BUNDLED WIND POWER GENERATION PROJECT BY SAVITA OIL TECHNOLOGIES LTD, INDIA

Document Prepared by EKI Energy Services Limited.

Project Title	Bundled Wind Power generation project by Savita Oil Technologies Ltd., India
Version	02
Report ID	891[1]
Date of Issue	15-February-2022
Project ID	891
Monitoring Period	01-January-2012 to 31-December-2017 (inclusive of both dates)
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[1] https://registry.verra.org/app/projectDetail/VCS/891

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1 PROJECT DETAILS

1.1 Summary Description of the Implementation Status of the Project

The project activity is the generation of electricity from wind power by installation of 3 nos. 1.25 MW Wind Turbine Generators (WTGs) of Suzlon make in Sadawaghapur forest site in Satara district of Maharashtra and 3 nos. of 1.5 MW Wind Turbine Generators (WTGs) of Regen make at Thadichery & Koduvilarpatti site in Theni district of Tamil Nadu. The total installed capacity of the project is 8.25 MW. The purpose of the project is to produce power from clean source and to reduce the dependence on fossil fuels for energy requirements. Project proponent has signed a power purchase agreement (PPA) with "Maharashtra State Electricity Distribution Company Limited" (MSEDCL) for the WTGs in Maharashtra and "Tamil Nadu Electricity Board" (TNEB) for the WTGs in Tamil Nadu to export the electricity to local grid. The project displaces electricity from the Indian grid. This helps in significant reduction of GHG emissions as the Grid is mostly dependent on fossil fuel generated electricity. The details of the WTG and their commissioning details are as follows:

Name of Investor	Location	Model /Type	Capacity	Date of commissioning
Maharashtra	S-40	S-66	1.25	30-March-2010
	S-63	S-66	1.25	
	S-64	S-66	1.25	
Tamil Nadu	T45	Vensys 77	1.5	18-March-2010
	T46	Vensys 77	1.5	18-March-2010
	T75	Vensys 77	1.5	29-March-2010

The total actual GHG Emission reductions achieved in current monitoring period of 01-January 2012 to 31-December-2017 are 88,358 tCO_2e through displacing 94,453.35 MWh of electricity from fossil-fuel dominated electricity grid with electricity generation using wind energy resources.

1.2 Sectoral Scope and Project Type

As per the UNFCCC CDM Guidelines, the project activity belongs to:

Sectoral Scope : 01 - Energy industries (renewable / non-renewable sources)

The project is not a grouped project activity

1.3 Project Proponent

Organization name	Savita Oil Technologies Limited
Contact person	Purva Sood
Title	Ms.
Address	66/67, Nariman Bhavan, Nariman Point, Mumbai- 400021, Maharashtra, India
Telephone	+91 9820639020
Email	psood@savita.com

1.4 Other Entities Involved in the Project

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

1.5 Project Start Date

The start date of the project activity is defined as the "the date on which the project began reducing or removing GHG emissions". For this project activity, the start date of the project activity was 18-March-2010, which is the date of commissioning of the first WTG

1.6 Project Crediting Period

Crediting Period Start date : 18- March-2010
Crediting Period End date : 17-March-2020
Total No. of years : 10 Years

CDM Crediting Period Start Date: - 01-January- 2013
CDM Crediting Period End Date: - 31- December-2022

No credits were issued so far in CDM

1.7 Project Location

Village: Sadawaghapur
Taluka: Patan
District: Satara
State: Maharashtra
Country: India

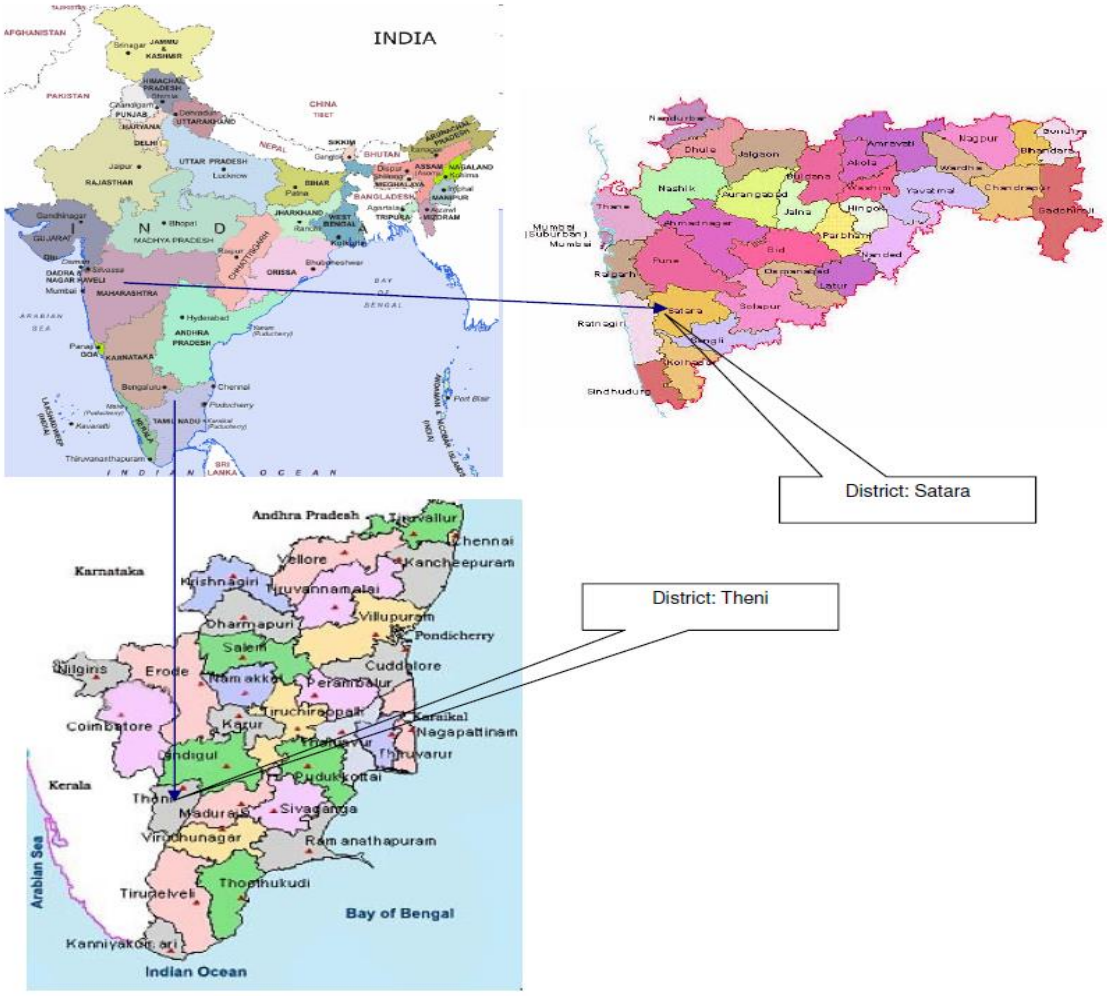
. The Coordinates are

WTG	Latitude (N)	Longitude (E)
S- 40	17°24'00"	73°56'18"
S- 63	17°25'16.8"	73°55'33.6"
S-64	17°25'22.8"	73°55'40.2"

Village: Thadichery & Koduvilarpatti
Taluka: Theni
District: Theni
State: Tamil Nadu
Country: India

The Coordinates are

WTG	Latitude (N)	Logitude (E)
T45	9°56'38.06"	73°56'18"
T46	9°56'44.20"	77°27'37.70"
T75	9°56'42.78"	73°29'39"



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1.8 Title and Reference of Methodology

Title: Grid-connected electricity generation from renewable sources
Reference: The project activity meets the eligibility criteria of small-scale project as it is less than 15 MW
Methodology: Grid-connected electricity generation from renewable sources AMS-I. D (Version 16.0)[2]

Type I: Energy industries (renewable / non-renewable sources)
Tools referred with above methodology and applicable for project activity are:

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

Tool to calculate the emission factor for an electricity system - Version 02.2.1 (EB 63, Annex 19)[3]

1.9 Participation under other GHG Programs

The project has been registered under CDM as UN 5485[4] but the project activity will not claim any form of environmental credits for the given monitoring period other than Verra. Hence there will not be any double counting for the said monitoring period. The declaration of the same has been provided to the assessment team

