

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

CONTENTS

- A. General description of the project activity
 - A.1. Brief description of the project activity
 - A.2. Project participants
 - A.3. Location of the project activity
 - A.4. Technical description of the project
 - A.5. Title, reference and version of the baseline and monitoring methodology applied to the project activity
 - A.6. Registration date of the project activity
 - A.7. Crediting period of the project activity and related information
 - A.8. Name of responsible person(s)/entity(ies)
- B. Implementation of the project activity
 - B.1. Implementation status of the project activity
 - B.2. Revision of the monitoring plan
 - B.3. Request for deviation applied to this monitoring period
 - B.4. Notification or request of approval of changes
- C. Description of the monitoring system
- D. Data and parameters monitored
 - D.1. Data and parameters used to calculate baseline emissions
 - D.2. Data and parameters used to calculate project emissions
 - D.3. Data and parameters used to calculate leakage emissions
 - D.4. Other relevant data and parameters
- E. Emission reductions calculation
 - E.1. Baseline emissions calculation
 - E.2. Project emissions calculation
 - E.3. Leakage calculation
 - E.4. Emission reductions calculation
 - E.5. Comparison of actual emission reductions with estimates in the registered CDM-PDD
 - E.6. Remarks on difference from estimated value

MONITORING REPORT
Version 01 -Date: 16/11/2010
Wind Electricity Generation Project;
UNFCCC reference number 2092
First Monitoring Period
31/01/2009 to 23/08/2010(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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Reliance Innoventures Limited (RINL) is a Company incorporated under the Indian Companies Act, 1956. The project activity comprises of installation of 30 Wind Electric Generators (WEGs) each of capacity 1500 kW supplied by Suzlon Energy Ltd, at Ambavade Khurd, Chavanwadi, Chalkewadi, Borgewadi, Pawarwadi, Galmewadi, Dhebewadi and Maskarwadi villages of Satara District, Maharashtra.

The objective of the project activity is develop, design, engineering, procure, finance, construct, operate and maintain the 45 MW wind based generation facility in the state of Maharashtra. The Project participant has signed Power Purchase Agreement (PPA) for 13 years period, with Maharashtra State private utility M/s. Reliance Energy Ltd.

The project activity displaces renewable power in the absence of the project activity; same amount of electricity would have been procured from conventional thermal power generation facilities.

A brief summary of the project activity from the date of construction till the date of operation are given below:

Sr. No.	Location No	Date of Construction (PO Date)	Date of Commissioning	Operation Start Date
1	GPP 28	9-Feb-07	5-Dec-07	5-Dec-07
2	GPP 30	9-Feb-07	15-Dec-07	15-Dec-07
3	GPP 44	9-Feb-07	20-Dec-07	20-Dec-07
4	GPP 56	9-Feb-07	3-Jan-08	3-Jan-08
5	GPP 57	9-Feb-07		
6	GPP 40	9-Feb-07	9-Jan-08	9-Jan-08
7	GPP 41	9-Feb-07		
8	GPP 42	9-Feb-07		
9	GPP 43	9-Feb-07		
10	GPP 58	9-Feb-07	11-Jan-08	11-Jan-08
11	GPP 61	9-Feb-07		
12	GPP 62	9-Feb-07		
13	GPP 63	9-Feb-07		
14	GPP 65	9-Feb-07		

Sr. No.	Location No	Date of Construction (PO Date)	Date of Commissioning	Operation Start Date
15	GPP 66	9-Feb-07		
16	GPP 89	9-Feb-07		
17	GPP 90	9-Feb-07		
18	GPP 94	9-Feb-07		
19	GPP 45	9-Feb-07	25-Jan-08	25-Jan-08
20	GPP 48	9-Feb-07	2-Feb-08	2-Feb-08
21	GPP 46	9-Feb-07		
22	GPP 47	9-Feb-07		
23	GPP 49	9-Feb-07	4-Mar-08	4-Mar-08
24	GPP 95	9-Feb-07		
25	GPP 59	9-Feb-07	29-Mar-08	29-Mar-08
26	GPP 92	9-Feb-07	20-Jun-08	20-Jun-08
27	GPP 93	9-Feb-07		
28	GPP 87	9-Feb-07	17-Nov-08	17-Nov-08
29	GPP 91	9-Feb-07	27-Mar-09	27-Mar-09
30	GPP 96	9-Feb-07	27-Mar-09	27-Mar-09

Total emission reductions achieved by the project activity during the monitoring period are given below.

Sl. No.	Monitoring Period		Baseline Emissions tCO2	Project Emission tCO2	Leakage	Emissions reductions tCO2
1	31-Jan-09	25-Feb-09	62.64	0	0	62
2	22-Jan-09	25-Feb-09	1,693.69	0	0	1693
3	25-Feb-09	25-Mar-09	2,315.88	0	0	2315
4	25-Mar-09	29-Apr-09	5,257.28	0	0	5257
5	29-Apr-09	26-May-09	8,554.16	0	0	8554
6	26-May-09	25-Jun-09	9,920.77	0	0	9920
7	25-Jun-09	24-Jul-09	18,087.89	0	0	18087
8	24-Jul-09	25-Aug-09	14,899.01	0	0	14899
9	25-Aug-09	22-Sep-09	3,432.11	0	0	3432
10	22-Sep-09	24-Oct-09	5,621.42	0	0	5621
11	24-Oct-09	26-Nov-09	4,639.55	0	0	4639

