

MONITORING REPORT FORM (CDM-MR) *
Version 01 - in effect as of: 28/09/2010

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* as contained within the document entitled "Guidelines for completing the monitoring report form (CDM-MR)" (EB 54 meeting report, annex 34).

MONITORING REPORT**Version 02****23/06/2011****25.70 MW Bundled Wind Power Project in Udumalpet, Tamilnadu****UNFCCC registration reference number: 1015****Second Monitoring Period****November 13, 2007 to November 10, 2010****(First and last days included)****SECTION A. General description of the project activity****A.1. Brief description of the project activity: >>**

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Purpose of the project activity and the measures taken to reduce greenhouse gas emissions

The project is a wind based power generation project of 25.70 MW installed capacity having 28 wind turbines. The main purpose of the project activity is to generate electrical energy through sustainable means using wind power resources.

Brief description of the installed technology and equipments

The project activity consists of 22 wind electric generators (WEG) of 750 kW, 5 WEG of 1650 kW and 1 WEG of 950 kW erected in and around Udumalpet, Tirupur District of the Indian State of Tamil Nadu.

Relevant dates for the project activity

The project site falls within the latitudes N 10041'00" and N 10034'49" and longitudes E 7708'00" and E 77021'32" in the State of Tamilnadu in Southern India.

The list of project promoters, type of WEG, commissioning date of the WEG, HTSC numbers and their Latitudes and Longitudes are as tabulated below:

Sl. No.	Project Promoter	Capacity (MW)	Date of Commissioning	H.T. SC No.
1	Royal Classic	0.750	31.12.2004	600
	Royal Classic	0.750	31.12.2004	601
	Royal Classic	0.750	30.09.2004	574
	Classic Knit	0.750	18.03.2004	368
2	Jayabalaji Dyeing	0.750	18.03.2005	644
	Jayabalaji Dyeing	0.750	22.03.2005	672
3	Goldensun Indus	0.750	18.03.2005	643
	Goldensun Indus	0.750	22.03.2005	673
4	Kongoor Textile	0.750	28.05.2004	446
5	GVG Industries	0.750	18.03.2004	359
	GVG Paper Mills	0.750	29.03.2004	402

	GVG Paper Mills	0.750	24.06.2005	841
	SVPB Spinners	0.750	18.03.2004	357
	SVA Syntex	0.750	18.03.2004	358
6	Cylwin Knitwear	0.750	30.03.2004	405
7	City Mills	0.750	31.03.2004	425
	City Mills	0.750	29.03.2004	395
	City Mills	0.750	29.03.2004	397
	City Mills	1.650	28.05.2005	824
8	RB Wovens	0.750	31.12.2004	599
	RB Wovens	0.750	18.03.2005	645
9	Inter ocean	0.950	26.03.2005	689
	Inter ocean	1.650	11.01.2005	602
10	Sri Gowrishankarar	1.650	05.05.2005	801
11	Asian Handlooms	1.650	30.09.2004	581
12	Kannapiran	1.650	10.02.2005	613
13	Prachi Exports	0.750	30.03.2004	413
	Prachi Exports	0.750	31.03.2004	423

All the WTGs of the project activity are in operation from the commissioning and operating satisfactorily during the reported monitoring period.

Total emission reductions achieved in this monitoring period

During the reported monitoring period from November 13, 2007 to November 08, 2010 (Both Days Inclusive) the project has generated 117,128,557 Units of electricity and thus contributing to GHG mitigation of the tune of 100,730 tCO₂e.

A.2. Project Participants

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Name of Party involved	Private and / or Public entity Project Participants	Kindly indicate if the Party involved wishes to be considered as Project Participant
Government of India (Host Country)	Vestas Wind Technology India Private Limited	No
Switzerland Government	Vestas Wind Technology India Private Limited	No

A.3. Location of the project activity:

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All the WTGs of this project activity are situated in Udumalpet (Tirupur District) of the Indian State of Tamil Nadu.

Complete information of the location of all the WEGS of the project activity is provided as follows:

Sl. No.	Project Promoter	Capacity (MW)	H.T. SC No.	Latitude	Longitude
1	Royal Classic	0.750	600	N10° 38' 29"	E77° 08' 16"
	Royal Classic	0.750	601	N10° 38' 21"	E77° 08' 15"
	Royal Classic	0.750	574	N10° 38' 19"	E77° 08' 00"

