Monitoring Report

Project Title - 14 MW Wind Power Project in Maharashtra

Monitoring Period
2007-06-08 to 2009-06-07
(Both days are inclusive)

Submitted by
M/s Shah Promoters & Developers
Apte Road, Deccan Gymkhana,
AST-1, Success Chambers
Maharashtra State, India

(Version 02)

August 13th 2009

Contents

1. Introduction

The proposed project activity by M/s Shah Promoters & Developers(SPD) is a small-scale project involving installation of 10 wind electric generators (WEGs) of individual capacities 1.25 MW (4 machines) and 1.5 MW (6 machines). The WEGs totaling to 14 MW installed capacity have been commissioned in Dhule and Sangli Districts of Maharashtra.

Table: 1.1 Capacity and make of the WEGs

Number	Individual capacity	Total Capacity	Make
Four	1.25 MW	5 MW	S-70
Six	1.50 MW	9 MW	S-82

The project was registered at UNFCCC (Ref Number 2342) on 2009-06-08 and the details of the same can be viewed on http://cdm.unfccc.int/Projects/DB/RWTUV1229007791.61/view

This is the first Monitoring Report of project titled '14 MW Wind Power Project in Maharashtra' under VCS 2007.1. The Emission Reduction (ERs) achieved by this VER (Voluntary Emission Reduction) project, by generating renewable energy has been considered for the monitoring period 2007-06-08 to 2009-06-07 .

Table: 1.2 Summary of Achieved Emission Reductions

Period	Estimation of Project Activity Emission (tCO_2e)	Total Baseline Emissions (tCO_2e)	Estimation of Leakage (tCO_2e)	Estimation of Emission Reduction (tCO_2e)
2007-06-08 to 2007-12-31	0	3647	0	3647
2008-01-01 to 2008-12-31	0	18266	0	18266
2009-01-01 to 2009-06-07	0	5955	0	5955
Total	0	27868	0	27868
Total (after rounding down)				27868

Table 1.3: Summary of Generation

Generation	***MWh***
2007	4491
2008	22493
2009	7334
Total Generation	34318

The project operation has been monitored in accordance with the requirements of the applicable Monitoring Methodology as described in its Project Design Document (PDD) and the Project Monitoring Plan (MP) registered under CDM.

The implemented project activity, sells electricity generated from its WEGs to the Maharashtra State Electricity Distribution Company Ltd. (MSEDCL) which falls under Western Region electricity grid network(now Integrated Northern, Eastern, Western and Northern east Grid i.e. Integrated NEWNE) of India, resulting in displacement of same amount of electricity generated in fossil fuel dominated thermal plants. Thus the project activity reduces CO_2 and other GHG emissions equivalent to the electricity generated in the Integrated NEWNE grid. The project activity also contributes to the regional sustainable development.

Project also complies with the VCS Project Description clauses 1.12, 1.13, 1.14, 8.1 and 8.2 as, PP owns the WEGs and the project activity is not implemented to create GHG emissions primarily for the purpose of its subsequent removal or destruction. This monitoring report for the project activity is prepared to verify voluntary emission reductions under VCS 2007.1 .The supplementary VCS PD is also submitted which is in line with the requirements of Policy Announcement from VCS association dated 19th March, 2008.

2. Description of the Project Activity

The project activity consists of installation of 14 MW wind power project to generate electricity in high wind speed areas of Maharashtra. M/s Shah Promoters & Developers (SPD) is the promoter of these wind farms. The project activity consists of 10 wind electric generators (WEGs) installed in two different sites within Maharashtra. The generated electricity from WEGs is exported to state electric utility namely Maharashtra State Electricity Distribution Company Limited (MSEDCL) and transmitted through state electricity grid.

Site	WEG Location No[1].	Installed Capacity (MW)	Technology	Village, District	Substation	Commissioning Date
Site-I	J- 17	1.25	SUZLON, S70	Jamade, Dhule	Jamde Substation	2006-08-10
	J- 21	1.25	SUZLON, S70	Jamade, Dhule	Jamde Substation	
	J- 22	1.25	SUZLON, S70	Jamade, Dhule	Jamde Substation	
	J- 23	1.25	SUZLON, S70	Jamade, Dhule	Jamde Substation	
Site-II	N- 4	1.50	SUZLON, S82	Nagaj, Sangli	Ghatnadre Substation	2007-09-30
	N- 5	1.50	SUZLON, S82	Nagaj, Sangli	Ghatnadre Substation	
	N-6	1.50	SUZLON, S82	Nagaj, Sangli	Ghatnadre Substation	
	N-7	1.50	SUZLON, S82	Nagaj, Sangli	Ghatnadre Substation	
	N-8	1.50	SUZLON, S82	Nagaj, Sangli	Ghatnadre Substation	
	N-9	1.50	SUZLON, S82	Nagaj, Sangli	Ghatnadre Substation	
10 machines				**14 MW**		

Table 2.1

2.1. Project Location

A location detail of each site is mentioned in Table 2.2.

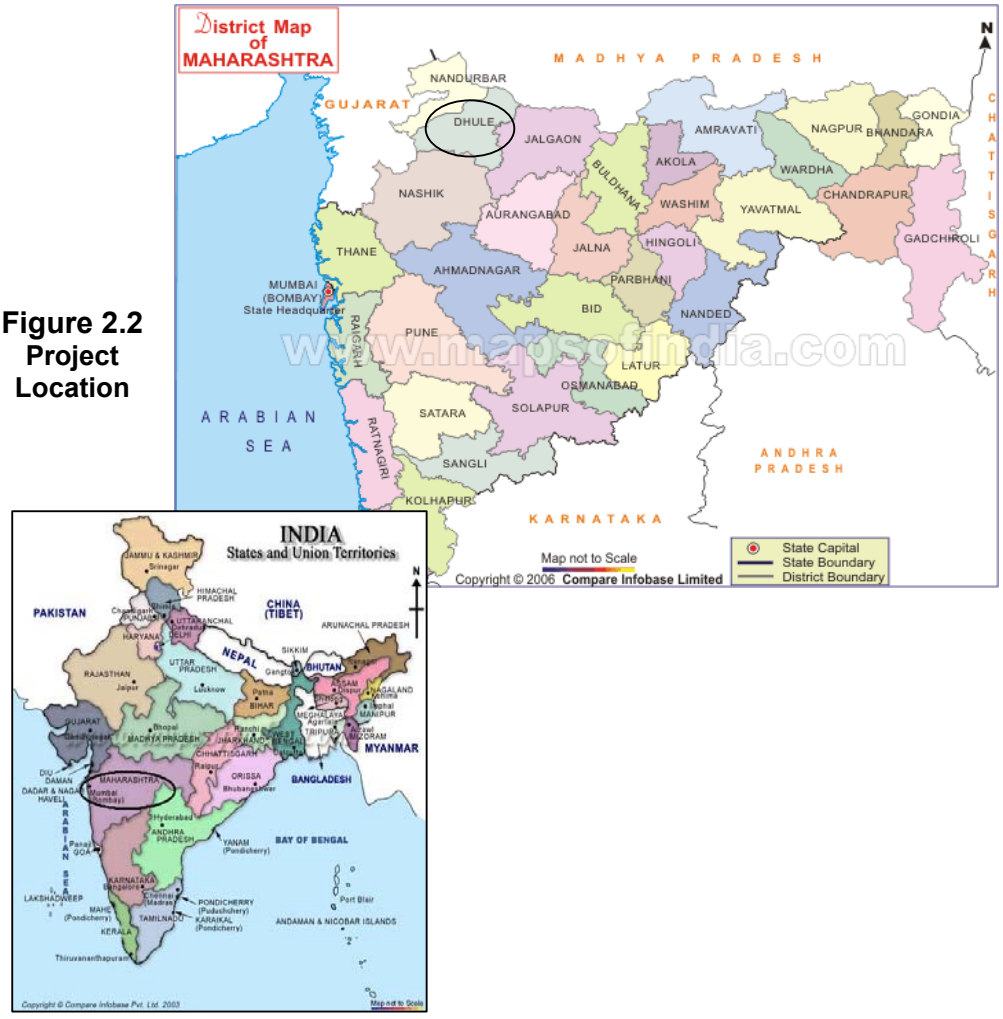
The location of individual wind turbines are:

[1]This number is the unique identification number of the WTG given by the O & M contractor and cannot be duplicated for any other WTG. The number can be verified from the micro-siting drawings and various nodal agency clearances. *Copy of the micrositing drawing and clearances have been submitted to the DOE*

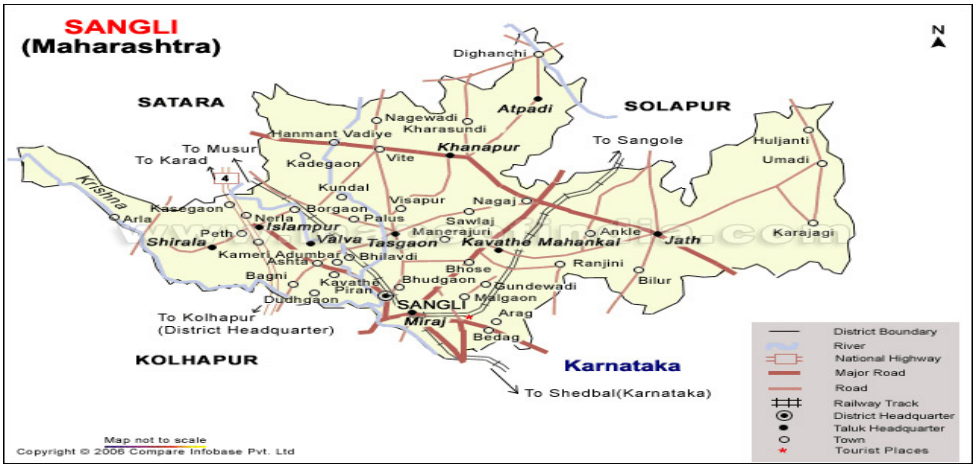
Site	WINDMILL LOCATION NO.	ADDRESSES	Latitude	Longitude
Site – I	J-17	R. S. No. - 19, Village – Jamade, Taluka - Sakari, Dist - Dhule	20°59'24.89" N	74°18'51.52"E
	J-21	R. S. No. - 19, Village – Jamade, Taluka - Sakari, Dist – Dhule	20°59'24.89" N	74°18'51.52"E
	J-22	R. S. No. - 19, Village – Jamade, Taluka - Sakari, Dist - Dhule	20°59'24.89" N	74°18'51.52"E
	J-23	R. S. No. – 19, Village – Jamade, Taluka - Sakari, Dist - Dhule	20°59'24.89" N	74°18'51.52"E
Site – II	N-4	Survey no.-585, Village – Nagaj, Taluka - Kawathe Mahakal, Dist - Sangli	17°08' 00.00" N	74°55'59.98" E
	N-5	Survey no.- 604, Village – Nagaj, Taluka - Kawathe Mahakal, Dist - Sangli	17°08' 00.00" N	74°55'59.98" E
	N-6	Survey no.- 604, Village – Nagaj, Taluka - Kawathe Mahakal, Dist. - Sangli	17°08' 00.00" N	74°55'59.98" E
	N-7	Survey no.- 604, Village – Nagaj, Taluka - Kawathe Mahakal,Dist - Sangli	17°08' 00.00" N	74°55'59.98" E
	N-8	Survey no.- 604, Village – Nagaj, Taluka - Kawathe Mahakal, Dist - Sangli	17°08' 00.00" N	74°55'59.98" E
	N-9	Survey no.- 604, Village – Nagaj, Taluka - Kawathe Mahakal, Dist -Sangli	17°08' 00.00" N	74°55'59.98" E

Table 2.2

Figure 2.2 Project Location



Map of Dhule



Map of Sangli

2.2. Project Boundary

As per the methodology, "the project boundary encompasses the physical, geographical site of the renewable generation source".

The project boundary includes the WEGs, regional grid (Western grid[2]) & substations of the project. The flow diagram showing boundary of the project is as follows:

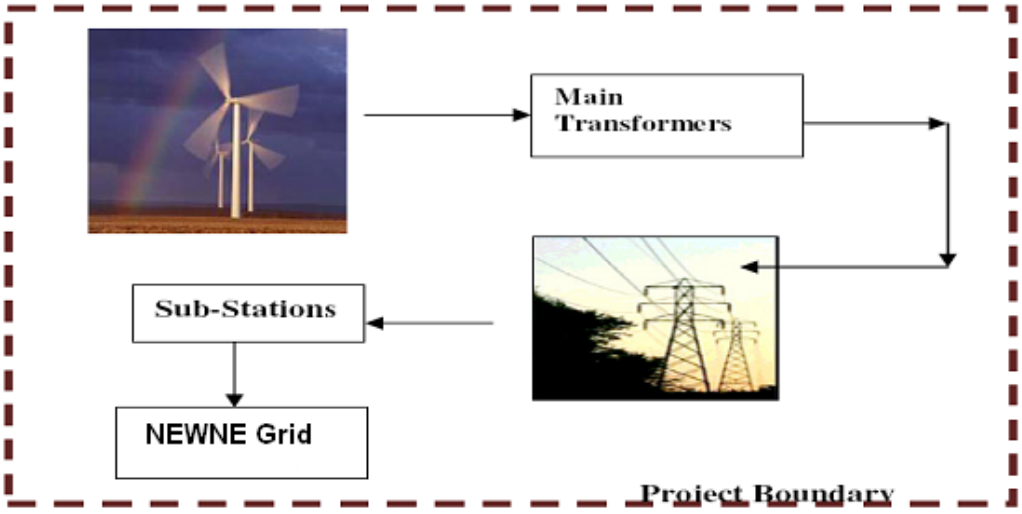


Figure 2.3 Project Boundary

[2] Western Regional Grid is now part of NEWNE grid due to integration of North, East, West and North Eastern grids into NEWNE grid

