Monitoring Report

Project Title - 10 MW Wind Power Project in Maharashtra by Deepak Fertilizers and Petrochemicals Corporation Limited

Monitoring Period
2007-04-24 to 2009-06-15

Submitted by

M/s Deepak Fertilisers and Petrochemical Corporation Ltd, Opp. Golf Course, Shastri Nagar, Yerwada, Pune-411006 Maharashtra, INDIA

(Version05)

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Contents

1. Introduction

The proposed project activity is a wind power project of 10 MW installed capacity in the State of Maharashtra by M/s Deepak Fertilisers and Petrochemical Corporation Ltd. (hereafter DFPCL or project participant). It consists of eight wind electricity generators (WEGs) of 1.25 MW capacity each.

Table: 1 Ownership Details of WTGs

Name of Company	No of WTGs	Capacity (in MW)
Deepak Fertilisers and Petrochemical Corporation Ltd.	8	10

The project was registered at UNFCCC (Ref Number 2540) on June 16th, 2009 and the details of the same can be viewed on http://cdm.unfccc.int/Projects/DB/SGS-UKL1240498237.32/view

This is the first Monitoring Report of project titled '10 MW Wind Power Project in Maharashtra by Deepak Fertilizers and Petrochemicals Corporation Limited' under VCS. The document reports, the Emission Reduction (ERs) achieved by this VER (Voluntary Emission Reduction) project, for producing renewable energy, covering the monitoring period from 2007-04-24 to 2009-06-15.

Table: 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)
01.05.07 to 31.12.07	0	5290	0	5290
01.01.08 to 31.12.08	0	12833	0	12833
01.01.09 to 31.05.09	0	6028		6028
Total	**0**	**24151**	**0**	**24151**

Note: Monitoring Period for the present case is 2007-04-24 to 2009-06-15, but emission reduction has been accounted only from 01/05/2007 to 31/05/2009. This is due to the fact that the credit report and JMR issued by the state utility is on monthly basis. Hence for better transparency for the said monitoring period, the emission reduction for the period of 24/05/2007 to 31/05/2007 and 01/06/2009 to 15/06/2009 has not been included and accounted for the emission reduction calculation.

Table 3: Summary of Generation

Generation	***MWh***
2007(01.05.07 to31.12.07)	6531
2008	15844
2009 (01.01.09-31.05.09)	7442
Total Generation	**29817**

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), including social benefit indicators.

The implemented project activity, sells electricity generated from its WTGs to the Maharashtra State Electricity Distribution Company Ltd. (MSEDCL) which falls under Western Region electricity grid network of India. This avoids generation of same amount of energy in fossil fuel dominated thermal plants. Thus the project activity avoids CO_2 and other GHG emissions that would have happened in the absence of the project activity. The project activity also contributes to the regional sustainable development.

The different units of Project activity were commissioned on 29/09/2006.

Project also complies with the VCS Project Description template clauses 1.12, 1.13, 1.14, 8.1 and 8.2 as, PP owns the WTGs (proof of same has been given in Annexure 3) 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 only and have not created another form of environmental credit. Further, the emission reduction generated from the project activity are generated voluntarily and would not be use to comply with the emission reduction targets or any legal /regulatory compliance or to participate in emission trading program. 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 10 MW wind power project to generate electricity in high wind speed areas of Maharashtra. M/s Deepak Fertilisers and Petrochemical Corporation Ltd. is the promoter of these wind farms. The project activity consists of 8 wind electric generators (WEGs) installed in the state of Maharashtra. The generated electricity from WEGs is connected to state electric utility namely Maharashtra State Electricity Distribution Company Limited (MSEDCL) and transmitted through state electric grid.

Deepak Fertilisers and Petrochemical Corporation Ltd. have procured the WTGs from M/s. Suzlon Energy Ltd. In total the project activity consists of eight WTGs of 1.25 MW capacity each.

2.1. Project Location

A location detail of each site is mentioned in Table 4

The location of individual wind turbines are:

WTG Location no	Village	Taluka	District	Latitude	Longitude
J087	Aichale	Sakri	Dhule	21º13´37.8˝N	74º22´37.6˝E
J091	Aichale	Sakri	Dhule	21º13´52˝N	74º23´07.8˝E
K441	Dhandane	Nandurbar	Nandurbar	21º18´33.4˝N	74º20´44.2˝E
K442	Dhandane	Nandurbar	Nandurbar	21º19´47.6˝N	74º19´30.3˝E
K513	Wankute	Nandurbar	Nandurbar	21º19´56.1˝N	74º19´47.1˝ E
K514	Wankute	Nandurbar	Nandurbar	21º20´34.0˝N	74º19´47.1˝E
K478	Mandal	Nandurbar	Nandurbar	21º19´40.8˝N	74º22´11.7˝E
K503	Vavad	Nandurbar	Nandurbar	21º20´01.9˝N	74º22´21.7˝E

