

## **4.5 MW Bundled Wind Power Project**

### **Monitoring Report**

**Monitoring period: 15 April 2006 – 16 September 2008**

**Version 3.0**

**09/04/2010**



**VVD and Sons Private Limited**

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## **1. Project Description**

The project activity is promoted by VVD and Sons Private Limited which consists of 6 WEGs of capacity 0.75 MW each accounting to a total capacity of 4.5 MW. The emission reductions from the project over the crediting period of 10 years would be around 88,200 tonnes of CO<sub>2</sub> equivalent (tCO<sub>2</sub>e). The project is a 'Grid connected Renewable Electricity Generation' project that falls under the Scope -1 of Sectoral scope: Energy Industries (renewable-/non-renewable sources)<sup>1</sup>. The methodology applied is the UNFCCC CDM methodology prescribed by VCS board namely AMS I.D, Version 14. The capacity of project activity is less than the 15 MW threshold limit for type 1 projects as specified in Appendix B of the simplified modalities and procedures for small-scale CDM project activities.

The purpose of the project proponent in promoting this project is to generate electricity through tapping clean and renewable wind energy, available in the state of Tamil Nadu which is power deficit and cater the state electricity demand during peak energy requirements period. The project activity is located in Tirunelveli district of Tamil Nadu, India. Locations of all WEGs are given in Annex 2 to this report. The energy generated is exported to the TNEB.

The monitoring period covered in this monitoring report is from 15 April, 2006 to 16 September, 2008.

## **2. Baseline Information**

The baseline for the project activity is the generation of electricity in existing power plants connected to the Southern Grid (SG) of India. In accordance with paragraph 9 of AMS I.D. version 14, the baseline is the kWh produced by the renewable energy generating unit multiplied by the emission coefficient, determined as either the combined margin or the weighted average emissions of the current generation mix. For the project activity, the emission coefficient is determined as the combined margin (CM) for the Southern Grid, consisting of both the operating margin (OM) and build margin (BM), according to procedures prescribed in the "Tool to calculate emission factor for an electricity system". In accordance with paragraph 9 of

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<sup>1</sup><http://cdm.unfccc.int/DOE/scopes.html>

AMS I.D. version 14, the baseline is the kWh produced by the renewable generating unit multiplied by an emission coefficient (measured in kg CO<sub>2</sub> / kWh) determined. As explained in the PD, the emission factor was determined using the combined margin method for the Southern Grid.

### Calculation of Combined Margin emission factor

The combined margin will be calculated as follows:

$$EF_{grid,CM,y} = EF_{grid,OM,y} \times W_{OM} + EF_{grid,BM,y} \times W_{BM}$$

Where,

$EF_{grid,BM,y}$	=	Build margin CO <sub>2</sub> emission factor in year y (tCO <sub>2</sub> /MWh)
$EF_{grid,OM,y}$	=	Operating margin CO <sub>2</sub> emission factor in year y (tCO <sub>2</sub> /MWh)
$W_{OM}$	=	Weighting of operating margin emissions factor (%)
$W_{BM}$	=	Weighting of build margin emissions factor (%)

As per the Version 1.1 of "Tool to calculate the emission factor for an electricity system", the default values to be used for Wind Power projects are

$$W_{OM} = 0.75$$

$$W_{BM} = 0.25$$

Hence, the Combined margin Co<sub>2</sub> Emission Factor is calculated as below:

$$EF_{Grid,CM} = W_{OM} * OM + W_{BM} * BM$$

$$= 0.75 * 0.998157296 + 0.25 * 0.71331778$$

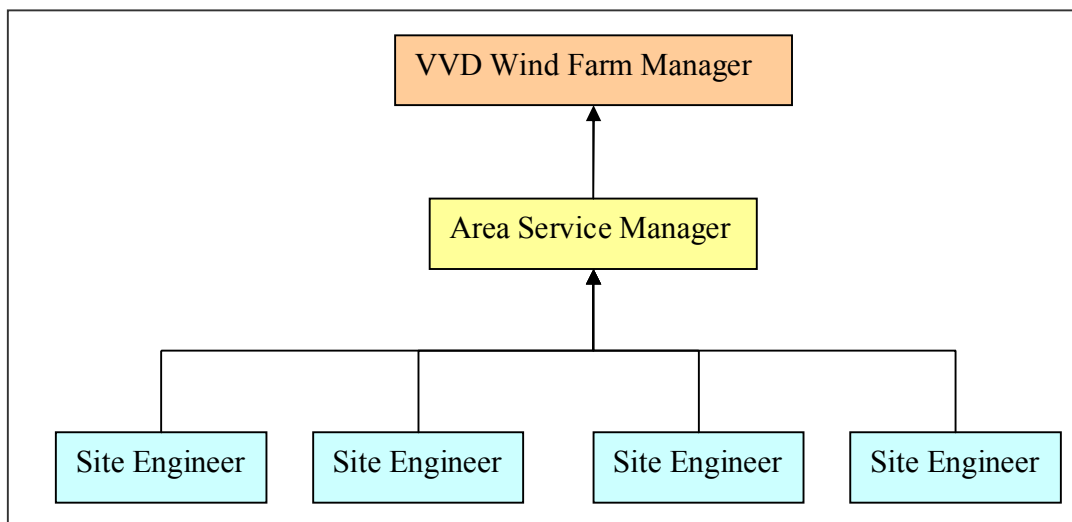
$$= 0.92694742 \text{ tCO}_2/\text{MWh}$$

Therefore, the baseline is the kWh produced by the renewable wind power generating unit multiplied by 0.92694742 tCO<sub>2</sub>/MWh calculated in a transparent and conservative manner.

### 3. Monitoring Information

The project promoters have entered into an agreement with the WEG Supplier (M/s. Vestas Wind Technology Limited) for operation and maintenance of their six WEGs for a period of five years and will be renewed at the end of every contract. The WEG supplier has a dedicated and technically well equipped team to take care of the regular operation and maintenance of each WEG. The project promoter has appointed a wind farm manager to supervise the activities of operation and maintenance team.

The diagram below illustrates the operational management of the CDM team of VVD.



#### Roles & responsibilities:

Site Engineer:

*Role:* Monitors the WEGs at the site.

*Responsibility:*

- Reports to ASM on working condition of the WEG and the TNEB energy meter.

Area Service Operator:

*Role:* Manages the wind farm data of each machine

*Responsibility:*

- Replacement of TNEB energy meter in case of failure.
- Identifies the WEGs which are not working and escalating it to the wind farm manager.
- Uploads the generation data in their (WEG Supplier) respective website to make the same available for the PP.

VVD Wind Farm Manager:

*Role:* Manages the wind farm data and raises the invoice.

*Responsibility:*

- Verifies the monitoring data submitted by the O&M team and TNEB energy meter data.
- In case of any discrepancies between them, then the he escalate it to VVD's management.

**Parameters monitored and detailed monitoring procedures:**

<b>Data / Parameter:</b>	<b>E<sub>Gen</sub></b>
Data unit:	kWh
Description:	Net Electricity Generated
Source of data to be used:	Energy Meter
Value of data applied for the purpose of calculating expected emission reductions	178,50,586 kWh
Description of measurement methods and procedures to be applied:	The net electricity generated is the net electricity pumped into the southern grid. This parameter is calculated using measured exported and imported electricity parameters.

