

# WIND POWER PROJECT IN TIRUPUR DISTRICT

Document Prepared By

NSL Wind Power Company (Phoolwadi) Pvt. Ltd

<b>Project Title</b>	Wind Power Project in Tirupur District
<b>Version</b>	03
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<b>Monitoring Period</b>	11/07/2011 to 30//01/2013
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## Table of Contents

1. PROJECT DETAILS
  - 1.1 Summary Description of Project
  - 1.2 Sectoral Scope and Project Type
  - 1.3 Project Proponent
  - 1.4 Other Entities Involved in the Project
  - 1.5 Project Start Date
  - 1.6 Project Crediting Period
  - 1.7 Project Location
  - 1.8 Title and Reference of Methodology
2. IMPLEMENTATION STATUS
  - 2.1 Implementation Status of the Project Activity
  - 2.2 Deviations from the Monitoring Plan
  - 2.3 Grouped Project
3. DATA AND PARAMETERS
  - 3.1 Data and Parameters Available at Validation
  - 3.2 Data and Parameters Monitored
  - 3.3 Description of the Monitoring Plan
4. QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS
  - 4.1 Baseline Emissions
  - 4.2 Project Emissions
  - 4.3 Leakage
  - 4.4 Summary of GHG Emission Reductions and Removals
5. ADDITIONAL INFORMATION

## 1 PROJECT DETAILS

### 1.1 Summary Description of Project

NSL Wind Power Company (Phoolwadi) Pvt. Ltd. has implemented a 49.5 MW wind Power project in Tirupur District in the state of Tamil Nadu. ReGen Powertech Private Limited is the Technology Supplier for this project.

The proposed project activity involves power generation using Wind Energy Converters (WEC) of 1.5 MW capacity each. The purpose of the project activity is to commission and operate 33 WECs to a total capacity of 49.5 MW in the state of Tamil Nadu. The power generated by this project activity has been supplied to Tamil Nadu state electricity grid, which is a part of Southern Grid, India. The project activity will help to reduce the supply demand gap in the state and also helps in contributing to the sustainable development by using wind energy as the source of power generation and reduction of GHG Emission. The first machine has been commissioned on 11/07/2011 and the project is under operation since then. Thus, the start date of operation of project activity is the start date of monitoring period i.e. 11/07/2011 and end date of monitoring period is 30/01/2013 which is a day before the CDM crediting period starts as 31/01/2013. The total emission reduction achieved during this period is 143,512 tonnes of CO<sub>2</sub>.

In the absence of the project activity, the equivalent amount of electricity would have been generated by power plants connected to the southern grid, which is dominated by fossil fuels.

### 1.2 Sectoral Scope and Project Type

**Sectoral Scope** : 01 Energy Industries (renewable-/non-renewable sources)  
**Project Type** : Type I – Renewable Energy Projects  
**Project Category** : ACM 0002 of version 13.0.0

The tools used for the project activity are as follows:

- “Tool to calculate emission factor for an electricity system” – Version 02.2.1 , Approved in EB 63<sup>1</sup>.
- “Tool for the demonstration and assessment of additionality” - Version 06.0.0. Approved in EB 65<sup>2</sup>.
- “Guidance on assessment of investment analysis”- Version 5. Approved in EB 62<sup>3</sup>.

The project activity is not a grouped project.

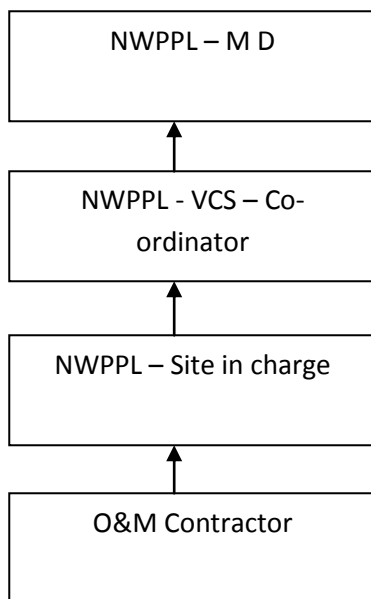
### 1.3 Project Proponent

<sup>1</sup>[http://cdm.unfccc.int/filestorage/Z/U/L/ZULY095DAFBVKQ2IEXSM6HRT7NOG1C/eb63\\_repan19.pdf?t=TIV8bHc3MWQ2fDCJz9hEWk1d5fEgpXWIEBK\\_](http://cdm.unfccc.int/filestorage/Z/U/L/ZULY095DAFBVKQ2IEXSM6HRT7NOG1C/eb63_repan19.pdf?t=TIV8bHc3MWQ2fDCJz9hEWk1d5fEgpXWIEBK_)