1.10 Other Forms of Credit

- Emission Trading Programs and Other Binding Limits: The PP has not applied this project in any Emission Trading Programs and other Binding Limits.
- Other Forms of Environmental Credit:- The project will not claim in any GHG benefits for the present monitoring period. PP not participating for REC benefits can be verified from this link- https://www.recregistryindia.nic.in/index.php/publics/accredited_regens

1.11 Sustainable Development Contributions

Contribution to sustainable development:
Ministry of Environment, Forest and Climate Change has stipulated economic, social, environment and technological well-being as the four indicators of sustainable development. The project contributes to sustainable development using the following ways.
Social well-being: The project has helped in generating employment opportunities during the construction and operation phases. The project activity has lead to development in infrastructure in the region like development of roads and also may promote business with improved power generation.
Economic well-being: The project is a clean technology investment in the region, which would not have been taken place in the absence of the VCS benefits the project activity has also helped to reduce the demand supply gap in the state.
Technological well-being: The successful operation of project activity would lead to promotion of wind power generation and would encourage other entrepreneurs to participate in similar projects
Environmental well-being: Wind energy being a renewable source of energy, it reduces the dependence on fossil fuels and conserves natural resources which are on the verge of depletion. Due to its zero emission, the Project activity also helps in avoiding significant amount of GHG emissions and specific pollutants like SOx, NOx, and SPM associated with the conventional thermal power generation facilities
Sustainable Development Contributions
According to the Appendix 2- the document history mentioned in the VCS Standard Version 4.2 (latest version), it is clearly mentioned that Project Proponent is required to demonstrate contributions to a minimum of three SDGs, effective immediately for all projects registered on or after 20 January 2023. Since this is the 2nd Verification of this project and it is registered before 20 January 2023, SDG reporting is not required for the current version and the PP will demonstrate contribution to at least two SDGs by 20 January 2025

[3] https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-07-v2.2.1.pdf

[4] https://cdm.unfccc.int/Projects/DB/LRQA%20Ltd1323423959.3/view

Table 1: Sustainable Development Contributio

Row number	SDG Target	SDG Indicator	Net Impact on SDG Indicator	Current Project Contributions	Contributions Over Project Lifetime
1)	7.2	7.2.1: Renewable energy share in the total final energy consumption	Implemented activities to increase	About 94,453.35 MWh renewable electricity was supplied to the Indian grid during the current monitoring period that helps to increase the renewable energy share in the energy mix.	First Monitoring Period: 18-March-2010 to 31-December-2011 (Inclusive of both the dates) 32,151.39MWh Second Monitoring Period: 01-January-2012 to 31-December-2017 (Inclusive of both the dates) 94,453.35MWh
2)	13.0	Tonnes of greenhouse gas emissions avoided or removed	Implemented activities to decrease	By supplying 94,453.35 MWh clean electricity to Indian grid, the project avoided release of 88,358 tonnes of carbon dioxide in to the atmosphere during the reporting period.	First Monitoring Period: 18-March-2010 to 31-December-2011 (Inclusive of both the dates) 30,096 tCO_2 Second Monitoring Period: 01-January-2012 to 31-December-2017 (Inclusive of both the dates) 88,358 tCO_2

2 SAFEGUARDS

2.1 No Net Harm

The project activity does not involve any major construction activity. It primarily requires the installation of the wind turbines, interfacing the generators with the State Electricity Board by setting up HT transmission lines and installation of other accessories.

The report on "Developmental Impacts and Sustainable Governance Aspects of Renewable Energy Projects" prepared by MNRE dated September 2013[5]. This report clearly mentioned that wind project activity operations do not result in direct air pollution, noise pollution. Please refer above web link for the same.
Thus there are no any significant impacts due to implementation of project activity on air, water, soil quality and ambience are envisaged due to the project activity.

2.2 Local Stakeholder Consultation

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

Ref. web link - https://registry.verra.org/app/projectDetail/VCS/891

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

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

2.3 AFOLU-Specific Safeguards

Not Applicable

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

3 IMPLEMENTATION STATUS

3.1 Implementation Status of the Project Activity

The purpose of the project is to generate electricity by wind energy which is clean form of energy. After the project activity has been commissioned, project proponent has not made any changes in the project boundary.

State	Location No.	Meter No.	Accuracy	Substation	Feeder Name/No.	Date of Commissioning
Maharashtra	S-40	04961755	0.2	Sadawaghapur	Feeder 03	30-March-2010
	S-63	04961761		Sadawaghapur	Feeder 04	30-March-2010
	S-64			Sadawaghapur		30-March-2010
Tamil Nadu	T45	TNB 04537	0.5	Theni	-	18-March-2010
	T46	TNB 04534		Theni	-	18-March-2010
	T75	TNB 04517		Theni	-	29-March-2010

Meter Details for the Sub- station at Sadawaghapur, Maharashtra; -

Feeder	Meter	Old Meter Number	New Meter Number	Meter change date
03	Main Meter	04961755	14796507	18-February-2013
	Check Meter	04939180	14796508	18-February-2013
04	Main Meter	04961761	14796504	18-February-2013
	Check Meter	04961757	14796505	18-February-2013

3.2 Deviations

2.1.1 Methodology Deviations

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

2.1.2 Project Description Deviations

The contact details of the project proponent and other entities has been updated in section 1.3 and 1.4 of the Monitoring report.

Hence a project description deviation is requested to approve the changes done in section 1.3 and 1.4 of the present Monitoring Report.

The changes have been done during the current monitoring period and the above-mentioned deviations are of permanent nature and does not have any impact on the project applicability, baseline scenario and additionality

3.3 Grouped Projects

Not applicable as the project is a not a grouped project activity

4 DATA AND PARAMETERS

4.1 Data and Parameters Available at Validation

Data / Parameter	$EF_{NEWNE,CM,y}$
Data unit	tCO_2/MWh
Description	Combined Margin Grid emission factor for NEWNE grid (now unified Indian Grid)
Source of data	CEA website Version :05 (Valid from 1st November 2009)
Value applied	0.9224
Justification of choice of data or description of measurement methods and procedures applied	As required by the methodology AMS-I.D data from the official source need to be used for the calculation of emission factor and emission reduction. To meet this requirement here, emission factor is calculated using $EF_{Grid,OM}$ and $EF_{Grid,BM}$. Following formula is used in calculation $EF_{NEWNE,CM,y} = 0.75 \times EF_{NEWNE,OM,y} + 0.25 \times EF_{NEWNE,BM,y}$.
Purpose of Data	For the calculation of the Baseline Emission
Comments	This parameter is fixed ex-ante for the entire crediting period.

Data / Parameter	$EF_{South,CM,y}$
Data unit	tCO_2/MWh
Description	Combined Margin Grid emission factor for South Grid (now unified Indian grid)
Source of data	CEA website Version :05 (Valid from 1st November 2009)
Value applied	0.9445
Justification of choice of data or description of measurement methods and procedures applied	As required by the methodology AMS-I.D data from the official source need to be used for the calculation of emission factor and emission reduction. To meet this requirement here, emission factor is calculated using $EF_{Grid,OM}$ and $EF_{Grid,BM}$. Following formula is used in calculation $EF_{NEWNE,CM,y} = 0.75 \times EF_{NEWNE,OM,y} + 0.25 \times EF_{NEWNE,BM,y}$.
Purpose of Data	For the calculation of the Baseline Emission
Comments	Data will be kept for crediting period + 2 Years.

Data / Parameter	$EF_{NEWNE,OM,y}$
Data unit	tCO_2/MWh
Description	Weighted average of 3 years (2006-07, 2007-08, 2008-09) CO2 Operating Margin emission factor of the NEWNE grid (now unified Indian Grid)
Source of data	CEA website Version :05 (Valid from 1st November 2009)
Value applied	1.0049
Justification of choice of data or description of measurement methods and procedures applied	The combined margin emissions factor is calculated as follows: $EF_{grid,CM,y} = EF_{grid,OM,y} * W_{OM} + EF_{grid,BM,y} * W_{BM}$ Where: $EF_{grid,BM,y}$= Build margin CO_2 emission factor in year *y* (tCO_2/MWh) $EF_{grid,OM,y}$= Operating margin CO_2 emission factor in year *y* (tCO_2/MWh) W_{OM} = Weighting of operating margin emissions factor (%) = 75% W_{BM}= Weighting of build margin emissions factor (%) = 25%
Purpose of Data	For the calculation of the Baseline Emission
Comments	This parameter is fixed ex-ante for the entire crediting period.

