

44 MW Bundled Wind Power Project in Maharashtra managed by Enercon India Limited.



Enercon (India) Ltd.

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Project Title	44 MW Bundled Wind Power Project in Maharashtra managed by Enercon India Limited.
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1 PROJECT DETAILS

1.1 Summary Description of Project

The Project activity is located across Satara, Sangli, Nasik, and Ahmednagar District in the state of Maharashtra in India. The machines are provided, operated and maintained by Enercon (India) Ltd. It involves the installation of 55 turbines of Enercon make (E-48), each of which has a rated output of 800kW, providing a total capacity of 44 MW. The net electricity supplied by the project activity during the monitoring period is 70,657.894 MWh.

The purpose of the project activity is to generate electricity using wind power resources in the region and provide reliable, renewable power to the Maharashtra state electricity grid, which is part of the NEWNE grid. The total GHG emission reductions for the entire monitoring period are 64,008 tCO₂e. The project contributes to sustainability in the region by reducing pollution, creating employment opportunities, improving the livelihoods of the local people. At a larger scale, the project assists Maharashtra and ultimately India in stimulating and accelerating the commercialization of grid-connected renewable energy technologies and markets in India.

1.2 Sectoral Scope and Project Type

Sectoral scope : 1 Energy Industries (renewable -/ non renewable sources)

Project Type: I, Renewable energy project.

1.3 Project Proponent

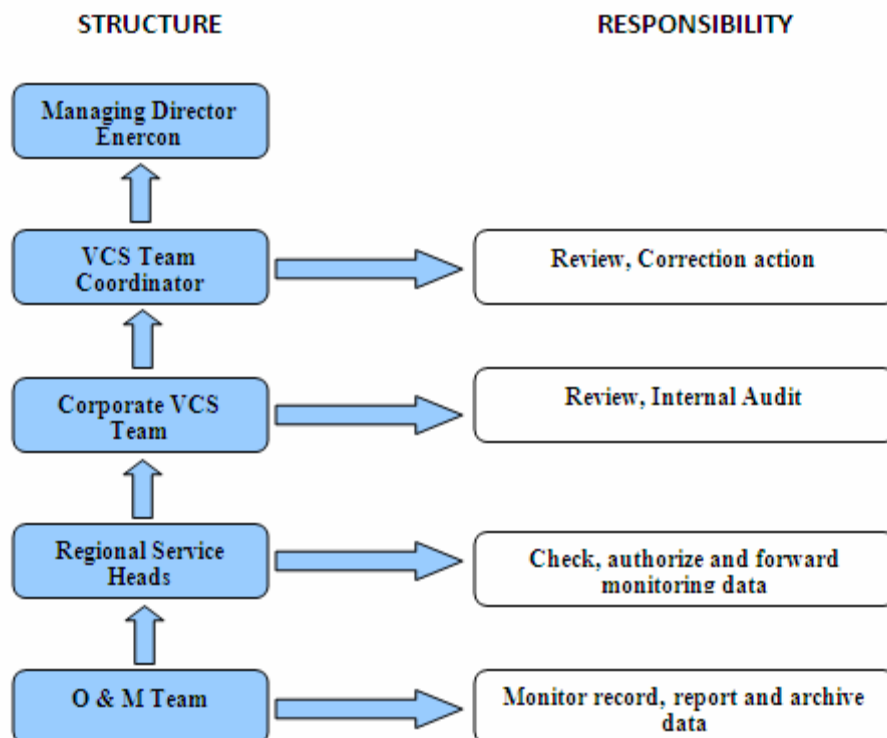
Enercon (India) Limited

The Project is operated and managed by Enercon (India) Ltd.

Organization:	Enercon (India) Limited
Street/P.O.Box:	A-9, Veera Desai Road
Building:	Enercon Tower
City:	Mumbai
State/Region:	Maharashtra
Postcode/ZIP:	400053
Country:	India
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URL:	-
Represented by:	-
Title:	Managing Director
Salutation:	Mr
Last name:	Mehra
Middle name:	-
First name:	Yogesh
Department:	-

Mobile:	+91-98200 40301
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Direct tel:	+91-22-22-6702 2832 extn. 7111
Personal e-mail:	-

Roles & Responsibilities



1.4 Other Entities Involved in the Project

Sr. No.	Customers Name	Address	Contact Number/email ID	Roles/Responsibilities
1	G. B. Rubber Products	S-157, M.I.D.C., Bhosari, Pune	+91-20-27120323 gbrubber@vsnl.net	Project Investor
2	Atlas Tours & Travels Pvt. Ltd	"Haji Mahal", 53 Mohammed Ali Road, Mumbai	+91-22-6141-1000 info@atlastravels.com	Project Investor
3	Shah Lulla Estate Developers	'Poshish', 1 st Floor, Lale Plot, Madhavnagar	+91-233-2377585 poshish@pn3.vsnl	Project Investor

		Road, Sangli	net.in	
4	Liberty Oil Mills Ltd.	Amerchand Mansion, 'D' Wind: 16, Madame Cama Road, Colaba, Mumbai	+91-22-66381000 admin@libertyoilmills.com	Project Investor
4	Liberty Oil Mills Ltd.	Amerchand Mansion, 'D' Wind: 16, Madame Cama Road, Colaba, Mumbai	+91-22-66381000 admin@libertyoilmills.com	Project Investor
5	Paceman Sales Promotion P. Ltd.	14, Netaji Subhas Road, 4 th Floor, Kolkata.	+91-33-2231-6142 purti2961@dataone.in	Project Investor
6	Delta Enterprises	Clover Centre, 7 Moledina Road, Pune	+91-20-26132000	Project Investor
7	Shreem Capacitors Pvt. Ltd.	P.B. No. 43, Industrial Estate, Plot No. 43/46, Jaisingpur	+91-2322-221021 kpr_shreem@sancharnet.in	Project Investor
8	Kishor Food Products P. Ltd	"Matruchhya" Post Box No. 23, Dondaicha	+91-20-25630872	Project Investor
9	Mahanagar Developers	San Mahu Complex, Bund Garden Road, Pune.	+92-20-2612-4265 sales@goelgangaddevelopers.com	Project Investor
9	Mahanagar Developers	San Mahu Complex, Bund Garden Road, Pune.	+92-20-2612-4265 sales@goelgangaddevelopers.com	Project Investor
10	Mr. J. P. Patel	39/D, Gultekdi, J.N. Marg, Pune	+91-20 2644 4625	Project Investor
11	Mr. C. P. Patel	39/D, Gultekdi, J.N. Marg, Pune	+91-20 2644 4625	Project Investor
12	Mr. V. V. Patel	39/D, Gultekdi, J.N. Marg, Pune	+91-20 2644 4625	Project Investor