<sup>2</sup>[http://cdm.unfccc.int/filestorage/9/A/G/9AGSVUJ4HP731N0DRL8CYF5EXTBZKQ/eb65\\_repan21.pdf?t=NDJ8bHc1MWRwfDB\\_K5g9GNf7yg--IAB8iFg2](http://cdm.unfccc.int/filestorage/9/A/G/9AGSVUJ4HP731N0DRL8CYF5EXTBZKQ/eb65_repan21.pdf?t=NDJ8bHc1MWRwfDB_K5g9GNf7yg--IAB8iFg2)

<sup>3</sup>[http://cdm.unfccc.int/filestorage/O/H/N/OHNFC4T6RUZEQXDL20JVG7MWK35YI1/eb62\\_repan5.pdf?t=eDl8bHc2ZXhyfDBPwToPTqhFjrWImG0aC3Np](http://cdm.unfccc.int/filestorage/O/H/N/OHNFC4T6RUZEQXDL20JVG7MWK35YI1/eb62_repan5.pdf?t=eDl8bHc2ZXhyfDBPwToPTqhFjrWImG0aC3Np)

The organisational structure of this VCS project activity is as follows.



Contact details of the project proponent are as follows:

Organization:	NSL Wind Power Company (Phoolwadi) Pvt. Ltd.
Street/P.O.Box:	Road No. 12, Banjara Hills,
Building:	#8-2-684/2/A, NSL ICON
City:	Hyderabad
State/Region:	Andhra Pradesh
Postcode/ZIP:	500034
Country:	India
Telephone:	040 3051 4444
FAX:	040 2332 7919
E-Mail:	pnr@nslindia.com
URL:	<a href="http://www.nslpower.com/">http://www.nslpower.com/</a>
Represented by:	-
Title:	GM (Finance)
Salutation:	Mr
Last name:	P

Middle name:	-
First name:	Nageswara Rao
Department:	-
Mobile:	-
Direct FAX:	040 2332 7919
Direct tel:	040 3051 4444
Personal e-mail:	pnr@nslindia.com

## 1.4 Other Entities Involved in the Project

There are no other entities involved in this project activity.

## 1.5 Project Start Date

The project start date for this project is said to be 11<sup>th</sup> July 2011. This is the day on which the first machine was commissioned.

## 1.6 Project Crediting Period

The project is registered under Clean Development Mechanism (CDM) of UNFCCC with 10 years crediting period (Reference No: 9538).<sup>4</sup> Crediting period of the project under CDM starts on 31<sup>st</sup> January 2013 and ends on 30<sup>th</sup> January 2023.

The project has begun generating GHG emission reductions from 11<sup>th</sup> July 2011. Hence, monitoring period for VCS begins on 11<sup>th</sup> July 2011 and ends on 30<sup>th</sup> January 2013, since the crediting period under CDM starts on 31<sup>st</sup> January 2013. So, considering the start date of crediting period under VCS is 11<sup>th</sup> July 2011 and renewable once at the end of the first crediting period of 10 years and the same is limited to 10<sup>th</sup> July 2021.. The PP wish to kept has an option to claim carbon credits in any GHG program, but it ensures that there will not be any double counting on carbon credit benefit (VCS/CDM) during the applicable crediting period.

## 1.7 Project Location

The wind power project is located in Tiruppur District, Tamil Nadu State, India. The geo-coordinates of the project location is as follows:

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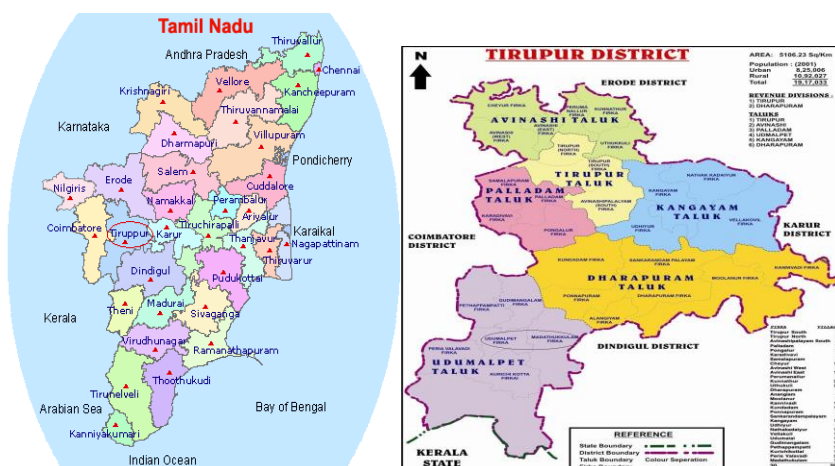
<sup>4</sup> <http://cdm.unfccc.int/Projects/DB/SGS-UKL1359122058.75/view>

Table 1: Geo Co-ordinates of WECs.

