

13.75 MW wind power project in Davangere, Karnataka, India

Document Prepared By (Sargam Retails Pvt. Limited)

Project Title	13.75 MW wind power project in Davangere, Karnataka, India
Version	02
Date of Issue	28 th July 2011
Project ID	3700
Monitoring Period	31 st March 2009 to 06 th January 2011
Prepared By	Sargam Retails Pvt. Limited
Contact	Sargam Retails Pvt. Limited, Indira Gandhi Marg, Malpani House, Sangamner, Maharashtra, ZIP- 422605 Telephone: +91 2425 225011 Email id: prafulla@malpani.com URL: www.malpani.com

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1 PROJECT DETAILS

1.1 Summary Description of Project

The project activity leads to the installation of 10 Wind Turbine Generators (WTGs) of total generating capacity of 13.75 MW (5 nos of Suzlon make S 82 WTGs each having generating capacity of 1500 kW & 5 nos of Suzlon make S 64 WTGs each having generating capacity of 1250 kW). The WTGs are located in Davangere district of Karnataka state of India.

The main purpose of the project activity is to generate electrical energy through sustainable means using wind power resources, to utilize the generated output for supply to Karnataka Power Transmission Company Limited (KPTCL) and to contribute to climate change mitigation efforts. This renewable energy produced is partially contributing to the electricity provided by the KPTCL.

The project utilizes wind energy for generating electricity which otherwise would have been generated through alternate fuels (most likely - fossil fuel) based power plants thus, contributing to reduction in specific emissions (emissions of pollutant) including GHG emissions.

1.2 Sectoral Scope and Project Type

The project activity falls under the following Sectoral scope and Type:

Sectoral Scope: 01 Energy Industries (renewable/non-- Renewable sources).

Type I: Renewable Energy project

Category D: "Grid connected renewable electricity generation" (Version 15).

1.3 Project Proponent

Contact information of the person & entity responsible for completing the monitoring report form is as below.

Organization:	Sargam Retails Pvt. Limited
Street/P.O.Box:	Indira Gandhi Marg,
Building:	Malpani House,
City:	Sangamner
State/Region:	Maharashtra
Postcode/ZIP:	422605
Country:	India
Telephone:	+91 2425 225011
FAX:	+91 2425 225003

E-Mail:	prafulla@malpani.com
URL:	www.malpani.com
Represented by:	
Title:	Head- Wind Power Projects
Salutation:	Mr.
Last Name:	Khinvasara
Middle Name:	Premchand
First Name:	Prafulla
Direct Fax	+91 2425 225003
Mobile:	+91 9822322145
Direct tel:	+91 2425 225011 (Extension 215)
Personal E-Mail:	prafulla@malpani.com

Roles and responsibilities:

Director: In the project management structure Director is responsible for the project management. He is responsible to plan and allocate the annual budget for operation, estimation of the likely operating cost, electricity dispatch, organising third party contractors, revenue collection from BESCOM etc. The Director will check the monthly electricity generated and annual emission reduction calculations. Operation and maintenance of wind generators is done by Suzlon Infrastructure Services Limited and they are responsible to Director.

Head- Wind Power Projects: Head- Wind Power Projects is assisting to director for completing the task discussed above. He is responsible for the electricity generations at the individual wind turbine installations. He crosschecks the log book regularly and report to Director for any abnormality.

Shift In-charge: Shift in charge is responsible for recording the electricity meter reading in the KPTCL meter.

Record Handling: OEM contractors are collecting daily report with all the related parameters. All the records is given to Director on every month. The Director has final responsibility for record keeping. The O&M personnel are qualified engineers and are trained at the WTG manufacturing facility of Suzlon Energy Limited at Daman & Pondicherry for operating and ensuring best performance of the WTGs. The general conditions set out for metering, recording, meter readings, meter inspections, Test & Checking and communication shall be as per the PPA (power purchase agreement) with KPTCL

1.4 Other Entities Involved in the Project

Not applicable

1.5 Project Start Date

The project start date is 31st March 2009 that is the date of the commissioning of first WTG.