3. Details of Project Proponent

Table 3.1: Contact Details of Project Proponents

Organization:	M/s Shah Promoters & Developers
Street/P.O.Box:	Apte Road, Deccan Gymkhana
Building:	AST-1, Success Chambers
City:	Pune
State/Region:	Maharashtra
Postfix/ZIP:	411 004
Country:	India
Telephone:	91-20-25531777
Fax:	91-20-24275998
E-Mail:	vastushree@vsnl.net
URL:	
Represented by:	
Title:	Partner
Salutation:	Mr
Last Name:	Shah
Middle Name:	Chandrakant
First Name:	Rajesh
Department:	Management
Mobile:	91-9822095858
Direct Fax:	91-20-24275998
Direct tel:	91-20-242275996
Personal E-Mail:	Rajeshshah28@yahoo.co.in

4. Sustainability Criteria

The proposed project is contributing to the sustainable development of the region[3] in following manner.

i) **Social well-being**

The proposed project has resulted in better living conditions for the local community. There was growth in job opportunities in the region owing to erection and operation of the wind farm. The employment of local populace has brought about improvement in living standard and subsequently has led to the development of better basic amenities such as roads and medical facilities. Thus the project has contributed to the social well being of the region.

ii) Economic well being

The project has created direct and indirect job opportunities at the time of installation and later during operation of the WEGs. The investment for the project activity has increased the economic activity of the local area. The above contributes to the economic well being and social well being of the local community. The project activity also contributes to nation's economy by reducing import of coal and other fossil fuel for electricity generation in hard currency.

[3] Ministry of Environment and Forests web site: http://envfor.nic.in:80/divisions/ccd/cdm_iac.html

iii) Environmental well being

The project utilizes wind energy for generating electricity which otherwise would have been generated through alternate fuels (most likely – fossil fuel) based power plants. This will lead to reduction in specific emissions (emissions of pollutant/unit of energy generated) including GHG emissions. As wind power projects produce no end products in the form of solid waste (ash etc.), they address the problem of solid waste disposal encountered by most other sources of power. Being a renewable resource, using wind energy to generate electricity contributes to resource conservation.

iv) Technological well-being

The generated electricity from the project activity will be connected to the grid. The project activity will improve the supply of electricity with clean, renewable wind power while contributing to the regional/local economic development. The benefits include:

- Improved power quality
- Reactive power control
- Mitigation of transmission and distribution congestion

In view of the above, the project participants consider that the project activity will profoundly contributes to the sustainable development.

5. Monitoring Methodology and monitoring Plan

As per the Voluntary Carbon standards, methodologies and guidelines that have been approved by CDM executive board can be referred for emission reduction calculation. Hence the same has been referred.

5.1 Monitoring Methodology:

As defined under Appendix B of the simplified modalities and procedures for small-scale CDM project activities, the project activity falls under following project types and categories:

Project Type:	I – Renewable Energy Projects
Project Category:	I.D. – Grid connected renewable electricity generation (Version 13)
Reference:	Appendix B of the simplified M&P for small scale CDM project activities

5.2 Monitoring Plan:

Being a small-scale project activity of Type I.D. category, the monitoring methodology and plan has been developed in line with the guidance provided in paragraph 13 of category I.D. of Appendix B.

As required in the methodology following data needs to be monitored,

Table 5.1: Details of Monitored Data

Data / Parameter:	EGy
Data unit:	MWh
Description:	Net Electricity export to the grid
Source of data to be used:	Joint meter reading by MSEDCL and promoter
Value of data	--
Description of measurement methods and procedures to be applied:	The data will be measured by metering. Every month these meter readings will be recorded by plant personnel. These records will be archived for cross-checking yearly figures.
QA/QC procedures to be applied:	The project revenue is based on the net units displaced as measured by metering system involving common bulk meter and the individual WTG controller meter. The common bulk meters constitute main meter and check meter. The accuracy of the main meter and check meter can be verified by comparing each other. Other than main meter, the project proponent has check meter so that the accuracy of main meter can be verified. The calibration of the meters will be done annually by state utility. Other than periodic calibration of the meters the reading of both meters, will be matched every month.
Any comment:	This data will be archived up-to two years after the completion of crediting period or last issuance whichever is later.

Parameter:	EF Grid, y
Data unit:	tonnes of CO2 eq /MWh
Description:	Weighted average grid emission factor
Source of data to be used:	The value has been provided by Central Electricity Authority
Value of data	0.81
Description of measurement methods and procedures to be applied:	The data will be taken from the latest CEA database available.
QA/QC procedures to be applied:	The value has been taken from official statistics published by Central Electricity Authority , which is a official data available in public domain.
Any comment:	This data will be archived up-to two years after the completion of crediting period or last issuance whichever is later.

Monitoring Procedure

As emission reductions from the project is determined by the number of units exported to the grid. It is mandatory to have a monitoring system in place and ensure that the project activity produces and exports the rated power at the stipulated norms. The sole objective of having monitoring system is to have a constant watch on the emission reductions.

The delivered energy will be metered by Suzlon and MSEDCL at the high voltage side of the step up transformers. Metering will be done either for two /three / more wind turbines depending on the location of wind turbines and service connection number. Metering equipments will be electronic trivector meters*. The metering equipments will be maintained in accordance with electricity standards and will have the capability of recording daily and monthly readings. Records of joint meter reading will be maintained at site and a copy will be maintained at the head office.

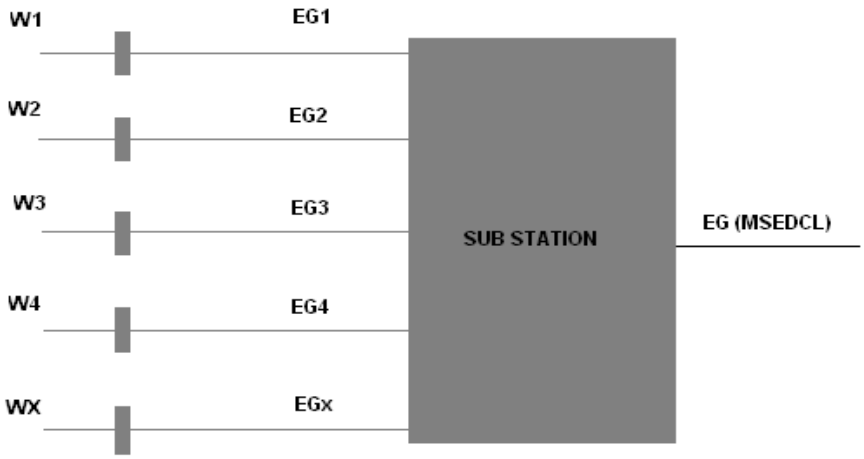
The project activity essentially involves generation of electricity from wind, the employed WEGs can only convert wind energy into electrical energy and cannot use any other input fuel for electricity generation. Thus no special ways and means are required to monitor leakage from the project activity.