13	Mr. J. V. Patel	39/D, Gultekdi,J.N. Marg, Pune	+91-20 2644 4625	Project Investor
14	Mr. S. V. Patel	39/D, Gultekdi,J.N. Marg, Pune	+91-20 2644 4625	Project Investor
15	Mr. V. L. Patel	39/D, Gultekdi,J.N. Marg, Pune	+91-20 2644 4625	Project Investor
16	Laxmi Narayan Best Chiwda	374, Bhavani Peth, Pune	+91-20-26454561	Project Investor
17	Om Shanti Wind Farms P. Ltd	12-1-58, Gunj Road, Raichur	+91-8532-235202 kamal@askgroup.biz	Project Investor
18	New Sahyadri Industries Ltd.	"Swastik House", 39/D, Gultekdi,J.N. Marg, Pune	+91-20-2645-8888 swastikroofing@silworld.in	Project Investor
19	Mr. P. L. Patel	39/D, Gultekdi,J.N. Marg, Pune	+91-20 2644 4625	Project Investor
20	Elpro International	17 th Floor, Nirmal, Nariman Point Mumbai	+91-22-2202-3075	Project Investor
21	Prachar Energy	105,B-Wing, Samkeet Apartments, Sant Janabai Marg, Off. Hanuman Road, Vile Parle (E), Mumbai	+91-22-261-08750 deepak@prachar.in	Project Investor
22	D.J. Malpani	Plot No. 36, Somwar Peth, Pune	+91-20-2612 5060	Project Investor
23	International Conveyors Ltd.	10, Middleton Row, Post Box No. 9282, Kolkata	+91-33-2229-6033 icltld@vsnl.net	Project Investor
24	Metalfab Hightech Private Limited	E21-25 & 33B/2,MIDC, Industrial Area, Hingna Road, Nagpur	+91-7104-234240 mfhpl@hotmail.com	Project Investor
25	Gargi Construction Co. Pvt. Ltd.	Clover Centre, 7 Moledina Road, Pune	+91-20-26132000	Project Investor

26	Mohite & Mohite	'Mohite House', 240/B, Gen. Tihorat Marg, Tarabai park, Kolhapur	+91-231-2669991 mohicon@sanchar.net.in	Project Investor
27	Indiana Engineering Works (Bombay) P. Ltd.	Indiana House, Off. M.V. road, Marol Naka, andheri (East), Mumbai	+91(22)-2850 4743, 2850 5611	Project Investor
28	Welpack Industries Ltd.	87, Government Estate, Ganesh Nagar, Nr. Gaurda Petrol Pump, Charkop, Kandivale (W), Mumbai	+91-22-2867-8111 info@welpackind.com	Project Investor
29	Sunilkumar Ramanlal Shah	4920941, "Jeevan Jyoti", 151, Bhavani Path, Palace Street, Satara.	+91-9823016132	Project Investor

1.5 Project Start Date

07th February 2006

1.6 Project Crediting Period

The crediting period for the project activity is considered from April 1, 2006 to March 31, 2016, for 10 years.

1.7 Project Location

The Project is spread across villages in Kadvekhurd, Varekarwadi, Bhambarwadi & Panchpatta, in Satara, Sangli, Nasik & Ahmednagar district in the state of Maharashtra. The location of the units is on the micro-siting data to get optimum performance. The latitudinal & longitudinal as well as the unique identification details of individual machines are as given in the following table:

Sr. No.	Customers Name	Machine Capacity (MW)	Site	Taluka	District	Latitude	Longitude
1	G. B. Rubber Products	1.6	Kadvekhurd	Patan	Satara	N 17°33'15" to 17°33'56" E 73°55'28" to 73°56'51"	
2	Atlas Tours & Travels Pvt. Ltd	0.8	Kadvekhurd	Patan	Satara		
3	Shah Lulla Estate Developers	0.8	Kadvekhurd	Patan	Satara		
4	Liberty Oil Mills Ltd.	2.4	Kadvekhurd	Patan	Satara		
4	Liberty Oil Mills Ltd.	1.6	Varekarwadi	Patan	Satara	N 17°11'47.6" 17°11'51.2"	E 73°59'12.7" 73°59'13.5"
5	Paceman Sales Promotion P. Ltd.	0.8	Bhambarwadi	Shirla	Sangli	N 17°8'36.5"	E 73°55'14.3"
6	Delta Enterprises	2.4	Bhambarwadi	Shirla	Sangli	N 17°7'11.3" 17°8'35.6" 17°8'28.5"	E 73°56'5.7" 73°55'2.8" 73°55'21.7"
7	Shreem Capacitors Pvt. Ltd.	3.2	Bhambarwadi	Shirla	Sangli	N 17°8'52.1" 17°8'58.2" 17°9'2.8" 17°9'34.8"	E 73°55'10.1" 73°55'6" 73°55'5.4" 73°55'6.1"

8	Kishor Food Products P. Ltd	0.8	Bhambarwadi	Shirla	Sangli	N 17°8'53.2"	E 73°54'57.7"
9	Mahanagar Developers	7.2	Bhambarwadi	Shirla	Sangli	N 17°9'7.6" 17°9'14.7" 17°9'19.1" 17°9'24.6" 17°9'28.2" 17°9'14.5" 17°9'10.8" 17°9'10.9" 17°8'10.9"	E 73°55'5.8" 73°55'2.5" 73°55'3.6" 73°55'6" 73°55'6.7" 73°55'18.1" 73°55'36.6" 73°55'3.5" 73°56'0.5"
9	Mahanagar Developers	0.8	Panchpatta	Sinnar	Nasik	N 19°39'12.8"	E 73°48'41.4"
10	Mr. J. P. Patel	0.8	Panchpatta	Sinnar	Nasik	N 19°45'53.4"	E 73°50'32.8"
11	Mr. C. P. Patel	0.8	Panchpatta	Sinnar	Nasik	N 19°45'17.1"	E 73°50'31.4"
12	Mr. V. V. Patel	0.8	Panchpatta	Sinnar	Nasik	N 19°44'58"	E 73°50'13.1"
13	Mr. J. V. Patel	0.8	Panchpatta	Sinnar	Nasik	N 19°45'12.7"	E 73°50'29.2"
14	Mr. S. V. Patel	0.8	Panchpatta	Sinnar	Nasik	N 19°45'46.9"	E 73°50'34.1"
15	Mr. V. L. Patel	0.8	Panchpatta	Sinnar	Nasik	N 19°44'33.5"	E 73°50'29.2"