Sl. No.	Monitoring Period		Baseline Emissions tCO ₂	Project Emission tCO ₂	Leakage	Emissions reductions tCO ₂
12	26-Nov-09	23-Dec-09	1,156.96	0	0	1,157
13	23-Dec-09	29-Jan-10	912.76	0	0	912
14	29-Jan-10	25-Feb-10	1,360.15	0	0	1,360
15	25-Feb-10	31-Mar-10	3,907.93	0	0	3,907
16	31-Mar-10	28-Apr-10	4,014.44	0	0	4,014
17	28-Apr-10	26-May-10	7,564.16	0	0	7,564
18	26-May-10	26-Jun-10	8,999.04	0	0	8,999
19	26-Jun-10	23-Jul-10	10,611.14	0	0	10,611
20	23-Jul-10	23-Aug-10	14,679.31	0	0	14,679
TOTAL						1,27,682

A.2. Project Participants

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Name of Party involved ((host) indicates a host Party)	Private and/or public entity(ies)Project participants (as applicable)	Kindly indicate if the Party involved wishes to be considered as project participant (Yes/No)
India (host)	Reliance Innoventures Limited (Private entity)	No

A.3. Location of the project activity:

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The project activity is located at Ambavade Khurd, Chavanwadi, Chalkewadi, Borgewadi, Pawarwadi, Galmewadi, Dhebewadi and Maskarwadi villages of Satara District.

The project activity is located 325 km. from Mumbai. The closest National Highway (NH4) is 30 km. from the location of the project activity and the nearest railway station is located at Satara, 55 km. from the project activity.

The site is having following geographical parameters and its location shown in the map -



Sl. No.	WEG No.	Village	Loc. No.	Latitude	Longitude
1	WEG - 1	Galmewadi	GPP-28	N17° 10' 51.4"	E73° 59' 20.7"
2	WEG - 2	Galmewadi	GPP-30	N17° 11' 17.0"	E73° 59' 13.5"
3	WEG - 3	Ambewad Khurd	GPP-96	N17° 11' 37.0"	E73° 59' 07.0"
4	WEG - 4	Ambewad Khurd	GPP-40	N17° 13' 59.9"	E73° 55' 16.3"
5	WEG - 5	Ambewad Khurd	GPP-41	N17° 14' 12.3"	E73° 54' 39.3"
6	WEG - 6	Ambewad Khurd	GPP-42	N17° 14' 23.2"	E73° 54' 38.4"
7	WEG - 7	Ambewad Khurd	GPP-43	N17° 14' 34.1"	E73° 54' 43.5"
8	WEG - 8	Chavanwadi	GPP-44	N17° 14' 45.7"	E73° 54' 45.3"
9	WEG - 9	Ambewad Khurd	GPP-45	N17° 14' 59.6"	E73° 54' 51.4"
10	WEG - 10	Ambewad Khurd	GPP-46	N17° 15' 09.8"	E73° 54' 57.5"
11	WEG - 11	Ambewad Khurd	GPP-47	N17° 15' 18.3"	E73° 55' 02.8"
12	WEG - 12	Ambewad Khurd	GPP-48	N17° 15' 26.9"	E73° 55' 06.3"
13	WEG - 13	Ambewad Khurd	GPP-49	N17° 15' 37.6"	E73° 55' 10.8"
14	WEG - 14	Ambewad Khurd	GPP-53	N17° 15' 17.0"	E73° 55' 15.2"
15	WEG - 15	Dhebewadi	GPP-60	N17° 15' 22.3"	E73° 55' 34.1"
16	WEG - 16	Ambewad Khurd	GPP-55	N17° 15' 09.6"	E73° 55' 18.5"
17	WEG - 17	Ambewad Khurd	GPP-56	N17° 14' 16.7"	E73° 55' 50.4"
18	WEG - 18	Ambewadi Khurd	GPP-58	N17° 14' 49.3"	E73° 56' 02.4"
19	WEG - 19	Ambewad Khurd	GPP-59	N17° 14' 35.5"	E73° 55' 56.9"
20	WEG - 20	Maskarwadi	GPP-61	N17° 15' 05.8"	E73° 56' 19.3"
21	WEG - 21	Galmewadi	GPP-62	N17° 14' 30.6"	E73° 52' 37.8"
22	WEG - 22	Galmewadi	GPP-63	N17° 14' 17.8"	E73° 53' 19.4"
23	WEG - 23	Galmewadi	GPP-65	N17° 14' 06.1"	E73° 54' 00.2"
24	WEG - 24	Galmewadi	GPP-66	N17° 14' 14.8"	E73° 54' 17.1"
25	WEG - 25	Ambewad Khurd	GPP-89	N17° 14' 55.3"	E73° 51' 57.0"
26	WEG - 26	Ambewad Khurd	GPP-90	N17° 15' 05.9"	E73° 51' 57.6"
27	WEG - 27	Ambewad Khurd	GPP-91	N17° 15' 13.2"	E73° 52' 06.0"
28	WEG - 28	Borgewadi	GPP-94	N17° 15' 40.2"	E73° 52' 42.4"
29	WEG - 29	Chalkewadi	GPP-95	N17° 15' 55.1"	E73° 40' 25.7"
30	WEG - 30	Pawarwadi	GPP -57	N17° 14' 22.5"	E73° 55' 48.3"

A.4. Technical description of the project

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RINL has sourced the WEGs from Suzlon Energy Ltd., one of the leading manufacturers of the WEGs in the world. Suzlon Energy Ltd. developed Model S.82/1500 kW specific to the low wind conditions (GL/ class - III sites) with their R&D capability in Germany and Netherlands. Type certification for the Model S.82 was received from Germanischer Lloyd, Germany and Center for Wind Energy Technology (C-WET) in India. Technology of S.82/1500 kW is also approved by Ministry of New and Renewable Energy (MNRE)

Technology of S.82/1500 kW was introduced in the Indian market, in the year 2006 and is currently manufactured in India with the ISO certification process for the design, development, and manufacture of the WEGs. Salient features of S.82/1500 kW are as follows.

