



**Verified Carbon  
Standard**

# 33.9 MW BUNDLED WIND POWER PROJECT IN STATES OF KARNATAKA AND TAMIL NADU



Document Prepared by EKI Energy Services Limited

<b>Project Title</b>	33.9 MW Bundled Wind Power Project in Karnataka and Tamil Nadu
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# 1 PROJECT DETAILS

## 1.1 Summary Description of the Implementation Status of the Project

The project activity consists of the 19 machines of Suzlon make of 1.5 MW each, and 9 nos of 0.6 MW each totalling to the capacity of 33.9 MW. The Project considered harnessed renewable resources in the region, thereby displacing non-renewable natural resources thereby ultimately leading to sustainable economic and environmental development.

The project is a bundled project activity having two investors. The project involves a total of 19 nos. of WEGs of 1.5 MW each and 9 nos of 0.6 MW each.

The project under consideration is located in the states of Karnataka and Tamil Nadu. The project is owned by Super Wind Project Private Ltd. and Simran Wind Project Private Ltd.

The first machine under the project activity was commissioned on 30-March-2008 and the last machine under the project activity was commissioned on 05-February-2009. The expected operational lifetime of the project is for 20 years. The total emission reductions achieved under this monitoring period is 33,189 tCO<sub>2</sub>.

## 1.2 Sectoral Scope and Project Type

The project activity is considered under zero-emissions „grid-connected electricity generation from renewable sources“ that generates electricity in excess of 15 MW (limit for small scale project). Therefore as per the scope of the project activity enlisted in the „list of sectoral scopes and related approved baseline and monitoring methodologies“, the project activity may principally be categorized in Scope Number 1, Sectoral Scope - Energy industries (renewable/ non-renewable sources).

## 1.3 Project Proponent

<b>Organization name</b>	Simran Wind Project Private Limited
<b>Contact person</b>	Mr. Satish Raval
<b>Title</b>	Manager
<b>Address</b>	2F and 3F, Park Plaza, North Block, 71 Park Street Kolkata, West Bengal-700019
<b>Telephone</b>	+91 33 30213100
<b>Email</b>	<a href="mailto:satish.raval@technoenergy.co.in">satish.raval@technoenergy.co.in</a>

## 1.4 Other Entities Involved in the Project

<b>Organization name</b>	EKI Energy Services Limited
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<b>Role in the Project</b>	Project Consultant
<b>Contact person</b>	Anjali
<b>Title</b>	Project Manager
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### 1.5 Project Start Date

30-March-2008, being the date of commissioning of first WEG in the project

### 1.6 Project Crediting Period

The first renewable crediting period is 10 years. Start date is 01-April-2008 and the end date is 31-March-2018.

### 1.7 Project Location

The project is located located in the states of Karnataka and Tamil Nadu and spreads over the Gadag and Chitradurga district in Karnataka and Dindigul, Coimbatore and Erode in Tamil Nadu. The details of the Wind Energy Generators are-

Sl.No	Loc. No	MW	Site	District	Longitude	Latitude
<b>KARNATAKA</b>						
1	K342	1.50	Kappalgudda	Gadag	76° 07'43.6"E	13° 11'40.9"N
2	K345	1.50	Kappalgudda	Gadag	75° 47'35.8"E	15° 05'07.8"N
3	K346	1.50	Kappalgudda	Gadag	75° 47'41.7"E	15° 05'01.9"N
4	K347	1.50	Kappalgudda	Gadag	75° 47'47.3"E	15° 04'55.1"N
5	K350	1.50	Kappalgudda	Gadag	75° 48'06.7"E	15° 04'32.3"N
6	K69	1.50	Elkurnahalli	Chitradurga	76° 27'07.9"E	14° 05'11.6"N
7	K70	1.50	Elkurnahalli	Chitradurga	76° 27'09.5"E	14° 05'04.0"N
8	K71	1.50	Elkurnahalli	Chitradurga	76° 27'10.1"E	14° 04'56.4"N