QA/QC procedures to be applied:	<p>Calibration: As per CEA metering regulations, EB meters are to be calibrated once in every five years. However, the prevailing practice with respect to Calibration of energy meters in the region is once in two years. All EB meters were calibrated by TNEB during the monitoring period and found to be operating in the required accuracy range. The metering equipment shall be maintained in accordance with Central Electricity Authority (CEA) standards<sup>2</sup>. All the meters shall be calibrated with reference to a portable standard meter of class 0.2.</p> <p>Calibration of the meters were carried out on the following dates:</p> <table border="1"> <thead> <tr> <th>HTSC.No</th> <th>Sl. No.</th> <th>Fixed on</th> <th colspan="2">Periodical test on</th> </tr> </thead> <tbody> <tr> <td>1608</td> <td>4804346</td> <td>16.03.06</td> <td>05.01.08</td> <td></td> </tr> <tr> <td>1690</td> <td>4726597</td> <td>26.03.06</td> <td>24.07.08</td> <td></td> </tr> <tr> <td>2122</td> <td>4863823</td> <td>28.12.06</td> <td>14.10.08</td> <td></td> </tr> <tr> <td rowspan="2">2123<sup>3</sup></td> <td>4863658</td> <td>28.12.06</td> <td>14.10.08</td> <td></td> </tr> <tr> <td>4962009</td> <td>20.02.09</td> <td>20.02.09</td> <td></td> </tr> <tr> <td>2227</td> <td>4880999</td> <td>26.03.07</td> <td>1.08.08</td> <td>23.12.08</td> </tr> <tr> <td>2245</td> <td>4880996</td> <td>27.03.07</td> <td>29.06.07</td> <td>17.12.08</td> </tr> </tbody> </table>	HTSC.No	Sl. No.	Fixed on	Periodical test on		1608	4804346	16.03.06	05.01.08		1690	4726597	26.03.06	24.07.08		2122	4863823	28.12.06	14.10.08		2123 <sup>3</sup>	4863658	28.12.06	14.10.08		4962009	20.02.09	20.02.09		2227	4880999	26.03.07	1.08.08	23.12.08	2245	4880996	27.03.07	29.06.07	17.12.08
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2245	4880996	27.03.07	29.06.07	17.12.08																																				
Any comment:	$E_{Gen} = E_{Exp} - E_{Imp}$																																							

<b>Data Parameter:</b>	<b>E<sub>Imp</sub></b>
Data unit:	kWh
Description:	Electricity Imported
Source of data to be used:	Energy Meter
Value of data applied for the purpose of calculating	76,629 kWh

<sup>2</sup> [http://www.cea.nic.in/e&c/regulations/notified\\_regulations/Metering\\_Regulations.pdf](http://www.cea.nic.in/e&c/regulations/notified_regulations/Metering_Regulations.pdf)

<sup>3</sup> Note during this period there was a fault which resulted in replacement of the meter.

expected emission reductions	
Description of measurement methods and procedures to be applied:	This parameter is monitored and measured using TNEB energy meter installed by the government of Tamil Nadu in the transformer yard. The meter reading is noted down once in a month by the TNEB personnel in the presence of the O&M personnel. The PP will raise an invoice to the TNEB called as form B for the supply based on the generation report provided.
QA/QC procedures to be applied:	<p>Calibration: Refer E<sub>Gen</sub> Table</p> <p>Reporting: On a daily basis, a compilation of the energy data from each WEG controller panel is uploaded on the O&amp;M Contractor's website. This data is accessible to the Manager-Wind at the project promoter's administration office. The Manager-Wind takes regular print-outs of the daily reports from the website and archives the same. A monthly consolidated report of the WEG controller data will be uploaded at the end of each month this report is archived along with the TNEB's monthly report. The Manager-Wind forwards the monthly reports, bills in paper to the Director for review and approval.</p> <p>Data Archiving: Once the monthly reports are approved by the Director, they are archived in paper at the respective administrative office by the Manager- Wind. Electronic copies of monthly reports are archived by the Manager-Wind.</p>
Any comment:	Data monitored is to be kept for two years after the end of the crediting period or the last issuance of VCUs for the project whichever occurs later