Table 4

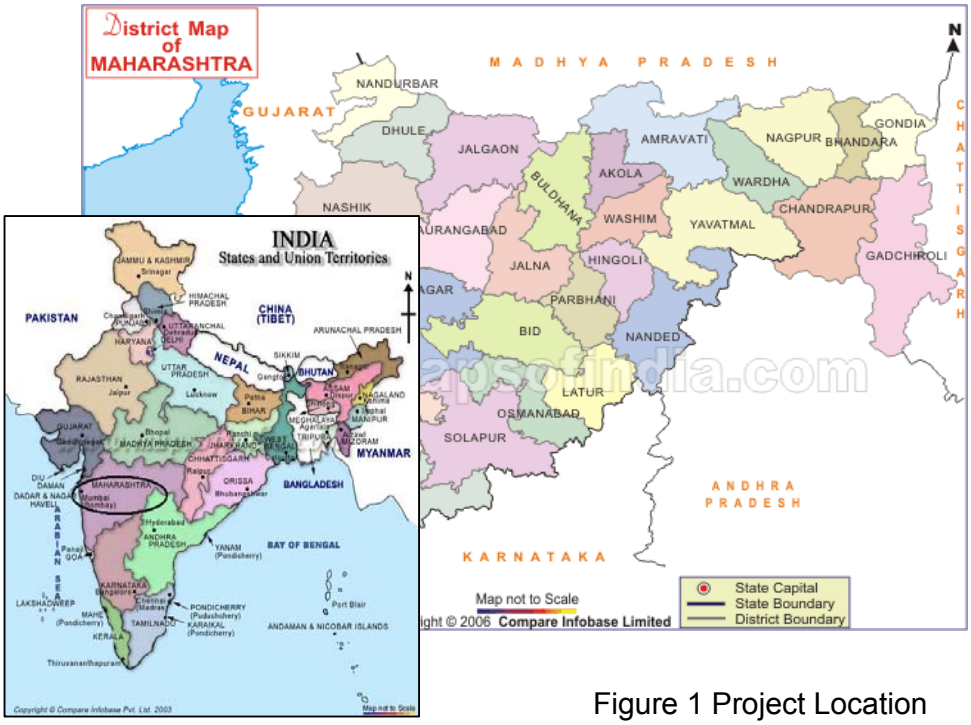


Figure 1 Project Location

2.2. Project Boundary

Project boundary specified in the Appendix B of simplified modalities and procedures is that which encompasses the physical and geographical site of the renewable generation source. This includes the wind turbine installation, pooling and MSEDCL sub-stations. The proposed

project activity evacuates the power to Western Region Grid1. Therefore, all the power plants contributing electricity to the Western Region Grid are taken in the connected (project) electricity system for the purpose of baseline estimation. The meter which is used to measure the electricity supplied to grid is at substation and is an integral part of project boundary.

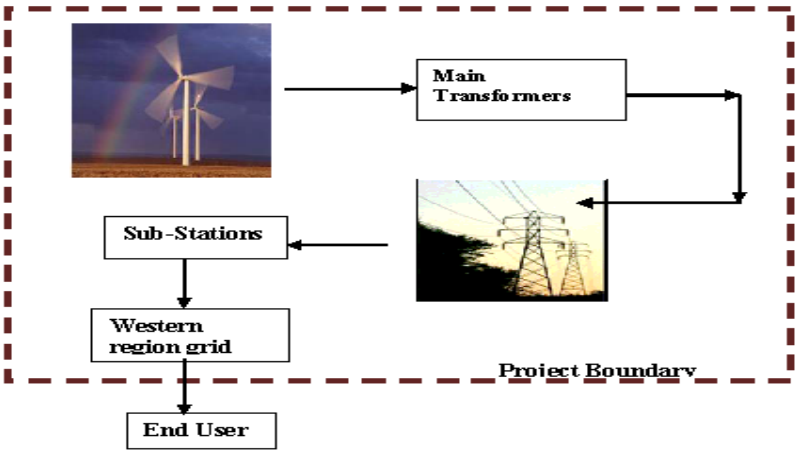


Figure 2 Project Location

3. Details of Project Proponent

Table 5 : Contact Details of Project Proponents

Organization:	Deepak Fertilisers and Petrochemical Corporation Ltd.
Street/P.O.Box:	Opp. Golf Course, Shastri Nagar
Building:	Yerwada
City:	Pune
State/Region:	Maharashtra
Postfix/ZIP:	411006
Country:	INDIA
Telephone:	+91-20-66458000
FAX:	+91-020-26683723
E-Mail:	dbanerjee@deepakfertilisers.com
URL:	www.dfpcl.com
Represented by:	
Title:	Vice President: Finance and Accounts
Salutation:	Mr.
Last Name:	Banerjee
Middle Name:	--
First Name:	D.
Department:	Management
Mobile:	+91-9657727401
Direct FAX:	+91-20- 26683723
Direct tel:	+91-20- 66458070
Personal E-Mail:	--

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

4. Sustainability Criteria

Indian economy is highly dependent on "Coal" as fuel to generate energy and for production processes. Thermal power plants are the major consumers of coal in India and yet the basic electricity needs of a large section of population are not being met.

This results in excessive demands for electricity and places immense stress on the environment. Changing coal consumption patterns will require a multi-pronged strategy focusing on demand, reducing wastage of energy and the optimum use of Renewable Energy (RE) sources.

Government of India has stipulated following indicators for sustainable development in the interim approval guidelines[2] for CDM projects.

1. Social well-being

The proposed project activity has led to alleviation of poverty by establishing direct and indirect employment benefits accruing out of ancillary units for manufacturing towers, erection and maintenance of the WTGs and security services. The infrastructure in and around the project area has also improved due to project activity. This includes development of road network, increased accessibility to medical facilities and improvement in the quality of electricity in terms of its availability and frequency as the generated electricity is fed into a deficit grid.