9	H29	1.5	Koppalahalli	Hassan	76° 07'43.6"E	13° 11'40.9"N
10	H34	1.5	Aidahalli	Hassan	76° 08'05.8"E	13° 12'23.9"N
11	K75	1.5	Ellukurnahalli	Chitradurga	76° 07'57.2"E	13° 12'15.6"N
12	K76	1.5	Ellukurnahalli	Chitadurga	76° 26'23.7"E	14° 05'20.5"N

Sl.No	Loc. No	MW	Site	District	Longitude	Latitude
<b>TAMILNADU</b>						
1	E767	0.60	Kozhumankondan	Dindigul	77° 27'24.6"E	10° 34'18.5"N
2	E777	0.60	Kovilammappatti	Dindigul	77° 28'09.7"E	10° 34'23.4"N
3	E778	0.60	Kovilammappatti	Dindigul	77° 28'00.7"E	10° 34'14.6"N
4	E779	0.60	Kovilammappatti	Dindigul	77° 28'00.9"E	10° 33'43.3"N
5	E780	0.60	Thalaiyuthu	Dindigul	77° 27'36.3"E	10° 33'20.7"N
6	E781	0.60	Melkaripatti	Dindigul	77° 27'53.2"E	10° 34'32.8"N
7	E782	0.60	Kovilammappatti	Dindigul	77° 27'40.3"E	10° 33'42.6"N
8	E797	0.60	Kattur	Coimbatore	77° 23'46.7"E	10° 55'41.8"N
9	E86	1.50	Kattur	Coimbatore	77° 22'21.4"E	10° 56'14.1"N
10	G-557	0.60	Midapadi	Dindigul	77° 24'22.1"E	10° 33'09.7"N
11	G-970	1.50	Kannamanaickanur	Coimbatore	77° 18'27.7"E	10° 33'00.7"N
12	Q48	1.50	V.Kallipalayam	Coimbatore	77° 20'21.3"E	10° 55'19.8"N
13	Q51	1.50	V.Kallipalayam	Coimbatore	77° 21'20.4"E	10° 55'27.6"N
14	Q199	1.50	Kundadam	Erode	77° 26'05.6"E	10° 49'48.7"N
15	Q220	1.50	Kethelrev	Erode	77° 26'06.9"E	10° 48'15.3"N
16	Q394	1.50	Kethelrev	Erode	77° 26'30.3"E	10° 48'05.3"N

## 1.8 Title and Reference of Methodology

The project is part of the Voluntary Carbon Standards, which is a GHG program that has been approved by the VCS Board. Accordingly, under the VCS program, as per the modalities and procedures for large-scale CDM project activities, the type and category of the project activity is as under:

**Sectoral Scope:** 1, Energy industries (renewable/ non-renewable sources)

**Project Category:** ACM0002, Version-10<sup>1</sup>, “Consolidated baseline methodology for grid connected electricity generation from renewable sources

## 1.9 Participation under other GHG Programs

The Project activity has not applied for any other GHG programs.

## 1.10 Other Forms of Credit

**Emission Trading Programs and Other Binding Limits:** The project proponent is not participating in any other emission trading program and other binding limits.

**Other Forms of Environmental Credit:** The project activity neither has nor intends to generate any other form of GHG related environmental credit for GHG emission reductions or removals claimed under the VCS Program.

## 1.11 Sustainable Development

The Ministry of Environment and Forests, Govt. of India has stipulated the social wellbeing, economic wellbeing, environmental wellbeing and technological well being as the four indicators for sustainable development in the interim approval guidelines by host country for Clean Development Mechanism (CDM) projects” approval. The following paragraphs details the project adherence to the indicators

### **Social wellbeing:**

- “The CDM project activity should lead to alleviation of poverty by generating additional employment, removal of social disparities and contribution to provision of basic amenities to people leading to improvement in quality of life of people”
- The candidate CDM project has resulted in investment in rural sector thereby creating employment opportunities for the skilled, semi-skilled and unskilled manpower available in and around project facility.