The salient Features of the 1.5 MW WEG are as Follows: -

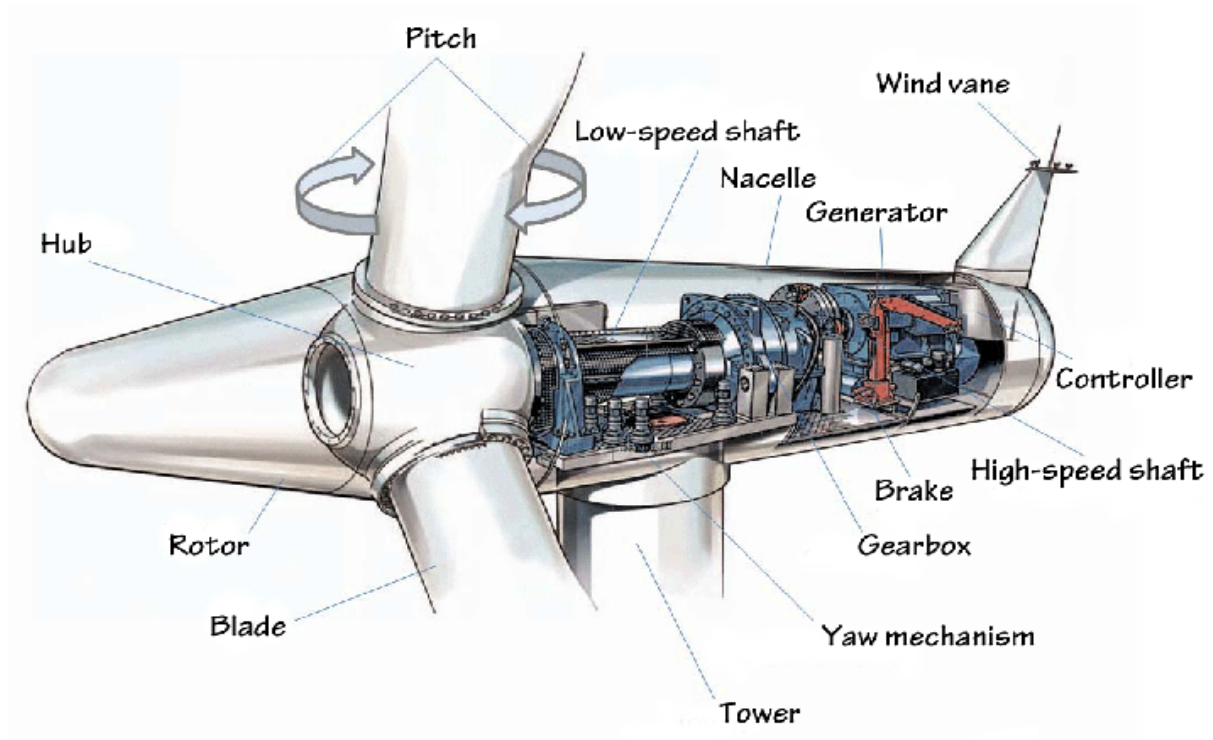
1. Higher Efficiency - Designed to achieve increased efficiency and co-efficient of power (C_p)
2. Minimum Stress and Load - Well-balanced weight distribution ensures lower static & dynamic loads
3. Shock Load-free Operation
4. Intelligent Control – Sophisticated and advanced technologies applied by extensive operational experience maximizes yield
5. Peak Power Factor - High-speed asynchronous generator with a multi-stage intelligent switching compensation system delivers power factor up to 0.99
6. Climatic Shield - Hermetically sheltered, advanced over-voltage and lightning protection system
7. Unique Micro-Pitching Control - Unmatched fine pitching with 0.1° resolution to extract every possible unit of power
8. Grid-friendly - Grid friendly design generates harmonics-free pure sinusoidal power
9. ISO-certified vendors confirm high quality components and the manufacturing as well as installation procedures are ISO 9001:2000 certified.
10. ISO 9001:2000 certification for Installation, Commissioning, Operation and Maintenance

Considering the largest size from available size of the turbines developed considering Indian climate and logistics requirement, the turbine will occupy lesser / optimised land area than equivalent project capacity of the lower range of turbines, and also the turbine doesn't consumes any fossil fuels and having zero emission technology, which states that the technology employed is environmentally safe and sound.

In wind energy generation, kinetic energy of wind is converted into mechanical energy and subsequently into electrical energy. Wind has considerable amount of kinetic energy when blowing at high speeds. This kinetic energy when passes through the blades of the wind turbines, it is converted into mechanical energy and rotates the wind blades. When the wind blades rotate, the shaft connected to the generator also rotates, thereby producing electricity. The diagrammatic view of this technology is provided in below diagram¹:

¹ <http://www.suzlon.com/pdf/S82%20product%20brochure.pdf>

The major components of a wind turbine



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

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Title: "Consolidated baseline methodology for grid-connected electricity generation from renewable sources (ACM0002)" Version: 06

Scope no: 1

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

Date: 19 May 2006

A.6. Registration date of the project activity:

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31/01/2009

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

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Crediting period considered at time of registration is from 15/10/2008 or from the date of registration of the project i.e. 31/01/2009, whichever is later.