1.6 Project Crediting Period

The start date of the crediting period is from 31st March 2009 that is the date of the commissioning of first WTG and the end date is 6th January 2011 that is one day prior to the date of registration of the project under CDM.

1.7 Project Location

The project activity is located at Davangere in the state of Karnataka.

Davangere: 14° 27'13.39"N, 75° 55'08.15"E,

Latitude & Longitude:

Location Details of M/s Sargam Retails					
Capacity	Location No.	R.S. No.	Village	Taluka	District
1.5 MW	K-543	111	Yaraganal	Honnali	Davangere
1.5 MW	K-544	111	Yaraganal	Honnali	Davangere
1.5 MW	K-549	28	Kudurekonda	Honnali	Davangere
1.5 MW	K-550	28	Kudurekonda	Honnali	Davangere
1.5 MW	K-551	28	Kudurekonda	Honnali	Davangere
1.25 MW	K-538	111	Yaraganal	Honnali	Davangere
1.25 MW	K-539	111	Yaraganal	Honnali	Davangere
1.25 MW	K-540	111	Yaraganal	Honnali	Davangere
1.25 MW	K-541	111	Yaraganal	Honnali	Davangere
1.25 MW	K-542	111	Yaraganal	Honnali	Davangere

WEG	Capacity (MW)	Taluka	District	Latitude	Longitude
K-543	1.5 MW	Honnali	Davangere	14°09'17.4"	75°30'11.9"
K-544	1.5 MW	Honnali	Davangere	14°09'10.4"	75°30'17.6"
K-549	1.5 MW	Honnali	Davangere	14°09'03.2"	75°30'23.1"
K-550	1.5 MW	Honnali	Davangere	14°08'57.2"	75°30'29.9"
K-551	1.5 MW	Honnali	Davangere	14°08'51.2"	75°30'36.7"
K-538	1.25 MW	Honnali	Davangere	14°08'45.3"	75°30'43.7"
K-539	1.25 MW	Honnali	Davangere	14°08'39.5"	75°30'50.9"
K-540	1.25 MW	Honnali	Davangere	14°08'13.3"	75°31'32.4"
K-541	1.25 MW	Honnali	Davangere	14°08'07.4"	75°31'38.8"
K-542	1.25 MW	Honnali	Davangere	14°07'59.5"	75°31'44.1"

In this project activity, the project boundary is composed of 10 Wind Turbine Generators and the metering equipment for the generator and substation, and the grid (Southern regional grid) which is used to transmit the generated electricity.

The details of the meters at 33 kV end have been provided below:

WTGs	WTG Location No.	Main Meter No.	Check Meter No.
5 x 1.25 MW	K-538, K-539, K-540, K-541, K-542	08001351	08001352
5 x 1.5 MW	K-543, K-544, K-549, K-550, K-551	08001358	08001371

1.8 Title and Reference of Methodology

The project activity has applied following baseline and monitoring methodology

Title: AMS – I.D – Grid connected renewable electricity generation

Type: I – Renewable Energy project

Version: 15

Reference: The list of the small-scale CDM project activity categories contained in 'Appendix B of the simplified M&P for small-scale CDM project activities'

2 IMPLEMENTATION STATUS

2.1 Implementation Status of the Project Activity

Starting date of the operation of the project activity 31st March 2009, which is the earliest date of commissioning of the wind mill of the project activity and 29th May 2009 which is date of the commissioning of the last WTG of the project activity.

The commissioning dates of the WTGs installed in the project activity have been provided in the table below:

Capacity	WTG Location No	Commissioning Dates
1.5 MW x 05 Nos	K-543, K-544, K-549, K-550, K-551	31 st March 2009
1.25 MW x 04 Nos	K-538, K-539, K-541, K-542	31 st March 2009
1.25 MW x 01 Nos	K-540	29 th May 2009

The project activity consists of 10 number WTG's totalling 13.75 MW capacity and supplying the entire electricity to Karnataka Power Transmission Company Limited (KPTCL). There has been no major downtime of equipments, overhaul times or exchange of equipments in the project activity during the current monitoring period.

The project activity is not an AFOLU type of project, hence not applicable.