S.No	Location No	Village	Latitude	Longitude
1	RKPT 465	Kondampatti	10° 42' 15.391" N	77° 14' 17.901" E
2	RAK 444	Anaikadavu	10° 43' 30.983" N	77° 9' 40.871" E
3	RIN 397	Iluppanagaram	10° 42' 40.834" N	77° 10' 24.108" E
4	RKPT 502	Kondampatti	10° 42' 1.297" N	77° 14' 9.738" E
5	RIN 421	Iluppanagaram	10° 43' 5.674" N	77° 9' 58.754" E
6	RVG 274	Vadugapalayam	10° 41' 36.949" N	77° 13' 48.538" E
7	RSP 68	Somavarapatti	10° 42' 2.215" N	77° 12' 33.058" E
8	RVP 433	Virugalpatti	10° 42' 21.917" N	77° 11' 12.368" E
9	RIN 433	Iluppanagaram	10° 42' 59.917" N	77° 10' 21.744" E
10	RVP 53	Virugalpatti	10° 43' 1.547" N	77° 8' 57.101" E
11	RVG 292	Vadugapalayam	10° 42' 13.301" N	77° 13' 42.751" E
12	RVP 86	Virugalpatti	10° 42' 57.446" N	77° 8' 38.451" E
13	RJKM 17	J.Krishnapuram	10° 48' 34.394" N	77° 14' 27.477" E
14	RJKM 529	J.Krishnapuram	10° 47' 45.572" N	77° 15' 32.568" E
15	RKPI 240	Kammalapatti	10° 49' 41.656" N	77° 14' 57.202" E
16	RKPI 257	Kammalapatti	10° 49' 57.304" N	77° 14' 30.628" E
17	RJKM 593	J.Krishnapuram	10° 48' 25.535" N	77° 14' 46.729" E
18	RSPR 433	Sencheriputhur	10° 48' 20.444" N	77° 15' 28.880" E
19	RJKM 535	J.Krishnapuram	10° 48' 1.713" N	77° 15' 27.621" E
20	RTK 137	Talakkarai	10° 48' 35.987" N	77° 13' 51.881" E
21	RSPR 157	Sencheriputhur	10° 48' 31.749" N	77° 15' 9.055" E
22	RSPR 161	Sencheriputhur	10° 48' 39.607" N	77° 15' 33.334" E
23	RAYM 40	Ayyampalayam	10° 49' 30.720" N	77° 14' 39.941" E
24	RSPR 199	Sencheriputhur	10° 48' 47.367" N	77° 16' 2.089" E
25	RJKM 62	J.Krishnapuram	10° 48' 16.891" N	77° 13' 46.935" E

26	RKTM 366	Kottamangalam	10° 40' 22.112" N	77° 15' 46.576" E
27	RKTM 389	Kottamangalam	10° 40' 11.207" N	77° 15' 6.924" E
28	RKTM 250	Kottamangalam	10° 39' 36.748" N	77° 15' 43.511" E
29	RKTM 540	Kottamangalam	10° 39' 27.480" N	77° 14' 12.494" E
30	RPM 364	Pookulam	10° 38' 2.905" N	77° 13' 56.287" E
31	RPM 331	Pookulam	10° 38' 5.271" N	77° 13' 25.585" E
32	RPM 349	Pookulam	10° 37' 27.713" N	77° 13' 54.617" E
33	RAM 65	Amandakadavu	10° 45' 43.902" N	77° 14' 14.830" E

The location of WECs is shown in the following maps.



## 1.8 Title and Reference of Methodology

The methodology applied for the project is Title: “Consolidated baseline methodology for grid-connected electricity generation from renewable sources” and Reference: ACM 0002 of version 13.0.0.

## 2 IMPLEMENTATION STATUS

### 2.1 Implementation Status of the Project Activity

The project activity has been commissioned & running successfully. As on 31/03/2012, the project participant has completed the commissioning of all the 33 WECs. There have been no events which has affected the GHG emission reductions and monitoring. Overall the project is running successfully. The first WTG has been commissioned on 11/07/2013 which is start date of operation of the project activity. The commissioning details of the project activity are as follows:

S.No	Ht.Sc.No	Village	Commissioning date
1	URA – 41	Vadugapalayam	11.07.2011
2	URA-51	Virugalpatti & Iluppanagaram	18.08.2011
3	URA – 52	Virugalpatti	18.08.2011
4	URA – 53	Virugalpatti	18.08.2011
5	URA – 54	Virugalpatti	18.08.2011
6	URA – 57	Kondampatti	18.08.2011
7	URA – 58	Somavarapatti	18.08.2011
8	URA – 62	Iluppanagaram	23.08.2011
9	URA – 63	Iluppanagaram	23.08.2011
10	URA – 68	Vadugapalayam	17.09.2011
11	URA – 69	Kondampatty	17.09.2011
12	URA – 72	Kottamangalam	23.09.2011
13	URA – 73	Kottamangalam	23.09.2011
14	URA – 74	Kottamangalam	27.09.2011
15	URA – 80	Anaikadavu	29.09.2011
16	URA – 81	Kottamangalam	29.09.2011
17	URA – 88	J.Krishnapuram	30.09.2011
18	URA – 89	Sencheriputhur	30.09.2011
19	URA – 90	Sencheriputhur	30.09.2011
20	URA – 91	J.Krishnapuram	30.09.2011
21	URA - 92	J.Krishnapuram	30.09.2011
22	URA – 93	Thalakkarai	30.09.2011
23	URA – 94	J.Krishnapuram	30.09.2011
24	URA – 95	S.Ayyampalayam	30.09.2011
25	URA – 96	Sencheriputhur	30.09.2011
26	URA – 97	Pukkulam	30.09.2011