Data / Parameter	$EF_{South,OM,y}$
Data unit	tCO_2/MWh
Description	Weighted average of 3 years (2006-07, 2007-08, 2008-09) CO_2 Operating Margin emission factor of the South grid (now unified Indian Grid)
Source of data	CEA website Version :05 (Valid from 1st November 2009)

Value applied	0.9868
Justification of choice of data or description of measurement methods and procedures applied	The combined margin emissions factor is calculated as follows: $EF_{grid,CM,y} = EF_{grid,OM,y} * W_{OM} + EF_{grid,BM,y} * W_{BM}$ Where: $EF_{grid,BM,y}$= Build margin CO_2 emission factor in year *y* (tCO_2/MWh) $EF_{grid,OM,y}$= Operating margin CO_2 emission factor in year *y* (tCO_2/MWh) W_{OM} = Weighting of operating margin emissions factor (%) = 75% W_{BM}= Weighting of build margin emissions factor (%) = 25%
Purpose of Data	For the calculation of the Baseline Emission
Comments	This parameter is fixed ex-ante for the entire crediting period.

Data / Parameter	$EF_{NEWNE,BM,y}$
Data unit	tCO_2/MWh
Description	CO_2 Built Margin emission factor of the NEWNE grid (now Unified Indian Grid)
Source of data	CEA website Version :05 (Valid from 1st November 2009)
Value applied	0.6752
Justification of choice of data or description of measurement methods and procedures applied	As required by the methodology AMS-I.D data from the official source need to be used for the calculation of emission factor and emission reduction. To meet this requirement here, emission factor is estimated and officially published by Central Electricity Authority, Government of India.
Purpose of Data	For the calculation of the Baseline Emission
Comments	Data will be kept for crediting period + 2 Years.

Data / Parameter	$EF_{South,BM,y}$
Data unit	tCO_2/MWh
Description	CO_2 Built Margin emission factor of the South grid (now unified Indian Grid)
Source of data	CEA website Version :05 (Valid from 1st November 2009)
Value applied	0.8179
Justification of choice of data or description of measurement methods and procedures applied	As required by the methodology AMS-I.D data from the official source need to be used for the calculation of emission factor and emission reduction. To meet this requirement here, emission factor is estimated and officially published by Central Electricity Authority, Government of India
Purpose of Data	For the calculation of the Baseline Emission
Comments	Data will be kept for crediting period + 2 Years.

Data / Parameter	W_{om}
Data unit	Dimensionless
Description	Weightage for Operating Margin
Source of data	Tool to calculate the emission factor for an electricity system. (Version 02.2.1)
Value applied	0.75
Justification of choice of data or description of measurement methods and procedures applied	As required by the Tool to calculate the emission factor for an electricity system. (Version 02.2.1)
Purpose of Data	For the calculation of the Baseline Emission
Comments	Data will be kept for crediting period + 2 years

Data / Parameter	W_{BM}
Data unit	Dimensionless
Description	Weightage for Build Margin
Source of data	Tool to calculate the emission factor for an electricity system. (Version 02.2.1)
Value applied	0.25
Justification of choice of data or description of measurement methods and procedures applied	As required by the Tool to calculate the emission factor for an electricity system. (Version 02.2.1)
Purpose of Data	For the calculation of the Baseline Emission
Comments	Data will be kept for crediting period + 2 years

4.2 Data and Parameters Monitored

Data / Parameter	$EG_{y,Mah}$
Data unit	MWh
Description	Net electricity exported to grid
Source of data	Electricity generation statements
Description of measurement methods	Monitoring: Monitored through the meter readings from bidirectional main meter (electronic tri-vector meter) capable of

and procedures to be applied	monitoring electricity export and electricity import. Meter located at sub-station. Meter accuracy class 0.2s. Data type: Measured & Calculated Archiving: Electronic Recording Frequency: Continuous monitoring, hourly measurement and at least monthly recording Responsibility: The site-in-charge shall be responsible for the regular recording of data. Calibration Frequency: The meters shall be calibrated annually Calibration details: -Refer to Appendix 2
Frequency of monitoring/recording	Continuous monitoring, hourly measurement and at least monthly recording
Value monitored	38,621.35
Monitoring equipment	Electrical Energy Meters which are electronic tri-vector meters of accuracy class 0.2s (Main & Check meters).details of calibration is given in appendix 1
QA/QC procedures to be applied	Meter calibration conducted annually in Maharashtra and internal audit system is in place as mentioned in Section B.7.2. Measurement results can be cross checked with records for sold/purchased electricity (e.g., invoices/receipts)
Purpose of the data	Calculation of baseline emissions
Calculation method	As described in section 2.1 of this document
Comments	Data archived: The data will be kept for two years after the end of the crediting period or the last issuance of CERs for this project activity, whichever occurs later.

Data / Parameter	$EG_{y\,TN}$
Data unit	MWh
Description	Net electricity exported to grid
Source of data	Electricity generation statements
Description of measurement methods and procedures to be applied	Monitoring: Monitored through the meter readings from bidirectional main meter (electronic tri-vector meter) capable of monitoring electricity export and electricity import. Meter accuracy class 0.5s Data type: Measured & Calculated

	Archiving: Electronic Recording Frequency: Continuous monitoring, hourly measurement and at least monthly recording Responsibility: The site-in-charge shall be responsible for the regular recording of data. Calibration Frequency: The meters shall be calibrated once every three years. Calibration Details: Refer to Appendix 1
Frequency of monitoring/recording	Continuous monitoring, hourly measurement and at least monthly recording
Value monitored	55,832.01
Monitoring equipment	Electrical Energy Meters which are electronic tri-vector meters of accuracy class 0.5
QA/QC procedures to be applied	Meter calibration shall be conducted once every three years in Tamil Nadu and internal audit system is in place as mentioned in Section B.7.2. Measurement results shall be cross checked with records for sold/purchased electricity (e.g., invoices/receipts)
Purpose of the data	Calculation of baseline emissions
Calculation method	As described in section 2.1 of this document
Comments	Data archived: The data will be kept for two years after the end of the crediting period or the last issuance of CERs for this project activity, whichever occurs later.

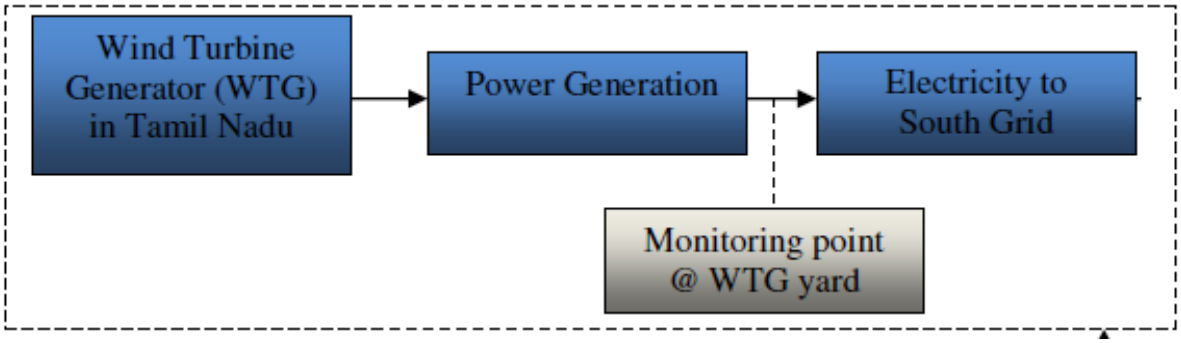
4.3 Monitoring Plan

The project activity is in accordance with approved small scale methodology AMS I.D, and therefore, can use the monitoring methodology for type I.D of 'Appendix B of the simplified M&P for small-scale CDM project activities-Version 16, - Grid connected renewable electricity generation.

