WIND POWER PROJECT IN RAJASTHAN

Document Prepared By Mytrah Energy (India) Limited

Project Title	Wind power Project in Rajasthan
Version	2
Report ID	VCS8591
Date of Issue	08-10-2013
Project ID	CDM registration Id: 8591
Monitoring Period	19th June 2011 to 30th December 2012
Prepared By	By Mytrah Energy (India) Limited
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Table of Contents

1 PROJECT DETAILS

1.1 Summary Description of Project

Mytrah Energy (India) Limited (MEIL) (formerly Caparo Energy (India) Limited) is entering into the renewable energy sector with an objective to build wind power assets in India. MEIL has set up 42 MW wind power project in Jaisalmer District in the state of Rajasthan. The project activity comprises of 20 Wind Energy Generators (WEGs) with a capacity of 2.1 MW each.

The Project activity is a zero emissions wind based power generation project connected to NEWNE regional grid of India. The project will help to reduce the supply demand gap in the state and will also generate power using zero emissions wind based power generation which helps to reduce GHG emissions and specific pollutants like SOx, NOx, and SPM associated with the conventional thermal power generation facilities. The project activity will conserve fossil fuel like coal, which can be used in other industrial applications. In the project site, there are other wind projects owned by other customers connected to the same substation. There is an apportioning procedure which is approved by the state nodal agency for apportioning the electricity to each and every customer. The WEG commissioning details has been mentioned under Section 2.1.

1.2 Sectoral Scope and Project Type

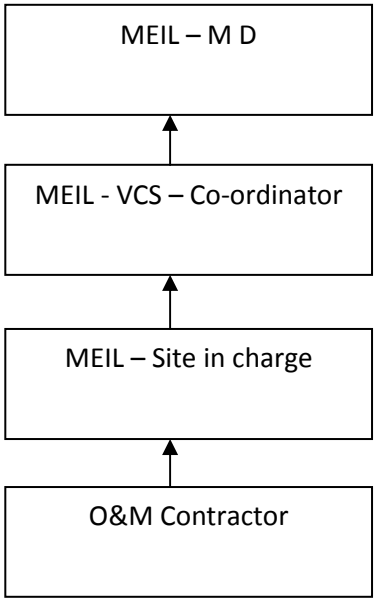
As per the categorisation by UNFCCC, the project activity falls under 'Scope 1, Sectoral Scope: Energy industries (renewable/non-renewable) Project Proponent.

Methodology applied is ACM 0002 of version 12.3.0

The project is not a bundled project activity

1.3 Project Proponent

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



Contact details of the project proponent are as follows:

Organization:	Mytrah Energy (India) Limited
Street/P.O.Box:	8001
Building:	Q-City, S.No: 109, Nanakramguda, Gachibowli
City:	Hyderabad
State/Region:	Andhra Pradesh
Postcode/ZIP:	500032
Country:	India
Telephone:	+91 40 4396 0000
FAX:	+91-40- 43960001
E-Mail:	
URL:	
Represented by:	
Title:	Managing Director
Salutation:	Mr.
Last name:	Kailas
Middle name:	
First name:	Vikram
Department:	
Mobile:	
Direct FAX:	+91 40 4396 0000
Direct tel:	+91-40- 43960001
Personal e-mail:	Vikram.Kailas@mytrah.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 19th June 2011. This is because the first WEG was commissioned as on the said date.

1.6 Project Crediting Period

The project is registered under Clean Development Mechanism (CDM) of UNFCCC with 10 years crediting period (Reference No: 8591) on 13th Dec 2012.[1] Crediting period of the project under CDM starts on 31st December 2012 and ends on 30th December 2022.

The project has begun generating GHG emission reductions from 19th June 2011. Hence, crediting period for VCS begins on 19th June 2011 and ends on 30th December 2012, since the crediting period under CDM starts on 31st December 2012.

The project proponent will also not claim GHG emission reductions under two schemes for the same period. Emission reduction achieved for the period from 19th June 2011 and ends on 30th December 2012 project is claimed under VCS scheme and emission reduction achieved from 31st December 2012 to 30th December 2022 will be claimed under CDM.

1.7 Project Location

The wind power project is located in Tejwa – Mokal village, Jaisalmer District, Rajasthan State, India. The geo- coordinates of the project location is as follows.