16	Laxmi Narayan Best Chiwda	0.8	Panchpatta	Sinnar	Nasik	N 19°45'2.9"	E 73°50'12.6"
17	Om Shanti Wind Farms P. Ltd	0.8	Aundhewadi	Sinnar	Nasik	N 19°45'7.7"	E 73°50'12.8"
18	New Sahyadri Industries Ltd.	1.6	Panchpatta	Akole	Ahmednagar	N 19°44'24.3" 19°44'28.2"	E 73°50'40.8" 73°50'35.7"
19	Mr. P. L. Patel	0.8	Panchpatta	Akole	Ahmednagar	N 19°41'7.2"	E 73°48'48.2"
20	Elpro International	0.8	Panchpatta	Akole	Ahmednagar	N 19°41'41.8"	E 73°48'53.3"
21	Prachar Energy	1.6	Panchpatta	Akole	Ahmednagar	N 19°39'17.8" 19°39'22.7"	E 73°48'42.7" 73°48'47.5"
22	D.J. Malpani ¹	1.6	Panchpatta	Akole	Ahmednagar	N 19°41'16.6" 19°41'20.6"	E 73°48'53" 73°48'55.6"
23	International Conveyors Ltd.	0.8	Panchpatta	Akole	Ahmednagar	N 19°41'37"	E 73°48'54.3"
24	Metalfab Hightech Private Limited	0.8	Panchpatta	Akole	Ahmednagar	N 19°41'11.9"	E 73°48'51.6"
25	Gargi Construction	1.6	Panchpatta	Akole	Ahmednagar	N 19°41'26.1"	E 73°48'55.1"

¹ The Panama Wind Energy transferred WTGs to D.J. Malpani on April 2011

	Co. Pvt. Ltd.					19°41'31.1"	73°48'54.5"
26	Mohite & Mohite	2.4	Panchpatta	Akole	Ahmednagar	N 19°42'15.6" 19°42'20.5" 19°42'25.6"	E 73°49'6.4" 73°49'15.9" 73°49'15.3"
27	Indiana Engineering Works (Bombay) P. Ltd.	1.6	Panchpatta	Akole	Ahmednagar	N 19°39'27.5" 19°39'32.4"	E 73°48'49" 73°48'49.8"
28	Welpack Industries Ltd.	0.8	Panchpatta	Akole	Ahmednagar	N 19°39'7.9"	E 73°48'37"
29	Sunilkumar Ramanlal Shah	0.8	Panchpatta	Akole	Ahmednagar	N 19°44'38.6"	E 73°50'22.5"

1.8 Title and Reference of Methodology

The project under consideration has been developed using UNFCCC CDM program approved methodology for large-scale CDM Project activity ACM 0002, Version 10.0 as approved by VCS 2007.1. The title of this baseline and monitoring methodology is "Consolidated baseline methodology for grid-connected electricity generation from renewable sources".

2 IMPLEMENTATION STATUS

2.1 Implementation Status of the Project Activity

The first machine under the project activity was commissioned on 7th February 2006 and last machine under the project activity was commissioned on 10th December 2008. The project activity consists of 55 machines (800 kWh) of Enercon make E-48. The commissioning date for all the machines included in the project activity is given in the table below.

Serial No	Customer Name	Individual Capacity	Loc No.	Capacity	Date of Commissioning
1	G. B. Rubber Products	0.8	1	1.6	14-Feb-06

Serial No	Customer Name	Individual Capacity	Loc No.	Capacity	Date of Commissioning
2	G. B. Rubber Products	0.8	2		14-Feb-06
3	Shah Lulla Estate Developers	0.8	4	0.8	14-Feb-06
4	Liberty Oil Mills Ltd.	0.8	6	2.4	7-Feb-06
5	Liberty Oil Mills Ltd.	0.8	7		7-Feb-06
6	Liberty Oil Mills Ltd.	0.8	8		7-Feb-06
7	Liberty Oil Mills Ltd.	0.8	1	1.6	8-Feb-06
8	Liberty Oil Mills Ltd.	0.8	2		8-Feb-06
9	Paceman Sales Promotion P. Ltd.	0.8	36	0.8	22-Mar-06
10	Delta Enterprises	0.8	37	1.6	22-Mar-06
11	Delta Enterprises	0.8	38		15-Jun-06
12	Delta Enterprises	0.8	19	0.8	15-Jun-06
13	Mahanagar Developers	0.8	53	4.8	5-Jan-07
14	Mahanagar Developers	0.8	54		6-Mar-07
15	Mahanagar Developers	0.8	55		5-Jan-07
16	Mahanagar Developers	0.8	56		5-Jan-07
17	Mahanagar Developers	0.8	57		5-Jan-07
18	Mahanagar Developers	0.8	61		5-Jan-07
19	Mahanagar Developers	0.8	62	2.4	6-Mar-07
20	Mahanagar Developers	0.8	63		5-Jan-07
21	Mahanagar Developers	0.8	60		6-Mar-07
22	Mahanagar Developers	0.8	30	0.8	28-Feb-07
23	Kishor Food Products P. Ltd.	0.8	47	0.8	10-Dec-08
24	Mr. J. P. Patel	0.8	95	0.8	29-Mar-07
25	Mr. C. P. Patel	0.8	84	0.8	31-Mar-07
26	Mr. V. V. Patel	0.8	80	0.8	31-Mar-07
27	Mr. J. V. Patel	0.8	83	0.8	29-Mar-07
28	Mr. S. V. Patel	0.8	94	0.8	29-Mar-07
29	Mr. V. L. Patel	0.8	76	0.8	29-Mar-07
30	Laxmi Narayan Best Chiwda	0.8	81	0.8	29-Mar-07
31	New Sahyadri Industries Ltd.	0.8	74	1.6	27-Jan-07
32	New Sahyadri Industries Ltd.	0.8	75		27-Jan-07
33	Mr. P. L. Patel	0.8	45	0.8	6-Feb-07
34	Elpro International	0.8	52	0.8	30-Dec-06
35	Prachar Energy	0.8	31	1.6	3-Mar-07
36	Prachar Energy	0.8	32		3-Mar-07
37	D. J. Malpani	0.8	47	1.6	30-Dec-06
38	D.J. Malpani	0.8	48		30-Dec-06
39	International Conveyors Ltd.	0.8	51	0.8	30-Dec-06