	Classic Knit	0.750	368	N10° 41' 00"	E77° 20' 29"
2	Jayabalaji Dyeing	0.750	644	N10° 34' 52"	E77° 09' 46"
	Jayabalaji Dyeing	0.750	672	N10° 34' 57"	E77° 09' 58"
3	Goldensun Indus	0.750	643	N10° 34' 59"	E77° 09' 47"
	Goldensun Indus	0.750	673	N10° 34' 49"	E77° 10' 00"
4	Kongoor Textile	0.750	446	N10° 38' 40"	E77° 08' 13"
5	GVG Industries	0.750	359	N10° 39' 41"	E77° 08' 38"
	GVG Paper Mills	0.750	402	N10° 39' 30"	E77° 11' 26"
	GVG Paper Mills	0.750	841	N10° 39' 38"	E77° 11' 26"
	SVPB Spinners	0.750	357	N10° 39' 58"	E77° 08' 21"
	SVA Syntex	0.750	358	N10° 39' 49"	E77° 08' 37"
6	Cylwin Knitwear	0.750	405	N10° 41' 00"	E77° 21' 32"
7	City Mills	0.750	425	N10° 40' 33"	E77° 10' 25"
	City Mills	0.750	395	N10° 40' 43"	E77° 10' 17"
	City Mills	0.750	397	N10° 40' 10"	E77° 09' 17"
	City Mills	1.650	824	N10° 38' 27"	E77° 11' 26"
8	RB Wovens	0.750	599	N10° 35' 21"	E77° 09' 53"
	RB Wovens	0.750	645	N10° 35' 09"	E77° 09' 31"
9	Inter ocean	0.950	689	N10° 39' 26"	E77° 09' 55"
	Inter ocean	1.650	602	N10° 36' 14"	E77° 11' 05"
10	Sri Gowrishankarar	1.650	801	N10° 37' 09"	E77° 09' 17"
11	Asian Handlooms	1.650	581	N10° 36' 47"	E77° 10' 27"
12	Kannapiran	1.650	613	N10° 37' 00"	E77° 10' 32"
13	Prachi Exports	0.750	413	N10° 38' 16"	E77° 08' 50"
	Prachi Exports	0.750	423	N10° 38' 13"	E77° 09' 01"

A.4. Technical description of the project

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The technology is a clean technology since there are no GHG emissions associated with the electricity generation. The implemented project activity consists of 28 WTGs (Vestas make).

TECHNICAL SPECIFICATION OF THE WEGs IN THE PROJECT ACTIVITY

SI No	Parameters	NM 48/750	NM 54/950	NM 82/1650
1	Operational Data			
	Nominal Output	750 kW	950 kW	1650 kW
	Power Regulation	Stall	Stall	Active-Stall™
	Cut-In Speed	4 m/s	3.5 m/s	3.5 m/s
	Cut-Out Speed	25 m/s	25 m/s	24 m/s
2	Rotor			
	Rotor Diameter	48.2 m	54.5 m	82 m
	Rotor Swept Area	1824 cm ²	2333 m ²	5281 m ²
	Number of Blades	3 nos.	3 nos.	3 nos.
3	Brake System			
	Blade tip Air Brake	Hydraulic, fail safe	Hydraulic, fail safe	Full Blade Pitch
	Disc Brake	Hydraulic	1 Pcs. Hydraulic fail safe	Hydraulic Disc Brake
4	Drive Train			
	Gear type	Planetary - parallel axle	Planetary - Parallel axle	Planetary/Helical gears
	Ratio	1:67.5 - 50Hz	1.67.5 - 50 Hz	1:70.2 - 50Hz
	Main Shaft	High quality forged shaft	Forged shaft and flange	High quality forged shaft
	Main Bearing	Spherical roller bearing	Spherical roller bearing	Self aligning roller bearing
	Cooling	Closed circiut liquid cooling	Heat exchanger with pump	Closed circiut liquid cooling
5	Generator			
	Type	Asynchronous	Asynchronous	Asynchronous
	Nominal Voltage	690 V	690 V	690 V
	Nominal Frequency	50 Hz	50 Hz	50 Hz
	Name Plate Rating	750/200 kW	950/200 kW	1650/900 kW
	Cooling	Closed circuit liquid cooling	Liquid cooled with pump	Closed circuit liquid cooling
6	Yaw			
	Type	Ball Bearing	Sliding Bearing	Ball bearing slewing ring with gearing and yaw breaks
	Drive Mechanism	4 electrical planetary gears	3 electrical planetary gears	6 active electric yaw drives
7	Tower			
	Type	Conical, Steel, PU Painted	Conical, Steel, Painted	Tubular, Steel, PU Painted
	Hub Height	According to type approvals	According to type approvals	According to approvals
8	Controller			
	Type	Computer controlling	Computer controlling	Microprocessor based computer control system
	Capacitor Bank	NO LOAD Compensated	NO LOAD Compensated	Automatic intelligent phase compensation logic, multistage