The location of WEGs is as given below

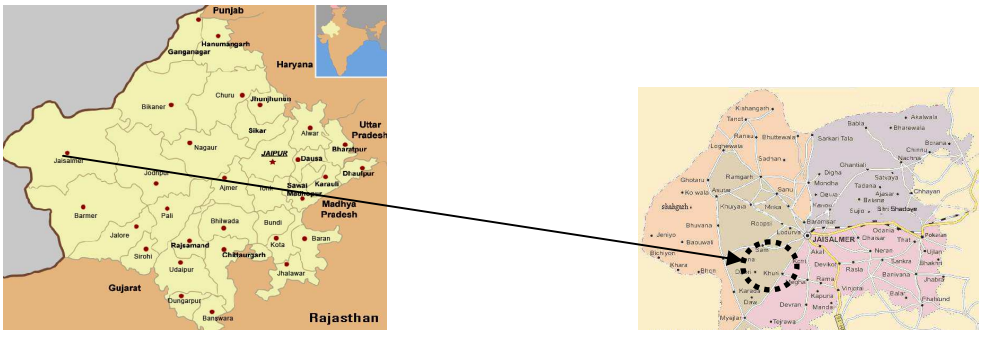
The geographical location of the project site is as shown below:

Sl No	WEG	Latitude	Longitude
1	MK014	27.1631	70.6809
2	MK015	27.1612	70.6858
3	MK016	27.1594	70.6907
4	MK017	27.1576	70.6956
5	MK021	27.1466	70.7251
6	MK039	27.1697	70.6926

[1] http://cdm.unfccc.int/Projects/DB/DNV-CUK1354785555.66/view

7	MK040	27.1715	70.6877
8	MK042	27.1752	70.6779
9	MK043	27.1771	70.6730
10	MK066	27.1837	70.6848
11	MK067	27.1812	70.6891
12	MK068	27.1804	70.6949
13	MK069	27.1782	70.6995
14	MK092	27.1887	70.7016
15	MK093	27.1905	70.6966
16	MK094	27.1924	70.6917
17	MK161	27.2195	70.6917
18	MK163	27.2237	70.6833
19	MK164	27.2255	70.6784
20	MK165	27.2274	70.6735

The geographical location of the project site is as shown below:



1.8 Title and Reference of Methodology

Title:

The methodology applied for the project is ACM 0002 of version 12.3.0.

2 IMPLEMENTATION STATUS

2.1 Implementation Status of the Project Activity

The project activity has been commissioned and commenced operation on 19th June 2011. The commissioning schedule of the project activity is shown below.

S.No	Make	WEG-HTSC No.	Commissioned on
1	Suzlon	MK014	04/08/2011
2	Suzlon	MK015	19/07/2011
3	Suzlon	MK016	19/07/2011
4	Suzlon	MK017	19/07/2011
5	Suzlon	MK021	30/09/2011
6	Suzlon	MK039	12/07/2011
7	Suzlon	MK040	12/07/2011
8	Suzlon	MK042	19/07/2011
9	Suzlon	MK043	04/08/2011
10	Suzlon	MK066	12/07/2011
11	Suzlon	MK067	30/06/2011
12	Suzlon	MK068	30/06/2011
13	Suzlon	MK069	30/06/2011
14	Suzlon	MK092	19/06/2011
15	Suzlon	MK093	25/06/2011
16	Suzlon	MK094	30/06/2011
17	Suzlon	MK161	25/06/2011
18	Suzlon	MK163	25/06/2011
19	Suzlon	MK164	19/06/2011
20	Suzlon	MK165	19/06/2011

Since the project activity is a wind energy project, there no leakage emissions associated with the project. The shutdown details have been included under section 5. Additional Information

2.2 Project Description Deviations

There have been no temporary deviations from the description of the project activity

2.3 Grouped Project

Not Applicable

3 DATA AND PARAMETERS

3.1 Data and Parameters Available at Validation

Data Unit / Parameter:	$EF_{grid,OMsimple,y}$
Data unit:	tCO_2/MWh

Description:	Operating margin CO_2 emission factor of NEWNE Grid
Source of data:	Central Electricity Authority: CO_2 Emission Database CEA CO_2 Baseline database Version 07
Value applied:	0.9842
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 0.9842. The operating Margin is calculated ex ante and fixed during the crediting period.