### **Economic well being:**

- “The CDM project activity should bring in additional investment consistent with the needs of the people”
- The project invests in a region which would not have happened without the CDM project.

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<sup>1</sup> <https://cdm.unfccc.int/UserManagement/FileStorage/NF9EDA0V5K382HW0JR14GS7XYQUMCP>

- Southern grid, being a power deficit grid, needs additional power generating units. It's highly desirable that deficit be met with renewable energy generating sources so as to reduce the harmful impact on the environment.
- The project will increase availability of power in the grid generated from an emission-free resource; it will positively contribute towards reduction in (demand) use of finite natural resource like Coal.

**Technological well being:**

- “The CDM project activity should lead to transfer of environmentally safe and sound technologies with a priority to the renewables sector or energy efficiency projects that are comparable to best practices in order to assist in upgradation of technological base”
- The project promotes high capacity MW class Suzlon WEGs at the project site that paves the way for future investments in this sector.
- This will also give rise to increased interest in wind energy in the country. This in turn would push the investment into research into creating better wind turbines.

**Environmental well being:**

- This should include a discussion of impact of the project activity on resource sustainability and resource degradation, if any, due to proposed activity; bio-diversity friendliness; impact on human health; reduction of levels of pollution in general;”
- The Project brings about environmental wellbeing by-
  - Generating power from wind energy, being a renewable source, contributes to resource conservation. There is no emissions from the project activity CO<sub>2</sub> abatement and reduction of greenhouse gas emissions through development of renewable technology;
  - Having no harmful impact on human health because of zero emissions for the generating source.

## 2 SAFEGUARDS

### 2.1 No Net Harm

The project does not involve any potential negative environmental and socio economic impacts and hence this criteria is not applicable to this project activity.

The report on “Developmental Impacts and Sustainable Governance Aspects of Renewable Energy Projects” prepared by MNRE dated September 2013. This report clearly mentioned that wind project activity operations do not result in direct air pollution, noise pollution. Please refer below web link for the same<sup>2</sup>.

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.

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<sup>2</sup> <http://mnre.gov.in/file-manager/UserFiles/report-on-developmental-impacts-of-RE.pdf>

## 2.2 Local Stakeholder Consultation

As a part of continual improvement process, feedback from the associated stakeholders is vital, therefore a dedicated Visitor register cum grievance register has been placed at the project site which is accessible to stakeholders to provide their feedback on the project. It is appropriate publicly accessible location at which local stakeholders can provide their feedback on the project. This location is also conducive to continuous and regular checks for stakeholder comments.

The stakeholders are requested to share their experiences and grievances on continuous basis. Registers is used to records the grievances and feedback. During the current monitoring period, positive feedbacks had been received regarding site operation. No any grievances received during the current monitoring period, therefore, no any mitigation measures were required. Incase of grievances, the nature of probable resolution is discussed with the plant head office and implemented by the site incharge

## 2.3 AFOLU-Specific Safeguards

This section is not applicable here as the project activity is a wind project activity.

# 3 IMPLEMENTATION STATUS

## 3.1 Implementation Status of the Project Activity

The first WEG was commissioned on 31-March-2008 and the last machine was commissioned on 05-February-2009. The commissioning schedule is provided below:

VCS (Simran)					
Sl.No	Loc. No	MW	Commissioning date	Site	District
<b>TAMILNADU</b>					
1.	E767	0.60	30-September-2008	Kozhumankondan	Dindigul
2.	E777	0.60	28-July-2008	Kovilammapatti	Dindigul
3.	E778	0.60	30-September-2008	Kovilammapatti	Dindigul
4.	E779	0.60	28-July-2008	Kovilammapatti	Dindigul
5.	E780	0.60	28-July-2008	Thalaiyuthu	Dindigul
6.	E781	0.60	28-July-2008	Melkaripatti	Dindigul
7.	E782	0.60	5-August-2008	Kovilammapatti	Dindigul
8.	E797	0.60	28-September-2008	Kattur	Coimbatore
9.	E86	1.50	1-September-2008	Kattur	Coimbatore
10.	G-557	0.60	31-March-2008	Midapadi	Dindigul
11.	G-970	1.50	31-March-2008	Kannamanaickanur	Coimbatore
12.	Q48	1.50	30-March-2008	V.Kallipalayam	Coimbatore