2.2 Deviations from the Monitoring Plan

Not Applicable

2.3 Grouped Project

Not Applicable.

3 DATA AND PARAMETERS

3.1 Data and Parameters Available at Validation

Data Unit / Parameter:	EF _y
Data unit:	tCO ₂ / MWh
Description:	Combined Margin grid emission Factor

Source of data:	CEA website Version :04 (Valid from 1 st September 2008) ¹
Value applied:	0.927
Purpose of the data:	The value is used for the calculation of Baseline emissions.
Any comment:	-

Data Unit / Parameter:	EF_{OM,y}
Data unit:	tCO ₂ / MWh
Description:	CO ₂ Operating Margin emission factor of the grid
Source of data:	CEA website Version :04 (Valid from 1 st September 2008) ²
Value applied:	1.00
Purpose of the data:	The value is used for the calculation of Baseline emissions.
Any comment:	-

Data Unit / Parameter:	EF_{BM,y}
Data unit:	tCO ₂ / MWh
Description:	CO ₂ Built Margin emission factor of the grid
Source of data:	CEA website Version :04 (Valid from 1 st September 2008) ³
Value applied:	0.71
Purpose of the data:	The value is used for the calculation of Baseline emission.
Any comment:	The Emission factor is fixed ex-ante.

3.2 Data and Parameters Monitored

Data Unit / Parameter:	EG_{Net Exported} (EG_{Net Exported} = EG_{Exported} – EG_{Import} – EG_{Transmission Losses})
Data unit:	MWh

¹ <http://www.cea.nic.in/planning/c%20and%20e/Government%20of%20India%20website.htm>

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

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

Description:	Net Electricity Exported
Source of data:	Credit report sheets (As per KPTCL/BESCOM Form B) / invoices whichever is conservative
Description of measurement methods and procedures to be applied:	The parameter is calculated and not measured
Frequency of monitoring/recording:	Recording frequency is monthly.
Value monitored:	56,374
Monitoring equipment:	The value is calculated and not monitored. Hence not applicable.
QA/QC procedures to be applied:	The KPTCL meter is calibrated as per the KPTCL requirement. Net electricity exported mentioned in Form B is cross- checked with the invoices raised by the PP for the project activity. Whichever is the conservative value is considered for emission reduction calculation during verification for the project activity.
Calculation method:	$EG_{\text{Net Exported}} = EG_{\text{Exported}} - EG_{\text{Import}} - EG_{\text{Transmission Losses}}$
Any comment:	The data will be kept for two years after the end of the crediting period

Data Unit / Parameter:	EG Exported
Data unit:	MWh
Description:	Electricity Exported
Source of data:	Credit report sheets (As per KPTCL/BESCOM Form B)
Description of measurement methods and procedures to be applied:	The monitoring is carried out by Trivector meters having accuracy class of 0.2s.
Frequency of monitoring/recording:	The measurement frequency of electricity exported is continuous and the recording frequency is monthly.
Value monitored:	57,218
Monitoring equipment:	1. The meters installed in the project activity are electronic tri-vector meters. 2. The accuracy class of the meters of the project activity is 0.2s. 3. The details of the meter at the 33 kV end is provided below: a. The serial number of the main meter and check meter at location K-539 (RR No-KK- 03) to which 5 Nos x 1.25 MW WTGs are connected is 08001351 and 08001352.