2. Economic well-being

The project activity has resulted in investment in the developing region which otherwise would not have happened in the absence of the project activity. The generated electricity is fed into the Western Regional Grid through local grid, thereby improving the grid frequency and availability of electricity to the local consumers (villagers and sub-urban habitants) which has provided new opportunities for industries and economic activities to be setup in the area thereby resulting in greater local employment, ultimately leading to overall development. The project activity also leads to diversification of the national energy supply, which is dominated by conventional fuel based generating units.

3. 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, thereby contributing to the 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 source, using wind energy to generate electricity contributes to resource conservation. Thus the project causes no negative impact on the surrounding environment contributing to environmental well-being.

4. Technological well-being

The project activity leads to the promotion of WEGs into the region, demonstrating the success of high capacity wind turbines, which feed the generated power into the nearest sub-station,

2 Ministry of Environment and Forests web site: http://cdmindia.nic.in/host_approval_criteria.htm

thus increasing energy availability and improving quality of power under the service area of the substation. Hence, the project leads to technological well-being.

5. Monitoring Methodology and monitoring Plan

As per the Voluntary Carbon standards, methodologies and guidelines that have been approved by CDM executive board should 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

Methodology AMS I.D. also refers to:-

The approved consolidated methodology ACM0002 **"Consolidated baseline methodology for grid-connected electricity generation from renewable sources"**

Scope no: 1

Sectoral Scope Energy Industries: (Renewable/non-renewable)

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 6: Details of Monitored Data

Data / Parameter:	**$EG_{(Net\ export\ by\ project\ activity)}$**
Data unit:	MWh
Description:	Net generation from all the WTGs of the promoter at a particular site connected to same feeder.
Source of data to be used:	Credit report issued by the State Utility and invoices raised by the PP to the state utility.
Value of data	29817
Description of measurement methods and procedures to be applied:	The value will be taken from JMR
QA/QC procedures to be applied:	The value can be cross checked by calculating the value using apportioning procedure as explained in the section B.7.2 of the PDD.

Any comment:	Data will be archived during the whole crediting period + 2 years.

Data / Parameter:	$\sum_{0}^{n} EG_{n,y}$
Data unit:	MWh
Description:	The summation of total Electricity Generated (MWh) at the controller from all the wind turbines of the project proponent at a particular site
Source of data to be used:	Monitored through meters.
Value of data	J087 & J091 connected to Jamde feeder 05- 5793 K-441 & K-442 connected to Nandurbar feeder 01- 7853 K-502 connected to feeder to Nandurbar feeder no.02- 4420 K-513 & K-514 connected to Ranala rural feeder- 8401 K-478 connected to Ranala rural feeder- 3238 K-478 when connected to Gangapur 07 feeder- 1149 K-478 connected to Valve 07 feeder- 184
Description of measurement methods and procedures to be applied:	EGn,y is the electricity generated from an individual wind turbine measured through its controller meter.
QA/QC procedures to be applied:	--
Any comment:	Data will be archived during the whole crediting period + 2 years

Data / Parameter:	$\sum_{0}^{m} EG_{m,y}$
Data unit:	MWh
Description:	The summation of total Electricity Generated (MWh) from all the wind turbines at the site and connected to a particular feeder as measured at the individual controllers.
Source of data to be used:	Monitored through meters.
Value of data	All WTGs connected to Jamde feeder 05 (J087 & J091 are connected to this feeder)- 61785 All WTGs connected to Nandurbar feeder 01(K-441 & K-442 are connected to this feeder) – 99137 All WTGs to Nandurbar feeder no.02(K-502 is connected to this feeder)- 109914 All WTGs connected to Ranala rural feeder(K-513 and K-514 are connected to this feeder)- 33258 All WTGs connected to Ranala rural feeder (K-478 when connected to this feeder)- 24487 All WTGs connected to Gangapur 07 feeder(K-478 when connected to this feeder)- 20434 All WTGs connected to Valve 07 feeder (K-478 when connected to this feeder)- 2880

Description of measurement methods and procedures to be applied:	Direct reading from the controller meter
QA/QC procedures to be applied:	--
Any comment:	Data will be archived during the whole crediting period + 2 years

Data / Parameter:	$EG_{JMR,export}$
Data unit:	MWh
Description:	Total export as measured at the substation feeder of all wind turbines connected to the same feeder.
Source of data to be used:	Joint Meter Reading Report
Value of data	All WTGs connected to Jamde feeder 05 (J087 & J091 are connected to this feeder)- 59772 All WTGs connected to Nandurbar feeder 01(K-441 & K-442 are connected to this feeder)- 95099 All WTGs to Nandurbar feeder no.02 (K-502 is connected to this feeder)- 106117 All WTGs connected to Ranala rural feeder (K-513 and K-514 are connected to this feeder)- 32306 All WTGs connected to Ranala rural feeder (K-478 when connected to this feeder)- 23790 All WTGs connected to Gangapur 07 feeder (K-478 when connected to this feeder)- 19688 All WTGs connected to Valve 07 feeder (K-478 when connected to this feeder)- 2751
Description of measurement methods and procedures to be applied:	The value of total export from the all wind turbines connected to the same feeder is monitored through main meter & check meter at the substation.
QA/QC procedures to be applied:	Other than main meter, there is check meter to verify the accuracy of main meter. 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:	Data will be archived during the whole crediting period + 2 years