13.	Q51	1.50	31-March-2008	V.Kallipalayam	Coimbatore
14.	Q199	1.50	31-March-2008	Kundadam	Erode
15.	Q220	1.50	31-March-2008	Kethelrev	Erode
16.	Q394	1.50	30-March-2008	Kethelrev	Erode

KARNATAKA					
1.	H29	1.5	30-September-2008	Koppalahalli	Hassan
2.	H34	1.5	30-September-2008	Aidahalli	Hassan
3.	K75	1.5	31-December-2008	Ellukurnahalli	Chitradurga
4.	K76	1.5	05-February-2009	Ellukurnahalli	Chitadurga

VCS (Super)					
Sl.No	Loc. No	MW	Commissioning date	Site	District
1.	K342	1.50	31-December-2008	Kappalgudda	Gadag
2.	K345	1.50	31-December-2008	Kappalgudda	Gadag
3.	K346	1.50	30-September-2008	Kappalgudda	Gadag
4.	K347	1.50	31-December-2008	Kappalgudda	Gadag
5.	K350	1.50	30-September-2008	Kappalgudda	Gadag
6.	K69	1.50	30-September-2008	Elkurnahalli	Chitradurga
7.	K70	1.50	30-September-2008	Elkurnahalli	Chitradurga
8.	K71	1.50	30-September-2008	Elkurnahalli	Chitradurga

The actual GHG avoided during the current monitoring period is 33,189 tCO<sub>2</sub>e. Considering the annual average emission reductions as per the registered PDD which is 81,947 tCO<sub>2</sub>e per year, the number of days covered during the current monitoring period comes out to be 465 days based upon which the estimated emission reductions attributed to this monitoring period comes out to be 64,324 tCO<sub>2</sub>e. The actual VER is 48.40 % lower than the estimated VER. This variation is majorly due to the variations in wind flow pattern, grid availability and other parameters which are not in the control of PP.

## 3.2 Deviations

### 2.3.1 Methodology Deviations

There is no request for deviation applied during this monitoring period.

### 2.3.2 Project Description Deviations

#### Deviation 01:

PP has requested for deviation in the HTSC number of four WEGs from the registered VCS PD. During the time of validation E797, E86 Q-48 and Q-51 438 were having HT SC numbers as 765, 754, 708 and 707 respectively which has been changed to 638, 631, 589 and 588 respectively. The details of the same is mentioned below: -

WEG IDs	Old HTSC numbers	New HTSC numbers
E797	765	638
E86	754	631
Q-48	708	589
Q-51	707	588

This deviation does not have any impact on the applicability of the methodology, additionality, or the appropriateness of the baseline scenario of this project activity.

This deviation has already been approved during previous verification and is applicable for the current one also.

**Deviation 02:**

PP has requested for addition of "EKI Energy Services Limited" as other entity involved during current monitoring period.

This deviation does not have any impact on the applicability of the methodology, additionality, or the appropriateness of the baseline scenario of this project activity and thus deviation is sought for the same from the registered PDD.

This deviation has already been approved during previous verification and is applicable for the current one also.

### 3.3 Grouped Projects

This project activity is not a grouped project activity.