Therefore the start date of crediting period is considered as the date of registration, i.e. 31/01/2009.

PP has considered fixed crediting period of 10 years

A.8. Name of responsible person(s)/entity(ies):
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- Hetalkumar Shah (Deputy General Manager)
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Mobile: +91 9324655882

SECTION B. Implementation of the project activity
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B.1. Implementation status of the project activity

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The project activity comprises of installation of 30 Wind Electric Generators (WEGs) each of capacity 1500 kW supplied by Suzlon Energy Ltd, The objective of the project activity is develop, design, engineering, procure, finance, construct, operate and maintain the 45 MW wind based generation facility in the state of Maharashtra. The Project participant has signed Power Purchase Agreement (PPA) for 13 years period, with Maharashtra State private utility M/s. Reliance Energy Ltd.

The project activity starts generating from the date of commissioning of the WTGs. The WEG's commissioning details are provided below:

Sr. No.	Location No	Date of Commissioning	Survey No, as per Comm. Certificate issued by MSEDCL (formerly known as MSEB)
1	GPP 28	05-Dec-07	678
2	GPP 30	15-Dec-07	715
3	GPP 44	20-Dec-07	2125, 2126
4	GPP 56	03-Jan-08	1013
5	GPP 57		
6	GPP 40	09-Jan-08	17
7	GPP 41		20
8	GPP 42		25
9	GPP 43		25
10	GPP 58	11-Jan-08	90
11	GPP 61		1603
12	GPP 62		51
13	GPP 63		544
14	GPP 65		475
15	GPP 66		474
16	GPP 89		210
17	GPP 90		213
18	GPP 94		250
19	GPP 45	25-Jan-08	2116
20	GPP 48		1943
21	GPP 46	02-Feb-08	2084
22	GPP 47		2080
23	GPP 49		1935
24	GPP 95	04-Mar-08	395
25	GPP 59	29-Mar-08	1114
26	GPP 92	20-Jun-08	231
27	GPP 93		1602
28	GPP 87	17-Nov-08	66
29	GPP 91	27-Mar-09	213
30	GPP 96	27-Mar-09	470

Performance details of the project activity:

The project complied with all legal requirements during the current monitoring period. The project performance of the project during the current verification period (31/01/2009 to 23/08/2010) was normal.

Events or situations which may impact the applicability of the methodology are not occurred during the monitoring period.

B.2. Revision of the monitoring plan

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Not Applicable

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

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Not Applicable

B.4. Notification or request of approval of changes

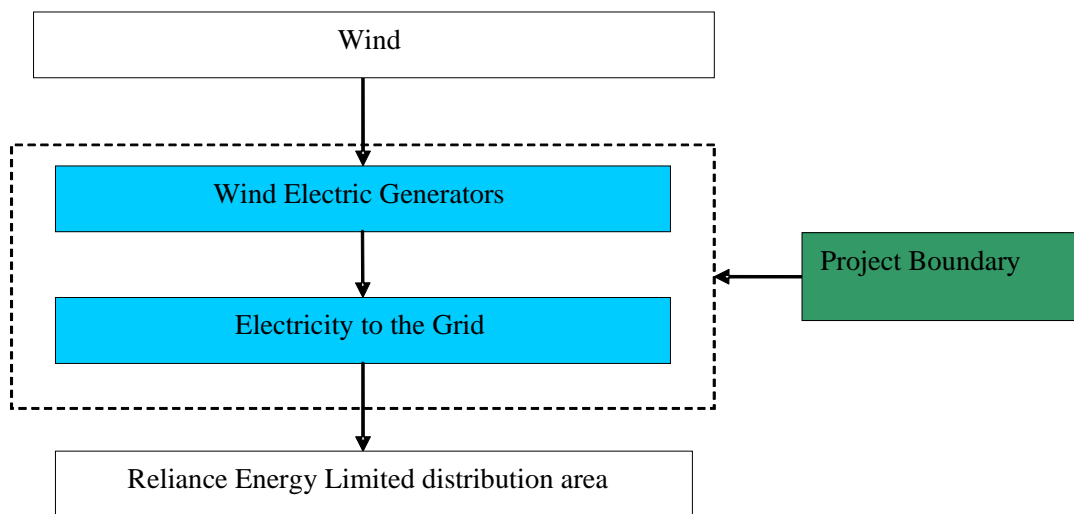
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Not Applicable

SECTION C. Description of the monitoring system

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The project boundary for the project activity supplies electricity to the grid as shown below in which 30 Wind Energy Generators of 1500 kW capacity are connected to substation, and the grid which is used to transmit the generated electricity (in this case the western regional grid).



Parameters monitored ex-post are electricity export (EGexport) and electricity import (EGimport) from the project activity. The same are used to calculate the net electricity export which is taken as the basis for emission reduction calculations.

The joint meter is installed at the sub-station (grid interconnection point) are used to measure the electricity export and electricity import on continuous basis. Every month the joint meter readings were taken by the State Electricity Board (SEB) as per Power Purchase Agreement (PPA) terms. The meters at the sub-station are in the custody of SEB. SEB officials record the readings from the common joint meter and the same are used to calculate net electricity exported to the grid. The site staffs of RINL are responsible for the collation of the electricity export, electricity import and calculate the net electricity export figures in spreadsheets on monthly basis. The same were forwarded to the Project controller who verified on monthly basis and prepared the emission reduction spreadsheets along with the monitoring report. The Project Head undertook the final review and had the overall responsibility for data management.