The monitoring methodology specified in the methodology requires that the project-monitoring plan to consist of metering the electricity generated by the renewable technology. In order to monitor the mitigation of GHG due to the project activity, the total energy exported needs to be measured. The net energy supplied to grid by the project activity multiplied by emission factor for regional grid, would form the baseline for the project activity.

Since the baseline methodology is based on ex ante determination of the baseline, the monitoring of baseline emission factor is not required. The sole parameter for monitoring is the electricity exported to the grid.

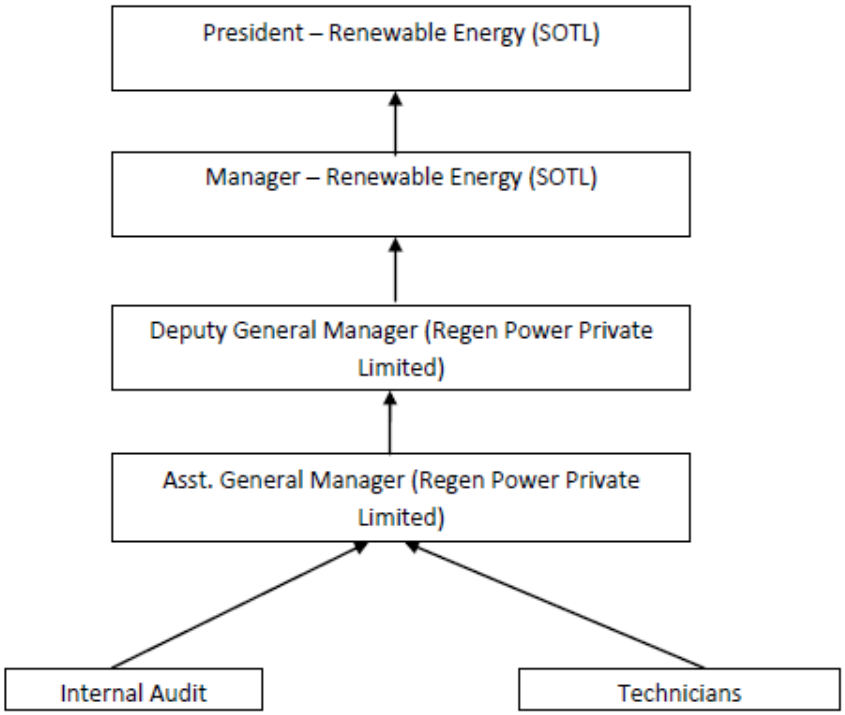
Line diagram of Tamil Nadu



Monitoring at Tamil Nadu

The Project is operated and managed by M/s Regen Powertech Pvt. Ltd. (RPPL) in Tamil Nadu.

The operational and management structure implemented by RPPL is as follows:



RPPL has provided panel meter on each WTG panel where the daily generation is monitored by the O&M service provider. Daily meter reading on panel is be taken by site-in-charge or personnel from O&M contractor. Meter reading is noted electronically.
However, Tamil Nadu Electricity Board (TNEB) have installed TNEB owned electronic tri-vector meters (Main meters) at each WTG transformer yard where the export and import of electrical energy is metered and the readings are taken by TNEB officials in presence of site-in-charge once in a month. The net energy generated from the specific WTG is calculated as a difference between electricity export and import values of the recording meter. These export/import values are obtained by multiplying the export/import readings of the recording meter with the multiplying factor of the recording meter. Monthly TNEB statement of net generation is provided to SOTL on the basis of which invoices are raised.

Main meters are calibrated at least once in three years as per the CEA Metering Regulations 2006.
The performance of the machines is monitored through:
1. Electric meters: Daily generation is monitored on panel meter provided on the WTG panel
2. Main meter by TNEB for recording the actual generation.
Daily Report: Daily report is generated and sent to SOTL by O&M service provider. Report consists of number of units produced, generation hours, grid and machine availability hours, and details of downtime due to machine/grid.

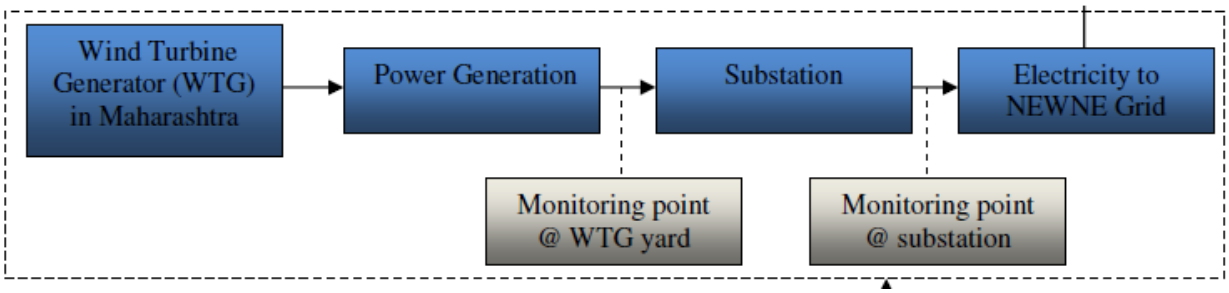
Internal audits & Performance review

The records are regularly audited and checked by the senior officials from project proponent on an annual basis. The officials monitor the actual emission reduction. The personnel responsible for taking readings at site are adequately trained.

Emergency Preparedness

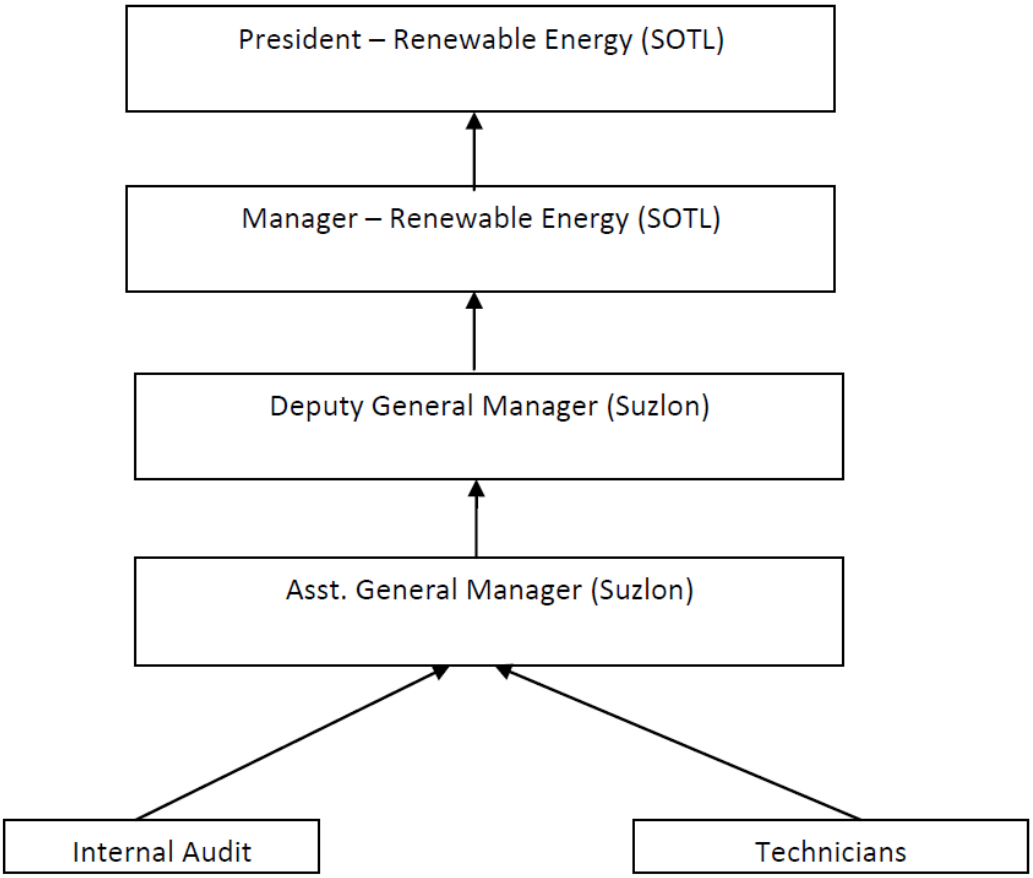
In the context of the project activity, the main meters are kept in sealed by TNEB and all maintenance is taken up by TNEB only. With reference to clause (4) of the Article 4 of the Energy Purchase agreement as provided below:
"(4) The State Transmission Utility/Distribution Licensee may provide Check Meters of the same specification as Main meters", the project proponents have not opted for check meters. Further, it may please be noted as per clause (8) and (9) of Article 4 of the Energy Purchase agreement:
"(8) Check meter readings shall be considered when Main Meters are found to be defective or stopped. Provided that, if difference between the readings of main and check meters vis-à-vis main meter reading exceeds twice the Percentage error applicable to the relevant class, both meters shall be tested and the one found defective shall be immediately replaced and reading of other will be considered.
(9) If during test or calibration, both the main meter and check meter are found to have errors beyond permissible limits, the bill shall be revised for the previous 3 (Three) months or the exact period if known and agreed upon by the parties, by applying correction as determined by the meter testing Wing of the STU/Distribution Licensee to the consumption registered by the meter with lesser error
Hence, in case of failure of the main meter clause (9) of Article 4 of the Energy Purchase agreement will come into effect and the generation would be accordingly calculated and approved by the meter testing Wing of the State Transmission Utility/Distribution Licensee.
In continuation to the above clause, the correction would be taken in accordance with Clause (viii) of the Circular dated 06/01/1993 issued by the Chief Engineer, TNEB, which states:
"During the defective period of the meters, the units generated can be computed based on the units recorded in the panel of the windmill and by comparison with the nearby windmill generator."
The project promoters have contracted the technology supplier for providing O&M services for the power project. The service provider would be responsible for maintenance of the necessary spare parts and consumables for the maintenance of the WTGs such as anemometers, wind vanes and sensors, oil filters, batteries, auxiliary motors and pumps, WTG controllers, slip rings, limit switches and sensors, detergents & solvents etc. The service provider would also be responsible for supply of necessary main components of the WTG such as main gearboxes, blades, generators, towers, hubs, main shafts & bearings, ground and top controller and hydraulic systems. The service provider would also ensure that occupational health and safety procedures are adhered to during the operation & maintenance activities. Additionally, spare meters would also be kept available at the site for replacement in case of failure of any of the monitoring equipment.