27	URA – 98	Pukkulam	30.09.2011
28	URA – 99	Kammalapatti	03.10.2011
29	URA – 105	J.Krishnapuram	08.12.2011
30	URA – 106	Sencheriputhur	08.12.2011
31	URA – 108	Kammalapatti	06.01.2012
32	URA – 109	Pukkulam	27.02.2012
33	URA – 133	Amandakadavu	31.03.2012

The project activity installed WECs of ReGen make V 82 model of 1.5 MW each. The technical details are shown below<sup>5</sup>.

## General Specifications:

WEC Type	: Direct Drive Horizontal Axis Wind Turbines with Variable Rotor speed
Rated Power	: 1500 kW
Rotor Diameter	: 82 m
Number of Blades	: 3 Nos
Hub-Height	: 85 m
Power control system	: Pitch control
Swept Area	: 5258 m <sup>2</sup>

## Wind Conditions:

Cut – in speed	: 3 m/s
Rated Wind speed	: 13 m/s (approximately)
Cut-out Speed	: 22 m/s

## Generator:

Type	: Synchronous, VariableSpeed
Cooling	: Passive Air cooled

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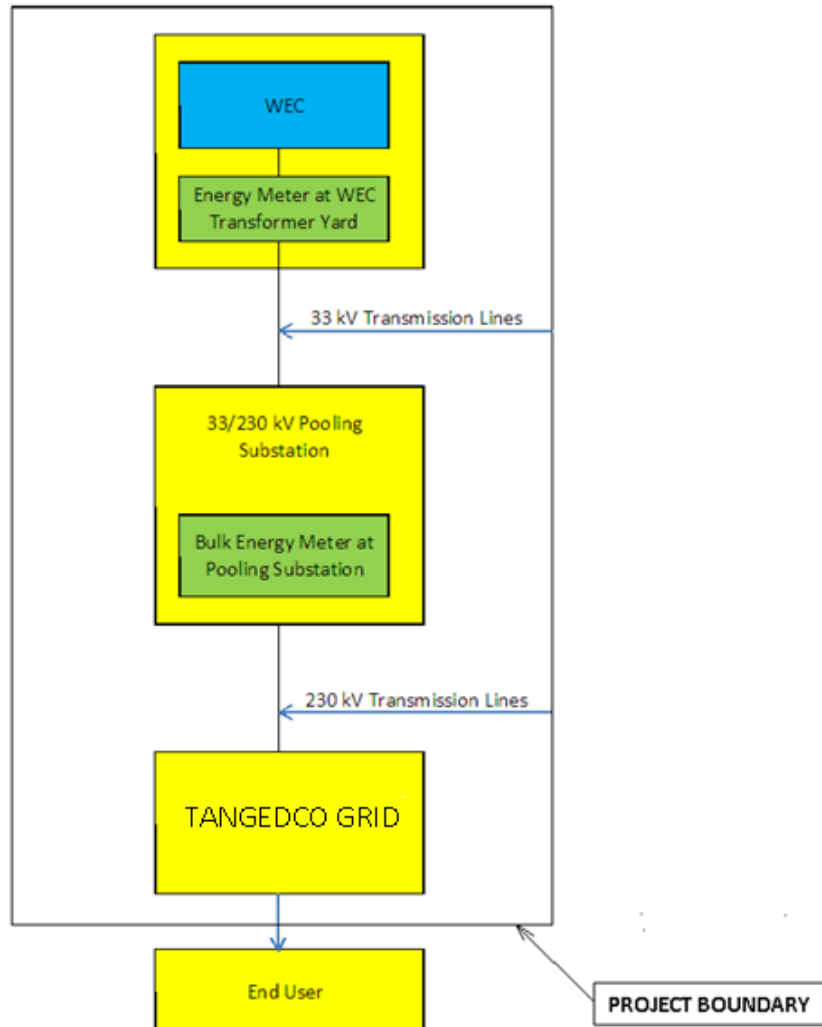
<sup>5</sup> Proposal from the WEC supplier

Excitation : Permanent Magnet

### Braking system:

Primary Brake System : Aerodynamic Brake, Individual full 90 deg. Blade pitch and control for each blade.

The project boundary has been depicted below:



## 2.2 Project Description Deviations

There have been no deviations from the description of the project activity and the monitoring plan.

## 2.3 Grouped Project

Not Applicable, as project is not a group project.