## 4 DATA AND PARAMETERS

### 4.1 Data and Parameters Available at Validation

Data / Parameter	EF <sub>OM,y</sub>
Data unit	tCO <sub>2</sub> e/MWh
Description	Operating Margin Emission Factor of Indian Grid
Source of data	"CO <sub>2</sub> Baseline Database for Indian Power Sector" published by the Central Electricity Authority, Ministry of Power, Government of India. The "CO <sub>2</sub> Baseline Database for Indian Power Sector" is available at <a href="http://www.cea.nic.in">www.cea.nic.in</a>

Value applied	0.9871
Justification of choice of data or description of measurement methods and procedures applied	Operating Margin Emission Factor has been calculated by the Central Electricity Authority using the simple OM approach in accordance with “Tool to calculate the emission factor for an electricity system” version 7.0.
Purpose of Data	Calculation of baseline emissions
Comments	Fixed ex-ante for the third crediting period

Data / Parameter	$EF_{BM,y}$
Data unit	tCO <sub>2</sub> e/MWh
Description	Build Margin Emission Factor of Indian Grid
Source of data	“CO <sub>2</sub> Baseline Database for Indian Power Sector” published by the Central Electricity Authority, Ministry of Power, Government of India.
Value applied	0.8179
Justification of choice of data or description of measurement methods and procedures applied	Build Margin Emission Factor has been calculated by the Central Electricity Authority in accordance with “Tool to calculate the emission factor for an electricity system” version 7.0.
Purpose of Data	Calculation of baseline emissions
Comments	Fixed ex-ante for the third crediting period

## 4.2 Data and Parameters Monitored

Data / Parameter	EG <sub>ey</sub>
Data unit	MWh (Mega-watt hour)
Description	Electricity exported to the grid by the Project
Source of data	Electricity exported by the project activity to the grid as per as per JMR(Form - B)
Description of measurement methods and procedures to be applied	Net electricity exported to the grid will be measured by the two-way export/import Trivector meter. The procedures for metering and meter reading will be as per the PPA
Frequency of monitoring/recording	<p><u>Frequency</u>: The meter reading will be taken in the first week of every month.</p> <p><u>Recording</u>: The recording of the meter reading will be done in the hard copy format once in a month in the form of JMR certificates.</p>

	<u>Archiving Policy:</u> The data will be archived for a period of 2 years after the end of the crediting period in the hard copy format.
<b>Value monitored</b>	Electricity supplied to the grid by the Project = 35,130MWh
<b>Monitoring equipment</b>	Trivector meters of accuracy class 0.2s and 0.5s
<b>QA/QC procedures to be applied</b>	QA/QC procedures are elaborated in the monitoring plan
<b>Purpose of the data</b>	Calculation of baseline emissions
<b>Calculation method</b>	Please refer section 4.3 below
<b>Comments</b>	Archiving policy: Project data and statement of generation will be archived for a period of crediting period + 2 years in paper form.

## 4.3 Monitoring Plan

### Reporting Period

This is the third monitoring report for the project activity. The monitoring period is from 21 December-2016 to 30-March-2018(both days including).

### Monitoring Methodology

The project is part of the Voluntary Carbon Standards, which is a GHG program that has been approved by the VCS Board. Accordingly, under the VCS program, as per the modalities and procedures for large-scale CDM project activities, the type and category of the project activity is as under:

**Sectoral Scope:** 1, Energy industries (renewable/ non-renewable sources)

**Project Category:** ACM0002, Version-10,“Consolidated baseline methodology for grid connected electricity generation from renewable sources”

The approved consolidated baseline and monitoring methodology ACM0002 is the choice of the baseline and monitoring methodology because:

- The project represents electricity capacity additions from wind sources;
- The project is a Greenfield electricity generation from wind sources;
- The geographical and system boundaries of the grid can be clearly identified and information on the characteristics of the grid is available.

The monitoring requirements for the project activity includes:-

- Metering procedures
- Calibration Frequency

- Data Archiving
- Monitoring roles and responsibility

### **Origin of the data**

The Project is operated and managed by Suzlon. The organization follows the documentation practices to ensure the reliability and availability of the data for operation of the wind power project. The monitored data can be found from the monthly JMR reports.