Data Unit / Parameter:	$EF_{grid,BM,y}$
Data unit:	tCO_2/MWh
Description:	Build margin CO_2 emission factor of NEWNE grid
Source of data:	Central Electricity Authority:CO2 Emission Database CEA CO_2 Baseline database Version 07
Value applied:	0.8588
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 0.8588.

Data Unit / Parameter:	$EF_{grid,CM,y}$
Data unit:	tCO_2/MWh
Description:	Combined margin CO_2 emission factor of NEWNE grid
Source of data:	Central Electricity Authority: CO_2 Emission Database CEA CO2 Baseline database Version 07

Value applied:	0.9529
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 0.9529.

3.2 Data and Parameters Monitored

Data Unit / Parameter:	$EG_{PJ,y}$
Data unit:	MWh
Description:	Quantity of net electricity exported to the grid during the year y.
Source of data:	Certificate for share of electricity generated by Wind Farm.
Description of measurement methods and procedures to be applied:	Net electricity supplied will be calculated based on the difference between calculated values of "export" and calculated value "import" on the JVVNL energy meter at the common evacuation point and the percentage transmission loss as prescribed in the PPA for metering at 220 kV All the data items monitored under the monitoring plan will be archived for entire crediting period or till the last issuance of VER/CERs for this project activity whichever occurs later. Calibration Frequency: All Energy meters will be tested for accuracy at least once in a year. The accuracy class of the energy meter is 0.2s.
Frequency of monitoring/recording:	Measuring frequency: Continuous Reading frequency: Daily Recording frequency: Monthly.
Value applied:	95622.1864
Monitoring equipment:	Energy meters of 0.2s accuracy class
QA/QC procedures to be applied:	Net electricity supplied to the grid by the project activity will be cross checked with invoices submitted to JVVNL.
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 Unit / Parameter:	$E_{,WEG,I,y}$
Data unit:	MWh/y
Description:	Quantity of Electricity generated by the individual WEGs of the PP in year y
Source of data:	WEG Controller meter reading
Description of measurement methods and procedures to be applied:	Electricity generated by the WEG will be continuously monitored by the controller meter installed within the WEG. These reading are recorded online by the technology supplier Calibration Frequency: The WEG controller meter does not require calibration as per the specification provided by the technology supplier
Frequency of monitoring/recording:	Continuous measuring
Value applied:	100575.683 (summation of generation from all 20 WEGs in MWh)
Monitoring equipment:	Microprocessor based controller meter
QA/QC procedures to be applied:	The quantity of electricity generated by the individual WEG will be cross-checkd with the online tracking system provided by the technology supplier
Calculation method:	Not Applicable
Any comment:	-

3.3 Description of the Monitoring Plan

The electricity exported to the grid through the project activity and the electricity imported from the JVVNL grid will be monitored. The electricity export and import is through a common evacuation system having common metering equipments. Suzlon Energy Limited has been identified as the common agency responsible for joint metering. Net electricity exported by the project proponent is calculated as mentioned below:

$EG_{PJ,y}$= (Export-Import) X (1+Transmission Loss)= 91944.41 MWh*(1+4%) = 95622.1864 MWh