- The proposed project activity requires evacuation facilities for sale to grid and the evacuation facility is essentially maintained by the state power utility (MSEDCL).
- The electricity generation measurements are required by the utility and the investors to assess electricity sales revenue and / or wheeling charges.
- The project activity has therefore envisaged two independent measurements of generated electricity from the wind turbines.
- The primary recording of the electricity fed to the state utility grid will be carried out jointly at the incoming feeder of the state power utility (MSEDCL). Machines for sale to utility are connected to the feeder.
- The joint measurement will be carried out once in a month in presence of both parties (the developer's representative and officials of the state power utility). Both parties will sign the recorded reading.
- Metering equipment - Metering is carried out through electronic trivector meters*of accuracy class 0.2% required for the project. The main meter shall be installed and owned by MSEDCL, whereas the project participant owns the check meters. The metering equipments are maintained in accordance with electricity standards.
- The secondary monitoring, which will provide a backup (fail-safe measure) in case the primary monitoring is not carried out, would be done at the individual WEGs. Each WEG is equipped with an integrated electronic meter. These meters will be connected to the Central Monitoring Station (CMS) of the entire wind farm through a wireless Radio Frequency (RF) network (PLC). The generation data of individual machine can be monitored as a real-time entity at CMS. The snapshot of generation on the last day of every calendar month will be kept as a record both in electronic as well as printed (paper) form.

*Trivector Meter - is a device that measures the amount of electrical energy supplied to the utility. It is called as tri-vector meter because it measures energy consumption of the three phase lines R, Y, B which are 120 phase difference from each other. It measures the consumption in terms of the active energy, reactive energy, apparent energy, power factor

Description of billing calculation from net meter to individual meters

Each substation is connected to a number of wind turbines. The generation reading is collectively displayed by the substation meter. The net generation of each of the wind turbines is then calculated in the following manner:



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, Suzlon Energy Limited, are always present on site to monitor various parameters of power generation and deal with any problems related to generation, transmission or maintenance. EGn,y is the electricity generated from an individual wind turbine measured through its controller meter. The summation of total Electricity Generated from all the wind turbines of the project proponent in MWh is presented as

$$\sum_{0}^{n} EG_{n,y}$$

And the summation of total Electricity Generated from all the wind turbines at the given site and connected to the particular feeder in MWh as measured at the individual controllers is presented as

$$\sum_{0}^{m} EG_{m,y}$$

A ratio based on these two set of measured values is used for apportioning the net electricity supplied to the western regional 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, usually in the first week 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” (EGJMR,export) and “import” (EGJMR,import) of the electricity to/ from the western grid. There is a single meter which gives both the export and import values, this metered reading gives the net value of line losses and auxiliary consumption. Further, as there is a common MSEDCL joint meter for multiple project proponents, the joint meter reading (JMR) 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 the EPC contractor (SEL in this case) based on the power generation from the individual wind turbines connected to this MSEDCL meter. SPD O&M personnel 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.

EG,SPD(MSEDCL) , the electricity supplied to the grid by the project activity is calculated as follows:

$$EG_{SPD,(MSEDCL)} = \frac{\sum_{0}^{n} EG_{n,y} \; * \; EG_{MSEDCL}}{\sum_{0}^{m} EG_{m,y}}$$

Where

$EG_{SPD, MSEDCL}$	Net generation at measured at MSEDCL meter from all the WTGs included in this project activity
$\sum_{0}^{n} EG_{n,y}$	Total electricity generated by the WTGs included in this project activity at the controller.
EG_{MSEDCL}	Total net generation at MSEDCL substation feeder obtained by deducting (EGJMR,import) from (EGJMR,export)
$\sum_{0}^{m} EG_{m,y}$	Total generation of all the WTGs connected to the feeder at controller.

Meter Details:

The details of meter installed are described below.

Table 5.2

J – 17
Connected to Jamde S/S feeder no 13 *Sr. No of Main Meter: 04737790* *Tech Details: Electronic Trivector Meter; Make: Elster Metering (P) Ltd.; (Alpha S+)* *Sr. No of Check Meter: 04737791* *Tech Details: Electronic Trivector Meter; Make: Elster Metering (P) Ltd.; (Alpha S+)* *Commissioned on 10.08.2006*
J – 21
Connected to Jamde S/S feeder no 14 *Sr. No of Main Meter: 04738075* *Tech Details: Electronic Trivector Meter; Make: Elster Metering (P) Ltd.; (Alpha S+)* *Sr. No of Check Meter: 04738076* *Tech Details: Electronic Trivector Meter; Make: : Elster Metering (P) Ltd.; (Alpha S+)* *Commissioned on 10.08.2006*
J – 22
Connected to Jamde S/S feeder no 14 *Sr. No of Main Meter: 04738075* *Tech Details: Electronic Trivector Meter; Make: Elster Metering (P) Ltd.; (Alpha S+)* *Sr. No of Check Meter: 04738076* *Tech Details: Electronic Trivector Meter; Make: : Elster Metering (P) Ltd.; (Alpha S+)* *Commissioned on 10.08.2006*
J – 23

Connected to Jamde S/S feeder no 14 *Sr. No of Main Meter: 04738075* *Tech Details: Electronic Trivector Meter; Make: Elster Metering (P) Ltd.; (Alpha S+)* *Sr. No of Check Meter: 04738076* *Tech Details: Electronic Trivector Meter; Make: : Elster Metering (P) Ltd.; (Alpha S+)* *Commissioned on 10.08.2006*
N – 4, N-5, N-6, N-7, N8 & N9
Connected to Jamde S/S feeder no 5 (Sep 2007-May 2008) *Sr. No of Main Meter: 047225792* *Tech Details: Accuracy Class (Accu. Cl.) : 0.2, Burden: 50 - 100 VA, Potential Transformer Ratio (PTR)– 33kV/110V, 50 Hz,* *Sr. No of Check Meter: 04725794* *Tech Details: Accuracy Class (Accu. Cl.) : 0.2, Burden: 50 - 100 VA, Potential Transformer Ratio (PTR)– 33kV/110V, 50 Hz,* *Commissioned on 30.09.2007*

The details of the subsequent feeder change and corresponding main and check meter details are given below:

Table 5.3

WTG No.	***Period***	***Feeder details***
N – 4, N-5, N-6, N-7, N8 & N9	*June 2008-July 2008*	*Connected to Jamde S/S feeder no 9* *Sr. No of Main Meter: 04902207* *Tech Details: Accuracy Class (Accu. Cl.) : 0.2* *Sr. No of Check Meter: 04902209* *Tech Details: Accuracy Class (Accu. Cl.) : 0.2*
N – 4, N-5, N-6, N-7	*August 2008 to June 2009*	*Connected to Jamde S/S feeder no 9* *Sr. No of Main Meter: 04902207* *Tech Details: Accuracy Class (Accu. Cl.) : 0.2* *Sr. No of Check Meter: 04902209* *Tech Details: Accuracy Class (Accu. Cl.) : 0.2*
N8, N9	*August 2008 to June 2009*	*Connected to Jamde S/S feeder no 10* *Sr. No of Main Meter:* 04902210 *Tech Details: Accuracy Class (Accu. Cl.) : 0.2* *Sr. No of Check Meter:* 04902208 *Tech Details: Accuracy Class (Accu. Cl.) : 0.2*