Line diagram of Maharashtra



Monitoring at Maharashtra

The Project is operated and managed by Suzlon in Maharashtra. The operational and management structure implemented by Suzlon is as follows:



All the WTGs are connected & captured in a digital system located at that site only. The daily generation reports are made available to SOTL by the O&M service providers. SOTL has the overall responsibility for collating the monitored data received from all the three locations. Any failure in the WTG, including in its monitoring system, will trigger the interlocking circuit which will stop generation of electricity immediately.

A particular feeder may comprise of WTGs belonging to owners other than SOTL but belonging to the same O&M service provider. At the MSEDCL sub-station, the total export & import to this feeder is monitored using the main meter & the check meter, which are electronic trivector

meters. The total export at this meter is generally arrived at by multiplying the monthly meter reading to the multiplying factor of the meter concerned. The monthly meter reading is arrived at as the difference between the current meter reading and the previous meter reading. The period between these two readings is usually a period of 30 days which may vary. In a similar fashion, total import at this meter is also calculated. Hence, net electricity export is calculated as the difference between total export and total import at the meter. Additionally, MSEDCL receives daily export & import figures for each WTG from the O&M service provider with the help of which it calculates the electricity export by each WTG at the WTG controller. The WTG controller is located within the WTG assembly itself. It then arrives at the export value of each WTG by apportioning the reading of the main/check meter in the same ratio at which each of the WTG had exported electricity. The formula applied on each WTG of a particular feeder is as follows:

Export of WTG to Grid

= (% generation of individual WTG connected to feeder) x (Net Electricity Export @ MSEDCL meter for the feeder)

where, % generation of individual WTG connected to feeder

= (Controller reading @ Individual WTG)/(Sum of Controller reading of all WTGs connected on feeder)

The electricity export reports are generated by MSEDCL on credit notes and sent to SOTL through the O&M service provider on a monthly basis. Thus, to further elaborate, it may be said, that every month, SOTL receives credit notes from MSEDCL for all its WTGs from the O&M service provider. Some of the information mentioned in the credit notes is as follows:

1. Current meter reading of total export of the concerned feeder
2. Previous meter reading of total export of the concerned feeder
3. Current meter reading of total import of the concerned feeder
4. Previous meter reading of total import of the concerned feeder
5. Multiplying factor of meter
6. % generation of individual WTG connected to meter

Upon receipt of these reports, SOTL generates invoices on sale of electricity and sends to MSEDCL. Thereafter MSEDCL makes payments against the invoices.

SOTL is overall responsible for storing and archiving data as well as the preparation of monitoring report and communicate with EB of UNFCCC for project performance, registration and verification of the CDM project activity.

Internal audits and Performance Review:-

The records are regularly audited and checked by the senior officials from project proponent on an annual basis. The officials will monitor the actual emission reduction. The site-in charge will be responsible for taking reading at site.

Emergency Preparedness

Incase if monitoring meter failure errors, the grid officials would immediately replace the meter with a calibrated meter. There are two meters provided at each feeder: a Main Meter and a Check Meter. In case of failure of the meters, generation will be calculated based on the corresponding norms (Section 11.02 [c], [d] & [e]) as laid down in the Power Purchase Agreement:

"[c] If during testing, both the Main and Check Meter are found within the permissible limit of error i.e. 0.5s the energy consumption will be as per the Main Meter. If during test, any of the Main Meters is found to be within the permissible limits of error but the corresponding Check Meter is beyond the permissible limit; the energy consumption will be as per the Main Meter. The Check Meter shall be calibrated immediately.

If during the tests, the Main Meter is found to be beyond the permissible limits of error, but the corresponding Check Meter is found to be within the permissible limits of error, then the energy consumption for the month to-date and time of such test shall be in accordance with Check Meter.

The Main Meter shall be calibrated immediately and the energy for the period thereafter shall be as per the calibrated Main Meter.
[d] If during any of the monthly meter readings, the variation between the main meter and the check meter is more than 0.5s, all the meters shall be re-tested and calibrated immediately by MSEDCL, at the Seller's cost.

[e] The correction required as per the result of the testing will be applied to the generation and consumption of energy for the period from last meter reading to the time of such test checks. Energy for the periods thereafter shall be in accordance with the calibrated Main Meter."

The O&M service provider is responsible for maintenance of the necessary spare parts and consumables for the maintenance of the WTGs such as anemometers, wind vanes and sensors, oil filters, batteries, auxiliary motors and pumps, WTG controllers, slip rings, limit switches and sensors, detergents & solvents etc. The service provider would also be responsible for supply of necessary main components of the WTG such as main gearboxes, blades, generators, towers, hubs, main shafts & bearings, ground and top controller and hydraulic systems. The service provider would also ensure that occupational health and safety procedures are adhered to during the operation & maintenance activities. Additionally, spare meters would also be kept available at the site for replacement in case of failure of any of the monitoring equipment's.

5 QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS

5.1 Baseline Emissions

The baseline emissions are to be calculated using the following formula

Baseline Emissions = $EG_{y,Mah}$ x $EF_{NEWNE,CM,y}$ + $EG_{y,TN}$ x $EF_{South,CM,y}$

As per the CDM PDD, the baseline emission factor which is 0.9224tCO_2/MWh for Maharashtra (=$EF_{NEWNE,CM,y}$) and 0.9445 tCO_2/MWh for Tamil Nadu (=$EF_{south,CM,y}$)

The net export from the project activity is:

a) 38,621.35 MWh for Maharashtra

b) 55,832.01 MWh for Tamil Nadu

Hence, BE_y =0.9224 * 38,621.35 + 0.9445 * 55,832.08

= 35,624 + 52,733

=88,358 tCO_2 (round down)

Vintage period	Tamil Nadu	Maharashtra	Overall (tCO_2)
2012	11,594	6,089	17,683
2013	8,902	6,206	15,108
2014	8,034	5,379	13,413
2015	5,621	5,493	11,114

2016	9,439	6,635	16,075
2017	9,142	5,822	14,965
Total	**52,733**	**35,623**	**88,358**

Thus, the emission reduction achieved for the complete monitoring period is 88,358 tCO_2e.