The net electricity exported from project activity was calculated as the difference of the electricity export figures {registered in the joint meter report (JMR)} and the electricity import figures (registered in the JMR) derived from the continuously measured export and import electricity at metering location.

RINL entered into an Operation & Maintenance Agreement with the M/s Suzlon Wind farm Services Limited (SWSL) for carrying out the necessary operation and maintenance of the project activity during the designed life of the project.

The operation and maintenance contract covers the following services:

1) Routine Maintenance Services

Routine Maintenance involves making available suitable manpower for operation and maintenance of the Equipment and covers periodic preventive maintenance, cleaning and up keep 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

2) Security Services

This service includes watch and ward and Security of the Wind Farm and the Equipment.

3) Management Services

- a. Data logging in 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 RINL, of electricity generated at the wind farm and supplied to SEB grid.

4) Technical Services

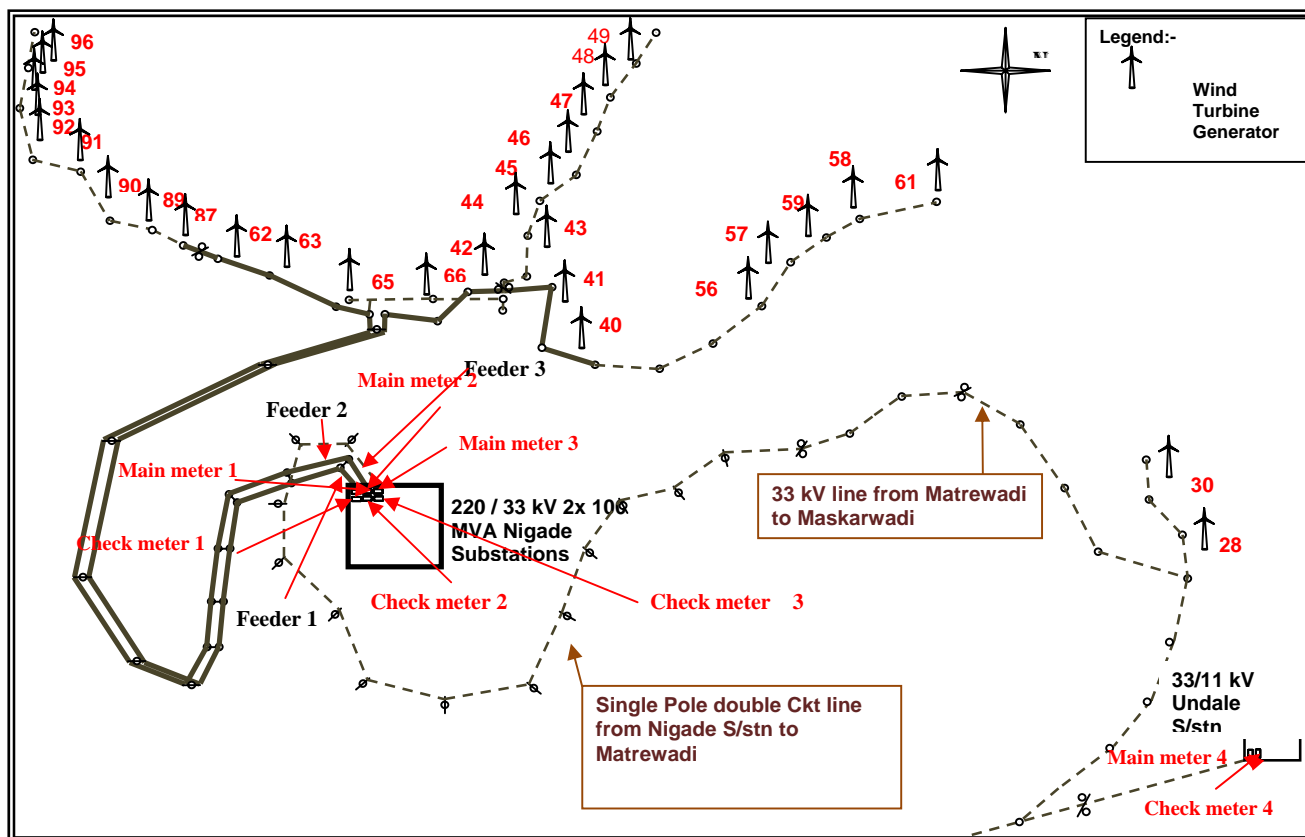
- a. Visual inspection of the WEG and all parts thereof.
- b. Technical assistance including checking of various technical, safety and operational parameters of the Equipment, trouble shooting and relevant technical services.

The SEB carries out the calibration, periodical testing, sealing and maintenance of meters in the presence of RINL representative. The frequency of meter testing is on annual basis.

The Article 11 of the Power Purchase Agreement of the project activity, which clearly identifies the following:

- ***Metering and recording of power generation and consumption data***
- ***Testing and Calibration of metering instruments***
- ***Recording and approving authority***

The monitoring system of the project activity has been portrait in a single line diagram as shown below



Organizational Responsibility:

RINL has formed a dedicated CDM and project team which is responsible for the recording and storing the data related to the project activity. The project team is also responsible for collation and preparation of monitoring reports and corresponding emission reduction sheets. All the monitoring data is maintained in the electronic form which is further cross verified by the project head and archived for the project life time.