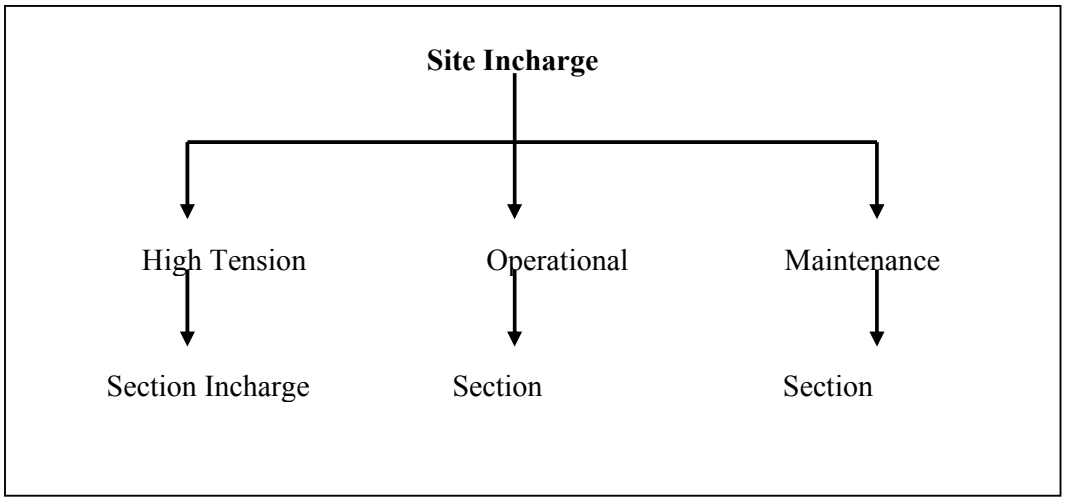
All the meters were periodically calibrated and evidence for the same has been submitted to the DOE.

Table 5.4: Details of Calibration of main meter & Check meter.

Site No.	Meter Type	Date of Calibration
J – 17	Main Meter 04737790	22/05/2008, 08/07/2009
J-21, J-22 and J-23	Main Meter 04738075	14/02/2006, 22/05/2008 08/07/2009
N-4, N-5, N-6, N-7, N-8 and N-9	Main Meter 047225792	29/09/2007, 11/03/2008
N-4, N-5, N-6, N-7,	Main Meter 04902207	05/07/2008,01/12/2008
N-8 and N-9	Main Meter 04902210	August 2008, 01/12/2008
J – 17	Check Meter 04737791	22/05/2008, 08/07/2009
J-21. J-22 and J-23	Check Meter 04738076	14/02/2006, 22/05/2008 08/07/2009
N-4, N-5, N-6, N-7, N-8 and N-9	Check Meter 04725787	11/03/2008
N-4, N-5, N-6, N-7,	Check Meter 04902209	05/07/2008,01/12/2008
N-8 and N-9	Check Meter 04902208	August 2008, 01/12/2008

The project participant has signed an operation and maintenance agreement with the supplier of the wind turbines i.e. Suzlon. The agreement is for a period of 10 years. The performance of the turbines, safety in operation and scheduled /breakdown maintenances is responsibility of Suzlon and is organized and monitored by them. So the authority and responsibility of project management lies with the O & M contractor.

The organizational hierarchy of Suzlon for O& M management is as follows



Routine Maintenance Services:

Routine Maintenance Labour Work involves making available suitable manpower for operation and maintenance of the equipment and covers periodic preventive maintenance, cleaning and upkeep of the equipment including –

a) Tower Torquing
b) Blade Cleaning
c) Nacelle Torquing and Cleaning
d) Transformer Oil Filtration
e) Control Panel & LT Panel Maintenance

f) Site and Transformer Yard Maintenance

Security Services: This service includes watch and ward and security of the wind farm and the equipment.

Management Services:

Data logging in for power generation, grid availability, machine availability.
Preparation and submission of monthly performance report in agreed format.
Taking monthly meter reading jointly with utility of power generated at Wind Farm and supplied to grid from the meter/s maintained by utility for the purpose and co-ordinate to obtain necessary power credit report/ certificate.

Technical Services:

a) Visual inspection of the WEGs and all parts thereof.
b) Technical assistance including checking of various technical, safety and operational parameters of the equipment, trouble shooting and relevant technical services.

Training Schedules observed:

Training of staff operating and maintaining the WEGs is carried out by the WTG manufacturer and supplier (Suzlon). Special emphasis is given to the training of the employees to enable them to develop their skills to meet changing WTG technology and to provide efficient and effective O&M services. There is an initial learning programme as well as continuous learning programmes for all employees. All newly-hired employees are required to attend an intensive two- to four-week, full-time training programme to familiarize them with business and operations.

6. Measures to insure the Accuracy of Results

Following measures are taken to ensure accuracy of readings & the calculations based there on.

Procedures for internal audit and management review:

An internal audit of the project activity would be done on a half yearly basis by a special audit team. The audit team would comprise competitive persons. The team would audit the project for the following aspects among other things:

- Are the monitoring of CDM parameters done in line with the CDM PDD and CDM Manual?
- Is the documentation of monitored CDM parameters done properly?
- Are equipments calibrated and maintained as scheduled?
- Is the quantity of CERs generated inline with that projected in the CDM PDD, if not, what are the reasons for deviation?
- Are necessary corrective actions being taken to address deviations?
- Check the authenticity of data monitored and recorded by random cross-checking with other sources.

The audit team will submit their observations to the Head- Wind Power Projects for his review and necessary action.

7. Period of Monitoring

2007-06-08 to 2009-06-07

8. VER (Voluntary Emission Reduction) Calculations

Emission Reduction = Baseline Emission – Project Emission – Leakage

Baseline Emission

In line with AMS-I.D. baseline emission for the project activity is being estimated as-

"The kWh produced by the renewable generating unit multiplied by an emission coefficient (measured in kg CO2e/kWh) calculated in a transparent and conservative manner as:

(a) A combined margin (CM), consisting of the combination of operating margin (OM) and build margin (BM) according to the procedures prescribed in the 'Tool to calculate the mission factor for an electricity system'.

OR

(b) The weighted average emissions (in kg CO2e/kWh) of the current generation mix. The data of the year in which project generation occurs must be used"

Baseline emissions = Grid emission factor * Power generated from the project
(tons of CO2) (tons of CO2/MWh) (MWh/year)

The project activity is displacing electricity from the Integrated NEWNE grid; hence weighted average emission of the Integrated NEWNE grid is being used.

9. Summary of VERs

Period	Estimation of Project Activity Emission (tCO_2e)	Total Baseline Emissions (tCO_2e)	Estimation of Leakage (tCO_2e)	Estimation of Emission Reduction (tCO_2e)
2007-06-08 to 2007-12-31	0	3647	0	3647
2008-01-01 to 2008-12-31	0	18266	0	18266
2009-01-01 to 2009-06-07	0	5955	0	5955
Total	0	27868	0	27868
Total (after rounding down)				27868

10. Monthly Operating Data

J-17	
Month	**Net (kWh)**
Jun-07[4]	127706.69
Jul-07	291452
Aug-07	260219
Sep-07	73396
Oct-07	31794
Nov-07	9649
Dec-07	22275
Jan-08	41392
Feb-08	44774
Mar-08	39235
Apr-08	119301
May-08	363824
Jun-08	274427
Jul-08	299349
Aug-08	212033
Sep-08	90087
Oct-08	25463
Nov-08	25137
Dec-08	22487
Jan-09	21458
Feb-09	36961
Mar-09	66166
Apr-09	146914
May-09	337472
June-09[5]	22140.82

J-21	
Month	**Net (kWh)**
Jun-07[6]	122759.41
Jul-07	217687
Aug-07	244328

[4] From 8th June to 30th June. Details has been included in the Emission Reduction excel sheet.