## 3 DATA AND PARAMETERS

### 3.1 Data and Parameters Available at Validation

Data Unit / Parameter:	EF <sub>grid,OMsimple,y</sub>
Data unit:	tCO <sub>2</sub> /MWh
Description:	Operating margin CO <sub>2</sub> emission factor of southern grid
Source of data:	Central Electricity Authority:CO2 Emission Database  CEA CO <sub>2</sub> Baseline database Version 06 dated March 11
Value applied:	0.9677
Purpose of the data:	Baseline Emission calculation
Any comment:	The operating margin emission factor is a 3-year generation-weighted average (2008-11) Data calculated to be 0.9677. The operating Margin is calculated ex ante and fixed during the crediting period.

Data Unit / Parameter:	EF <sub>grid,BM,y</sub>
Data unit:	tCO <sub>2</sub> /MWh
Description:	Build margin CO <sub>2</sub> emission factor of southern grid
Source of data:	Central Electricity Authority:CO2 Emission Database  CEA CO <sub>2</sub> Baseline database Version 06 dated March 11
Value applied:	0.7634
Purpose of the data:	Baseline Emission calculation
Any comment:	The Build Margin would be calculated ex ante and

	fixed during the crediting period. For ex ante calculation the most recent data available has been used and the build margin thus calculated is 0.7634.
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Data Unit / Parameter:	EF <sub>grid,CM,y</sub>
Data unit:	tCO <sub>2</sub> /MWh
Description:	Combined margin CO2 emission factor of southern grid
Source of data:	Central Electricity Authority:CO2 Emission Database  CEA CO2 Baseline database Version 06 dated March 11
Value applied:	0.9167
Purpose of the data:	Baseline emission calculation
Any comment:	The combined margin would be calculated ex-ante and fixed for the entire crediting period and the combined margin thus calculated is 0.9167.

## 3.2 Data and Parameters Monitored

Data Unit / Parameter:	EG <sub>PJ,y</sub>
Data unit:	MWh/year
Description:	Quantity of Net Electricity exported to the grid during the year y.
Source of data:	Monthly energy Statement of TANGEDCO Limited.
Description of measurement methods and procedures to be applied:	Measurement: Net quantity of electricity exported by the project is calculated as the net of sum of export from individual meters, sum of import from individual meters and line losses.  Data Type: Calculated  Archiving Procedure: All the data items monitored under the monitoring plan .  Responsibility: Project Manager of NSL Power

	Company (Phoolwadi) Pvt. Ltd. is responsible for maintain the records.
Frequency of monitoring/recording:	Monthly Recording
Value monitored:	156,553 .36 (Monthly Net electricity exported values have been included in Additional Information section 5 of the MR)
Monitoring equipment:	Not Applicable as Calculated Parameter
QA/QC procedures to be applied:	Net electricity supplied to the grid by the project activity has been cross checked with invoices submitted to TANGEDCO LIMITED.
Calculation method:	Net quantity of electricity exported by the project is calculated as the net of sum of export from individual meters, sum of import from individual meters and line losses
Any comment:	Data is use for baseline emission calculation. All the data items monitored under the monitoring plan will be kept for 2 years after the end of crediting period or till the last issuance of ERs for this project activity, whichever occurs later

Data Unit / Parameter:	$E_{exp}$
Data unit:	MWh
Description:	Electricity exported from the power plant during the year y.
Source of data:	Monthly energy Statement of TANGEDCO Limited.
Description of measurement methods and procedures to be applied:	Electricity exported can be recorded in the energy meter installed by TANGEDCO LIMITED
Frequency of monitoring/recording:	Measuring frequency: Continuous Reading frequency: Daily Recording frequency: Monthly.
Value monitored:	159,978 (Monthly electricity exported values have been included in Additional Information section 5 of the MR)
Monitoring equipment:	Energy meters installed for individual WEC (the details have been provided under section 3.3 of the MR.)

QA/QC procedures to be applied:	<p>The energy meters have to be calibrated at least once in 5 years as per CEA guidelines<sup>6</sup>. On a Conservative basis, the meters will be calibrated at least once in 3 years.</p> <p>All meter were calibrated before installation and the details have been provided under section 3.3 of the MR.</p> <p>Electricity exported has been cross checked with invoices submitted to TANGEDCO LIMITED</p>
Calculation method:	Not Applicable
Any comment:	<p>Data is use for baseline emission calculation.</p> <p>All the data items monitored under the monitoring plan will be kept for 2 years after the end of crediting period or till the last issuance of ERs for this project activity, whichever occurs later</p>

Data Unit / Parameter:	$E_{imp}$
Data unit:	MWh/year
Description:	Electricity imported by the power plant during the year y.
Source of data:	Monthly energy Statement of TANGEDCO Limited.
Description of measurement methods and procedures to be applied:	Electricity imported can be recorded in the energy meter installed by TANGEDCO LIMITED
Frequency of monitoring/recording:	<p>Measuring frequency: Continuous</p> <p>Reading frequency: Daily</p> <p>Recording frequency: Monthly</p>
Value monitored:	210,536 (Monthly electricity Imported values have been included in Additional Information section 5 of the MR)
Monitoring equipment:	Energy meters installed for individual WEC (the details have been provided under section 3.3 of the MR.)