Serial No	Customer Name	Individual Capacity	Loc No.	Capacity	Date of Commissioning
40	Shreem Capacitors Pvt. Ltd.	0.8	50	3.2	10-Dec-08
41	Shreem Capacitors Pvt. Ltd.	0.8	51		10-Dec-08
42	Shreem Capacitors Pvt. Ltd.	0.8	52		10-Dec-08
43	Shreem Capacitors Pvt. Ltd.	0.8	58		10-Dec-08
44	Metalfab Hightech Private Limited	0.8	46	0.8	6-Feb-07
45	Atlas Tours & Travels Pvt. Ltd.	0.8	5	0.8	7-Feb-06
46	Om Shanti Wind Farms P. Ltd.	0.8	82	0.8	31-Mar-07
47	Gargi Construction Co. Pvt. Ltd.	0.8	49	1.6	30-Dec-06
48	Gargi Construction Co. Pvt. Ltd.	0.8	50		30-Dec-06
49	Mohite & Mohite	0.8	59	2.4	30-Dec-06
50	Mohite & Mohite	0.8	60		30-Dec-06
51	Mohite & Mohite	0.8	61		30-Dec-06
52	Indiana Engineering Works (Bombay) P. Ltd.	0.8	33	1.6	3-Mar-07
53	Indiana Engineering Works (Bombay) P. Ltd.	0.8	34		3-Mar-07
54	Welpack Industries Ltd.	0.8	29	0.8	28-Feb-07
55	Sunilkumar Ramanlal Shah	0.8	77	0.8	30-Mar-08

The project has supplied 70.693 GWh of electricity to the grid in the monitoring period, which indicates that the project has performed reasonably well during the monitoring period (1st Dec 2011 to 30th September 2012).

There have not been any special events comprising of major overhauls and downtime of project activity during the said monitoring period; thus there has not been any change in the operation of project activity during the monitoring period. Also, there have not been any events that may impact the GHG emission reductions and monitoring in current monitoring period.

2.2 Project Description Deviations

No deviation in the project description occurred in the current monitoring period.

2.3 Grouped Project

N/A.

3 DATA AND PARAMETERS

3.1 Data and Parameters Available at Validation

Data Unit / Parameter:	EF _{grid, y}
Data unit:	tCO ₂ / MWh
Description:	Combined margin emission factor of NEWNE grid
Source of data:	Calculated from operating and built margin, using 75%-25% weights used (Source: CEA database Version 4 October 2008 http://www.cea.nic.in/reports/planning/cdm_co2/cdm_co2.htm)
Value applied:	0.9058975
Purpose of the data:	To calculate Baseline Emissions.
Any comment:	This value is calculated on ex-ante basis and will remain fixed for the entire crediting period.

Data Unit / Parameter:	EF _{OM, y}
Data unit:	tCO ₂ / MWh
Description:	Operating margin emission factor of NEWNE Grid
Source of data:	Calculated from CEA database (Source: CEA database Version 4 October 2008 http://www.cea.nic.in/reports/planning/cdm_co2/cdm_co2.htm)
Value applied:	1.00862
Purpose of the data:	To calculate Baseline Emissions.
Any comment:	This value is calculated on ex-ante basis and will remain fixed for the entire crediting period.

Data Unit / Parameter:	EF _{BM, y}
Data unit:	tCO ₂ / MWh
Description:	Build margin emission factor of NEWNE grid
Source of data:	Calculated from CEA database (Source: CEA database Version 4 October 2008 http://www.cea.nic.in/reports/planning/cdm_co2/cdm_co2.htm)
Value applied:	0.59771
Purpose of the data:	To calculate Baseline Emissions.
Any comment:	This value is calculated on ex-ante basis and will remain fixed for the entire crediting period.

3.2 Data and Parameters Monitored

Data Unit / Parameter:	EG _{Export, y}
Data unit:	MWh (Mega-watt hour)
Description:	Electricity exported to the grid by the project

	activity in year y
Source of data:	Monthly certificates issued by MSEDCL
Description of measurement methods and procedures to be applied:	The electricity exported to the grid by the wind farm is calculated by MSEDCL (apportioning procedure) on the basis of Panel Meter meter reading and the meter readings taken at Grid Interconnection point (Substation)..
Frequency of monitoring/recording:	Monthly
Value monitored:	1 December 2011 to 30 September 2012 = 70,693.181 MWh
Monitoring equipment:	Calculated as per formulas described under section 3.3.
QA/QC procedures to be applied:	QA/QC procedures will be implemented pursuant to PPA agreement.
Calculation method:	Described in Section 3.3
Any comment:	Not Applicable

Data Unit / Parameter:	EG _{Import,y}
Data unit:	MWh (Mega-watt hour)
Description:	Electricity imported from the grid
Source of data:	Monthly certificates issued by MSEDCL
Description of measurement methods and procedures to be applied:	The electricity imported from the grid by the wind farm is calculated by MSEDCL (apportioning procedure) on the basis of Panel Meter meter reading and the meter readings taken at Grid Interconnection point (Substation).
Frequency of monitoring/recording:	Monthly
Value monitored:	1 December 2011 to 30 September 2012 = 35.287 MWh
Monitoring equipment:	Calculated as per formulas described under section 3.3.
QA/QC procedures to be applied:	QA/QC procedures will be implemented pursuant to PPA agreement.
Calculation method:	Described in Section 3.3
Any comment:	Not Applicable

Data Unit / Parameter:	EG _{y, net}
Data unit:	MWh (Mega-watt hour)
Description:	Net electricity supplied to the grid by the Project.

Source of data:	Calculated from EG,export and EG,import as (EG,export – EG,import)
Description of measurement methods and procedures to be applied:	Net electricity supplied to the grid will be calculated by the values of Electricity import and Electricity export. The Net electricity is recorded as following: (Net Electricity = Net Export – Net Import) The procedures for metering and meter reading will be as per the provisions of the wheeling and banking arrangement.
Frequency of monitoring/recording:	Monthly
Value monitored:	1 December 2011 to 30 September 2012 = 70,657.894 MWh
Monitoring equipment:	The Energy Meters of accuracy class 0.2s has been used to measure the electricity exported & imported to grid.
QA/QC procedures to be applied:	QA/QC procedures will be implemented pursuant to PPA agreement.
Calculation method:	Explained in Section 3.3
Any comment:	Not Applicable

3.3 Description of the Monitoring Plan

Approved monitoring methodology ACM0002 / Version 10 Sectoral Scope: 1, “Consolidated methodology for grid-connected electricity generation from renewable sources”, by CDM - Meth Panel is proposed to be used to monitor the emission reductions.