Data / Parameter:	$EG_{JMR,import}$
Data unit:	MWh
Description:	Total import as measured at the substation feeder of all wind turbines connected to the same feeder.
Source of data to be	Joint Meter Reading Report

used:	
Value of data	All WTGs connected to Jamde feeder 05 (J087 & J091 are connected to this feeder)- 479 All WTGs connected to Nandurbar feeder 01 (K-441 & K-442 are connected to this feeder)- 443 All WTGs to Nandurbar feeder no.02 (K-502 is connected to this feeder)- 460 All WTGs connected to Ranala rural feeder(K-513 and K-514 are connected to this feeder)- 192 All WTGs connected to Ranala rural feeder (K-478 when connected to this feeder)- 122 All WTGs connected to Gangapur 07 feeder (K-478 when connected to this feeder)- 80 All WTGs connected to Valve 07 feeder (K-478 when connected to this feeder)- 46
Description of measurement methods and procedures to be applied:	The value of total import from the all wind turbines connected to the same feeder is monitored through main meter & check meter at the substation.
QA/QC procedures to be applied:	Other than main meter, there is check meter to verify the accuracy of main meter. 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:	Data will be archived during the whole crediting period + 2 years

Data / Parameter:	**Grid Emission Factor**
Data unit:	t CO_2 / MWh
Description:	Weighted Average Grid Emission rate
Source of data to be used:	Central Electricity Authority – CDM - Carbon Dioxide baseline database latest available version
Value of data	0.81
Description of measurement methods and procedures to be applied:	The used data is from an official source.
QA/QC procedures to be applied:	The archive of data will be maintained for crediting period + 2 years. The archiving will be done both on paper and electronically.
Any comment:	This value will change every year as per the latest information available from CEA.

Comparison between estimated annual emission reductions in the registered PDD v/s actual emission reductions:

Refer to the "GUIDELINES ON COMPLETENESS CHECK OF REQUESTS FOR ISSUANCE" paragraph 10 bullet (VIII) Comparison of the actual emission reduction claimed in the monitoring period with the estimate in the registered PDD has been carried out in the following table.

Estimated emission reductions(as per registered CDM PDD 14313 tCO2e/year) for the said monitoring period	29819 tCO2e
Actual emission reductions during Monitoring Period.	24151 tCO2e

It is evident from the above that the emission reduction from the project during the said monitoring period is within the estimated Emission reduction as mentioned in the registered CDM PDD. In the registered PDD, PP has considered a PLF of 19 % for estimation of emissions reductions (20% CUF subjected to a 5% transmission loss). However actual PLF achieved for the considered monitoring period is 16.34%. Hence, this proves appropriateness of the emission reduction estimated in the registered PDD.

Monitoring Procedure

The project activity essentially involves generation of electricity from wind, the employed WEG can only convert wind energy into electrical energy and cannot use any other input fuel for electricity generation. The operation of WEGs is emission free and no emissions are produced during the lifetime of the WEG.

- 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.
- 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 is carried out jointly at the incoming feeder of the state power utility (MSEDCL). Turbines for sale to utility are connected to the feeder.
- The joint measurement is carried out once in a month in presence of both parties (the project participant's representative and officials of the state power utility). Both parties sign the recorded reading.
- Metering equipment - Metering is carried out through electronic trivector meters of accuracy class 0.2% required for the project. As per the PPA (under section 11.01) dated 06/11/2006 between Deepak Fertilizers & Petrochemicals Limited (Seller) and the Maharashtra State Electricity Company Limited, the details of metering equipment has been defined as follows:

  (a) The Seller shall, at its own expense, duly install the approved Real Time TOD Meters with online features at the Metering Point ("the Main Meter"). The metering equipment shall be duly approved, tested and sealed by the MSEDCL.

  (b) The seller may at its option provided for a check meter, at its cost, to measure the delivery of Wind Energy during periods when Meter or related accessories such as CT/PT have failed or developed a fault. The MSEDCL shall adopt no other method of assessment of delivery of Wind Energy except for the main meter and the check meter.

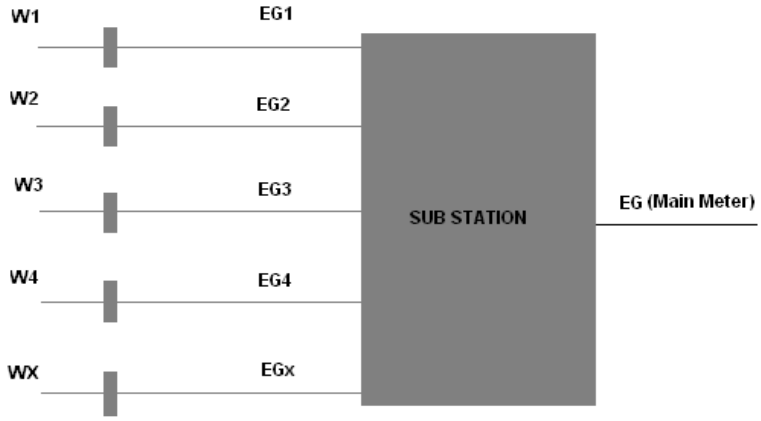
- Meter readings - The monthly meter readings (both main and check meters) at the project site and the receiving station are taken simultaneously and jointly by the parties on a pre-determined day of the following month. At the conclusion of each meter reading an appointed representative of the MSEDCL and the project participant's signs a document indicating the number of kWh exported to the grid.
- The secondary monitoring, which provides a backup (fail-safe measure) in case the primary monitoring is not carried out, as it is done at the individual WEGs. Each WEG is equipped with an integrated electronic meter. These meters are connected to the Central Monitoring Station (CMS) of the entire wind farm through a wireless Radio Frequency (RF) network (SCADA). The generation data of individual machine can be monitored as a real-time entity at CMS.