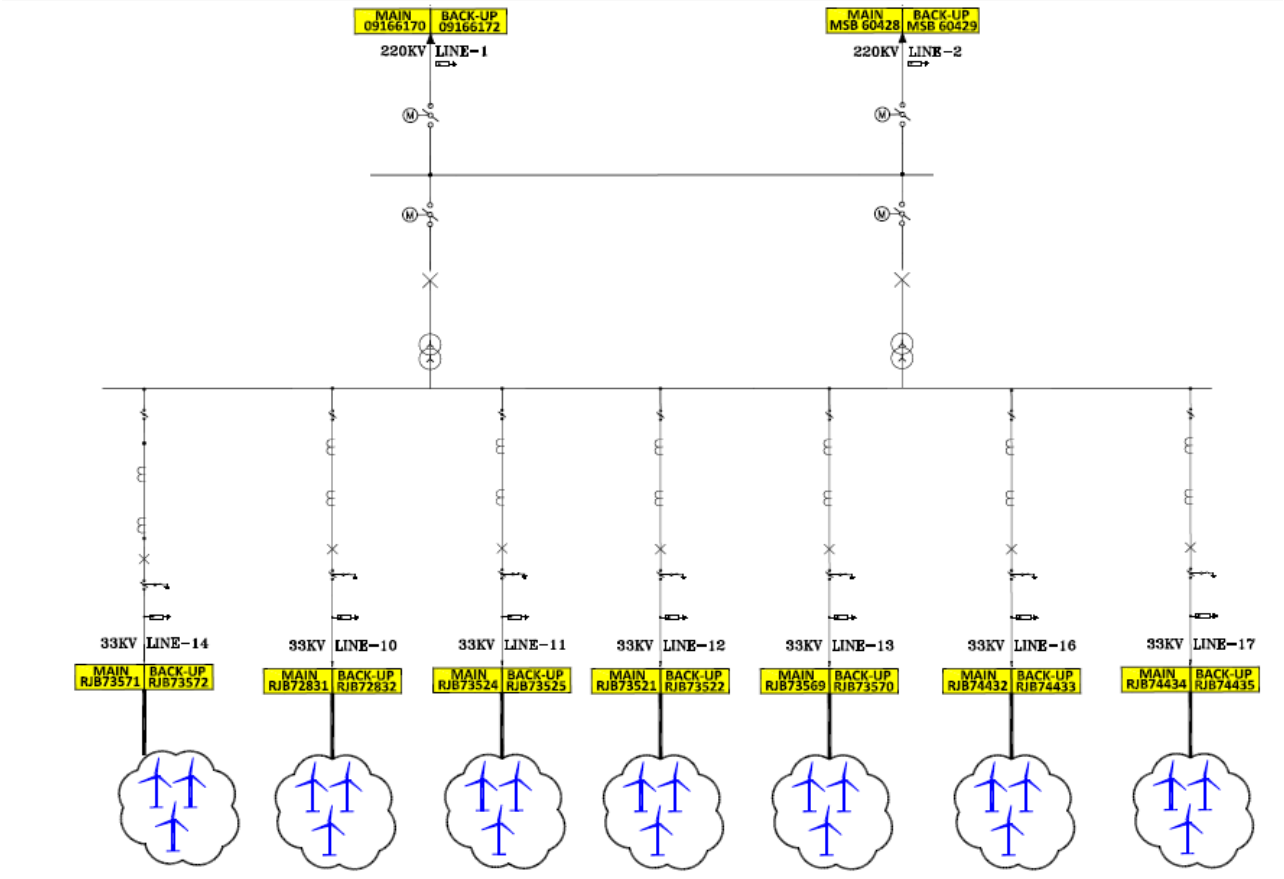
Where

Export-Import = is sourced from monthly energy breakup report issued by Suzlon energy limited (O & C contractor for the project) = 91944.41 MWh.

Transmission losses= 4% is sourced from power purchase agreement signed with Jodhpur Vidyut Vitran Nigam limited.

Net electricity exported by the project proponent ($EG_{PJ,y}$) can be cross checked from sales invoices raised to Jodhpur Vidyut Vitran Nigam limited.

The project proponent has entered into agreement with the WEG- Supplier – Suzlon Energy Limited for the operation and maintenance of WEGs. The WEG supplier has dedicated and technically well-equipped O&M team for day to day Operation and maintenance of each WEG. O&M contractor will provide a monthly report, which includes wind data, generation data, major breakdown events and machine availability, which forms the basis for invoicing and emission reduction computation. Project Manager is responsible for recording of monthly Joint Meter Readings of export and import. Monthly power export and import data will be sent regularly to CDM coordinator of MEIL. All data will be archived for a period two years after crediting period. The single line diagram for the project activity is as follows:



The calibration details for the energy meters are as follows:

WEG	Feeder Number	Meter Number	Meter Make	Newly calibrated	Calibration Due Date	Calibration Date	Next Calibration