The monitoring includes collection, monitoring, recording, reporting and archiving of data. The applied methodology requires monitoring of net electricity supplied to the grid. The values of grid emission factors are fixed ex-ante and remain same throughout the crediting period.

a) Purpose of monitoring: The main purpose of the monitoring is to check the electricity exported to the NEWNE grid from the project under consideration.

b) Types of data and information to be reported, including units of measurement:

$EG_{y, net}$

c) Origin of the data: Electricity supplied by the project activity to the grid as per energy generation certificates given by Maharashtra State Electricity Distribution Co. Ltd (MSEDCL)

d) Monitoring, modelling, measurement or calculation approaches:

➤ Measurement or Calculation Approaches:

- The generated electricity is measured through a two step procedure wherein the first metering is carried out at the controller of the machine with on-board meter. The monitoring of all these wind turbines is done from a common monitoring station as a part of central monitoring system. The system consists of a state- of- the- art controlling and monitoring and well trained staff personnel of O&M contractor, Enercon India Limited, are always present on site to monitor various parameters of power generation and deal with any problems related to generation, transmission or maintenance. $EG_{gross, y}$ is the electricity generated from an individual wind turbine measured through its panel meter. The summation of total Electricity exported and imported from wind turbine of the project proponent from individual meters (panel meter) in MWh is presented as

$$\sum EG_{gross\ export, y} \text{ and } \sum EG_{gross\ import, y}$$

and the summation of total Electricity exported and imported (panel data) from the other wind turbines attached to the common MSEDCL meter at the sub-station in MWh is presented as

$$\sum EG_{total\ import} \text{ and } \sum EG_{total\ export}$$

A ratio based on these two set of measured values would be used for apportioning the net electricity supplied to the NEWNE grid by the project activity. The second metering is carried out at grid interconnection point (sub station) wherein the Joint Meter Reading (JMR) is carried out on last day of every month in presence of the representatives of the project proponent & the state electricity utility (MSEDCL). This JMR is used for calculation of the amount of electricity supplied to the grid against which the utility makes the payment to the project proponent. The JMR gives both the “export” ($EG_{JMR, export}$) and “import” ($EG_{JMR, import}$) of the electricity to/ from the NEWNE grid. There is a single meter which gives both the export and import values, this metered reading would give value net of line losses and auxiliary consumption. Further, as there is a common MSEDCL joint meter for multiple project proponents, the joint meter reading (JMR) is taken every month by MSEDCL personnel reflects the cumulative monthly generation for all wind turbines connected to this MSEDCL meter. The apportioning of electricity generated from the various wind turbines is done by EIL, based on the power generation from the individual

wind turbines connected to this MSEDCL meter. O&M personnel from EIL prepare a monthly report on generation and consumption. This report contains details of power exported/imported to/from the grid by each of the wind turbines connected. This apportioned value is then used by the project proponent to raise invoice from MSEDCL.

In last verification (3rd Verification) deviation was sought and same was approved.

In current monitoring period EG_{Gross} parameter is not considered similar to last verification, because now the credit breakup is used as source for taking the values of EG_{export} & EG_{import} , the credit breakup is issued on monthly basis & is authorized by MSEDCL.

There is no requirement of apportioning of EG_{export} & EG_{import} to be done by PP, as it is done by MSEDCL & a credit breakup is issued.

EG_{export} the electricity exported to the grid by the project activity was previously calculated as follows:

$$EG_{export} = EG_{JMR, export} \times \frac{\sum_0^n EG_{gross export, y}}{(\sum_0^n EG_{gross export, y} + \sum_0^n EG_{total export, y})}$$

EG_{import} the electricity drawn from the grid by the project activity is calculated as follows:

$$EG_{import} = EG_{JMR, import} \times \frac{\sum_0^n EG_{gross import, y}}{(\sum_0^n EG_{gross import, y} + \sum_0^n EG_{total import, y})}$$

The values of EG_{export} & EG_{import} are available in the Credit Breakup given by MSEDCL, so from the breakup sheet the values are sourced & the net electricity supplied to grid has been calculated as the difference between Electricity Exported & Electricity Imported.

$EG_{y, net}$, the net electricity supplied to the grid by the project activity, is calculated as follows:

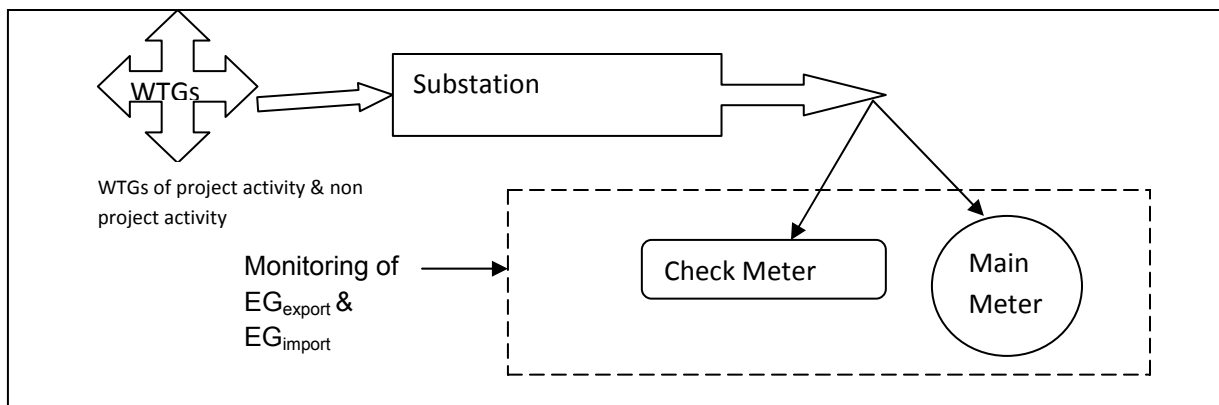
$$EG_y = EG_{export} - EG_{import}$$

The meters located at the grid sub-station are sealed, maintained and calibrated by the state electricity utility. The meters are tested and maintained as per the Metering Code for Maharashtra. Additionally, each wind turbine is equipped with an integrated electronic meter. The electricity generated is recorded 24 hours.