<b>Data Parameter:</b>	<b>E<sub>Exp</sub></b>
Data unit:	kWh
Description:	Electricity Exported
Source of data to be used:	Energy Meter
Value of data applied for the purpose of calculating expected emission reductions	179,27,215 kWh
Description of measurement methods and procedures to be applied:	This parameter is monitored and measured using TNEB energy meter installed by the government of Tamil Nadu in the transformer yard. The meter reading is noted down once in a month by the TNEB personnel in the presence of the O&M personnel. The PP will raise an invoice to the TNEB called as form B for the supply based on the generation report provided.
QA/QC procedures to be applied:	<p>Calibration: Refer E<sub>Gen</sub> Table</p> <p>Reporting: On a daily basis, a compilation of the energy data from each WEG controller panel is uploaded on the O&amp;M Contractor's website. This data is accessible to the Manager-Wind at the project promoter's administration office. The Manager-Wind takes regular print-outs of the daily reports from the website and archives the same. A monthly consolidated report of the WEG controller data will be uploaded at the end of each month this report is archived along with the TNEB's monthly report. The Manager-Wind forwards the monthly reports, bills in paper to the Director for review and approval.</p>

	<p>Data Archiving: Once the monthly reports are approved by the Director, they are archived in paper at the respective administrative office by the Manager- Wind. Electronic copies of monthly reports are archived by the Manager-Wind.</p>
Any comment:	<p>Data monitored is to be kept for two years after the end of the crediting period or the last issuance of VCUs for the project whichever occurs later</p>

#### 4. Emission Reductions

The generated electricity from the project activity is being exported to Tamil Nadu Electricity Board which is a component of the Southern Grid of India. The emission factor for baseline emissions was computed from the operating margin emission factor and build margin emission factor for the Southern grid. The baseline emission factor was determined to be 0.92694742 tCO<sub>2</sub>e/MWh (refer to PD). Since the calibration of the energy meter HTSC No. 1690 has been delayed, as per the guidelines EB 52 annex 60 "Guidelines for assessing compliance with the calibration frequency requirements" the data of HTSC 1690 is revised with the accuracy class of the corresponding energy meter. Since the calibration report states no error, as per the guidelines para 4 (a) the maximum permissible error (accuracy class) of the energy meter is applied to the delayed period (March 25, 2008 to July 23, 2008). The power data ( $E_{Exp}$  &  $E_{Imp}$ ) between the period March 20, 2008 and August 13, 2008 (*The starting date of monitoring of the April month is on March 20, 2008 and ending of the August month is on August 13, 2008. So conservatively though the dates lie in the calibrated period PP applied the correction as per the EB 52, annex 60 para 4(a) is updated with the standard error of the respective measuring meters in the following manner*

$$\text{Import} = \text{Import} + (\text{Accuracy class of energy meter} * \text{Import})$$

$$\text{Export} = \text{Export} - (\text{Accuracy class of energy meter} * \text{Export})$$

The cumulative net electricity generated after the above stated correction by the project from 15 April, 2006 to 16 September, 2008 amounted to 178,50,586 kWh. Correspondingly, the emission reductions are **16,546** tonnes of CO<sub>2</sub> equivalent. Month-wise WEG specific electricity generation data is given in Annex 1. Additionally, the excel sheet containing data for all the energy meter readings corresponding to export and import of electricity from each WEG, and supporting TNEB electricity generation statements have been submitted to the DOE for verification.

Calculation of emission reductions (ER):

$$ER_y = BE_y = (EG_y \times EF_y)$$

Where

$ER_y$  = Emission reductions in year y in tCO<sub>2</sub>e

$BE_y$  = Baseline emissions in year  $y$  in  $tCO_2e$   
 $EG_y$  = Net electricity generated in year  $y$  in MWh  
 $EF_y$  = Baseline emission factor in  $tCO_2e / MWh$

For the monitoring period, emission reductions are calculated as:

$$ER = 178,50,586 \text{ kWh} \times 0.92694742 \text{ tCO}_2e/MWh = \mathbf{16,546} \text{ tCO}_2e$$