[5] From 1st June to 7th June. Details has been included in the Emission Reduction excel sheet

[6] From 8th June to 30th June. Details has been included in the Emission Reduction excel sheet

Sep-07	72538
Oct-07	33654
Nov-07	9143
Dec-07	22317
Jan-08	41543
Feb-08	46719
Mar-08	56930
Apr-08	148000
May-08	395340
Jun-08	247962
Jul-08	280753
Aug-08	229713
Sep-08	95725
Oct-08	25532
Nov-08	24880
Dec-08	23757
Jan-09	22387
Feb-09	42990
Mar-09	73617
Apr-09	144297
May-09	347019
June-09[7]	15203.64

J-22	
Month	**Net**
	(kWh)
Jun-07[8]	119667.36
Jul-07	239697
Aug-07	208648
Sep-07	72524
Oct-07	33769
Nov-07	9445
Dec-07	21529
Jan-08	40434
Feb-08	36371
Mar-08	55457
Apr-08	135304

[7] From 1st June to 7th June. Details has been included in the Emission Reduction excel sheet

[8] From 8th June to 30th June. Details has been included in the Emission Reduction excel sheet

May-08	386874
Jun-08	260490
Jul-08	294750
Aug-08	236702
Sep-08	97150
Oct-08	27942
Nov-08	27263
Dec-08	24747
Jan-09	22707
Feb-09	42946
Mar-09	76122
Apr-09	158224
May-09	365165
June-09[9]	39830.16

J-23	
Month	**Net**
	(kWh)
Jun-07[10]	70558.37
Jul-07	213358
Aug-07	266299
Sep-07	68563
Oct-07	34337
Nov-07	9572
Dec-07	22678
Jan-08	39999
Feb-08	45669
Mar-08	43703
Apr-08	157929
May-08	347532
Jun-08	246770
Jul-08	303865
Aug-08	246874
Sep-08	101644
Oct-08	28515
Nov-08	26670
Dec-08	24933
Jan-09	24061

[9] From 1st June to 7th June. Details has been included in the Emission Reduction excel sheet

[10] From 8th June to 30th June. Details has been included in the Emission Reduction excel sheet

Feb-09	45368
Mar-09	81699
Apr-09	141861
May-09	323503
June-09[11]	34287.92

N-4, N-5, N-6, N-7, N-8, N-9	
Month	**Net (kWh)**
Sep-07	858
Oct-07	318953.3
Nov-07	671467.8
Dec-07	570545.6
Jan-08	561394.2
Feb-08	1074709
Mar-08	
Apr-08	534285.2
May-08	908142.1
Jun-08	2511445.8
Jul-08	2324480.1

N-4, N-5, N-6, N-7	
Month	**Net (kWh)**
Aug-08	1981356.1
Sep-08	1174374
Oct-08	588813.6
Nov-08	667680.5
Dec-08	26560.2
Jan-09	303725
Feb-09	301891.7
Mar-09	587024.1
Apr-09	695138.4
May-09	1283802.2
June-09	1776597.4

N-8, N-9	
Month	**Net (kWh)**
Aug-08	970613

[11] From 1st June to 7th June. Details has been included in the Emission Reduction excel sheet

Sep-08	546044.9
Oct-08	1707302.2
Nov-08	304977.6
Dec-08	199066.7
Jan-09	225269.8
Feb-09	146579
Mar-09	282832.1
Apr-09	295956.6
May-09	580362.5
June-09	837198.3

Annexure 1

Baseline emission reductions have been estimated using Weighted Average emission factor (in kgCO_2 equ/kWh) for the Integrated NEWNE Grid.

Emission Estimation:

Weighted Average Emission Rate (tCO2/MWh) for Integrated NEWNE Grid Emission Factor – 0.810 tCO2/MWh

Baseline emissions or CERs generated by the project are estimated to be:

Baseline emissions $_{(project)}$ = Grid emission factor * Power generated from the project

(tons of CO_2) *(tons of CO_2/GWh)* *(GWh/year)*

Annexure 2: Undertaking from PP related to VCS PD clause 1.12; 1.13

SHAH PROMOTERS & DEVELOPERS
AST - 1, Success Chambers, 1232 Apte Road, Deccan Gymkhana, Pune 411004.
Ph. : 25531777, Fax : 24275998, E-mail : vastushree@vsnl.net

15-07-09

Letter of Undertaking

We undertake that the "**14 MW Wind Power Project in Maharashtra**", located at Dhule & Sangli districts of Maharashtra, India is not implemented to create GHG emissions primarily for the purpose of its subsequent removal or destruction.

Further, the project is voluntary and hence not part of any legal or regularity requirement. Also, project has not created another form of environment credit.

For M/s. SHAH PROMOTERS AND DEVELOPERS

RAJESH C. SHAH

Annexure 3: Proof of Title

Parts of power purchase agreement (PPA) for sites are provided to the verification team.

Annexure 4: PLF & Generation details

J- 17					
Month-Year	Generation at Controller (kWh)	Machine Availability (%)	Grid Availability (%)	Generation at 100% Grid Availability (kWh)	PLF at 100% Grid
Jun-07	244,842	98.07	99.58	245,875	27.32
Jul-07	333,450	99.86	98.1	339,908	36.55
Aug-07	270,163	99.31	99.38	271,848	29.23
Sep-07	78,601	99.19	99.7	78,838	8.76
Oct-07	37,146	99.71	99.04	37,506	4.03
Nov-07	14,189	99.93	99.29	14,290	1.59
Dec-07	27,544	99.11	98.45	27,978	3.01
Jan-08	45,767	99.9	99.69	45,909	4.94
Feb-08	50,436	99.19	99.74	50,567	5.81
Mar-08	41,748	91.94	99.27	42,055	4.52
Apr-08	111,172	98.97	99.88	111,306	12.37
May-08	366,048	99.95	99.52	367,814	39.55
Jun-08	301,217	97.6	99.61	302,396	33.6
Jul-08	305,891	97.86	98.64	310,108	33.34
Aug-08	223,920	98.33	98.61	227,076	24.42
Sep-08	94,407	98.98	99.72	94,672	10.52
Oct-08	30,625	99.99	99.65	30,733	3.3
Nov-08	28,435	99.86	99.25	28,650	3.18
Dec-08	26,802	99.46	99.77	26,864	2.89
Jan-09	24,852	99.42	99.9	24,877	2.67
Feb-09	39,774	99.27	97.91	40,623	4.84
Mar-09	72,270	99.02	97.58	74,062	7.96
Apr-09	134,428	99.93	99.31	135,362	15.04
May-09	357,464	99.66	99.4	359,622	38.67
Jun-09	192890	81.02	87.75	219818	24.42