The Organization and responsibility chart for the CDM project activity is described below.

Sl. No	Designation	Responsibilities
01	Project Head	<ol style="list-style-type: none"> Overall responsibility of the Project including CDM. Review of monitoring reports and emission reduction calculation sheet. Coordinate with DOE during verification process.
02	Project Controller	<ol style="list-style-type: none"> Operation & Maintenance of the wind farm. Review of Project including performance evaluation. Invoicing of the generated electricity. Project Documentation: Preparation of monitoring reports and emission reduction calculation sheet.
03	Site staff	<ol style="list-style-type: none"> Collation of generation and consumption data Preparation of spreadsheets mentioning electricity export, electricity import and net electricity export

Archiving of data:

Data shall be archived for 20 years (operational lifetime) + 2 years.

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_{OMv}
Data unit:	tCO ₂ / MWh
Description:	Operating Margin emission factor for Western regional grid
Source of data to be used:	“CO ₂ Baseline Database for Indian Power Sector” Version 3.0 published by the Central Electricity Authority, Ministry of Power, Government of India ²
Value applied	1.00 tCO ₂ /MWh.
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Baseline emission calculations
Additional comment:	Value is calculated based on ex-ante approach

Data / Parameter:	EF_{BMv}
Data unit:	tCO ₂ / MWh
Description:	Build Margin emission factor for Western regional grid
Source of data to be used:	“CO ₂ Baseline Database for Indian Power Sector” Version 3.0 published by the Central Electricity Authority, Ministry of Power, Government of India ³
Value applied	0.59 tCO ₂ /MWh
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Baseline emission calculations
Additional comment:	Value is calculated based on ex-ante approach

Data / Parameter:	EF_y
Data unit:	tCO ₂ / MWh
Description:	Combined Margin CO ₂ emission factor for Western regional grid
Source of data to be used:	Registered PDD
Value applied	0.8975 tCO ₂ /MWh
Indicate what the	

² Source: <http://www.cea.nic.in/planning/c%20and%20e/Government%20of%20India%20website.htm>

³ Source: <http://www.cea.nic.in/planning/c%20and%20e/Government%20of%20India%20website.>

data are used for (Baseline/ Project/ Leakage emission calculations)	Baseline emission calculations
Additional comment:	.

D.2. Data and parameters monitored

Data / Parameter:	EGy
Data unit:	MWh/year
Description:	Net Electricity supplied to the grid by the Project activity in year y
Measured /Calculated /Default:	Calculated from EGexport and EGimport (EGexport – EGimport)
Source of data:	Monthly Joint Energy Meter Reading Reports
Value (s) of monitored parameter:	1,42,100
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Baseline Emission Calculation
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)	Net electricity supplied to grid is calculated as product of difference between EGexport and EGimport (EGexport – EGimport)..
Measuring/Recording frequency:	Continuous measurement and monthly recording.
Calculation method (if applicable):	The net electricity supplied to the grid is calculated by the summation of the net electricity export figures mentioned in the joint meter reading reports.
QA/QC procedures applied:	The quantity of net electricity supplied is cross-verified from the invoice raised on Reliance Infrastructure Ltd.

Data / Parameter:	EGexport
Data unit:	MWh
Description:	Electricity exported to the grid by the Project activity in year y
Measured /Calculated /Default:	Measured
Source of data:	Monthly Joint Energy Meter Reading Reports
Value (s) of monitored parameter:	Actual measured data (i.e. 1,44,273.32)
Indicate what the data are used for (Baseline/	Baseline Emission Calculation

Project/ Leakage emission calculations)						
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)	The export of electricity was measured by the energy meter installed at common metering point. Joint meter readings were taken jointly by representatives of SEB and representative of RINL as per the applicable provisions mentioned in the Power Purchase Agreement. The joint meter readings were recorded once in a month. Net electricity supplied to grid is calculated as product of difference between EGexport and EGimport (EGexport – EGimport). The detail of energy meter quality is listed below.					
	Meter No.	Accuracy Class	Serial No.	Calibration Frequency	Date of Last Calibration	Validity
	Main meter 1	0.2	0004937714	As per PPA	30/03/2010	As per PPA
	Check meter 1	0.2	0004937715	As per PPA	30/03/2010	As per PPA
	Main meter 2	0.2	0004937716	As per PPA	30/03/2010	As per PPA
	Check meter 2	0.2	0004937717	As per PPA	30/03/2010	As per PPA
	Main meter 3	0.2	0004939176	As per PPA	30/03/2010	As per PPA
	Check meter 3	0.2	0004939177	As per PPA	30/03/2010	As per PPA
	Main Meter 4	0.2	0004948746	As per PPA	30/03/2010	As per PPA
	Check meter 4	0.2	0004948747	As per PPA	30/03/2010	As per PPA
Measuring/Recording frequency:	Continuous measurement and monthly recording.					
Calculation method (if applicable):	As per Joint Meter reading report					
QA/QC procedures applied:	The energy meters were checked for accuracy as per SEB guidelines on a regular basis and are subject to periodic calibration as per PPA.					

