequency.

Generating point: This would be exact place where energy is generated at the various individual windmills

Border point: It is the connection point of the electrical line between the wind-farm and the grid (MESCOM).

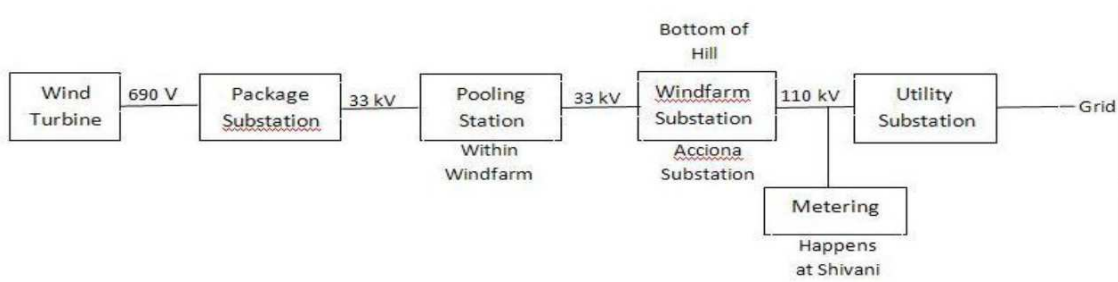
Point of measurement: The exact place where meters are connected to measure energy fed in to the grid.

Each of the double circuit lines has a measuring point with two measurement meters:

Main meter: This would primarily be used for accounting and billing of electricity.

Check meter: This shall be connected to the same core of the Current Transformer (CT) and Voltage Transformer (VT) to which main meter is connected and be used for accounting and billing of electricity in case of failure of main meter.

All the meters would be of 0.2 accuracy class.



Main and check meters reading:

The reading shall be taken simultaneously and jointly periodically by the company personnel along with the MESCOM and/or KPTCL officials as per the regulatory requirements. The same will form the basis for raising invoice and receiving payments for net electricity sold. Data integrity between main and check meters reading will be performed. If there is any discrepancy, a report explaining the problem detected and the corrective actions to be taken will be created and documented.

The calibration of the energy meters is sole responsibility of the State Electricity Utility or an entity authorized by the State Electricity Utility.

Data uncertainty:

In case the Main and Check meters are found to be faulty, the correction factor as per the requirements stated in PPA would be applied to determine the electricity generation for that period.

Procedure in case the effective date of registration falls within the billing cycle:

The project participant will request the Utility to certify the JMR readings from the date of registration till the next start date of the billing cycle. In the event of the above mentioned doesn't take place, since it is not an obligation of the Utility, Project Participant will make necessary arrangements for the relevant documents available to the DOE during the verification of the project activity.

5 QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS

5.1 Baseline Emissions

The emission reduction ER_y by the project activity during a given year y is the difference between baseline emissions (BE_y), project emissions (PE_y) and emissions due to leakage (Ly), as follows:

$$ER_y = BE_y - PE_y - Ly.$$

Baseline Emission are calculated by multiplying the net quantity of electricity supplied by this project activity (EGY) with the CO₂ baseline emission factor for the electricity displaced due to the project (EFCO₂ elec) as follows:

As per description earlier under this document:

$$BE_y = EG_{BL,y} * EF_{CO_2}$$

EF_{CO₂} is Combined margin CO₂ 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” (tCO₂/MWh) (i.e, 0.9445 tCO₂/MWh).

The vintage wise baseline emissions are calculated below:

Year	Vintage	Net Export (MWh)	Grid Emission factor (tCO ₂ /MWh)	Baseline Emission* (tCO ₂)
2012	01-Apr-12 to 31-Dec-12	117800	0.9445	111,261
2013	01-Jan-13 to 31-Dec-13	142224	0.9445	134,330
2014	01-Jan-14 to 31-Dec-14	129169	0.9445	122,000
2015	01-Jan-15 to 31-Dec-15	118232	0.9445	111,670
2016	01-Jan-16 to 31-Dec-16	133475	0.9445	126,066
2017	01-Jan-17 to 31-Dec-17	125980	0.9445	118,988
2018	01-Jan-18 to 31-Mar-18	20359	0.9445	19,229
Total		787,238	0.9445	743,544

* rounded down values

5.2 Project Emissions

The project activity involves in harnessing wind power. So, the emissions from the project are zero.

$$PE_y = 0$$

5.3 Leakage

No leakage emissions have been considered and hence the leakage emission is zero.

5.4 Net GHG Emission Reductions and Removals

As per the applied methodology, emission reductions are calculated as follows:

$$ER_y = BE_y - PE_y - LE_y$$

Where,

ER_y = Emission Reduction in tCO₂e/year

BE_y = Baseline emission in tCO₂/year

PE_y = Project emissions in tCO₂e/year

LE_y = Leakage emission in tCO₂e/year

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)
2012*	111,261	0	0	111,261
2013	134,330	0	0	134,330
2014	122,000	0	0	122,000
2015	111,670	0	0	111,670
2016	126,066	0	0	126,066
2017	118,988	0	0	118,988
2018	19,229	0	0	19,229
Total	743,544	0	0	743,544

*From 01-April-2012 to 31-December-2012

**From 01-January 2018 to 31-March-2018

Comparison between actual emission reduction & estimated emission reduction:

Monitoring period start date	01-April-2012	
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Monitoring period end date	31-March-2018	
Number of days	2191	Days
Annual estimated emission reduction	128,809	tCO ₂ /yr
Estimation for the monitoring period	773,207	tCO ₂ e
Actual Emission Reduction	743,544	tCO ₂ e
Difference	-3.8%	

The actual emission reduction achieved during the monitoring period is 3.8% lesser than the estimated emission reduction. Hence no additional justification is required.

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