	<table><tr><th>Meter No</th><th>Type</th><th>Accuracy Class</th></tr><tr><td>Main Meter 08001351</td><td>3p 4w</td><td>0.2s</td></tr><tr><td>Check Meter 08001352</td><td>3p 4w</td><td>0.2s</td></tr></table>	Meter No	Type	Accuracy Class	Main Meter 08001351	3p 4w	0.2s	Check Meter 08001352	3p 4w	0.2s			
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	Check Meter 08001352	3p 4w	0.2s										
b. The serial number of the main meter and check meter at location K-543 (RR No-KK- 04) to which 5 Nos x 1.5 MW WTGs are connected is 08001358 and 08001371.													
	<table><tr><th>Meter No</th><th>Type</th><th>Accuracy Class</th></tr><tr><td>Main Meter 08001358</td><td>3p 4w</td><td>0.2s</td></tr><tr><td>Check Meter 08001371</td><td>3p 4w</td><td>0.2s</td></tr></table>	Meter No	Type	Accuracy Class	Main Meter 08001358	3p 4w	0.2s	Check Meter 08001371	3p 4w	0.2s			
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	Main Meter 08001358	3p 4w	0.2s										
Check Meter 08001371	3p 4w	0.2s											
QA/QC procedures to be applied:	<u>Archiving Policy:</u> Paper & Electronic <u>Responsibility:</u> Head (Wind Power Project) would be responsible for regular calibration of the meter. <u>Calibration Frequency:</u> Once a year. <table><tr><th>Meter No</th><th>Date of Last Calibration</th></tr><tr><td>Main Meter 08001351</td><td>14th March 2009, 25th January 2010,14th October 2010</td></tr><tr><td>Check Meter 08001352</td><td>14th March 2009, 25th January 2010,14th October 2010</td></tr><tr><td>Main Meter 08001358</td><td>27th March 2009, 25th January 2010, 13th October 2010</td></tr><tr><td>Check Meter 08001371</td><td>27th March 2009, 25th January 2010, 13th October 2010</td></tr></table>			Meter No	Date of Last Calibration	Main Meter 08001351	14 th March 2009, 25 th January 2010,14 th October 2010	Check Meter 08001352	14 th March 2009, 25 th January 2010,14 th October 2010	Main Meter 08001358	27 th March 2009, 25 th January 2010, 13 th October 2010	Check Meter 08001371	27 th March 2009, 25 th January 2010, 13 th October 2010
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Check Meter 08001371	27 th March 2009, 25 th January 2010, 13 th October 2010												
Calculation method:	-												
Any comment:	The data will be kept for two years after the end of the crediting period												

Data Unit / Parameter:	EG import
Data unit:	MWh
Description:	Electricity Imported
Source of data:	Credit report sheets (As per KPTCL/BESCOM Form B)
Description of measurement methods and procedures to be applied:	The monitoring is carried out by Trivector meters having accuracy class of 0.2s
Frequency of monitoring/recording:	The measurement frequency of electricity exported is continuous and the recording frequency is monthly.

Value monitored:	132																		
Monitoring equipment:	1. The meters installed in the project activity are electronic tri-vector meters. 2. The accuracy class of all the meters of the project activity is 0.2s 3. The details of the meter at the 33 kV end is provided below: a. The serial number of the main meter and check meter at location K-539 (RR No-KK- 03) to which 5 Nos x 1.25 MW WTGs are connected is 08001351 and 08001352. <table><tr><th>Meter No</th><th>Type</th><th>Accuracy Class</th></tr><tr><td>Main Meter 08001351</td><td>3p 4w</td><td>0.2s</td></tr><tr><td>Check Meter 08001352</td><td>3p 4w</td><td>0.2s</td></tr></table> b. The serial number of the main meter and check meter at location K-543 (RR No-KK- 04) to which 5 Nos x 1.5 MW WTGs are connected is 08001358 and 08001371. <table><tr><th>Meter No</th><th>Type</th><th>Accuracy Class</th></tr><tr><td>Main Meter 08001358</td><td>3p 4w</td><td>0.2s</td></tr><tr><td>Check Meter 08001371</td><td>3p 4w</td><td>0.2s</td></tr></table>	Meter No	Type	Accuracy Class	Main Meter 08001351	3p 4w	0.2s	Check Meter 08001352	3p 4w	0.2s	Meter No	Type	Accuracy Class	Main Meter 08001358	3p 4w	0.2s	Check Meter 08001371	3p 4w	0.2s
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Check Meter 08001371	27 th March 2009, 25 th January 2010, 13 th October 2010																		
Calculation method:	-																		
Any comment:	The data will be kept for two years after the end of the crediting period																		