Data / Parameter:	EGimport
Data unit:	MWh
Description:	Electricity imported to the grid by the Project activity in year y
Measured /Calculated /Default:	Measured
Source of data:	Monthly Joint Energy Meter Reading Reports
Value (s) of monitored parameter:	Actual measured data (i.e. 2,173.32)
Indicate what the data are used for (Baseline/ Project/ Leakage	Baseline Emission Calculation

emission calculations)																																																							
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)	<p>The import of electricity was measured by the energy meter installed at common metering point. Joint meter readings were taken jointly by representatives of SEB and representative of RINL as per the applicable provisions mentioned in the Power Purchase Agreement. The joint meter readings were recorded once in a month.</p> <p>Net electricity supplied to grid is calculated as product of difference between EGexport and EGimport; (EGexport – EGimport). The details of energy meter quality is listed below.</p> <table><tr><th>Meter No.</th><th>Accuracy Class</th><th>Serial No.</th><th>Calibration Frequency</th><th>Date of Last Calibration</th><th>Validity</th></tr><tr><td>Main meter 1</td><td>0.2</td><td>0004937714</td><td>As per PPA</td><td>30/03/2010</td><td>As per PPA</td></tr><tr><td>Check meter 1</td><td>0.2</td><td>0004937715</td><td>As per PPA</td><td>30/03/2010</td><td>As per PPA</td></tr><tr><td>Main meter 2</td><td>0.2</td><td>0004937716</td><td>As per PPA</td><td>30/03/2010</td><td>As per PPA</td></tr><tr><td>Check meter 2</td><td>0.2</td><td>0004937717</td><td>As per PPA</td><td>30/03/2010</td><td>As per PPA</td></tr><tr><td>Main meter 3</td><td>0.2</td><td>0004939176</td><td>As per PPA</td><td>30/03/2010</td><td>As per PPA</td></tr><tr><td>Check meter 3</td><td>0.2</td><td>0004939177</td><td>As per PPA</td><td>30/03/2010</td><td>As per PPA</td></tr><tr><td>Main Meter 4</td><td>0.2</td><td>0004948746</td><td>As per PPA</td><td>30/03/2010</td><td>As per PPA</td></tr><tr><td>Check meter 4</td><td>0.2</td><td>0004948747</td><td>As per PPA</td><td>30/03/2010</td><td>As per PPA</td></tr></table>	Meter No.	Accuracy Class	Serial No.	Calibration Frequency	Date of Last Calibration	Validity	Main meter 1	0.2	0004937714	As per PPA	30/03/2010	As per PPA	Check meter 1	0.2	0004937715	As per PPA	30/03/2010	As per PPA	Main meter 2	0.2	0004937716	As per PPA	30/03/2010	As per PPA	Check meter 2	0.2	0004937717	As per PPA	30/03/2010	As per PPA	Main meter 3	0.2	0004939176	As per PPA	30/03/2010	As per PPA	Check meter 3	0.2	0004939177	As per PPA	30/03/2010	As per PPA	Main Meter 4	0.2	0004948746	As per PPA	30/03/2010	As per PPA	Check meter 4	0.2	0004948747	As per PPA	30/03/2010	As per PPA
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Check meter 4	0.2	0004948747	As per PPA	30/03/2010	As per PPA																																																		
Measuring/Recording frequency:	Continuous measurement and monthly recording.																																																						
Calculation method (if applicable):	As per Joint Meter reading report																																																						
QA/QC procedures applied:	The energy meters were checked for accuracy as per SEB guidelines on a regular basis and are subject to periodic calibration as per PPA.																																																						

*Note: EG was monitored continuously. This parameter is reported in units appropriate to actual monitored vintage.

SECTION E. Emission reductions calculation

E.1. Baseline emissions calculation

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The project activity meets the eligibility criteria to use simplified modalities and procedure for small scale CDM project activities as set out in paragraph 6 (c) of decision 17/CP.7 as explained in the earlier sections.

Since the project is a grid connected renewable energy project, emission reduction quantity depends on the units of electricity exported to the grid (in MWh) and the baseline emission factor of the western regional grid.

According to the ACM 0002 - Version 6, computations of ER_y, BE_y and EF_y are as follows

Emission reductions (ER_y)

Net emission reductions ER_y by the project activity during a given year “y” is

$$ER_y = BE_y - PE_y - L_y \text{ ----- (1)}$$

Where,

- ER_y - Net Emission Reduction in tCO₂/year
- BE_y - Baseline emissions in tCO₂/year
- PE_y - Project emissions in tCO₂/year
- L_y - Emissions due to leakage in tCO₂/year

Baseline emissions (BE_y)

BE_y is calculated by multiplying the net quantity of electricity supplied by the project activity (EG_y) with the CO₂ baseline emission factor for the electricity displaced due to the project (EF_y) as follows:

$$BE_y = EG_y * EF_y \text{ ----- (2)}$$

Where:

- EF_y - Baseline emission factor in tCO₂/MWh
- EG_y - Net electricity supplied to the western regional grid in year y
- EG_{Baseline} - Baseline electricity supplied to the Grid in case of Modified or retrofit projects

Emission Factor (EF_y)

EF_y is calculated as the weighted average of the Operating Margin emission factor (EF_{OM, y}) and the Build Margin emission factor (EF_{BM, y})

$$EF_y = W_{OM} * EF_{OM, y} + W_{BM} * EF_{BM, y} \text{ ----- (3)}$$

Where

- EF_{OM, y} - emission factor of Operating Margin
- EF_{BM, y} - emission factor of Build Margin
- W_{OM} - weight factor of Operating Margin
- W_{BM} - weight factor of Build Margin

Project Emissions (PE_y):

The project activity converts wind energy to electricity energy and hence the emissions from the project activity are taken as nil.