<sup>6</sup> [http://www.cea.nic.in/reports/regulation/meter\\_reg.pdf](http://www.cea.nic.in/reports/regulation/meter_reg.pdf)

QA/QC procedures to be applied:	<p>The energy meters have to be calibrated at least once in 5 years as per CEA guidelines<sup>7</sup>. On a Conservative basis, the meters will be calibrated at least once in 3 years.</p> <p>All meter were calibrated before installation and the details have been provided under section 3.3 of the MR.</p> <p>Electricity imported has been cross checked with invoices submitted to TANGEDCO LIMITED</p>
Calculation method:	Not Applicable.
Any comment:	<p>Data is use for baseline emission calculation.</p> <p>All the data items monitored under the monitoring plan will be kept for 2 years after the end of crediting period or till the last issuance of ERs for this project activity, whichever occurs later</p>

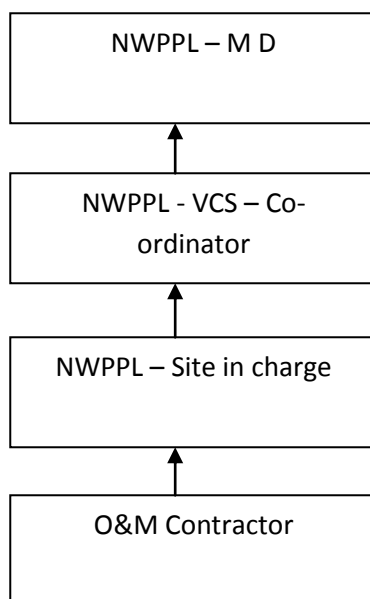
Data Unit / Parameter:	$E_{loss}$
Data unit:	MWh/year
Description:	Line Loss Export from the power plant during the year y.
Source of data:	Monthly energy Statement of TANGEDCO Limited.
Description of measurement methods and procedures to be applied:	Calculated
Frequency of monitoring/recording:	Monthly Recording
Value monitored:	3,214.181 (Monthly line loss values have been included in Additional Information section 5 of the )
Monitoring equipment:	Not Applicable as Calculated Parameter
QA/QC procedures to be applied:	This parameter can be cross checked with invoiced submitted to TANGEDCO LIMITED.
Calculation method:	<p>The line loss export from the power plant has been calculated by multiply the line loss percentage with the Electricity exported from the power.</p> <p>The following formulae will be used for calculation</p>

<sup>7</sup> [http://www.cea.nic.in/reports/regulation/meter\\_reg.pdf](http://www.cea.nic.in/reports/regulation/meter_reg.pdf)

	$E_{loss} = E_{exp} \times \text{Line Loss Percentage (Z\%)}$ <p>Total electricity exported by the WECs (inclusive of other project participants) was measured at the bulk meter located at the substation. The difference between the sum of individual meter readings of export of WECs (inclusive of other project participants connected to the bulk meter) and the electricity export measured at the bulk meter has been used for calculation of Line Loss Percentage (Z%).</p>
Any comment:	<p>Data is use for baseline emission calculation.</p> <p>All the data items monitored under the monitoring plan will be kept for 2 years after the end of crediting period or till the last issuance of ERs for this project activity, whichever occurs later</p>

### 3.3 Description of the Monitoring Plan

The organizational structure of the project activity is as follows.



The project participant has entered into agreement with the WEC Supplier – ReGen Powertech Private Limited for the operation and maintenance of WECs. The WEC supplier has dedicated and technically well-equipped O&M team for day to day Operation and maintenance of each WEC. O&M contractor will provide a monthly report, which includes generation data, major breakdown events and machine availability. Project Manager is responsible for recording of monthly power export and import data. Monthly power export and import data is been sent regularly to CDM coordinator of NSL power Company (Phoolwadi) Pvt. Ltd. As the operation and



maintenance of the WECs have been outsourced to the technology supplier, ReGen Powertech Private Limited has trained the O&M personnel involved in the site periodically.

The Operation & Maintenance of the project is being done by ReGen Powertech Private Limited. As per the monitoring plan, the electricity exported to the TANGEDCO Limited grid through the project activity and the electricity imported from the TANGEDCO LIMITED grid is been monitored. The metering system comprises of a main and check meter at each WEC transformer yard that measure export and import of electricity. The energy meters are sealed by the representatives of TANGEDCO Limited. The O&M personnel are responsible for recording the generation data from each WEC on daily basis at the site. This is done through a Central Monitoring System (CMS) available at the project site. Monthly readings of energy meters are recorded by the officials from TANGEDCO (Tamil Nadu Generation and Distribution Corporation) Limited and the statement of TANGEDCO will be submitted to the project participant.