Monitoring will be done as:

- a. Meter reading: Meter readings are taken jointly by the representatives of TNEB & KPTCL/BESCOM, HESCOM and Suzlon. Such meter readings shall be treated as the accurate and final measurement of the energy supplied to grid by the power producer for preceding month for the period of payment. Electronic format of daily meter readings of the respective WTG"s will be collected and the same would be sent to the PP and the received data will be reviewed against the performance guarantee clause mentioned in the O&M contract and accordingly PP will be compensated by Suzlon. PP will archive this data for a period of 2 years after the crediting period.
- b. Frequency: The meter reading will be taken in the first week of every month.
- c. Recording: The recording of the meter reading will be done in the hard copy format once in a month in the form of JMR certificates.
- d. Archiving Policy: The data will be archived for a period of 2 years after the end of the crediting period in the hard copy format.

### **Managing data quality**

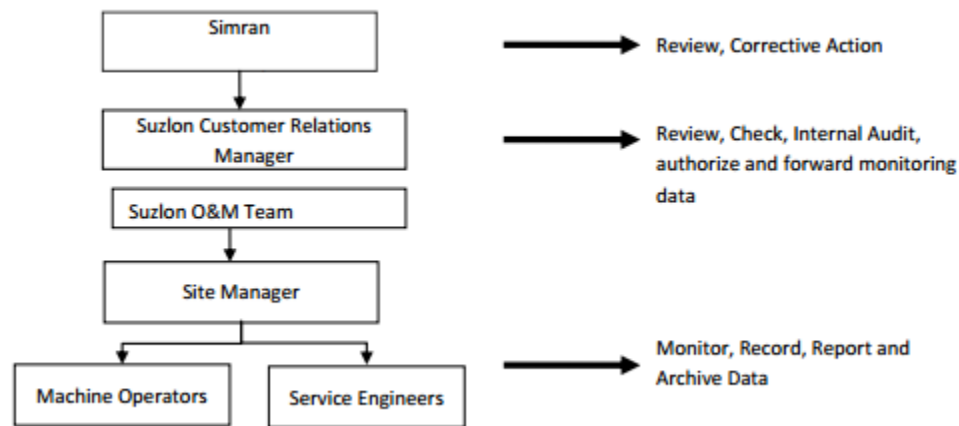
The accuracy of monitoring parameter is ensured by adhering to the calibration and testing procedure. The project will adhere to all the mandatory regulatory and statutory requirements at the state as well as national level. The data will be archived for a period of 2 years after the end of the crediting period in the hard copy format.

### **Monitoring roles and responsibilities**

The authority and responsibility of project overall project coordination in relation to the VCS validation would be with the project proponent. EPC Contractor is responsible for apportioning of the electricity generated.

The daily generation report received from Suzlon(Customer Relations Manager) will be compiled by the PP for the entire month and the same will be cross checked against the credit notes received from the Discom for any discrepancies.

The operational and management structure implemented by Simran along with Suzlon as follows



### Description of the monitoring plan

#### Metering:

Electricity supplied to the grid is metered by the Parties (KPTCL, Suzlon and the PP) at the high voltage side of the step up transformer installed at the Project Site.

#### Metering Equipment:

Metering system for the project activity consists of one main and one check meter. Both the meters are two-way Trivector meters capable of recording import and export of electricity and provide output in the form of net electricity supplied to the grid. The main meter is installed and owned by the Project, whereas check meters are owned by KPTCL. The metering equipment is maintained in accordance with electricity standards prevalent in Karnataka. The meters installed are capable of recording and storing half hourly readings of all the electrical parameters for a minimum period of 35 days with digital output.

#### Meter Readings:

The Net electricity supplied to the grid is recorded by taking a Joint Meter Reading (JMR) in the presence of Officials from off-taking Utility and Suzlon representatives. The Joint meter reading contains the value of energy imported and exported and the net export to the grid during the recording period. This Joint meter reading is certified by the Executive engineer of the utility and by Suzlon Officials. These certified readings are then used by the Discom officials to prepare the tariff invoices. Thus the sole monitoring parameter for the project activity is the net electricity supplied to the grid as mentioned in the JMR, which will be crosschecked with the value mentioned in the invoices.