All the relevant data & reports for maintaining accuracy in future monitoring and reporting of GHG's emission reductions is with the project participant, which follows Quality Management System (QMS) procedure as per ISO 9001 and is ISO certified organization.

Project participant has appointed a full time project in-charge to manage the overall project activity after commissioning. The project in-charge supervises the functioning of the wind farm in close coordination with the officials & technical personnel of Suzlon Energy Limited (SEL).

Description of billing calculation from main 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 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 (MWh) from all the wind turbines of the project proponent at a particular site is presented as

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

And the summation of total Electricity Generated (MWh) from all the wind turbines connected to the particular feeder 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 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. 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 grid. From these two values, EG(Main Meter reading) is calculated by deducting EGJMR,import from EGJMR,export . This EG(Main Meter reading) value is then used for calculating net export from individual windmills.

There is a single meter which gives both the export and import values, the reading gives the net value of line losses and auxiliary consumption by all windmills connected to a particular feeder. The apportioning of electricity generated from the various wind turbines is done by the EPC contractor based on the power generation at the controller from the individual wind turbines connected to the main meter. A monthly report on generation and consumption is prepared by the O&M contractor. This report contains details of power exported/imported to/from the grid by each of the wind turbines connected. This value is then used by the project proponent to raise invoice from state utility.

EG(Net Export, Project activity) , the electricity supplied to the grid by the project activity is calculated as follows:

$$EG_{\text{(Net export by project activity)}} = \frac{\sum_{0}^{n} EG_{n,y} * EG_{\text{(Main Meter reading)}}}{\sum_{0}^{m} EG_{m,y}}$$

Where

EG(Net export by project activity)	Net generation from all the WTGs of the promoter at a particular site.
$\sum_{0}^{n} EG_{n,y}$	Total electricity generated by the WTGs of the promoter as measured at the controller
EG(Main Meter reading)	Total net generation from all wind turbines at the common metering point as calculated by EGJMR,export - EGJMR,import at the substation feeder.
$\sum_{0}^{m} EG_{m,y}$	Total generation of all the WTGs connected to the feeder as measured at controller.

This procedure will be applicable for all the wind turbines of the PP connected to a particular feeder of the substation. The net export to grid from the project activity will be the summation of net export of individual wind mills of the promoter.

The responsibility of calibration, periodical testing, sealing and maintenance of meters is with the respective state utilities. This is done in the presence of representatives of the promoter. The frequency of meter testing is annual or as decided by the state utility. All meters are tested

only at the Metering Point. Additionally, each wind turbine is equipped with an integrated electronic meter. The electricity generated is recorded by the O & M staff of the EPC contractor on 24 hour basis

The Accounts department of DFPCL receives the data from both the sources and keeps track of project activity which reduces the carbon emission reductions. The project performance is communicated to the higher management by the accounts department.

Description of calibration of WEG Controller

SCS Controller is a micro-processor based intelligent controller which has been specially designed for control of wind turbines. It uses a Woodward Multi function Relay that has three current inputs from CT and three direct voltage inputs (690 Volts). The analog values of current/voltage are converted into digital signal internally using A/D Converters at very high sampling rate. A software program reads these values and displays instantaneous parameters such as voltage, current, power factor, kVAh, kVArh and kWh. These instantaneous values are then time integrated and displayed/stored. Woodward relay does not have a display and needs special protocol to view energy readings as this relay communicates digital signal through special communication protocol.

In case of Malfunctioning of the controller, the WTG is programmed for automatic shut-down. Hence probability of error in controller meters is negligible.

For the project the feeder details are as follows:

Sr. No.	WTG Number	Substation(feeder connection)	Date of Commissioning	Main Meter Serial Number	Check Meter Serial Number
1	J87	Jamde Feeder - 05	29-Sep-06	4725781	4725782
2	J91	Jamde Feeder - 05	29-Sep-06	4725781	4725782
3	K441	Nandurbar Feeder - 1	29-Sep-06	4860902	4860904
4	K442	Nandurbar Feeder - 1	29-Sep-06	4860902	4860904
5	K478	Gangapur[3]	29-Sep-06	4961766	4890563 (Old: 4961767[4])
		Valve-07[5]		4863438	4863440
6	K503	Nandurbar Feeder - 2	29-Sep-06	4860905	4890568(Old: 4860906[6])
7	K514	Ranala	29-Sep-06	4725815	4725810
8	K513	Ranala	29-Sep-06	4725815	4725810

For the WTG K-478 feeder change details are as follows:

[3] Previously it was connected to Ranala rural feeder.

[4] The check meter was replaced due to the test mode button problem, Evidence for the same has been submitted to the DOE.

[5] K-478 during the period of 19/09/2008 to 22/11/2008 has been connected to the Valve-07 feeder.

[6] The check meter was replaced due to the display problem of the old meter, Evidence for the same has been submitted to the DOE.