Export and Import readings recorded at main meter are considered for billing purpose and estimation of emission reductions. In case of failure of main meter, readings of check meter are used. A bulk meter consisting of main meter and check meter are installed at the nearby pooling substation to measure total quantity of electricity exported and imported for the project activity. The difference between the sum of individual meters reading and the bulk meter reading is the basis for the calculation of line loss percentage (Z %). Net quantity of electricity exported by the project is calculated based on the net of sum of export from individual meters (E,exp), sum of import from individual meters (E,imp) and line losses export from individual WEC (E,loss). These readings are further used for billing purposes and the same will be used for the calculation of the emission reductions.

The energy meters are tested and calibrated atleast once in three years. The testing and calibration of the meter are conducted by the officials of TANGEDCO LIMITED or its authorized agencies and the results and correction so arrived will be applicable and binding on both the parties. During the test calibration, if there are errors beyond permissible limit, the bills shall be revised for the previous three months or for the exact period if known and agreed upon by both the parties, by applying correction as determined by the meter testing wing of the state transmission utility / distribution licensee to the consumption registered by the meters with lesser error.

All the data items monitored under the monitoring plan will be kept for 2 years after the end of crediting period or till the last issuance of ERs for this project activity, whichever occurs later.

Calibration details of energy meters are shown below:

S.No	Ht.Sc.No	Energy Meter Make	Accuracy class	Calibration details
1	URA 41	Wallby	0.2s	03.11.2011
2	URA-51	Wallaby	0.2s	18.08.2011
3	URA – 52	Wallaby	0.2s	18.08.2011

4	URA – 53	Wallaby	0.2s	18.08.2011
5	URA – 54	Wallaby	0.2s	18.08.2011
6	URA – 57	Wallaby	0.2s	18.08.2011
7	URA – 58	Wallaby	0.2s	18.08.2011
8	URA – 62	Wallaby	0.2s	23.08.2011
9	URA – 63	Wallaby	0.2s	23.08.2011
10	URA – 68	Wallaby	0.2s	17.09.2011
11	URA – 69	Wallaby	0.2s	17.09.2011
12	URA – 72	Wallaby	0.2s	23.09.2011
13	URA – 73	Wallaby	0.2s	23.09.2011
14	URA – 74	Wallaby	0.2s	27.09.2011
15	URA – 80	Wallaby	0.2s	29.09.2011
16	URA – 81	Wallaby	0.2s	29.09.2011
17	URA – 88	Wallaby	0.2s	30.09.2011
18	URA – 89	Wallaby	0.2s	30.09.2011
19	URA – 90	Wallaby	0.2s	30.09.2011
20	URA – 91	Wallaby	0.2s	30.09.2011
21	URA - 92	Wallaby	0.2s	30.09.2011
22	URA – 93	Wallaby	0.2s	30.09.2011
23	URA – 94	Wallaby	0.2s	30.09.2011
24	URA – 95	Wallaby	0.2s	30.09.2011
25	URA – 96	Wallaby	0.2s	30.09.2011
26	URA – 97	Wallaby	0.2s	30.09.2011
27	URA – 98	Wallaby	0.2s	30.09.2011
28	URA – 99	Wallaby	0.2s	03.10.2011
29	URA – 105	Wallaby	0.2s	08.12.2011
30	URA – 106	Wallaby	0.2s	08.12.2011

31	URA – 108	Wallaby	0.2s	06.01.2012
32	URA – 109	Wallaby	0.2s	27.02.2012
33	URA – 133	Wallaby	0.2s	31.03.2012

The energy meter for machine WF HTSC no: URA 41 was replaced on 03/11/2011 which is also calibration date and the details of both the meters are shown below:

Details	Old Meter	New Meter
Make	Secure	Wallby
Type	E3V055	MK6E
Sl.No	TN9 01182	HT2 110752
Class	0.5s	0.2s

Since, the first meter (TN9 01182) with accuracy class 5s was used for 1<sup>st</sup> WEC (URA 41) from 11/07/2011 to 03/11/2011 and the accuracy class is not as per monitoring plan (i.e. class 2s). This meter was replaced with new meter (HT2 110752) on 03/11/2011. In order to compensate the accuracy class, the PP has applied the 0.5% reduction in the export value and 0.5% increase in import value for Billing Month from August 2011 to December 2011 for WEC (URA 41), so are reduced by 0.5%, so the emission reductions calculated conservatively.