				installed on			**Due Date**
MK 66	Fed no-10	RJB 72831	Secure Meters Limited	19/06/2011	19/06/2012	16/03/2012	16/03/2013
		RJB 72832	Secure Meters Limited	19/06/2011	19/06/2012	16/03/2012	16/03/2013
MK164 MK 165	Fed no-11	RJB 73524	Secure Meters Limited	19/06/2011	19/06/2012	16/03/2012	16/03/2013
		RJB 73525	Secure Meters Limited	19/06/2011	19/06/2012	16/03/2012	16/03/2013
MK67 MK68 MK69 MK92 MK93 MK94	Fed no-12	RJB 73521	Secure Meters Limited	19/06/2011	19/06/2012	16/03/2012	16/03/2013
		RJB 73522	Secure Meters Limited	19/06/2011	19/06/2012	16/03/2012	16/03/2013
MK14 MK15 MK16 MK17	Fed no-14	RJB 73571	Secure Meters Limited	19/06/2011	19/06/2012	16/03/2012	16/03/2013
		RJB 73572	Secure Meters Limited	19/06/2011	19/06/2012	16/03/2012	16/03/2013
MK39 MK40 MK42 MK43	Fed no-13	RJB 73569	Secure Meters Limited	19/06/2011	19/06/2012	16/03/2012	16/03/2013
		RJB 73570	Secure Meters Limited	19/06/2011	19/06/2012	16/03/2012	16/03/2013
MK 21	Fed no-17	RJB 74434	Secure Meters Limited	19/06/2011	19/06/2012	16/03/2012	16/03/2013
		RJB 74435	Secure Meters Limited	19/06/2011	19/06/2012	16/03/2012	16/03/2013
MK 161 MK 163	Fed no-16	RJB 74432	Secure Meters Limited	19/06/2011	19/06/2012	16/03/2012	16/03/2013
		RJB 74433	Secure Meters Limited	19/06/2011	19/06/2012	16/03/2012	16/03/2013

Substation Meter Details	**Substation Line Details**	**Meter Number**	**Meter Make**	**Newly calibrated installed on**	**Calibration Due Date**	**Calibration Date**	**Next Calibration Due Date**
Amarsagar Substation Main Meter	SS Line 1	09166170	Larsen & Toubro	19/06/2011	19/06/2012	13/03/2012	13/03/2013
Amarsagar Substation	SS Line 1	09166172	Larsen &	19/06/2011	19/06/2012	13/03/2012	13/03/2013

Check Meter			Toubro				
Amarsagar Substation Main Meter	SS Line 2	MSB 60428	Secure Meters Limited	19/06/2011	19/06/2012	13/03/2012	13/03/2013
Amarsagar Substation Check Meter	SS Line 2	MSB 60429	Secure Meters Limited	19/06/2011	19/06/2012	13/03/2012	13/03/2013

4 QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS

4.1 Baseline Emissions

The baseline emissions are the product of electrical energy baseline EGBL, 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.

$BE_y = EG_{BL,y} * EF_{CO2,grid,y}$

Where:

BE_y :Baseline Emissions in year y; t CO_2

$EG_{BL,y}$:Energy baseline in year y; kWh

EF_{CO2} :Emission Factor in year y; t CO_2e/kWh

As per registerd CDM PDD, combined margin emission factor is 0.9529 tCO_2 /MWh. Hence the baseline emissions for the project activity for the current monitoring period are as follows.

$BE_y = EG_{BL,y} * EF_{CO2} = 95622.1864 * 0.9529 = 91118$ 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 CO2e)	Project emissions or actual net GHG removals by sinks (t CO2e)	Leakage (t CO2e)	Emission reductions or net anthropogenic GHG removals by sinks (t CO2e)
Total	91118	0	0	91118

Year wise VCUs details are as follow:-

Year	VCUs
2011	21074
2012	70044
Total	91118

5 ADDITIONAL INFORMATION

Month on Month generation and shutdown details for this monitoring period are shown below:

Months	Electricity Exported (Kwh) E,exp	Electricity Imported (Kwh) E,imp	Net Export (Kwh)
Jun-11			
MK 161,163,164,165	804631	725	803906
MK 92,93,94,67,68,69	384218	338	383880
MK 39, 40,42,15,16,17,66	0	0	0
MK 43,14	0	0	0
Net Electricity Export			1187786
Jul-11			
MK 161,163,164,165	1729179	3458	1725721
MK 92,93,94,67,68,69	2371268	4890	2366378
MK 39, 40,42,15,16,17,66	1342849	3101	1339748
MK 43,14			0
Net Electricity Export			5431847
Aug-11			
MK 161,163,164,165	1203773	5438	1198335
MK 92,93,94,67,68,69	1813480	7361	1806119
MK 39, 40,42,15,16,17,66	2107447	9333	2098114
MK 43,14	511845	2351	509494
Net Electricity Export			5612062
Sep-11			

MK 161,163,164,165	266288	0	266288
MK 92,93,94,67,68,69	383389	0	383389
MK 39, 40,42,15,16,17,66	478469	0	478469
MK 43,14	145056	0	145056
MK21	1017	0	1017
Net Electricity Export			1274219