WTG No.	*Period*	*Feeder details*
K- 478	November 2006-September 2008(up-to 18/09/2008)	*Connected to Ranala S/S feeder* *Sr. No of Main Meter: 04725815* *Accuracy Class (Accu. Cl.) : 0.2* *Sr. No of Check Meter: 04725810* *Tech Details: Accuracy Class (Accu. Cl.) : 0.2*
K- 478	September 2008(19/09/2008)-November 2008 (22/11/2008)	*Connected to Valve VII S/S feeder* *Sr. No of Main Meter: 4863438* *Tech Details: Accuracy Class (Accu. Cl.) : 0.2* *Sr. No of Check Meter: 4863440* *Tech Details: Accuracy Class (Accu. Cl.) : 0.2*
K-478	*November(29/11/2008) to June 2009*	*Connected to Gangapur S/S feeder* *Sr. No of Main Meter:* 04961766 *Tech Details: Accuracy Class (Accu. Cl.) : 0.2* *Sr. No of Check Meter:* 04961767 *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. The details of calibration of the meters are summarized below:

Sr. No.	Feeder & Connected Meters	Calibration Details
1	**Jamde Feeder – 05**	
	Main Meter Serial Number-4725781	Test Report dated 28/03/2006, Correspondence between MSEDCL and PP dated 12/10/2007 and 28/11/2007, Test Report dated 27/05/2008, Test Report dated 08/07/2009
	Check Meter Serial Number-4725782	Test Report dated 28/03/2006, Correspondence between MSEDCL and PP dated 12/10/2007 and 28/11/2007, Test Report dated 27/05/2008 , Test Report dated 08/07/2009
2	**Nandurbar Feeder - 1**	
	Main Meter Serial Number-4860902	Test Report dated 07/06/2006, Test Report dated 08/10/2007, Test Report dated 27/05/2008, Test Report dated 08/07/2009
	Check Meter Serial Number-4860904	Test Report dated 07/06/2006, Test Report dated 27/05/2008
3	**Gangapur**	
	Main Meter Serial Number-4961766	Test Reports dated 26/12/2008, Test Reports dated 14/09/2009
	Old Check Meter Serial Number-4961767	Test Reports dated 26/12/2008
	New Check Meter Serial	Test Reports dated 14/09/2009

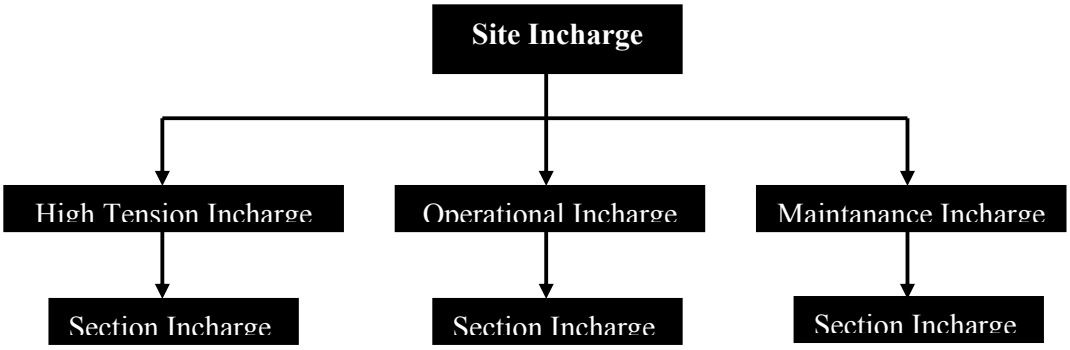
	Number-04890563	
4	**Nandurbar Feeder - 2**	
	Main Meter Serial Number-4860905	Test Report dated 07/06/2006, Test Report dated 08/10/2007, Test Report dated 27/05/2008, Test Report dated 08/07/2009
	Check Meter Serial Number-4890568	Test Report dated 27/05/2008, Test Report dated 08/07/2009
	Old Check Meter Serial Number-4860906	Test Report dated 07/06/2006
5	**Ranala**	
	Main Meter Serial Number-4725815	Test Report dated 23/03/2006, Test Report dated 17/08/2007, Test Report dated 12/08/2008
	Check Meter Serial Number-4725810	Test Report dated 23/03/2006, Test Report dated 17/08/2007, Test Report dated 12/08/2008
6	**Valve - 7**	
	Main Meter Serial Number-4863438	Testing Report dated 01/10/2008
	Check Meter Serial Number-4863440	Testing Report dated 01/10/2008

Operations and Maintenance:

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 are organized and monitored by them. So the authority and responsibility of project management lies with the O & M contractor.

ISO 9001:2000 standard has been adopted by Suzlon, who is responsible for monitoring, calibration and O & M of the project. Training is an essential part of the ISO system. To comply with the ISO standard, the training has to be provided to personnel according there responsibility with in organization.

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:

a) Data logging for power generation, grid availability, machine availability.
b) Preparation and submission of monthly performance report in agreed format.
c) 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 WTGs 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.

Besides the usual training programs for their staff Suzlon conducts specific familiarization capsules for customers, such that they are fully aware of the capabilities of the highly sophisticated WECs of Suzlon.

The training programme focuses mainly on the management, monitoring and maintenance, and safety and reliability aspects of wind power. The objectives include:

1. Understanding the various stages and aspects in the management of Wind Power systems
2. Understanding the importance of monitoring and maintenance of Wind Power systems and hence the various tasks involved in this
3. Understanding the importance of safety and reliability aspects involved with Wind Power and the measures taken.
4. Managing generation and other data for future reference

6. Measures to insure the Accuracy of Results

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

An internal review of the project activity would be done by the PP. The internal team would comprise competitive persons. The team would assess the project for the following aspects among other things:

1. Are the monitoring of VCS parameters done in line with the CDM PDD?
2. Is the documentation of monitored VCS parameters done properly?
3. Are equipments calibrated and maintained as scheduled?
4. Is the quantity of VCUs generated inline with that projected in the CDM PDD, if not, what are the reasons for deviation?
5. Are necessary corrective actions being taken to address deviations?