5.2 Project Emissions

The project uses wind energy only for power generation which leads to zero net GHG on-site emissions. Hence there is no net emission within the project boundary.

Hence, PEy= 0.

5.3 Leakage

The project proponents have identified no anthropogenic greenhouse gases by sources outside the project boundary that are significant, measurable and attributable to the project activity. Hence, no leakage is considered from the project activity.
LEy = 0.

5.4 Net GHG Emission Reductions and Removals

The Formula used to calculate the net emission reduction for the project activity is

$ER_y = BE_y - PE_y - LE_y$

Where,

ER_y = Emission Reduction in tCO_2

BE_y = Baseline emission in tCO_2

PE_y = Project emissions in tCO_2

LE_y = Leakage Emissions in tCO_2

For the project activity during the current monitoring period, as per section 5.1

$ER_y = BE_y - PE_y$

=88,358-0 tCO_2

=88,358 tCO_2

Year	Baseline emissions or removals (tCO_2e)	Project emissions or removals (tCO_2e)	Leakage emissions (tCO_2e)	Net GHG emission reductions or removals (tCO_2e)
01-January-2012 to 31-December-2012	17,683	0	0	17,683
01-January-2013 to 31-December-2013	15,108	0	0	15,108
01-January-2014 to 31-December-2014	13,413	0	0	13,413
01-January-2015 to 31-December-2015	11,114	0	0	11,114
01-January-2016 to 31-December-2016	16,075	0	0	16,075
01-January-2017 to 31-December-2017	14,965	0	0	14,965
Total	88,358	0	0	88,358

During the present monitoring period, estimated emission reductions achieved are 88,358 tCO_2e whereas estimated emission reductions was 91,692 tCO_2e. The project witnessed decrease of 4% in emission reductions as compared to ex-ante emissions.

APPENDIX 1:- METER CALIBRATION

For Sadawaghapur

Location No.	Main Meter No.	Check Meter No.	Substation Feeder no.	Accuracy Class	Date of Calibration	Next Calibration Date
S-40	04961755	04939180	Sadawaghapur Feeder 03	0.2	25-July-2011	24-July-2012
S-63	04961761	04961757	Sadawaghapur Feeder 04	0.2	25-July-2011	24-July-2012
S-64				0.2		
S40	04961755	04939180	Sadawaghapur Feeder 03	0.2	23- July-2012	22-July-2013
S-63	04961761	04961757	Sadawaghapur Feeder 04	0.2	23- July-2012	22-July-2013
S-64			Sadawaghapur Feeder 04	0.2	23- July-2012	22-July-2013
S40	04961755 (Old meter) 14796507[6] (New Meter)	04939180 (Old Meter) 1476508[7] (New Meter)	Sadawaghapur Feeder 03	0.2	18-February-2013	17-February-2014
S63	04961761 (Old Meter) 14796504 [8](New Meter)	04961757 (Old Meter) 14796505[9] (New Meter)	Sadawaghapur Feeder 04	0.2	18-February-2013	17-February-2014
S64				0.2		
S40	14796507	14796508	Sadawaghapur Feeder 03	0.2s	21- May-2014	20- May-2015
S63	14796504	14796505		0.2s		20-May-2015

[6] old main meter (04961755) replaced by new main meter (14796507) on meter replacement date 18-February- 2013

[7] old check meter (04939180) replaced by new check meter (1476508) on meter replacement date 18-February-2013

[8] old main meter (04961761) replaced by new main meter (14796504) on meter replacement date 18-February- 2013

[9] Old check meter (04961757) replaced by new check meter (14796505) on meter replacement date 18-February- 2013

S64			Sadawaghapur Feeder 04		21-May-2014	
S40	14796507	14796508	Sadawaghapur Feeder 03	0.2s	29-June-2015	28-June-2016
S63 S64	14796504	14796505	Sadawaghapur Feeder 04	0.2s	29-June-2015	28-June-2016
S40	14796507	14796508	Sadawaghapur Feeder 03	0.2s	23-May-2016	22-May-2017
S63 S64	14796504	14796505	Sadawaghapur Feeder 04	0.2s	23-May-2016	22-May-2017
S40	14796507	14796508	Sadawaghapur Feeder 03	0.2s	20-May-2017	19-May-2018
S63 S64	14796504	14796505	Sadawaghapur Feeder 04	0.2s	20-May-2017	19-May-2018

For Theni

Location No.	Main Meter No.	Substation	Meter Accuracycy	Date of Calibration	Next Calibration Date
T45	TNB 04537	Theni	0.5s	*27-March-2011*	*26-March-2014*
T46	TNB 04534		0.5s	*27-March-2011*	*26-March-2014*
T47	TNB 04517		0.5s	*27-March-2011*	*26-March-2014*
T45	TNB 04537	Theni	0.5s	04-February-2012	03-February-2015
T46	TNB 04534		0.5s	04-February-2012	03-February-2015
T47	TNB 04517		0.5s	04-February-2012	03-February-2015
T45	TNB 04537	Theni	0.5s	01-February-2015	31-January-2018
T46	TNB 04534		0.5s	01-February-2015	31-January-2018
T47	TNB 04517		0.5s	01-February-2015	31-January-2018

APPENDIX 2:- BREAKDOWN DETAILS

S 40

Gen. Date	Loc. No.	Breakdown Remark	Formula Parameter	Breakdown Hrs.
08-Jan-2012	S040	Elec FB NacelleFan	U	5.20
09-Jan-2012	S040	Elec FB NacelleFan	U	3.80
14-Jan-2012	S040	Shut Down Taken By OMS Team	U	0.10
18-Jan-2012	S040	Shut Down Taken By OMS Team for Maintenance	S	0.40
19-Jan-2012	S040	Shut Down Taken By OMS Team	U	1.30
19-Jan-2012	S040	Shut Down Taken By OMS Team	U	2.30
28-Jan-2012	S040	Modification	S	1.10
03-Feb-2012	S040	Shut Down Taken By OMS Team	U	0.60
03-Feb-2012	S040	Shut Down Taken By OMS Team	U	1.70
11-Feb-2012	S040	Shut Down Taken By OMS Team	U	0.30
11-Feb-2012	S040	Shut Down Taken By Projects Team	U	0.80
13-Feb-2012	S040	Shut Down Taken By OMS Team	U	0.60
13-Feb-2012	S040	Shut Down Taken By OMS Team	U	1.40
18-Feb-2012	S040	Shut Down Taken By OMS Team	U	0.10
18-Feb-2012	S040	Shut Down Taken By Projects Team	U	2.40
22-Feb-2012	S040	Shut Down Taken By OMS Team	U	0.10
28-Sep-2012	S040	Elec SafteyChainStop	U	3.10
09-Oct-2012	S040	WTG Preventive Maintenance	S	7.80
26-Oct-2012	S040	Shut Down Taken By OMS Team	U	3.00
29-Oct-2012	S040	Shut Down Taken By OMS Team	U	0.30
29-Oct-2012	S040	Shut Down Taken By OMS Team	U	1.30
02-Nov-2012	S040	SE RebootPLC	U	0.10
14-Nov-2012	S040	SE RebootPLC	U	0.10
26-Nov-2012	S040	Shut Down Taken By OMS Team	U	1.30
11-Dec-2012	S040	SE RebootPLC	U	0.10
19-Dec-2012	S040	SE RebootPLC	U	0.10
03-Mar-2013	S040	SE RebootPLC	U	0.10
06-Mar-2013	S040	Rep SE RebootPLC	U	1.10
09-Mar-2013	S040	Rep Pitch FreqConvPitch3 ErrStop	U	0.10
11-Mar-2013	S040	Rep SE RebootPLC	U	0.20
12-Mar-2013	S040	Rep SE RebootPLC	U	0.40
15-Mar-2013	S040	SE RebootPLC	U	0.10
02-Jun-2013	S040	Elec UPSBattChange	U	2.70
02-Jun-2013	S040	Rep Pitch CANComFail	U	0.10
03-Jun-2013	S040	Elec UPSBattChange	U	7.80
05-Jun-2013	S040	Shut Down Taken By OMS Team	U	0.60
16-Jun-2013	S040	Elec CurrentAsymmetry	U	0.10