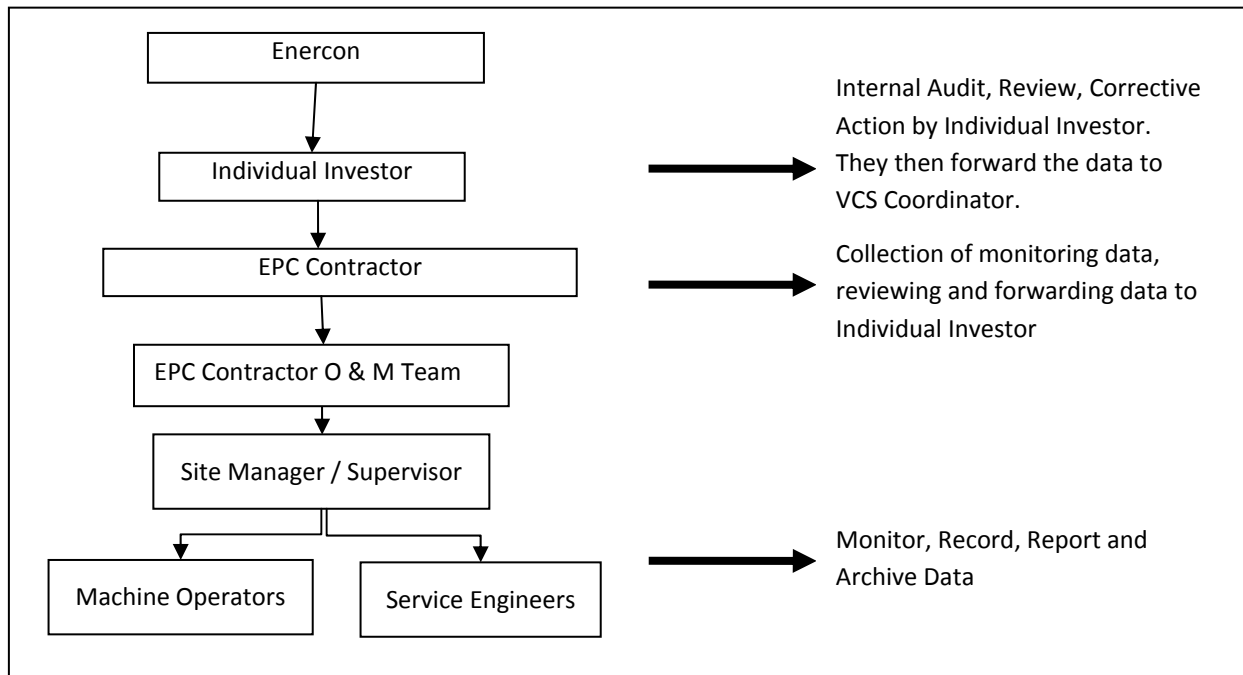
The procedures for metering and meter reading will be as per the provisions of the power purchase agreement signed between PPs and MSEDCL.

e) Monitoring times and periods, considering the needs of intended users: The Net electricity supplied to the grid is recorded monthly by taking a Joint Meter Reading (JMR) in the presence of officials from off-taking Utility (MSDCL) and Enercon as O&M contractor, on behalf of project sponsor. 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 utility and by Enercon Officials.

f) Monitoring roles and responsibilities: The sole parameter for monitoring is the electricity supplied to the grid. The Project is operated and managed by Enercon (India) Ltd. The GHG collection diagram is as follows:



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



Enercon India limited is an ISO 9001:2008 certified Quality Management system from Germanischer Lloyd. Enercon India limited follows the documentation practices to ensure the reliability and availability of the data for all the activities as required from the identification of the site, wind resource assessment, logistics, finance, construction, commissioning and operation of the wind power project. Adhering to the calibration and testing procedure as described in Power Purchase Agreement ensures the accuracy of monitoring parameter. The project adheres to all the mandatory regulatory and statutory requirements at the state as well as national level.

g) Managing Data Quality:

Data management is as per the ISO certification standards.

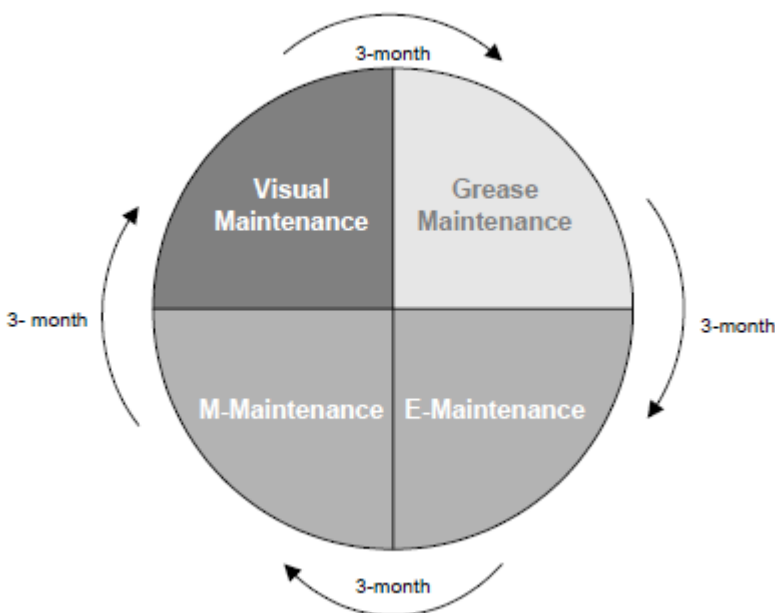
1. The data collection is ongoing process.
2. Two-way meter will be calibrated on regular basis (as per the requirement stipulated by SEB). Project Head would be responsible for regular calibration of the meter.
3. SCADA system connected to individual WECs for online monitoring.
4. The invoices are cross-checked with invoices raised to the MSEDCL.

h) Annual maintenance and major breakdown detail:-

Description of maintenance intervals: On project site there is a schedule for annual maintenance for the entire machine. There are four types of maintenance and machine has to stop for defined time period for maintenance as follows:

- 1) Visual maintenance: average 3 to 4 hr stop of WEC
- 2) Grease maintenance: average 3 to 4 hr stop of WEC
- 3) Electrical maintenance: average 16 to 20 hr stop of WEC
- 4) Mechanical maintenance: average 16 to 20 hr stop of WEC

Cycle for annual maintenance is according to following picture:



Annual Maintenance cycle

Maintenance comprises not only activities to determine and assess a wind turbine's actual state but also those to keep the system's nominal state. Repair work necessary to reconstruct the nominal state are not, however, part of these maintenance instructions.