## 4 QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS

### 4.1 Baseline Emissions

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

$$BE_y = EG_{PJ,y} * EF_{CO_2,grid,y}$$

Where:

$BE_y$  :Baseline Emissions in year y; t CO<sub>2</sub>

$EG_{PJ,y}$  :Energy baseline in year y; MWh

$EF_{CO_2}$  :Emission Factor in year y; t CO<sub>2</sub>e/MWh

As per the registered PDD, combined margin emission factor is 0.9167 tCO<sub>2</sub> /MWh. Hence the baseline emissions for the project activity for the current monitoring period are as follows.

$$BE_y = EG_{BL,y} * EF_{CO_2} = 156,553 * 0.9167 = 143,512 \text{ tCO}_2.$$

### 4.2 Project Emissions

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

## 4.3 Leakage

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

## 4.4 Summary of GHG Emission Reductions and Removals

Item	Baseline emissions or baseline net GHG removals by sinks (t CO <sub>2</sub> e)	Project emissions or actual net GHG removals by sinks (t CO <sub>2</sub> e)	Leakage (t CO <sub>2</sub> e)	Emission reductions or net anthropogenic GHG removals by sinks (t CO <sub>2</sub> e)
Total	143,512	0	0	143,512

## 5 ADDITIONAL INFORMATION

Month on Month generation and emission reductions achieved during this monitoring period are shown below<sup>8</sup>.

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<sup>8</sup> For every billing, the initial and final reading will be noted on 8<sup>th</sup> of every month at 12:00 hours. Hence, the end date of previous month billing period and the start date of next billing period are same. For eg, for may month billing period the energy exported by the project activity will be measured till 08/05/2012 at 12:00 hrs and the next billing period for June month starts on 08/05/2012 at 12:00 hrs.

Poolavadi Net Export Values towards Verified Emission Reductions (11/07/2011 to 30/01/2013)										
Month	Period (DD.MM.YY)	E <sub>exp</sub> (Electricity exported from the power plant during the year y.) (MWh)	E <sub>imp</sub> (Electricity imported by the power plant during the year y.) (MWh)	E <sub>loss</sub> (Line Loss Export from the power plant during the year y. ) (MWh)	EGP <sub>J,y</sub> (Quantity of Net Electricity exported to the grid during the year y. )(MWh)	Baseline Emission Factor (tCO2/MWh)	Baseline emissions (tCO2)	Project emission s (tCO2)	Leakage emissions (tCO2)	Emission Reductions (tCO2)
Aug-11	11.07.11 to 06.08.11	582	0.241	22.103	559.324	0.9167	513	0	0	513
Sep-11	06.08.11 to 06.09.11	2,808	1.440	37.633	2,769.349	0.9167	2,539	0	0	2,539
Oct-11	06.09.11 to 08.10.11	6,294	4.320	89.371	6,200.048	0.9167	5,684	0	0	5,684
Nov-11	08.10.11 to 08.11.11	1,720	27.005	89.458	1,603.890	0.9167	1,470	0	0	1,470
Dec-11	08.11.11 to 08.12.11	1,821	18.840	30.596	1,771.732	0.9167	1,624	0	0	1,624
Jan-12	08.12.11 to 09.01.12	2,408	12.408	24.318	2,371.026	0.9167	2,174	0	0	2,174
Feb-12	09.01.12 to 09.02.12	2,552	12.696	36.488	2,502.424	0.9167	2,294	0	0	2,294
Mar-12	09.02.12 to 08.03.12	3,764	15.504	117.824	3,631.024	0.9167	3,329	0	0	3,329
Apr-12	08.03.12 to 09.04.12	4,688	25.776	44.071	4,618.577	0.9167	4,234	0	0	4,234
May-12	09.04.12 to 08.05.12	9,484	16.632	254.160	9,212.784	0.9167	8,445	0	0	8,445
Jun-12	08.05.12 to 07.06.12	20,636	4.752	553.050	20,078.404	0.9167	18,406	0	0	18,406
Jul-12	07.06.12 to 09.07.12	24,160	3.360	553.269	23,603.571	0.9167	21,637	0	0	21,637
Aug-12	09.07.12 to 07.08.12	24,146	2.544	507.064	23,636.312	0.9167	21,667	0	0	21,667
Sep-12	07.08.12 to 07.09.12	24,588	1.320	454.873	24,131.543	0.9167	22,121	0	0	22,121
Oct-12	07.09.12 to 08.10.12	20,205	3.336	264.687	19,937.097	0.9167	18,276	0	0	18,276
Nov-12	08.10.12 to 07.11.12	2,589	14.304	43.489	2,530.823	0.9167	2,320	0	0	2,320
Dec-12	07.11.12 to 07.12.12	2,036	21.432	40.721	1,973.887	0.9167	1,809	0	0	1,809
Jan-13	07.12.12 to 07.01.13	3,005	15.240	24.344	2,965.888	0.9167	2,719	0	0	2,719
Feb-13	08.01.13 to 30.01.13	2,492	9.384774194	26.661	2,455.654	0.9167	2,251			2,251
Total		1,59,978	210.536	3,214.181	1,56,553.36		1,43,512	0	0	1,43,512
Note:										
1 Month column mentioned the billing month eg. Aug-11 for billing cycle 11.07.11 to 06.08.11. Because , the JMR is prepared in Aug-11.										
2 For Month Feb-13 : the value for period 08.01.13 to 30.01.2013 (22 days) is obtained from monthly value of Feb-13 (31 days) by apply factor multiplication of 22/31 days.										