## Annex 1

### Monitoring Data

HTSC No.	1608			
Month TNEB Statement Issued	Corresponding Period of Generation	Gross Export (kWh)	Import (kWh)	Net Export (kWh)
May - 06	15 April 2006 - 18 May 2006	167964	588	167376
June - 06	18 May 2006 - 15 June 2006	271212	24	271188
July-06	15 June 2006 - 15 July 2006	274620	48	274572
August-06	15 July 2006 - 17 August 2006	359172	48	359124
September-06	17 August 2006 - 16 September 2006	146952	228	146724
October - 06	16 September 2006 - 16 October 2006	207276	228	207048
November-06	16 October 2006 - 13 November 2006	6876	1284	5592
December-06	13 November 2006 - 13 December 2006	11052	1200	9852
January-07	13 December 2006 - 12 January 2007	14340	1308	13032
February-07	12 January 2007 - 12 February 2007	11232	1428	9804
March-07	12 February 2007 - 12 March 2007	17304	1284	16020
April-07	12 March 2007 - 11 April 2007	10500	1740	8760
May-07	11 April 2007 - 12 May 2007	86904	1068	85836
June-07	12 May 2007 - 13 June 2007	284364	180	284184
July-07	13 June 2007 - 13 July 2007	241044	48	240996
August-07	13 July 2007 - 13 August 2007	258972	60	258912
September-07	13 August 2007 - 13 September 2007	210708	180	210528

October - 07	13 September 2007 - 11 October 2007	170292	120	170172
November-07	11 October 2007 - 12 November 2007	34032	1704	32328
December-07	12 November 2007 -10 December 2007	5256	720	4536
January-08	10 December 2007- 10 January 2008	2856	708	2148
February-08	10 January 2008 - 11 February 2008	3612	660	2952
March-08	11 February 2008 - 20 March 2008	5820	540	5280
April-08	20 March 2008 - 20 April 2008	19800	948	18852
May-08	20 April 2008 - 14 May 2008	179076	156	178920
June-08	14 May 2008 - 14 June 2008	281700	36	281664
July-08	14 June 2008 - 14 July 2008	255204	12	255192
August-08	14 July 2008 - 13 August 2008	268260	36	268224
September-08	13 August 2008 - 13 September 2008	190716	168	190548
<b>TOTAL</b>	<b>15 April 2006 - 13 September 2008</b>	<b>3997116</b>	<b>16752</b>	<b>3980364</b>

<b>HTSC No.</b>	<b>1690</b>			
<b>Month TNEB Statement Issued</b>	<b>Corresponding Period of Generation</b>	<b>Gross Export (kWh)</b>	<b>Import (kWh)</b>	<b>Net Export (kWh)</b>
May - 06	15 April 2006 - 20 May 2006	117720	1236	116484
June - 06	20 May 2006 - 17 June 2006	282468	240	282228
July-06	17 June 2006 - 17 July 2006	323976	84	323892
August-06	17 July 2006 - 18 August 2006	332448	24	332424
September-06	18 August 2006 - 16 September 2006	207132	396	206736
October - 06	16 September 2006 -	248820	492	248328

	15 October 2006			
November-06	15 October 2006 - 13 November 2006	5148	1476	3672
December-06	13 November 2006 - 13 December 2006	10272	2280	7992
January-07	13 December 2006 - 11 January 2007	9216	1536	7680
February-07	11 January 2007 - 12 February 2007	8184	1776	6408
March-07	12 February 2007 - 12 March 2007	13284	1488	11796
April-07	12 March 2007 - 11 April 2007	8988	1944	7044
May-07	11 April 2007 - 12 May 2007	78108	1116	76992
June-07	12 May 2007 - 14 June 2007	306840	216	306624
July-07	14 June 2007 - 12 July 2007	230280	84	230196
August-07	12 July 2007 - 13 August 2007	258936	60	258876
September-07	13 August 2007 - 13 September 2007	215496	252	215244
October - 07	13 September 2007 - 10 October 2007	179340	120	179220
November-07	10 October 2007 - 11 November 2007	34368	2088	32280
December-07	11 November 2007 - 10 December 2007	4224	996	3228
January-08	10 December 2007- 10 January 2008	6060	780	5280
February-08	10 January 2008 - 11 February 2008	900	276	624
March-08	11 February 2008 - 20 March 2008	4824	792	4032
April-08	20 March 2008 - 20 April 2008	19653	771	18881
May-08	20 April 2008 - 14 May 2008	187493	205	187288
June-08	14 May 2008 - 14 June 2008	214824	48	214776
July-08	14 June 2008 - 14 July 2008	257844	36	257808