#### Procedure for Billing:

The PP shall submit to the designated officer of the Discom a monthly invoice for each billing period in the format prescribed by the discom from time to time setting forth those amounts payable by the discom for the delivered energy in accordance with the clauses mentioned in the PPA's

Monthly invoices shall be:

$$DE = X_1 - (X_1 * Z \%)$$

Where,

DE is the delivered energy pertaining to the project

$X_1$  is the reading of the energy meter installed at the project site

Z is the % transmission line loss incurred in the transmission line between the project and the receiving station and shall be

$$Z = [(X_1 + X_2 + X_3 + \dots) - Y] / (X_1 + X_2 + X_3 + \dots) * 100\%$$

Where

Y is the reading of the bulk energy meter installed on the 66 KV side of the receiving station  $X_2, X_3, X_4$  etc are the readings of the energy meters installed at the various individual wind mill power projects being developed/proposed to be set up in the area and connected to the receiving station.

#### **Inspection of Energy Meters:**

All main and check energy meters (export and import) and all associated instruments, transformers installed at the Project are of 0.2% accuracy class. Each meter is jointly inspected and sealed on behalf of the Parties and is not to be interfered with by either Party except in the presence of the other Party or its accredited representatives.

#### **Meter Test Checking:**

All main and check meters are tested for accuracy with reference to a portable standard meter. The portable standard meter is owned by KPTCL. The main and check meters shall be deemed to be working satisfactorily if the errors are within specifications for meters of 0.2 %accuracy class. The consumption registered by the main meters alone will hold good for the purpose of metering electricity supplied to the grid as long as the error in the main meters is within the permissible limits.

If during the meter test checking

- The main meter is found to be within the permissible limit of error and the corresponding check meter is beyond the permissible limits, then the meter reading will be as per the main meter as usual. The check meter shall, however, be calibrated immediately.

- The main meter is found to be beyond permissible limits of error, but the corresponding check meter is found to be within permissible of error, then the meter reading for the month up to the date and time of such test shall be as per the check meter. There will be a revision in the meter reading for the period from the previous calibration test up to the current test based on the readings of the check meter. The main meter shall be calibrated immediately and meter reading for the period thereafter till the next monthly meter reading shall be as per the calibrated main meter.
- Both the main meters and the corresponding check meters are found to be beyond the permissible limits of error, both the main meters shall be immediately calibrated and the correction applied to the reading registered by the main meter to arrive the correct reading of energy supplied for metering electricity supplied to the grid for the period from the last month's meter reading up to the current test. Meter reading for the period thereafter till the next monthly reading shall be as per the calibrated main meter.
- If during any of the monthly meter readings, the variation between the main meter and the check meter is more than the permissible limit for meters of 0.2% accuracy class, all the meters shall be re-tested and calibrated immediately.

**In case of the WEG's connected to TNEB grid the Monitoring procedure is as follows:**

- Meters (Both main and check) are installed right next to each WEG
- The Wind Energy Generator will be provided with energy meters with facilities to record export and import of energy. The meter has 0.5 % class accuracy.
- The reading of the meters shall be taken periodically by authorized officers of TNEB and representative of Suzlon, if present.
- The meters shall be tested for accuracy and shall be calibrated once in two years. Both parties shall seal the meter. Defective meters shall be replaced immediately.
- If during the annual calibrations, both the main and the check meters are found to have errors beyond permissible limits, the bill shall be revised for the previous 3 months or the exact period of know and agreed upon by both the parties, by applying corrections as determined by the meter testing wing of TNEB to the consumption registered by the meter with lesser error.
- In cases were a WEG has only the main meter installed- The O&M team checks the meters on daily basis. If the meter is found to non-functional, TNEB would be informed immediately and the meter will be replaced. Subsequent billing would happen according to the replaced meter. The generation for the intervening period would be forfeited.