Data Unit / Parameter:	EG Transmission Losses																													
Data unit:	kWh																													
Description:	Electricity Losses in Transmission																													
Source of data:	Calculated from Credit report sheets (As per KPTCL/BESCOM Form B)																													
Description of measurement methods and procedures to be applied:	The monitoring is carried out by Trivector meters having accuracy class of 0.2s.																													
Frequency of monitoring/recording:	Recording frequency is monthly.																													
Value monitored:	692,936																													
Monitoring equipment:	The value is calculated based on measurement at meters installed at 33 kV (VCB yard) and 220 kV (Sub-Station) meters. The detail of the meter at 33 kV end is provided below: a. The serial number of the main meter and check meter at location K-539 (RR No-KK- 03) to which 5 Nos x 1.25 MW WTGs are connected is 08001351 and 08001352. The accuracy class of this meter is 0.2s. <table><tr><th>Meter No</th><th>Type</th><th>Accuracy Class</th></tr><tr><td>Main Meter 08001351</td><td>3p 4w</td><td>0.2s</td></tr><tr><td>Check Meter 08001352</td><td>3p 4w</td><td>0.2s</td></tr></table> b. The serial number of the main meter and check meter at location K-543 (RR No-KK- 04) to which 5 Nos x 1.5 MW WTGs are connected is 08001358 and 08001371. The accuracy class of this meter is 0.2s. <table><tr><th>Meter No</th><th>Type</th><th>Accuracy Class</th></tr><tr><td>Main Meter 08001358</td><td>3p 4w</td><td>0.2s</td></tr><tr><td>Check Meter 08001371</td><td>3p 4w</td><td>0.2s</td></tr></table> The details of the meters at 220 kV end is provided below: <table><tr><th>Meter No.</th><th>Type</th><th>Accuracy Class</th></tr><tr><td>Main meter 08001856</td><td>WR300BB11RSAL</td><td>0.2s</td></tr><tr><td>Check Meter 08001858</td><td>WR300BB11RSAL</td><td>0.2s</td></tr></table>			Meter No	Type	Accuracy Class	Main Meter 08001351	3p 4w	0.2s	Check Meter 08001352	3p 4w	0.2s	Meter No	Type	Accuracy Class	Main Meter 08001358	3p 4w	0.2s	Check Meter 08001371	3p 4w	0.2s	Meter No.	Type	Accuracy Class	Main meter 08001856	WR300BB11RSAL	0.2s	Check Meter 08001858	WR300BB11RSAL	0.2s
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QA/QC procedures to be	Archiving Policy: Paper & Electronic																													

applied:	Calibration Frequency for 220 kV meters: Yearly. <table border="1"> <thead> <tr> <th>Meter No</th><th>Date of Last Calibration</th></tr> </thead> <tbody> <tr> <td>Main meter 08001856</td><td>15th June 2009, 30th March 2010</td></tr> <tr> <td>Check Meter 08001858</td><td>15th June 2009, 30th March 2010</td></tr> </tbody> </table> Calibration Frequency for 33 kV meters: Yearly. <table border="1"> <thead> <tr> <th>Meter No</th><th>Date of Last Calibration</th></tr> </thead> <tbody> <tr> <td>Main Meter 08001351</td><td>14th March 2009, 25th January 2010, 14th October 2010</td></tr> <tr> <td>Check Meter 08001352</td><td>14th March 2009, 25th January 2010, 14th October 2010</td></tr> <tr> <td>Main Meter 08001358</td><td>27th March 2009, 25th January 2010, 13th October 2010</td></tr> <tr> <td>Check Meter 08001371</td><td>27th March 2009, 25th January 2010, 13th October 2010</td></tr> </tbody> </table>	Meter No	Date of Last Calibration	Main meter 08001856	15 th June 2009, 30 th March 2010	Check Meter 08001858	15 th June 2009, 30 th March 2010	Meter No	Date of Last Calibration	Main Meter 08001351	14 th March 2009, 25 th January 2010, 14 th October 2010	Check Meter 08001352	14 th March 2009, 25 th January 2010, 14 th October 2010	Main Meter 08001358	27 th March 2009, 25 th January 2010, 13 th October 2010	Check Meter 08001371	27 th March 2009, 25 th January 2010, 13 th October 2010
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Calculation method:	Calculation procedure (EG_{Transmission Losses}): Z= % of line losses X= Cumulative of all the exported energies from all the metering points connected to the sub-station. i.e X= X1+X2+X3+.....Xn Y= Sub-Station Bulk meter readings Z= [(X-Y)/X]*100 EG_{Transmission Losses} = Z * EG_{exported}																
Any comment:	The data will be kept for two years after the end of the crediting period																