August-08	14 July 2008 - 13 August 2008	274620	36	274583
September-08	13 August 2008 - 13 September 2008	193452	204	193248
<b>TOTAL</b>	<b>15 April 2006 - 13 September 2008</b>	<b>4034919</b>	<b>21053</b>	<b>4013866</b>

HTSC No.	2122			
Month TNEB Statement Issued	Corresponding Period of Generation	Gross Export (kWh)	Import (kWh)	Net Export (kWh)
January-07	28 December 2006 - 11 January 2007	7440	456	6984
February-07	11 January 2007 - 12 February 2007	14544	1080	13464
March-07	12 February 2007 - 12 March 2007	19548	1152	18396
April-07	12 March 2007 - 16 April 2007	13404	1380	12024
May-07	16 April 2007 - 14 May 2007	102456	468	101988
June-07	14 May 2007 - 13 June 2007	202848	216	202632
July-07	13 June 2007 - 12 July 2007	198840	120	198720
August-07	12 July 2007 - 15 August 2007	237840	84	237756
September-07	15 August 2007 - 14 September 2007	194484	180	194304
October - 07	14 September 2007 - 11 October 2007	161052	144	160908
November-07	11 October 2007 - 12 November 2007	40488	1428	39060
December-07	12 November 2007 - 11 December 2007	6696	456	6240
January-08	11 December 2007- 12 January 2008	6516	252	6264
February-08	12 January 2008 - 12 February 2008	4020	432	3588
March-08	12 February 2008 - 20 March 2008	8412	336	8076
April-08	20 March 2008 -	15900	576	15324

	15 April 2008			
May-08	15 April 2008 - 15 May 2008	181500	168	181332
June-08	15 May 2008 - 15 June 2008	307320	48	307272
July-08	15 June 2008 - 15 July 2008	277104	60	277044
August-08	15 July 2008 - 15 August 2008	279708	48	279660
September-08	15 August 2008 - 16 September 2008	208884	192	208692
<b>TOTAL</b>	<b>28 December 2006 - 16 September 2008</b>	<b>2663724</b>	<b>9588</b>	<b>2654136</b>

<b>HTSC No.</b>	<b>2123</b>			
<b>Month TNEB Statement Issued</b>	<b>Corresponding Period of Generation</b>	<b>Gross Export (kWh)</b>	<b>Import (kWh)</b>	<b>Net Export (kWh)</b>
January-07	28 December 2006 - 11 January 2007	7068	564	6504
February-07	11 January 2007 - 12 February 2007	11508	2160	9348
March-07	12 February 2007 - 12 March 2007	18360	1740	16620
April-07	12 March 2007 - 16 April 2007	12036	2136	9900
May-07	16 April 2007 - 14 May 2007	99108	768	98340
June-07	14 May 2007 - 13 June 2007	189636	300	189336
July-07	13 June 2007 - 12 July 2007	187188	108	187080
August-07	12 July 2007 - 15 August 2007	226440	108	226332
September-07	15 August 2007 - 14 September 2007	191352	264	191088
October - 07	14 September 2007 - 11 October 2007	150924	168	150756
November-07	11 October 2007 - 12 November 2007	36600	1620	34980
December-07	12 November 2007 - 11 December 2007	5832	744	5088