## 5 QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS

### 5.1 Baseline Emissions

Baseline emission factor (Combined Margin) ( $EF_{grid, CM, y}$ ) = 0.9448 tCO<sub>2</sub>e/MWh

Annual electricity supplied to the grid by the Project ( $EG_{PJ,y}$ ) = 35,130 MWh

Baseline Emissions Reduction:  $ERY = EF_{grid, CM, y} * EG_{PJ,y}$

= 0.9448 tCO<sub>2</sub>e/MWh x 35,130 MWh

=33,189 tCO<sub>2</sub>e

### 5.2 Project Emissions

The project activity is a Greenfield wind power project and hence does not emit any carbon emissions.

### 5.3 Leakage

There are no leakage emissions from the project.

### 5.4 Net GHG Emission Reductions and Removals

Year	Baseline emissions or removals (tCO <sub>2</sub> e)	Project emissions or removals (tCO <sub>2</sub> e)	Leakage emissions (tCO <sub>2</sub> e)	Net GHG emission reductions or removals (tCO <sub>2</sub> e)
2016	1,147	0	0	1,147
2017	28,475			28,475
2018	3,567	0	0	3,567
Total	33,189	0	0	33,189

## APPENDIX I: CALIBRATION DETAILS

WEG ID No.	HT SC No.	Make	Type	Meter Sl.No.	Accuracy Class	Test 1	Valid till	Test 2	Valid till

H-29	NA	L&T	Main	6760723	0.20%	11-January-2015	11-January-2017	07-January 2017	07-January 2019
		L&T	Check	7041036	0.20%	11-January-2015	11-January-2017	07-January 2017	07-January 2019
H-34	NA	L&T	Main	7041049	0.20%	11-January-2015	11-January-2017	07-January 2017	07-January 2019
		L&T	Check	7041050	0.20%	14-January-2015	14-January-2017	07-January 2017	07-January 2019
K-75	NA	L&T	Main	8001330	0.20%	20-January-2015	20-January-2017	12-January-2017	12-January-2019
		L&T	Check	8001331	0.20%	20-January-2015	20-January-2017	12-January 2017	12-January 2019
K-76	NA	L&T	Main	8001334	0.20%	20-January-2015	20-January-2017	12-January 2017	12-January 2019
		L&T	Check	8001333	0.20%	20-January-2015	20-January-2017	12 -January 2017	12-January 2019
K-342	NA	L&T	Main	7041790	0.20%	04-January-2015	04-January-2017	02-January 2017	02-January 2019
		L&T	Check	7041792	0.20%	04-January-2015	04-January-2017	02-January 2017	02-January 2019
K-345	NA	L&T	Main	7041803	0.20%	15-January-2015	15-January-2017	12-January 2017	12-January 2019
		L&T	Check	7041821	0.20%	15-January-2015	15-January-2017	12-January 2017	12-January 2019
K-346	NA	L&T	Main	7041796	0.20%	21-January-2015	21-January-2017	17-january 2017	17-january 2019
		L&T	Check	7041808	0.20%	21-January-2015	21-January-2017	17-january 2017	17-january 2019
K-347	NA	L&T	Main	7041778	0.20%	24-January-2015	24-January-2017	20-January 2017	20-January 2019

		L&T	Check	8001337	0.20%	24-January-2015	24-January-2017	20-January-2017	20-January-2019
K-350	NA	L&T	Main	7041817	0.20%	22-January-2015	22-January-2017	20-January-2017	20-January-2019
		L&T	Check	7041818	0.20%	22-January-2015	22-January-2017	20-January-2017	20-January-2019
K-69	NA	L&T	Main	7341551	0.20%	20-February-2015	20-February-2017	16-January-2017	16-January-2019
		L&T	Check	7341558	0.20%	20-February-2015	20-February-2017	16-January-2017	16-January-2019
K-70	NA	L&T	Main	7341559	0.20%	20-February-2015	20-February-2017	16-January-2017	16-January-2019
		L&T	Check	7341560	0.20%	20-February-2015	20-February-2017	16-January-2017	16-January-2019
K-71	NA	L&T	Main	7341571	0.20%	20-February-2015	20-February-2017	16-January-2017	16-January-2019
		L&T	Check	7341577	0.20%	20-February-2015	20-February-2017	16-January-2017	16-January-2019