The details of the calibration are mentioned in the table 4 below:

Table 4: Meter calibration detail

Sr · No	Customer Name	District	Loc No.	Capacity	Date of Commissioning	Feeder details	Meter Serial Number (Main Meter)	Accuracy Class	Make	Calibration Dates	
1	G. B. Rubber Products	Satara	1	1.6	14-Feb-06	N/A	04760188	0.2	Elster	8-Sep-11	3-May-12
2	G. B. Rubber Products	Satara	2		14-Feb-06	N/A	04760188	0.2	Elster	8-Sep-11	3-May-12
3	Shah Lulla Estate Developers	Satara	4	0.8	14-Feb-06	N/A	04760188	0.2	Elster	8-Sep-11	3-May-12
4	Liberty Oil Mills Ltd.	Satara	6	2.4	7-Feb-06	N/A	04760188	0.2	Elster	8-Sep-11	3-May-12
5	Liberty Oil Mills Ltd.	Satara	7		7-Feb-06	N/A	04760188	0.2	Elster	8-Sep-11	3-May-12
6	Liberty Oil Mills	Satara	8		7-Feb-06	N/A	04760	0.2	Elster	8-Sep-11	3-May-12

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7	Liberty Oil Mills Ltd.	Satara	1	1.6	8-Feb-06	N/A	04760189	0.2	Elster	26-Aug-11	5-May-12
8	Liberty Oil Mills Ltd.	Satara	2		8-Feb-06	N/A	04760189	0.2	Elster	26-Aug-11	5-May-12
10	Paceman Sales Promotion P. Ltd.	Sangli	36	0.8	22-Mar-06	F-1	04862746	0.2	Elster	22-Jun-11	27-Aug-12
11	Delta Enterprises	Sangli	37	1.6	22-Mar-06	F-1	04862746	0.2	Elster	22-Jun-11	27-Aug-12
12	Delta Enterprises	Sangli	38		15-Jun-06	F-1	04862746	0.2	Elster	22-Jun-11	27-Aug-12
13	Delta Enterprises	Sangli	19	0.8	15-Jun-06	F-1	04862746	0.2	Elster	22-Jun-11	27-Aug-12
14	Mahanagar Developers	Sangli	53	4.8	5-Jan-07	F-3	04862747	0.2	Elster	22-Jun-11	27-Aug-12
15	Mahanagar Developers	Sangli	54		6-Mar-07	F-3	04862747	0.2	Elster	22-Jun-11	27-Aug-12
16	Mahanagar Developers	Sangli	55		5-Jan-07	F-3	04862747	0.2	Elster	22-Jun-11	27-Aug-12
17	Mahanagar Developers	Sangli	56		5-Jan-07	F-3	04862747	0.2	Elster	22-Jun-11	27-Aug-12
18	Mahanagar Developers	Sangli	57		5-Jan-07	F-3	04862747	0.2	Elster	22-Jun-11	27-Aug-12
19	Mahanagar Developers	Sangli	61		5-Jan-07	F-3	04862747	0.2	Elster	22-Jun-11	27-Aug-12
20	Mahanagar Developers	Sangli	62	2.4	6-Mar-07	F-3	04862747	0.2	Elster	22-Jun-11	27-Aug-12
21	Mahanagar Developers	Sangli	63		5-Jan-07	F-1	04862746	0.2	Elster	22-Jun-11	27-Aug-12
22	Mahanagar Developers	Sangli	60		6-Mar-07	F-3	04862747	0.2	Elster	22-Jun-11	27-Aug-12
23	Mahanagar Developers	Nasik	30	0.8	28-Feb-07	F-4	04862984	0.2	Elster	14-Jun-11	20-Jun-12
24	Kishor Food Products P. Ltd.	Sangli	47	0.8	10-Dec-08	F-3	04862747	0.2	Elster	22-Jun-11	27-Aug-12
25	Mr. J. P. Patel	Nasik	95	0.8	29-Mar-07	F-6	04862987	0.2	Elster	14-Jun-11	20-Jun-12
26	Mr. C. P. Patel	Nasik	84	0.8	31-Mar-07	F-6	04862987	0.2	Elster	14-Jun-11	20-Jun-12
27	Mr. V. V. Patel	Nasik	80	0.8	31-Mar-07	F-6	04862987	0.2	Elster	14-Jun-11	20-Jun-12
28	Mr. J. V. Patel	Nasik	83	0.8	29-Mar-07	F-6	04862987	0.2	Elster	14-Jun-11	20-Jun-12
29	Mr. S. V. Patel	Nasik	94	0.8	29-Mar-07	F-6	04862987	0.2	Elster	14-Jun-11	20-Jun-12
30	Mr. V. L. Patel	Nasik	76	0.8	29-Mar-07	F-6	04862987	0.2	Elster	14-Jun-11	20-Jun-12
31	Laxmi Narayan Best Chiwda	Nasik	81	0.8	29-Mar-07	F-6	04862987	0.2	Elster	14-Jun-11	20-Jun-12
32	New Sahyadri Industries Ltd.	Ahmednagar	74	1.6	27-Jan-07	F-5	04862983	0.2	Elster	14-Jun-11	20-Jun-12
33	New Sahyadri Industries Ltd.	Ahmednagar	75		27-Jan-07	F-5	04862983	0.2	Elster	14-Jun-11	20-Jun-12
34	Mr. P. L. Patel	Ahmednagar	45	0.8	6-Feb-07	F-1	04862978	0.2	Elster	14-Jun-11	20-Jun-12
35	Elpro International	Ahmednagar	52	0.8	30-Dec-06	F-1	04862978	0.2	Elster	14-Jun-11	20-Jun-12