6. Check the authenticity of data monitored and recorded by random cross-checking with other sources?

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

7. Period of Monitoring

2007-04-24 to 2009-06-15.

8. VER (Voluntary Emission Reduction) Calculations

Baseline methodology for projects under Type I.D has been detailed in paragraphs 7-11 (Type I.D) of the above-mentioned document. Paragraph 9 (Type I.D) applies to this project activity, which states that:

For all other systems, the baseline is the kWh produced by the renewable generating unit multiplied by an emission coefficient (measured in kg CO2equ/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 approved methodology ACM0002. Any of the four procedures to calculate the operating margin can be chosen, but the restrictions to use Simple OM and the Average OM calculations must be considered.

OR

(b) The weighted average emissions (in kg CO2equ/kWh) of the current generation mix.

Baseline emission reductions have been estimated using the weighted average emission (in kgCO2 equ/kWh) of the current generation mix, using the most recent statistics available at the time of PDD submission. (Paragraph 9, sub point (b))

In the proposed baseline, Integrated NEWNE Grid is used as the reference region for estimating the current generation mix. Using the methodology available for small-scale project activities, the weighted average emissions (in tCO2 e/GWh) of current generation mix of Integrated NEWNE Grid of India is used for the calculation of baseline. The weighted average emission factor data calculated and provided by Central Electricity Authority (CEA) is used for the proposed project activity.

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)
01.05.07 to 31.12.07	0	5290	0	5290
01.01.08 to 31.12.08	0	12833	0	12833

01.01.09 to 31.05.09	0	6028	0	6028
Total	**0**	**24151**	**0**	**24151**

10. Monthly Operating Data[7]

K- 441			
Month	**Export (kWh)**	**Import (kWh)**	**Net (kWh)**
May-07	0	0	0
Jun-07	0	0	0
Jul-07	18048	62	17986
Aug-07	273701	351	273350
Sep-07	132402	712	131690
Oct-07	68645	1969	66676
Nov-07	21083	1787	19296
Dec-07	50646	850	49796
Jan-08	64240	974	63266
Feb-08	82994	900	82094
Mar-08	119249	1198	118051
Apr-08	235070	580	234490
May-08	509298	4	509294
Jun-08	311601	450	311151
Jul-08	329157	113	329044
Aug-08	340040	74	339966
Sep-08	160724	1293	159431
Oct-08	42229	1808	40421
Nov-08	41072	1071	40001
Dec-08	47123	965	46158
Jan-09	42573	801	41772
Feb-09	72453	1027	71426
Mar-09	123212	915	122297
Apr-09	234600	735	233865
May-09	535130	42	535088

[7] Details of Month wise electricity generation from each WTG of the project, this is as per the credit report issued by the State Utility.

K-442			
Month	Export (kWh)	Import (kWh)	Net (kWh)
May-07	56466	1620	54846
Jun-07	17632	1495	16137
Jul-07	45529	765	44764
Aug-07	57352	870	56482
Sep-07	77973	845	77128
Oct-07	111385	1119	110266
Nov-07	225121	555	224566
Dec-07	511575	4	511571
Jan-08	288386	417	287969
Feb-08	283816	97	283719
Mar-08	302215	66	302149
Apr-08	152560	1227	151333
May-08	37634	1612	36022
Jun-08	40279	1050	39229
Jul-08	44770	917	43853
Aug-08	46602	877	45725
Sep-08	71993	1021	70972
Oct-08	120544	895	119649
Nov-08	223943	701	223242
Dec-08	543952	42	543910
Jan-09	56466	1620	54846
Feb-09	17632	1495	16137
Mar-09	45529	765	44764
Apr-09	57352	870	56482
May-09	77973	845	77128

K-478			
Month	Export (kWh)	Import (kWh)	Net (kWh)
May-07	15279	2424	12855
Jun-07	257458	602	256856
Jul-07	263761	773	262988
Aug-07	179611	286	179325
Sep-07	158398	886	157512
Oct-07	80012	2075	77937
Nov-07	19938	2888	17050
Dec-07	43623	1450	42173
Jan-08	62680	1449	61231
Feb-08	80649	1403	79246

Mar-08	134493	1551	132942
Apr-08	277050	585	276465
May-08	545857	0	545857
Jun-08	265160	359	264801
Jul-08	321010	113	320897
Aug-08	371608	122	371486
Sep-08	179294	580	178714
Oct-08	49509	1692	47817
Nov-08	19106	1016	18090
Dec-08	40895	1128	39767
Jan-09	39639	938	38701
Feb-09	82418	1009	81409
Mar-09	153865	899	152966
Apr-09	219926	432	219494
May-09	567181	28	567153

K-503			
Month	**Export**	**Import**	**Net**
	(kWh)	**(kWh)**	**(kWh)**
May-07	497294	146	497148
Jun-07	254633	730	253903
Jul-07	249846	621	249225
Aug-07	253418	301	253117
Sep-07	105208	500	104708
Oct-07	45959	1304	44655
Nov-07	16820	2118	14702
Dec-07	43062	940	42122
Jan-08	59886	1000	58886
Feb-08	79078	962	78116
Mar-08	98056	943	97113
Apr-08	209114	437	208677
May-08	421670	7	421663
Jun-08	280128	359	279769
Jul-08	247116	84	247032
Aug-08	266397	66	266331
Sep-08	125376	865	124511
Oct-08	30193	1328	28865
Nov-08	36342	1350	34992
Dec-08	39928	1112	38816
Jan-09	41249	850	40399
Feb-09	57414	768	56646
Mar-09	100024	692	99332