January-08	11 December 2007- 12 January 2008	5316	552	4764
February-08	12 January 2008 - 12 February 2008	3600	660	2940
March-08	12 February 2008 - 20 March 2008	7728	456	7272
April-08	20 March 2008 - 15 April 2008	15588	900	14688
May-08	15 April 2008 - 15 May 2008	116604	276	116328
June-08	15 May 2008 - 15 June 2008	284160	36	284124
July-08	15 June 2008 - 15 July 2008	267912	36	267876
August-08	15 July 2008 - 15 August 2008	272568	36	272532
September-08	15 August 2008 - 16 September 2008	206700	180	206520
<b>TOTAL</b>	<b>28 December 2006 - 16 September 2008</b>	<b>2316228</b>	<b>13812</b>	<b>2302416</b>

HTSC No.	<b>2227</b>			
Month TNEB Statement Issued	Corresponding Period of Generation	Gross Export (kWh)	Import (kWh)	Net Export (kWh)
April-07	26 March 2007 - 16 April 2007	5832	1116	4716
May-07	16 April 2007 - 14 May 2007	102900	744	102156
June-07	14 May 2007 - 13 June 2007	192312	276	192036
July-07	13 June 2007 - 12 July 2007	184776	156	184620
August-07	12 July 2007 - 15 August 2007	228120	72	228048
September-07	15 August 2007 - 14 September 2007	193536	228	193308
October - 07	14 September 2007 - 11 October 2007	149724	192	149532
November-07	11 October 2007 - 12 November 2007	37356	1668	35688
December-07	12 November 2007 -	6156	588	5568

	11 December 2007			
January-08	11 December 2007 - 12 January 2008	6192	312	5880
February-08	12 January 2008 - 12 February 2008	3180	504	2676
March-08	12 February 2008 - 20 March 2008	7536	504	7032
April-08	20 March 2008 - April 2008	14868	684	14184
May-08	15 April 2008 - 15 May 2008	177120	252	176868
June-08	15 May 2008 - 15 June 2008	301296	36	301260
July-08	15 June 2008 - 15 July 2008	277176	48	277128
August-08	15 July 2008 - 15 August 2008	274788	24	274764
September-08	15 August 2008 - 16 September 2008	262200	240	261960
<b>TOTAL</b>	<b>26 March 2007 - 16 September 2008</b>	<b>2425068</b>	<b>7644</b>	<b>2417424</b>

<b>HTSC No.</b>	<b>2247</b>			
<b>Month TNEB Statement Issued</b>	<b>Corresponding Period of Generation</b>	<b>Gross Export (kWh)</b>	<b>Import (kWh)</b>	<b>Net Export (kWh)</b>
April-07	27 March 2007 - 11 April 2007	2510	530	1980
May-07	11 April 2007 - 12 May 2007	49290	790	48500
June-07	12 May 2007 - 12 June 2007	243120	310	242810
July-07	11 June 2007 - 12 July 2007	200350	100	200250
August-07	12 July 2007 - 13 August 2007	266000	90	265910
September-07	13 August 2007 - 13 September 2007	251080	210	250870
October - 07	13 September 2007 - 10 October 2007	201700	140	201560
November-07	10 October 2007 - 12 November 2007	35870	1760	34110

December-07	12 November 2007 - 10 December 2007	6860	580	6280
January-08	10 December 2007- 10 January 2008	4850	310	4540
February-08	10 January 2008 - 11 February 2008	4870	810	4060
March-08	11 February 2008 - 20 March 2008	7260	490	6770
April-08	20 March 2008 - 20 April 2008	20140	1000	19140
May-08	20 April 2008 - 14 May 2008	168330	240	168090
June-08	14 May 2008 - 14 June 2008	276430	70	276360
July-08	14 June 2008 - 15 July 2008	275410	60	275350
August-08	15 July 2008 - 13 August 2008	272970	30	272940
September-08	13 August 2008 - 13 September 2008	203120	260	202860
<b>TOTAL</b>	<b>27 March 2007 - 13 September 2008</b>	<b>2490160</b>	<b>7780</b>	<b>2482380</b>