36	Prachar Energy	Ahmednagar	31	1.6	3-Mar-07	F-4	04862984	0.2	Elster	14-Jun-11	20-Jun-12
37	Prachar Energy	Ahmednagar	32		3-Mar-07	F-4	04862984	0.2	Elster	14-Jun-11	20-Jun-12
38	Panama Wind Energy Pvt. Ltd./D.J. Malpani	Ahmednagar	47	1.6	30-Dec-06	F-1	04862978	0.2	Elster	14-Jun-11	20-Jun-12
39	Panama Wind Energy Pvt. Ltd./D.J. Malpani	Ahmednagar	48		30-Dec-06	F-1	04862978	0.2	Elster	14-Jun-11	20-Jun-12
40	International Conveyors Ltd.	Ahmednagar	51	0.8	30-Dec-06	F-1	04862978	0.2	Elster	14-Jun-11	20-Jun-12
41	Shreem Capacitors Pvt. Ltd.	Sangli	50	3.2	10-Dec-08	F-3	04862747	0.2	Elster	22-Jun-11	27-Aug-12
42	Shreem Capacitors Pvt. Ltd.	Sangli	51		10-Dec-08	F-3	04862747	0.2	Elster	22-Jun-11	27-Aug-12
43	Shreem Capacitors Pvt. Ltd.	Sangli	52		10-Dec-08	F-3	04862747	0.2	Elster	22-Jun-11	27-Aug-12
44	Shreem Capacitors Pvt. Ltd.	Sangli	58		10-Dec-08	F-3	04862747	0.2	Elster	22-Jun-11	27-Aug-12
45	Metalfab Hightech Private Limited	Ahmednagar	46	0.8	6-Feb-07	F-1	04862978	0.2	Elster	14-Jun-11	20-Jun-12
46	Atlas Tours & Travels Pvt. Ltd.	Satara	5	0.8	7-Feb-06	N/A	04760188	0.2	Elster	8-Sep-11	3-May-12
47	Om Shanti Wind Farms P. Ltd.	Nasik	82	0.8	31-Mar-07	F-6	04862987	0.2	Elster	14-Jun-11	20-Jun-12
48	Gargi Construction Co. Pvt. Ltd.	Ahmednagar	49	1.6	30-Dec-06	F-1	04862978	0.2	Elster	14-Jun-11	20-Jun-12
49	Gargi Construction Co. Pvt. Ltd.	Ahmednagar	50		30-Dec-06	F-1	04862978	0.2	Elster	14-Jun-11	20-Jun-12
50	Mohite & Mohite	Ahmednagar	59	2.4	30-Dec-06	F-1	04862978	0.2	Elster	14-Jun-11	20-Jun-12
51	Mohite & Mohite	Ahmednagar	60		30-Dec-06	F-1	04862978	0.2	Elster	14-Jun-11	20-Jun-12
52	Mohite & Mohite	Ahmednagar	61		30-Dec-06	F-1	04862978	0.2	Elster	14-Jun-11	20-Jun-12
53	Indiana Engineering Works (Bombay) P. Ltd.	Ahmednagar	33	1.6	3-Mar-07	F-4	04862984	0.2	Elster	14-Jun-11	20-Jun-12
54	Indiana Engineering Works (Bombay) P. Ltd.	Ahmednagar	34		3-Mar-07	F-4	04862984	0.2	Elster	14-Jun-11	20-Jun-12
55	Welpack Industries Ltd.	Ahmednagar	29	0.8	28-Feb-07	F-4	04862984	0.2	Elster	14-Jun-11	20-Jun-12
56	Sunilkumar Ramanlal	Ahmednagar	77	0.8	30-Mar-08	F-6	04862987	0.2	Elster	14-Jun-11	20-Jun-12

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A meter change has been occurred in this monitoring period. The previous monitoring period i.e. Meter no. 04862989 has been replaced by 04862983 on 27/02/2012 for the customer M/s New Sahyadri Industries Ltd.

- As per revised Monitoring plan, the meters shall be tested for accuracy once annually. However it can be seen from above table that the consecutive calibrations are not done for the main meter annually on time. Therefore in accordance with “Guidelines For Assessing Compliance With The Calibration Frequency Requirements”–Annex 60 to EB 52, Paragraph 4(a) where calibration is not carried out in line with the frequency mentioned in the registered PDD, as a conservative approach, the energy export and import values (as mentioned in the Credit Notes) have been considered after applying the maximum possible value of error of the instrument to the measured values.
- Since the latest test certificate shows that meters are operating within their accuracy class 0.2%. In accordance with Annex 60, EB 52 we have applied a correction factor of +0.2% for imports and -0.2% for exports where there were found the gap in the calibration of the meters. The correction factor applied to meter reading can be validated from calculation of emission reductions provided in spreadsheet

4 QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS

4.1 Baseline Emissions

The baseline emissions (BE_y in tCO_2) are the product of the baseline emissions factor (EF_y in tCO_2/MWh) and the net electricity supplied by the project activity to the grid (EG_y in MWh)

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

BE_y - Baseline Emissions in year y (t CO_2)

$EG_{BL,y}$ - Quantity of net electricity supplied to the grid as a result of the implementation of the CDM project activity in year y (MWh)

$EF_{CO_2,grid,y}$ - CO_2 emission factor of the grid in year y (t CO_2/MWh)

$$BE_y = 70,657.894 * 0.9058975$$

$$BE_y = 64,008 \text{ t}CO_2$$

4.2 Project Emissions

The project involves the operation of a zero-emission wind farm, so

$$PE_y = 0.$$

4.3 Leakage

There is no leakage to this project so $LE_y = 0$.

4.4 Summary of GHG Emission Reductions and Removals

Months	Export (kWh)	Import (kWh)	Net Export (kWh)	VCUs (tCO ₂)
Dec-2011	3,520,447	5,649	3,514,798	3,184
Jan-2012	2,629,889	7,669	2,622,220	2,375
Feb-2012	2,535,182	4,808	2,530,374	2,292
Mar-2012	3,220,341	3,116	3,217,225	2,914
Apr-2012	3,631,697	2,640	3,629,057	3,288
May-2012	7,201,970	971	7,200,999	6,523
Jun-2012	12,222,418	2,345	12,220,074	11,070
Jul-2012	13,775,073	3,088	13,771,985	12,476
Aug-2012	14,460,880	1,622	14,459,257	13,099
Sep-2012	7,495,284	3,379	7,491,905	6,787
Total	70,693,181	35,287	70,657,894	64,008

Vintage	VCUs
Dec-2011	3,184
Jan-2012 to Sep-2012	60,824
TOTAL	64,008

5 ADDITIONAL INFORMATION

The Net Export is calculated, the values are calculated as the difference of the electricity exported to the grid & electricity imported from the grid, and both the values are taken from credit break up & Daily Generation Report.

The expected VCUs as per the validated PD for 10 months is 58,179. The actual VCUs as per the emission reduction calculation is 64,008. There is change of 9.1% in the expected and annual emission reductions. The difference in the total VCU is due to high wind availability leading to high plant load factor. Moreover the PLF determination is based on annual generation and in this monitoring period we have considered the generation only for 10 months.