A.5. Title, reference and version of the baseline and monitoring methodology applied to the project activity:

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Title: Consolidated methodology for grid-connected electricity generation from renewable sources

Reference: ACM0002

Version: 06

http://cdm.unfccc.int/filestorage/C/D/M/CDMWF_AM_BW759ID58ST5YEEV6WUCN5744MN763/b24_repan07_ACM0002_ver06_for_web.pdf?t=RDd8MTMwNjM4Mjg3MS4wNQ==|F6Iqb9NZ7W0mmIrnY4AGQzg6bGk=

A.6. Registration date of the project activity:

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Registration Date: 07/07/2007

<http://cdm.unfccc.int/Projects/DB/DNV-CUK1174563974.61>

A.7. Crediting period of the project activity and related information (start date and choice of crediting period):

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Crediting Period from 24 Jun 05 - 23 Jun 15

Crediting Period is Fixed (10 Years)

A.8. Name of responsible person(s)/entity(ies):

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M/s Vestas Wind India Private Limited, 298, Rajiv Gandhi Salai, Sholingnallur, Chennai 600 119, India

SECTION B. Implementation of the project activity

B.1. Implementation status of the project activity

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The project activity consists of twenty eight WTG's with total installed capacity of 25.70 MW. The WEGs of the project activity are situated in Udumalpet, Tirupur district of Tamil Nadu.

The first WEG of this project activity was commissioned on March 18, 2004 and the last WEG was commissioned on June 24, 2005. All the WEG are connected to the grid interconnection point and supply the generated electricity to the state electricity board (SEB).

All the WEGs are running satisfactorily during the reported monitoring period. All the physical and technical features as stated in the registered PDD are in place and project has been operated as described in the registered PDD. There are no special events occur during the reported monitoring period.

No events or situations happened during the reported monitoring period which can alter the applicability of the applied methodology.

However, there has been replacement of energy meter for few WTGs. The change of energy meter has no impact on the monitoring plan since the meters will be replaced immediately by the TNEB officials in case of meter failures.

Following Meters were Changed during the monitoring period and keeping the accuracy class same as of the previous meter:

Proponent	HTSC	Make	Meter No.	Date
GVG Industries	359	Elster	2345863	18.03.2004
		Elster	4698092	20.08.2005
		Wallaby	208320554	15.10.2009
SVPB Spinners	357	Elster	2345868	18.03.2004
		Elster	4723054	02.08.2006
SVA Syntex	358	Elster	2345869	18.03.2004
		Elster	4902037	13.08.2007
Asian Handlooms	581	Elster	2377998	01.10.2004
		Wallaby	208320690	10.11.2009
Prachi Exports	423	Elster	2350231	31.03.2004
			4901438	15.03.2008

Since the class of the meter i.e. 0.5 class accuracy was kept same for all changed meters it didn't affect the Emission Reduction Calculation.

B.2. Revision of the monitoring plan

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Revised Monitoring Plan was approved on 04 March 2010

<http://cdm.unfccc.int/UserManagement/FileStorage/8C5DLNWIQFPE17SXT4Y26MAORZU3BG>

B.3. Request for deviation applied to this monitoring period

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NA

B.4. Notification or request of approval of changes

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NA

SECTION C. Description of the monitoring system

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As per Approved Consolidated Baseline Methodology for zero emissions grid connected renewable electricity generation projects (ACM0002), leakage calculation is not required for electricity generation from wind. The project activity essentially involves generation of electricity from wind, the employed WEG only converts wind energy into electrical energy and does not use any other input fuel for electricity generation. Thus no special ways and means are required to monitor leakage from the project activity.

The primary monitoring of the electricity fed to the state utility grid will be carried out jointly at the incoming feeder of the state power utility (TNEB). Machines for sale to utility/captive will be connected to the feeder and 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.

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 LCS wherein the generation details are recorded, in case of failure of primary monitoring; generation of individual machine can be cross verified from an LCS reading. The same is archived daily in the customer database in the website www.power2customer.com.

The energy that is generated is metered at the Project site. The metering equipment is maintained according to strict standards laid down by TNEB.