J- 21					
Month-Year	Generation at Controller (kWh)	Machine Availability (%)	Grid Availability (%)	Generation at 100% Grid Availability (kWh)	PLF at 100% Grid
Jun-07	186,297	95.6	78.31	237,897	26.43
Jul-07	257,565	95.02	96.8	266,080	28.61
Aug-07	255,635	99.62	99.91	255,865	27.51
Sep-07	78,405	97.79	99.55	78,759	8.75
Oct-07	38,898	99.83	99.54	39,078	4.2

Nov-07	13,194	100	99.52	13,258	1.47
Dec-07	26,496	99.24	97.71	27,117	2.92
Jan-08	46,087	99.93	99.83	46,165	4.96
Feb-08	52,108	99.56	99.48	52,380	6.02
Mar-08	58,933	94.43	99.46	59,253	6.37
Apr-08	142,277	99.91	99.83	142,519	15.84
May-08	399,360	99.91	98.88	403,883	43.43
Jun-08	278,838	93.83	98.87	282,025	31.34
Jul-08	288,908	97.72	98.84	292,299	31.43
Aug-08	242,698	99.83	99.2	244,655	26.31
Sep-08	100,849	98.88	96.26	104,767	11.64
Oct-08	30,375	99.11	99.8	30,436	3.27
Nov-08	27,985	99.51	99.93	28,005	3.11
Dec-08	27,842	98.54	98.91	28,149	3.03
Jan-09	25,699	99.97	100	25,699	2.76
Feb-09	46,275	99.84	98.05	47,195	5.62
Mar-09	80,135	96.61	97.75	81,980	8.82
Apr-09	130,274	96.23	99.33	131,153	14.57
May-09	372,180	95.04	99.34	374,653	40.29
Jun-09	247168	86.67	85.34	289627	32.18

J- 22					
Month-Year	Generation at Controller (kWh)	Machine Availability (%)	Grid Availability (%)	Generation at 100% Grid Availability (kWh)	PLF at 100% Grid
Jun-07	233,611	97.96	97.47	239,675	26.63
Jul-07	263,115	96.75	93.97	279,999	30.11
Aug-07	218,168	96.53	91.92	237,346	25.52
Sep-07	78,369	98.87	99.69	78,613	8.73
Oct-07	38,907	99.81	99.47	39,114	4.21
Nov-07	13,452	99.8	99.44	13,528	1.5
Dec-07	25,688	98.91	98.25	26,146	2.81
Jan-08	45,403	99.63	99.73	45,526	4.9
Feb-08	40,301	91.85	98.75	40,811	4.69
Mar-08	57,793	98.44	99.15	58,288	6.27
Apr-08	129,044	94.74	99.81	129,290	14.37
May-08	390,638	99.93	98.97	394,703	42.44
Jun-08	290,987	95.75	99.13	293,541	32.62
Jul-08	303,238	98.16	98.83	306,828	32.99
Aug-08	250,394	99.57	99.08	252,719	27.17

Sep-08	102,225	99.2	99.12	103,133	11.46
Oct-08	33,345	98.94	99.78	33,419	3.59
Nov-08	30,919	100	100	30,919	3.44
Dec-08	28,794	98.28	98.87	29,123	3.13
Jan-09	26,086	99.39	99.87	26,120	2.81
Feb-09	46,045	99.75	97.94	47,013	5.6
Mar-09	82,996	97.67	97.75	84,906	9.13
Apr-09	145077	96.33	99.33	146056	16.22
May-09	390134	98.52	99.58	392683	42.22
Jun-09	27593	95.18	85.43	322992	35.88

J- 23					
Month-Year	Generation at Controller (kWh)	Machine Availability (%)	Grid Availability (%)	Generation at 100% Grid Availability (kWh)	PLF at 100% Grid
Jun-07	105,311	97.63	53.52	196,769	21.86
Jul-07	250,705	93.85	94.66	264,848	28.48
Aug-07	278,188	100	100	278,188	29.91
Sep-07	74,158	94.37	96.59	76,776	8.53
Oct-07	39,512	99.64	99.51	39,707	4.27
Nov-07	13,674	99.88	99.54	13,737	1.53
Dec-07	27,222	99.01	98.34	27,682	2.98
Jan-08	44,067	100	100	44,067	4.74
Feb-08	51,141	99.32	99.69	51,300	5.9
Mar-08	46,259	94.4	99.38	46,548	5.01
Apr-08	150,025	98.89	99.7	150,476	16.72
May-08	374,612	95.76	92.74	403,938	43.43
Jun-08	253,584	88.81	87.13	291,041	32.34
Jul-08	313,527	99.19	96.85	323,724	34.81
Aug-08	260,428	99.52	98.72	263,805	28.37
Sep-08	106,892	98.28	99.5	107,429	11.94
Oct-08	34,078	100	99.38	34,291	3.69
Nov-08	29,991	99.76	100	29,991	3.33
Dec-08	29,248	99.34	98.8	29,603	3.18
Jan-09	27,591	99.39	99.58	27,707	2.98
Feb-09	48,758	99.74	97.96	49,773	5.93
Mar-09	88,993	98.55	97.72	91,069	9.79
Apr-09	128,019	92.56	99.41	128,779	14.31
May-09	348,558	96.67	98.34	354,442	38.11
Jun-09	247,075	94.76	85.40	289315	32.14

N- 4					
Month-Year	Generation at Controller (kWh)	Machine Availability (%)	Grid Availability (%)	Generation at 100% Grid Availability (kWh)	PLF at 100% Grid
Sep-07	206	60	4.16	4,952	0.46
Oct-07	59,167	68.06	65.69	90,070	8.07
Nov-07	126,366	98.39	97.98	128,971	11.94
Dec-07	101,521	92.78	98.14	103,445	9.27
Jan-08	97,671	98.8	92.28	105,842	9.48
Feb-08	80,740	99.11	99.08	81,490	7.81
Mar-08	100,050	99.9	99.91	100,140	8.97
Apr-08	112,308	96.46	49.51	226,839	21
May-08	159,308	83.24	79.95	199,260	17.85
Jun-08	424,917	65.59	96.55	440,100	40.75
Jul-08	425,202	84.98	86.19	493,331	44.21
Aug-08	483,836	99.32	99.13	488,082	43.73
Sep-08	305,074	99.11	99.29	307,256	28.45
Oct-08	152,546	99.56	96.31	158,391	14.19
Nov-08	163,383	96.59	99.45	164,287	15.21
Dec-08	7,982	99.4	20.45	39,032	3.5
Jan-09	61,145	83.55	68.15	89,721	8.04
Feb-09	83,779	99.5	99.47	84,225	8.36
Mar-09	144,739	99.06	99.71	145,160	13.01
Apr-09	194,208	98.53	99.23	195,715	18.12
May-09	370,714	99	97.31	380,962	34.14

N- 5					
Month-Year	Generation at Controller (kWh)	Machine Availability (%)	Grid Availability (%)	Generation at 100% Grid Availability (kWh)	PLF at 100% Grid
Sep-07	76	45.45	4.58	1659	0.15
Oct-07	65,042	79.31	69.46	93,640	8.39
Nov-07	125,213	99.12	98.26	127,430	11.8
Dec-07	104,542	91.34	99.26	105,321	9.44
Jan-08	100,655	97.87	92.37	108,969	9.76
Feb-08	90,024	96.31	99	90,933	8.71
Mar-08	129,383	99.12	99.79	129,655	11.62
Apr-08	127,695	96.68	50.62	252,262	23.36
May-08	162,057	80.74	79.86	202,926	18.18
Jun-08	392,620	63.45	96.26	407,875	37.77
Jul-08	429,753	85.88	85.99	499,771	44.78