Apr-09	192336	487	191849
May-09	514305	38	514267

K-513			
Month	**Export**	**Import**	**Net**
	(kWh)	**(kWh)**	**(kWh)**
May-07	15061	2389	12672
Jun-07	268082	628	267454
Jul-07	216490	635	215855
Aug-07	294106	468	293638
Sep-07	117475	656	116819
Oct-07	57865	1501	56364
Nov-07	13784	1996	11788
Dec-07	35912	1194	34718
Jan-08	50306	1163	49143
Feb-08	66348	1154	65194
Mar-08	107635	1242	106393
Apr-08	233381	493	232888
May-08	531132	0	531132
Jun-08	301917	410	301507
Jul-08	301353	106	301247
Aug-08	318298	105	318193
Sep-08	146332	1163	145169
Oct-08	36957	1870	35087
Nov-08	31717	1669	30048
Dec-08	34096	1608	32488
Jan-09	32444	1545	30899
Feb-09	61037	1168	59869
Mar-09	107986	938	107048
Apr-09	225742	593	225149
May-09	555068	0	555068

K-514			
Month	**Export**	**Import**	**Net**
	(kWh)	**(kWh)**	**(kWh)**
May-07	16823	2668	14155
Jun-07	287342	672	286670
Jul-07	289668	849	288819
Aug-07	293144	467	292677
Sep-07	120416	673	119743
Oct-07	56408	1463	54945
Nov-07	11840	1715	10125
Dec-07	30990	1030	29960
Jan-08	46587	1077	45510
Feb-08	62002	1078	60924
Mar-08	110697	1277	109420
Apr-08	247492	523	246969
May-08	566703	0	566703
Jun-08	302406	409	301997
Jul-08	170567	60	170507

Aug-08	135327	45	135282
Sep-08	145555	1157	144398
Oct-08	36938	1870	35068
Nov-08	26947	1419	25528
Dec-08	25623	1209	24414
Jan-09	26324	1254	25070
Feb-09	60839	1165	59674
Mar-09	118696	1031	117665
Apr-09	234356	616	233740
May-09	577446	0	577446
J-087			
Month	**Export (kWh)**	**Import (kWh)**	**Net (kWh)**
May-07	0	0	0
Jun-07	0	0	0
Jul-07	2846	10	2836
Aug-07	242693	643	242050
Sep-07	82728	857	81871
Oct-07	43230	1475	41755
Nov-07	12684	2323	10361
Dec-07	24710	1483	23227
Jan-08	40637	1343	39294
Feb-08	52546	1193	51353
Mar-08	72982	1397	71585
Apr-08	159687	413	159274
May-08	346895	5	346890
Jun-08	238511	338	238173
Jul-08	255770	228	255542
Aug-08	225915	180	225735
Sep-08	102633	966	101667
Oct-08	32779	1599	31180
Nov-08	26670	1447	25223
Dec-08	23367	1491	21876
Jan-09	22942	1529	21413
Feb-09	50391	1151	49240
Mar-09	82621	774	81847
Apr-09	175550	478	175072
May-09	382289	76	382213
J-091			
Month	**Export (kWh)**	**Import (kWh)**	**Net (kWh)**
May-07	0	0	0
Jun-07	0	0	0
Jul-07	3373	12	3361
Aug-07	214627	568	214059
Sep-07	90801	940	89861
Oct-07	48238	1646	46592
Nov-07	11070	2027	9043
Dec-07	24588	1476	23112
Jan-08	45074	1489	43585
Feb-08	56672	1286	55386
Mar-08	83964	1607	82357

Apr-08	179527	464	179063
May-08	416650	6	416644
Jun-08	235297	334	234963
Jul-08	233273	208	233065
Aug-08	245822	196	245626
Sep-08	113779	1070	112709
Oct-08	36339	1772	34567
Nov-08	24239	1315	22924
Dec-08	22164	1414	20750
Jan-09	22902	1526	21376
Feb-09	59550	1361	58189
Mar-09	95912	900	95012
Apr-09	206913	563	206350
May-09	432452	86	432366

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

Weighted Average Emission Rate[8] (tCO2/MWh) (incl. Imports)			
	2005-06	2006-07	2007-08
NEWNE	0.84	0.82	0.81
South	0.73	0.72	0.72
India	0.81	0.80	0.79

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)*

[8] http://www.cea.nic.in/planning/c%20and%20e/database_publishing_ver4.zip

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

DEEPAK FERTILISERS
AND PETROCHEMICALS CORPORATION LIMITED
REGISTERED OFFICE :
Opp. Golf Course, Shastri Nagar, Yerawada, Pune - 411 006, India.
Tel. : +91-20-6645 8000 Fax : 2668 3723
Internet : www.dfpcl.com

Letter of Under-taking

We undertake that the "10 MW Wind Power Project in Maharashtra by Deepak Fertilisers and Petrochemicals Corporation Limited" 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 regulatory requirement. Also, the project has not generated another form of environmental credit.

For Deepak Fertilisers
And Petrochemicals Corporation Limited

D Banerjee
Vice-President: Finance and Accounts

Dated: 14th September, 2009

Annexure 3: Proof of Title

Power purchase agreements (PPA) and the Letter of approval from the host DNA has been provided to the verification team in this regard.