<b>Cumulative Electricity Generation in all WEGs</b>				
<b>H.T.Sc.No</b>	<b>Period</b>	<b>Total Export (kWh)</b>	<b>Total Import (kWh)</b>	<b>Total Net Export (kWh)</b>
1608	April 15, 2006 to September 13, 2008	3997116	16752	3980364
1690	April 15, 2006 to September 13, 2008	4034919	21053	4013866
2122	December 28, 2006 to September 16, 2008	2663724	9588	2654136
2123	December 28, 2006 to September 16, 2008	2316228	13812	2302416
2227	March 26, 2007 to September 16, 2008	2425068	7644	2417424
2245	March 27, 2007 to September 13, 2008	2490160	7780	2482380
<b>Total</b>	<b>April 15, 2006 to September 16, 2008</b>	<b>17927215</b>	<b>76629</b>	<b>17850586</b>

## Annex 2

### Project location and WEG specific details

HTSC No.	Location	S. F. No.	Latitude	Longitude
1608	Ayan Surandai Village	474 (P) & 510/2	N 8°59'07.3"	E 77°27'01.9"
1690	Achankuttam Village	201	N 8°57'44.9"	E 77°28'45.0"
2122	Sambavar Vadakarai Village	285/3 (P)	N 9°01'00.6"	E 77°24'05.5"
2123	Sambavar Vadakarai Village	188/7 (P), 8, 9 (P)	N 9°00'42.6"	E 77°24'16.7"
2227	Sambavar Vadakarai Village	200/11, 12, 13, 14, 15, 16B (P)	N 9°01'12.5"	E 77°24'05.2"
2245	Kulayaneri Village	187/4 (P) & 356/1A (P)	N 9°00'30.4"	E 77°26'21.7"

### Annex 3

#### Calibration details of energy meters

HTSC.No	Meter Serial. No.	Meter make	Class	Fixed on	Periodical test on	
1608	4804346	Elster	0.5	16.03.06	05.01.08	
1690	4726597	Elster	0.5	26.03.06	24.07.08	
2122	4863823	Elster	0.5	28.12.06	14.10.08	
2123	4863658	Elster	0.5	28.12.06	14.10.08	
	4962009	Elster	0.5	20.02.09	20.02.09	
2227	4880999	Elster	0.5	26.03.07	1.08.08	23.12.08
2245	4880996	Elster	0.5	27.03.07	29.06.07	17.12.08

## Annex 4

### Abbreviations

ACM	Approved Consolidated Methodology
AMS	Approved Small Scale Methodology
ASM	Area Service Manager
BM	Build Margin
CDM	Clean Development Mechanism
CEA	Central Electricity Authority
CM	Combined Margin
CO2	Carbon dioxide
HTSC	High Tension Service Connection
MW	Mega Watt
MWh	Megawatt hour
OM	Operating Margin
PP	Project Promoter
QA	Quality Assurance
QC	Quality Control
S.F.No	Survey Field Number
SG	Southern Grid
TNEB	Tamil Nadu Electricity Board
UNFCCC	United Nations Framework Convention on Climate Change
VERs	Verified Emission Reductions
VVD	VVD and Sons Private Limited
WEGs	Wind Energy Generators

## **Annex 5**

### **List of References**

1. Central Electricity Authority (CEA) of India Website:  
<http://www.cea.nic.in/planning/c%20and%20e/Government%20of%20India%20website.htm>
2. UNFCCC website URL: <http://unfccc.int/>
3. CEA metering regulations:  
[http://www.cea.nic.in/e&c/regulations/notified\\_regulations/Metering\\_Regulations.pdf](http://www.cea.nic.in/e&c/regulations/notified_regulations/Metering_Regulations.pdf)