Aug-08	455,069	98.78	98.11	463,835	41.56
Sep-08	288,423	99.11	99.29	290,485	26.9
Oct-08	148,759	99.65	96.14	154,732	13.86
Nov-08	171,464	97.88	99.16	172,916	16.01
Dec-08	7,992	99.34	20.43	39,119	3.51
Jan-09	58,405	83.36	68.05	85,827	7.69
Feb-09	91,447	98.62	99.59	91,823	9.11
Mar-09	156,770	99.27	99.69	157,257	14.09
Apr-09	196,298	97.73	98.61	199,065	18.43
May-09	351,896	98.81	97.8	359,812	32.24

N- 6					
Month-Year	Generation at Controller (kWh)	Machine Availability (%)	Grid Availability (%)	Generation at 100% Grid Availability (kWh)	PLF at 100% Grid
Sep-07	164	45.45	4.58	3,581	0.33
Oct-07	47,755	51.92	61.25	77,967	6.99
Nov-07	131,021	98.92	91.72	142,849	13.23
Dec-07	118,663	93.02	99.28	119,524	10.71
Jan-08	103,587	98.83	92.48	112,010	10.04
Feb-08	85,985	96.66	99.12	86,748	8.31
Mar-08	120,113	98.24	99.82	120,330	10.78
Apr-08	102,101	83.48	50.02	204,120	18.9
May-08	163,431	81.53	79.91	204,519	18.33
Jun-08	421,667	64.01	96.37	437,550	40.51
Jul-08	405,514	80.13	84.11	482,123	43.2
Aug-08	488,267	99.57	97.97	498,384	44.66
Sep-08	307,799	99.11	99.27	310,062	28.71
Oct-08	161,901	98.93	95.94	168,752	15.12
Nov-08	183,919	99.1	99.48	184,880	17.12
Dec-08	8,374	99.47	20.56	40,730	3.65
Jan-09	101,897	90.74	68.1	149,628	13.41
Feb-09	91,211	99.4	99.33	91,826	9.11
Mar-09	163,864	98.61	99.67	164,407	14.73
Apr-09	200,002	97.97	98.52	203,006	18.8
May-09	354,255	98.36	97.68	362,669	32.5
N- 7					
Month-Year	Generation at Controller (kWh)	Machine Availability (%)	Grid Availability (%)	Generation at 100% Grid Availability (kWh)	PLF at 100% Grid

Sep-07	188	35.71	5.83	3,225	0.3
Oct-07	74,345	89.34	65.06	114,271	10.24
Nov-07	133,208	98.88	98.26	135,567	12.55
Dec-07	110,450	92.19	99.2	111,341	9.98
Jan-08	101,399	98.54	92.48	109,644	9.82
Feb-08	86,017	97.65	99.18	86,728	8.31
Mar-08	104,072	97.57	99.81	104,270	9.34
Apr-08	117,685	94.21	48.94	240,468	22.27
May-08	166,268	81.31	79.98	207,887	18.63
Jun-08	448,970	66.2	96.44	465,543	43.11
Jul-08	439,175	83.23	86.02	510,550	45.75
Aug-08	505,624	99.38	98.99	510,783	45.77
Sep-08	303,747	99.39	99.3	305,888	28.32
Oct-08	153,697	98.95	96.31	159,586	14.3
Nov-08	175,488	96.22	99.29	176,743	16.37
Dec-08	7,449	98.36	20.59	36,178	3.24
Jan-09	97,222	96.07	68.19	142,575	12.78
Feb-09	76,689	99.79	99.67	76,943	7.63
Mar-09	146,041	99.39	99.67	146,525	13.13
Apr-09	178,305	99.25	99.15	179,834	16.65
May-09	338,156	98.92	97.25	347,718	31.16

N- 8					
Month-Year	Generation at Controller (kWh)	Machine Availability (%)	Grid Availability (%)	Generation at 100% Grid Availability (kWh)	PLF at 100% Grid
Sep-07	89	50	4.16	2,139	0.2
Oct-07	46,519	77.65	71.62	64,953	5.82
Nov-07	86,890	98.12	95.34	91,137	8.44
Dec-07	100,970	92.32	99.07	101,918	9.13
Jan-08	97,067	99.08	92.33	105,131	9.42
Feb-08	82,763	94.88	99.19	83,439	7.99
Mar-08	104,639	99.52	99.89	104,754	9.39
Apr-08	106,219	94.43	50.15	211,803	19.61
May-08	155,416	81.18	79.73	194,928	17.47
Jun-08	436,911	68.14	96.44	453,039	41.95
Jul-08	444,367	85.66	88.52	501,996	44.98
Aug-08	512,871	99.87	99.85	513,641	46.03
Sep-08	294,134	99.52	99.37	295,999	27.41
Oct-08	157,433	99.29	95.1	165,545	14.83

Nov-08	181,824	99.19	99.54	182,664	16.91
Dec-08	112,628	93.87	98.31	114,564	10.27
Jan-09	131,976	96.82	98.96	133,363	11.95
Feb-09	83,531	95.02	99.55	83,909	8.32
Mar-09	155,688	98.16	99.54	156,407	14.01
Apr-09	175,689	98.39	97.88	179,494	16.62
May-09	341,804	99.04	98.34	347,574	31.14

N- 9					
Month-Year	Generation at Controller (kWh)	Machine Availability (%)	Grid Availability (%)	Generation at 100% Grid Availability (kWh)	PLF at 100% Grid
Sep-07	157	36.36	4.58	3,428	0.32
Oct-07	53,302	90.41	69.79	76,375	6.84
Nov-07	91,504	97.37	96.98	94,353	8.74
Dec-07	91,737	93.09	99.31	92,374	8.28
Jan-08	86,677	98.77	92.5	93,705	8.4
Feb-08	83,632	97.69	99.19	84,315	8.08
Mar-08	95,994	98.42	99.91	96,080	8.61
Apr-08	90,020	92.65	49.37	182,337	16.88
May-08	147,993	81.74	79.67	185,757	16.64
Jun-08	449,126	72.14	96.83	463,829	42.95
Jul-08	395,707	84.14	85.43	463,194	41.5
Aug-08	445,341	96.13	99.47	447,714	40.12
Sep-08	266,867	98.64	99.29	268,775	24.89
Oct-08	121,231	95.77	95.47	126,983	11.38
Nov-08	137,404	98.81	99.33	138,331	12.81
Dec-08	96,758	99.31	98.65	98,082	8.79
Jan-09	104,100	98.27	98.68	105,493	9.45
Feb-09	83,769	99.82	99.65	84,063	8.34
Mar-09	141,090	96.65	98.96	142,573	12.78
Apr-09	154,498	97.93	98.11	157,474	14.58
May-09	302,167	99.13	98.17	307,800	27.58