18-Jun-2013	S040	Elec VoltageU2 LowStop	U	13.00
19-Jun-2013	S040	Elec VoltageU2 LowStop	U	24.00
20-Jun-2013	S040	Elec ACB OffStop	U	15.70
09-Jul-2013	S040	Shut Down Taken By OMS Team	U	0.30
20-Nov-2014	S040	Rep Pitch EmergencyRun	U	1.00
22-Nov-2014	S040	Rep Pitch EmergencyRun	U	0.30
24-Nov-2014	S040	Pitch EmergencyRun	U	0.40
11-Dec-2014	S040	Pitch Akku1Voltage LowStop	U	0.50
12-Dec-2014	S040	Rep Pitch EmergencyRun	U	0.10
20-Dec-2014	S040	Rep Pitch EmergencyRun	U	8.20
27-Dec-2014	S040	Shut Down Taken By OMS Team	U	1.90
25-Jan-2015	S040	Shut Down Taken By OMS Team	U	3.90
26-Jan-2015	S040	Capacitor Checking	S	0.90
03-Feb-2015	S040	WTG VCB Maintenance	S	1.10
05-Feb-2015	S040	IDRV Audit	S	3.20
09-Feb-2015	S040	Shut Down Taken By OMS Team	U	0.50
19-Feb-2015	S040	VCB Tripped	U	0.90

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Gen. Date	Loc. No.	Breakdown Remark	Formula Parameter	Breakdown Hrs.
01-Jan-2012	S063	Pitch CAN1ComFail	U	1.30
01-Jan-2012	S063	Shut Down Taken By Projects Team	U	0.20
01-Jan-2012	S063	Shut Down Taken By Projects Team	U	2.00
14-Jan-2012	S063	Shut Down Taken By OMS Team	U	0.20
16-Jan-2012	S063	Shut Down Taken By OMS Team	U	0.50
25-Jan-2012	S063	Monthly Lubrication	S	1.40
28-Jan-2012	S063	Modification	S	0.10
02-Feb-2012	S063	Shut Down Taken By OMS Team	U	0.20
02-Feb-2012	S063	Shut Down Taken By OMS Team	U	3.20
13-Feb-2012	S063	Shut Down Taken By OMS Team	U	0.50
13-Feb-2012	S063	Shut Down Taken By OMS Team	U	1.40
23-Feb-2012	S063	Shut Down Taken By OMS Team	U	0.10
23-Feb-2012	S063	Shut Down Taken By OMS Team	U	4.00
12-Jul-2013	S063	Shut Down Taken By OMS Team	U	0.80
13-Jul-2013	S063	VCB Tripped	U	2.40
14-Jul-2013	S063	Elec SafteyChainStop	U	1.00
19-Jul-2013	S063	Monthly Lubrication	S	1.50
20-Jul-2013	S063	VCB Tripped	U	6.40
21-Jul-2013	S063	VCB Tripped	U	12.50
21-Sep-2013	S063	Shut Down Taken By OMS Team	U	0.50
23-Sep-2013	S063	Shut Down Taken By OMS Team	U	0.70
08-Oct-2013	S063	Shut Down Taken By OMS Team	U	1.60
11-Oct-2013	S063	WTG Preventive Maintenance	S	8.70
12-Oct-2013	S063	Shut Down Taken By OMS Team	U	0.40
12-Oct-2013	S063	Shut Down Taken By Projects Team	U	1.40
09-Nov-2015	S063	Shut Down Taken By OMS Team	U	2.20

18-Nov-2015	S063	Elec UPSBattChange	U	1.90
02-Dec-2015	S063	Elec UPSBattChange	U	1.40
08-Dec-2015	S063	Shut Down Taken By OMS Team	U	0.20
08-Dec-2015	S063	Shut Down Taken By OMS Team	U	1.20
08-Dec-2015	S063	Shut Down Taken By OMS Team	U	3.00
09-Dec-2015	S063	Shut Down Taken By OMS Team	U	4.00
10-Dec-2015	S063	Shut Down Taken By OMS Team	U	2.00
11-Dec-2015	S063	Modification	S	5.60
15-Dec-2015	S063	Shut Down Taken By OMS Team	U	0.10
15-Dec-2015	S063	Shut Down Taken By OMS Team	U	0.60
18-Dec-2015	S063	Modification	S	4.90
21-Sep-2016	S063	Elec UPSBattChange	U	0.10
25-Sep-2016	S063	Mech GearOilFilter ChokedStop	U	0.20
12-Oct-2016	S063	Hyd SystemPressure LowStop	U	0.10
15-Oct-2016	S063	WTG Preventive Maintenance	S	6.10
05-Nov-2016	S063	INTL_WTG Shut Down By OMS	U	2.80
10-Nov-2016	S063	HT Line Maintenance	S	2.00
10-Nov-2016	S063	INTL_WTG Shut Down By OMS	U	0.20
10-Nov-2016	S063	Pitch EmergencyRun	U	0.40
13-Nov-2016	S063	Hyd SystemPressure HighStop	U	0.10
14-Nov-2016	S063	Mech GearOilFilter ChokedStop	U	0.10
21-Nov-2016	S063	Hyd SystemPressure HighStop	U	0.20
27-Nov-2016	S063	Mech GearOilFilter ChokedStop	U	0.30
04-Dec-2016	S063	Mech GearOilFilter ChokedStop	U	0.20
06-Dec-2016	S063	Mech GearOilFilter ChokedStop	U	0.10

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Gen. Date	Loc. No.	Breakdown Remark	Formula Parameter	Breakdown Hrs.
01-Jan-2012	S064	Shut Down Taken By Projects Team	U	0.80
01-Jan-2012	S064	Shut Down Taken By Projects Team	U	2.00
04-Jan-2012	S064	Monthly Lubrication	S	1.90
14-Jan-2012	S064	Shut Down Taken By OMS Team	U	0.10
16-Jan-2012	S064	Shut Down Taken By OMS Team	U	0.60
25-Jan-2012	S064	Preventive Check	U	0.40
27-Jan-2012	S064	Shut Down Taken By OMS Team	U	1.00
28-Jan-2012	S064	Modification	S	0.30
02-Feb-2012	S064	Shut Down Taken By OMS Team	U	0.20
02-Feb-2012	S064	Shut Down Taken By OMS Team	U	3.20
13-Feb-2012	S064	Shut Down Taken By OMS Team	U	0.90
13-Feb-2012	S064	Shut Down Taken By OMS Team	U	1.40
23-Feb-2012	S064	Shut Down Taken By OMS Team	U	0.10
23-Feb-2012	S064	Shut Down Taken By OMS Team	U	4.00
24-Feb-2012	S064	Shut Down Taken By OMS Team	U	0.30
18-Jul-2013	S064	Monthly Lubrication	S	2.40
20-Jul-2013	S064	Pitch Akku1Voltage LowStop	U	6.40
21-Jul-2013	S064	Pitch Akku1Voltage LowStop	U	12.60