In keeping with the standards and regulations laid down by the Tamilnadu Electricity Regulatory Commission, all points regarding inspection, checking and meter reading is listed below:

1. Both kW hour and kVARh flow are measured at interconnection points, and power transformer locations
2. Each metering point associated with determination of energy exported or imported is provided with energy meter or as per the agreement between the State Utility and the company
3. Minimum standards of accuracy of meter shall be of class 0.5 as stipulated by utility.
4. All current transformers and voltage transformers used in conjunction with Commercial (Tariff) metering conform to the relevant Indian Standards. These are of an accuracy class 0.5 or as stipulated by utility and of suitable rating to cater to the meter and lead wire burden.
5. Voltage supply to the metering is assured with necessary voltage selection schemes. Loss of potential relays is provided which shall initiate alarms on loss of one or more phases of the voltage supply to any meter.
6. A schedule is drawn up between the utility and the entities covering summation, collection, processing tariff meter readings at various connection sites.
7. The generating company furnishes recorded data of all electric measurements and events recorded by the operational metering to the utility at least once in a week or more often if required.
8. The utility is responsible to formulate the metering procedure and implement it. Hence all information metering data collected will be as accurate as possible and will be officially certified.

The WEG are operated and maintained by Vestas Wind Technology India Private Limited.

SECTION D. Data and parameters

D.1. Data and parameters determined at registration and not monitored during the monitoring period, including default values and factors	
Data / Parameter:	EF_y
Data unit:	tCO₂/MWh
Description:	Southern Grid EF
Source of data used:	CEA- CO ₂ Baseline Database for the Indian Power Sector (User Guide V1.1)
Value(s) :	0.86
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Data used for Baseline Emission calculations.
Additional comment:	The emission factor is fixed throughout the crediting period.

D.2. Data and parameters monitored	
Data / Parameter:	EGy
Data unit:	MWh
Description:	Net Electricity supplied to the grid by the project
Measured /Calculated /Default:	Calculated
Source of data:	TNEB Monthly Energy statements
Value(s) of monitored parameter:	117,128.5
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Data used for Baseline Emission Calculation
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)	Type : Trivector Energy Meters Accuracy class: 0.5 Calibration Frequency : Yearly
Measuring/ Reading/ Recording frequency:	Monthly
Calculation method (if applicable):	The electricity exported to the grid and the electricity imported from the grid generated by each WTG is measured at the energy meter installed at the transformer yard. Net electricity supplied is the difference between electricity exported to the grid and imported from the grid. This data is used for emission reduction calculation.
QA/QC procedures applied:	The energy meter is tested and calibrated periodically by TNEB as per the guidelines of TNERC. Net Electricity is supplied by the project to the grid is verified by the receipt of sales.

Calibration Details

As per TNEB guidelines the Calibration Certificates are obtained and submitted to DOE for verification. In cases where the calibration is implemented beyond the scheduled date, the maximum permissible error for the metering for the equipment has been applied for the period of gap as per the CDM EB 52 annex 60 guidelines. Conservative approach has been exercised in applying the maximum permissible error and in the calculation of emission reductions.

SECTION E. Emission reductions calculation

E.1. Baseline emissions calculation

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Baseline Emission = Net Generation from all the WTGs X Baseline Emission Factor

$$BE_y = EG_y \times EF_y$$

Period of measurement	Net Electricity generation (kWh)	Baseline emission factor (tCO ₂ /MWh)	Net emission reductions
13.11.2007 to	117,128,557	0.86	100,730

10.11.2010			
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E.2. Project emissions calculation

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Being a wind energy project, the project activity does not lead to any form of emission; hence project emission has not been considered in this case.

Hence, **PE_y = 0**

E.3. Leakage calculation

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As wind energy projects fall under clean energy sources for electricity generation, the emission from the project is taken as zero.

Hence, **Leakages=0**

E.4. Emission reductions calculation / table

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The emission reduction ER by the project activity during a given year y is the difference between the baseline emissions through substitution of electricity generation with fossil fuels (BE) and project emissions (PE)

$$ER_y = BE_y - PE_y - Leakages$$

Period of measurement	Total Baseline Emissions	Total Project Emissions	Total Leakages	Total Emission Reductions
13.11.2007 to 10.11.2010	1,00,730	0	0	1,00,730

E.5. Comparison of actual emission reductions with estimates in the CDM-PDD

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Comparison of the actual emission reduction with estimate in the CDM-PDD for the said monitoring period i.e. 13.11.2007 to 10.11.2010 (Inclusive Both Days) has been carried out in the following table

Item	Values applied in ex-ante calculation of the registered CDM-PDD	Actual values reached during the monitoring period
Emission reductions (tCO₂e)	40,756	
Expected ER from 13.11.2007 to 10.11.2010	1,22,156	1,00,730

E.6. Remarks on difference from estimated value in the PDD

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There is no increase in the No. of ERs in fact they have gone down by around 18%.

The decrease in ERs is attributed to the low wind during the monitoring period.

History of the document

Version	Date	Nature of revision
01	EB 54, Annex 34 28 May 2010	Initial adoption.
Decision Class: Regulatory Document Type: Guideline, Form Business Function: Issuance		