Oct-11			
MK 161,163,164,165	3612879	58465	3554414
MK 92,93,94,67,68,69			
MK 39, 40,42,15,16,17,66			
MK 43,14, MK21			
Net Electricity Export			3554414

Nov-11			
MK 161,163,164,165	1284668	72637	1212031
MK 92,93,94,67,68,69			
MK 39, 40,42,15,16,17,66			
MK 43,14, MK21			
Net Electricity Export			1212031

Dec-11			
MK 161,163,164,165	3048212	54946	2993266
MK 92,93,94,67,68,69			
MK 39, 40,42,15,16,17,66			
MK 43,14, MK21			
Net Electricity Export			2993266

Jan-12			
MK 161,163,164,165	3041981	41136	3000845
MK 92,93,94,67,68,69			
MK 39, 40,42,15,16,17,66			
MK 43,14, MK21			
Net Electricity Export			3000845

Feb-12			
MK 161,163,164,165	3424904	37388	3387516
MK 92,93,94,67,68,69			
MK 39, 40,42,15,16,17,66			
MK 43,14, MK21			
Net Electricity Export			3387516

Mar-12			
MK 161,163,164,165	5312477	46711	5265766
MK 92,93,94,67,68,69			

MK 39, 40,42,15,16,17,66 MK 43,14, MK21			
Net Electricity Export			5265766

Apr-12			
MK 161,163,164,165 MK 92,93,94,67,68,69 MK 39, 40,42,15,16,17,66 MK 43,14, MK21	4456579	36637	4419942
Net Electricity Export			4419942

May-12			
MK 161,163,164,165 MK 92,93,94,67,68,69 MK 39, 40,42,15,16,17,66 MK 43,14, MK21	7345985	19307	7326678
Net Electricity Export			7326678

Jun-12			
MK 161,163,164,165 MK 92,93,94,67,68,69 MK 39, 40,42,15,16,17,66 MK 43,14, MK21	15970366	7028	15963338
Net Electricity Export			15963338

Jul-12			
MK 161,163,164,165 MK 92,93,94,67,68,69 MK 39, 40,42,15,16,17,66 MK 43,14, MK21	14317750	12118	14305632
Net Electricity Export			14305632

Aug-12			
MK 161,163,164,165 MK 92,93,94,67,68,69 MK 39, 40,42,15,16,17,66 MK 43,14, MK21	6832936	32935	6800001
Net Electricity Export			6800001

Sep-12			
MK 161,163,164,165 MK 92,93,94,67,68,69 MK 39, 40,42,15,16,17,66 MK 43,14, MK21	3760048	46429	3713619
Net Electricity Export			3713619

Oct-12			
MK 161,163,164,165 MK 92,93,94,67,68,69	2308247	66551	2241696

MK 39, 40,42,15,16,17,66			
MK 43,14, MK21			
Net Electricity Export			2241696

Nov-12			
MK 161,163,164,165	1345875	71458	1274417
MK 92,93,94,67,68,69			
MK 39, 40,42,15,16,17,66			
MK 43,14, MK21			
Net Electricity Export			1274417

Dec-12			
MK 161,163,164,165	3092693	44676	3048017
MK 92,93,94,67,68,69			
MK 39, 40,42,15,16,17,66			
MK 43,14, MK21			
Net Electricity Export			3048017

Generation on 31st December 2012 in kWh	68682
Net Export from 19 June 2011 to 31 December 2012 in kWh	92013092
Net Export from 19 June 2011 to 30 December 2012 in kWh	91944410
Line loss	4.00%
Net electricity exported after considering transmission losses for the period from 19 June 2011 to 30 December 2012 in kWh	95622186
Emission factor of NEWNE grid in tCO2/MWh	0.9529
VCUs	91118

Year	**VCUs**
2011	21074
2012	70044
Total	91118

Shutdown Details:

S.No	WEG No	Total Shutdown Hours (June 2011 to December 2012)
1	MK014	270.65
2	MK015	373.1
3	MK016	375.5
4	MK017	373.76
5	MK021	209.02
6	MK039	253.2
7	MK040	302.74
8	MK042	331
9	MK043	292.26
10	MK066	300.58

11	MK067	338.8
12	MK068	325.8
13	MK069	122.1
14	MK092	308.6
15	MK093	390.06
16	MK094	311.29
17	MK161	373.85
18	MK163	323.65
19	MK164	330
20	MK165	402.38