01-Aug-2013	S064	Mech DriveTrainVib Stop	U	5.00
02-Aug-2013	S064	Mech DriveTrainVib Stop	U	22.10
03-Aug-2013	S064	Elec SafteyChainStop	U	15.50
17-Aug-2013	S064	Elec UPSBattChange	U	0.70
20-Aug-2013	S064	Rep WindPeak HighStop	FM	1.00
21-Aug-2013	S064	Elec UPSBattChange	U	0.10
31-Aug-2013	S064	Elec UPSBattChange	U	0.30
14-Sep-2013	S064	Elec UPSBattChange	U	4.50
16-Sep-2013	S064	Elec UPSBattChange	U	0.30
18-Sep-2013	S064	Elec UPSBattChange	U	0.90
27-May-2015	S064	Shut Down Taken By OMS Team	U	0.20
28-May-2015	S064	Rep Elec CurrentAsymmetry	U	1.50
29-May-2015	S064	Shut Down Taken By OMS Team	U	1.70
22-Jun-2015	S064	Mech Rpm DiffStop	U	0.20
23-Jun-2015	S064	Rep Pitch CANComFail	U	0.90
27-Jun-2015	S064	Pitch EndSwitch 5GradNeg Conv1	U	0.30
04-Jul-2015	S064	Rep Pitch EmergencyRun	U	2.00
05-Jul-2015	S064	Pitch BatterySurveillance1	U	0.60
08-Jul-2015	S064	Shut Down Taken By OMS Team	U	0.40
12-Jul-2015	S064	Shut Down Taken By OMS Team	U	0.10
12-Jul-2015	S064	Shut Down Taken By OMS Team	U	0.70
19-Jul-2015	S064	Rep Elec CurrentAsymmetry	U	15.20
20-Jul-2015	S064	Elec ReactivPower HighStop	U	13.00
01-Jun-2016	S064	Elec UPSBattChange	U	0.90
02-Jun-2016	S064	Hyd SystemPressure HighStop	U	10.40
07-Jun-2016	S064	Hyd HydPump LongStop	U	7.60
15-Jun-2016	S064	Hyd SystemPressure HighStop	U	0.20
17-Jun-2016	S064	Modification	S	1.10
18-Jun-2016	S064	VCB Tripped	U	11.20
25-Jun-2016	S064	Pitch Akku1Voltage LowStop	U	5.60
02-Jul-2016	S064	Elec UPSBattChange	U	1.70
23-Jul-2016	S064	Pitch Akku2Voltage LowStop	U	4.20
25-Jul-2016	S064	VCB Tripped	U	1.80
08-Aug-2016	S064	Pitch Akku1Voltage LowStop	U	7.50
09-Aug-2016	S064	Pitch Akku1Voltage LowStop	U	2.40
17-Aug-2016	S064	Mech DriveTrainVib Stop	U	2.00
18-Aug-2016	S064	Monthly Lubrication	S	1.40
24-Aug-2016	S064	Mech GearOilFilter ChokedStop	U	0.10
25-Aug-2016	S064	Mech GearOilFilter ChokedStop	U	0.10

For Theni

Date	Downtime	Analysis
02-01-2012	2 mins	W2(0.01):error_converter_not_ready;W3(0.03):error_converter_temperature_generator_capacitors
03-01-2012	47 mins	W1,W2(0.02):error_cabinet_cooling_control_cooling_fan_feedback;W1(0.10):error_converter_temperature_generator_capacitors;W3(0.27)

		:error_grid_voltage_limit_min;W3(0.04):error_grid_frequency;W3(0.30):EL Tripped at Substation
04-01-2012	30 mins	W3(0.10):error_converter_temperature_generator_capacitors;W1,W2(0.20) :EL Tripped at Substation
05-01-2012	24 mins	W1,W2(0.20):EL Tripped at Substation
06-01-2012	12 mins	W3(0.20):error_grid_voltage_limit_min
07-01-2012	1:00:00	W3(0.10):error_grid_voltage_limit_min;W1,W2,W3(0.30):EL Tripped at Substation
08-01-2012	18 mins	W3(0.30):error_grid_voltage_limit_min
09-01-2012	36 mins	W1,W2,W3(0.20):EL Tripped at Substation
11-01-2012	24 mins	W1,W2(0.20):EL Tripped at Substation
12-01-2012	18 mins	W3(0.10):error_converter_temperature_generator_capacitors;W3(0.20):EL Tripped at Substation
13-01-2012	12 mins	W2,W3(0.10):error_grid_voltage_limit_min
14-01-2012	9:12:00	W1,W2,W3(3.0):Ext. grid shutdown taken by theni SS for load shedding;W1,W2(0.20):EL Tripped at Substation
15-01-2012	18:12:00	W1,W2,W3(0.10):EL Tripped at Substation;W1,W2(5.80),W3(6.10):Ext. grid shutdown taken by Theni SS for load shedding
16-01-2012	18:42:00	W1,W2(0.30),W3(0.20):EL Tripped at Substation;W1,W2(6.10),W3(6.40):High/Low Frequency from Substation
17-01-2012	9:80:00	W1,W2 (3.20),W3(3.30):High/Low Frequency from Substation;W3(0.10):EL Tripped at Substation
18-01-2012	20 mins	W1,W2(0.10):EL Tripped at Substation
19-01-2012	12 mins	W3(0.10):error_converter_temperature_generator_capacitors;W3(0.10):EL Tripped at Substation
20-01-2012	6 mins	W3(0.10):error_converter_temperature_generator_capacitors;
23-01-2012	1:12:00	W1,W2(1.20):EL Tripped at Substation
24-01-2012	18 mins	W1,W2,W3(0.10):Ext. grid voltage fluctuation
28-01-2012	14:30:00	W1,W2,W3(4.50):Ext.l grid s/d taken by Theni SS for load shedding
29-01-2012	6 mins	W3(0.10):error_converter_temperature_generator_capacitors
30-01-2012	1:36:00	W3(0.10):error_converter_temperature_generator_capacitors;W3(1.50):LC taken by theni SS
31-01-2012	12 mins	W3(0.20):EL Tripped at Substation
01-02-2012	24 mins	W1,W2(0.10):High/Low Voltage from Substation;W3(0.20):EL Tripped at Substation
03-02-2012	6 mins	W3(0.10):error_converter_temperature_generator_capacitors
04-02-2012	1:12:00	W1,W2,W3(0.20):EL Tripped at Substation;W1(0.60):HT Side Fuse Failure
09-02-2012	18 mins	W3(0.30):error_converter_temperature_generator_capacitors
10-02-2012	24 mins	W1,W2(0.20)EL Tripped at Substation
12-02-2012	36 mins	W1,W2(0.30):EL Tripped at Substation
13-02-2012	1:48:00	W1(1.50):Preventive Action : Others;W2(0.20):Preventive Action : OIL Sample Taken;W3(0.10)P:EL Tripped at Substation
20-05-2014	8:42:00	W3(1.30):error_converter_temperature_generator_capacitors;W1,W2(2.4), W3(2.6):Load Shedding
21-05-2014	2:42:00	W1,W2,W3(0.9):Load Shedding
22-05-2014	14:24:00	W1,W2,W3(4.8):Load Shedding
23-05-2014	15:36:00	W1,W2,W3(5.2):Load Shedding
24-05-2014	7:30:00	W1,W2,W3(2.5):Load Shedding

25-05-2014	30:18:00	W1,W2(10.3),W3(9.7):Load Shedding
26-05-2014	4:54:00	W1(1.7):error_converter_grid_IGBT,W3(0.4):error_grid_current_unsymmetry ;W1,W2,W3,W4:(0.7):Load Shedding
27-05-2014	12 mins	W3(0.2):Load Shedding
28-05-2014	2:12:00	W1,W2(0.80),W3(0.60):Load Shedding
29-05-2014	12 mins	W3(0.2):EL Tripped at Substation
31-05-2014	4:30:00	W1,W2,W3(1.5):Load Shedding
01-06-2014	3:36:00	W1,W2,W3(1.2):Load Shedding
19-07-2015	32:39:00	W3(0.4):error_cabinet_cooling_control_cooling_fan_feedback; W1(10.37)W2(10.38)W3(10.84):Substation incoming Loadshedding
20-07-2015	28:26:00	W2(2):error_profi_node_41_diag;W2(1.8):HT Side Fuse Failure; W1W2(8.13)W3(7.8):Substation incoming Loadshedding
21-07-2015	11:33:00	W2(0.2):error_safety_system_safety_system_ok_from_pitch;W1(3.57)W2W 3(3.58):Substation incoming Loadshedding
22-07-2015	26:13:00	W1W2W3(5.5):LC Taken by TNEB;W1(3.23)W2(3.22)W3(2.78):Substation incoming Loadshedding
23-07-2015	19:27:00	W1(6.3)W2(6.29)W3(6.18):Substation incoming Loadshedding
24-07-2015	34:24:00	W2(0.9):Preventive Action : Others;W1(11.16)W2(11.2)W3(10.98):Substation incoming Loadshedding
25-07-2015	26:41:00	W1(8.79)W2(8.71)W3(8.91):Substation incoming Loadshedding
26-07-2015	15:43:00	W1(5.28)W2(5.25)W3(4.9):Substation incoming Loadshedding
27-07-2015	13:24:00	W1(4.52)W2(4.53)W3(4.35):Substation incoming Loadshedding
28-07-2015	1:34:00	W1(0.33)W2(0.25)W3(0.36):Substation incoming Loadshedding
29-07-2015	7:16:00	W1(2.47)W2(2.58)W3(2.11):Substation incoming Loadshedding

No major breakdown has been observed within this monitoring period