$$PE_y = 0 \text{ ----- (4)}$$

Leakage (L_y):

Leakage emissions on account of the project activity is considered zero as neither the WEGs are transferred from another activity nor any existing equipment of the project site needs to be transferred from the project site in accordance with the applied methodology.

$$L_y = 0 \text{ ----- (5)}$$

Therefore the above equation is simplified to $ER_y = BE_y$

Sl. No.	Monitoring Period		Net Generation MWh	Emission Factor tCO ₂ / MWh	Baseline Emissions tCO ₂
1	31-Jan-09	25-Feb-09	62.64	0.8975	62
2	22-Jan-09	25-Feb-09	1,693.69	0.8975	1,693
3	25-Feb-09	25-Mar-09	2,315.88	0.8975	2,315
4	25-Mar-09	29-Apr-09	5,257.28	0.8975	5,257
5	29-Apr-09	26-May-09	8,554.16	0.8975	8,554
6	26-May-09	25-Jun-09	9,920.77	0.8975	9,920
7	25-Jun-09	24-Jul-09	18,087.89	0.8975	18,087
8	24-Jul-09	25-Aug-09	14,899.01	0.8975	14,899
9	25-Aug-09	22-Sep-09	3,432.11	0.8975	3,432
10	22-Sep-09	24-Oct-09	5,621.42	0.8975	5,621
11	24-Oct-09	26-Nov-09	4,639.55	0.8975	4,639
12	26-Nov-09	23-Dec-09	1,156.96	0.8975	1,157
13	23-Dec-09	29-Jan-10	912.76	0.8975	912
14	29-Jan-10	25-Feb-10	1,360.15	0.8975	1,360
15	25-Feb-10	31-Mar-10	3,907.93	0.8975	3,907
16	31-Mar-10	28-Apr-10	4,014.44	0.8975	4,014
17	28-Apr-10	26-May-10	7,564.16	0.8975	7,564
18	26-May-10	26-Jun-10	8,999.04	0.8975	8,999

Sl. No.	Monitoring Period		Net Generation MWh	Emission Factor tCO ₂ / MWh	Baseline Emissions tCO ₂
19	26-Jun-10	23-Jul-10	10,611.14	0.8975	10,611
20	23-Jul-10	23-Aug-10	14,679.31	0.8975	14,679
TOTAL					1,27,682

E.2. Project emissions calculation

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Project Activity is Renewable Energy generation having NIL project emissions.

$$PE = 0$$

E.3. Leakage calculation

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No leakage emissions

$$L_y = 0$$

E.4. Emission reductions calculation / table

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EMISSION REDUCTIONS

$$ER_y = BE_y - PE_y - L_y$$

Where,

- ER_y - Net Emission Reduction in tCO₂/year
- BE_y - Baseline emissions in tCO₂/year
- PE_y - Project emissions in tCO₂/year
- L_y - Emissions due to leakage in tCO₂/year

Sl. No.	Monitoring Period		Baseline Emissions tCO ₂	Project Emission tCO ₂	Leakage	Emissions reductions tCO ₂
1	31-Jan-09	25-Feb-09	62.64	0	0	62
2	22-Jan-09	25-Feb-09	1,693.69	0	0	1,693
3	25-Feb-09	25-Mar-09	2,315.88	0	0	2,315
4	25-Mar-09	29-Apr-09	5,257.28	0	0	5,257
5	29-Apr-09	26-May-09	8,554.16	0	0	8,554

Sl. No.	Monitoring Period		Baseline Emissions tCO ₂	Project Emission tCO ₂	Leakage	Emissions reductions tCO ₂
6	26-May-09	25-Jun-09	9,920.77	0	0	9,920
7	25-Jun-09	24-Jul-09	18,087.89	0	0	18,087
8	24-Jul-09	25-Aug-09	14,899.01	0	0	14,899
9	25-Aug-09	22-Sep-09	3,432.11	0	0	3,432
10	22-Sep-09	24-Oct-09	5,621.42	0	0	5,621
11	24-Oct-09	26-Nov-09	4,639.55	0	0	4,639
12	26-Nov-09	23-Dec-09	1,156.96	0	0	1,157
13	23-Dec-09	29-Jan-10	912.76	0	0	912
14	29-Jan-10	25-Feb-10	1,360.15	0	0	1,360
15	25-Feb-10	31-Mar-10	3,907.93	0	0	3,907
16	31-Mar-10	28-Apr-10	4,014.44	0	0	4,014
17	28-Apr-10	26-May-10	7,564.16	0	0	7,564
18	26-May-10	26-Jun-10	8,999.04	0	0	8,999
19	26-Jun-10	23-Jul-10	10,611.14	0	0	10,611
20	23-Jul-10	23-Aug-10	14,679.31	0	0	14,679
TOTAL						1,27,682

E.5. Comparison of actual emission reductions with estimates in the CDM-PDD
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Item	Values applied in ex-ante calculation of the registered CDM-PDD (extrapolated for the monitoring period) ⁴	Actual values reached during the monitoring period
Emission reductions (tCO ₂ e)	1,28,150	1,27,682

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

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The actual emission reduction calculated from measured net export electricity to the grid is lower than the estimated emission reduction at the time of registration of the project activity with UNFCCC is due to lower wind during the mentioned monitoring period.

⁴ The ex-ante emission reduction from the registered project activity is 80937 tCO₂ per annum. The value is extrapolated for the monitoring period by multiplying with a factor of 19/12.