Data Unit / Parameter:	EG _{controller}
Data unit:	kWh
Description:	Electricity generated at Controller (MCS) ⁴
Source of data:	Plant (Daily generation readings)
Description of measurement	<u>Monitoring:</u> Microprocessor control systems (MCS) meter is a

⁴ For the month of January for which apportioning is done

methods and procedures to be applied:	micro-processor based intelligent controller which has been specially designed for control of wind turbines. The analog values of current/ voltage is 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.
Frequency of monitoring/recording:	The measurement frequency is continuous and recording frequency is daily.
Value monitored:	2,266,678
Monitoring equipment:	<u>Monitoring Equipment:</u> Microprocessor control systems (MCS) meter
QA/QC procedures to be applied:	Archiving Policy: Electronic In case of any problem related to the MCS meter, the WTG will automatically get shut down and the meter will be replaced by a new meter immediately. The MCS meter is digital meter and is never calibrated.
Calculation method:	-
Any comment:	The data will be kept for two years after the end of the crediting period

3.3 Description of the Monitoring Plan

The project activity is in accordance with approved small scale methodology AMS I.D, and therefore, can use the monitoring methodology for type I.D of 'Appendix B of the simplified M&P for small-scale CDM project activities'-Version 15.0, - Grid connected renewable electricity generation.

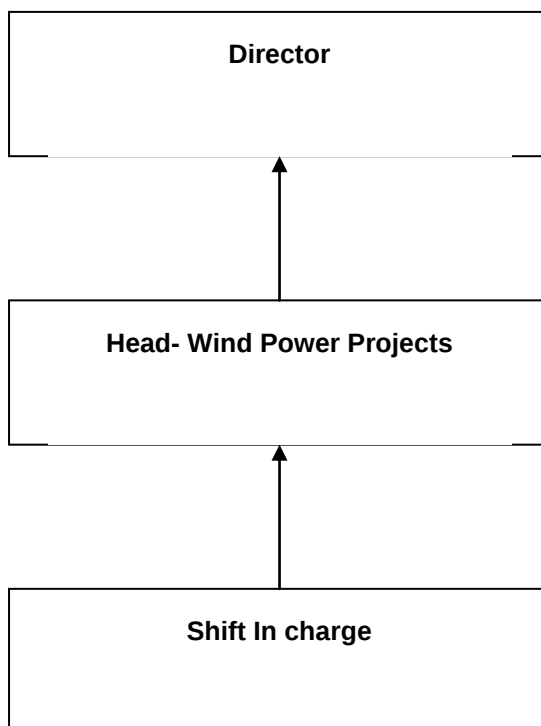
This approved monitoring methodology requires monitoring of the following:

- ✓ Net Electricity supplied from the project activity; and
- ✓ Computation of Emission Factor from published CEA database.

The monitoring methodology incorporated for project-monitoring plan consist of metering the electricity generated by the individual WTG's. In order to monitor the mitigation of GHG due to the project activity, the total energy exported needs to be measured. The net energy supplied to grid by the project activity multiplied by emission factor for regional grid, forms the baseline for the project activity. Since the baseline methodology is based on ex ante determination of the Emission factor, the monitoring of baseline emission factor is not required. The sole parameter for monitoring is the electricity supplied to the grid.

The Project is operated and managed by M/s Suzlon Energy Limited and/ or its Associate Companies. The operational and management structure implemented by the project participant monitors the emission reductions generated by the project activity:

Total electricity exported is the most important parameter required for the financial reporting and sustainability of the project and monitored with due care by both the parties (project proponent and KPTCL). For emission reductions project proponents has implemented the following structure.

**Roles and responsibilities:**

Director: In the project management structure Director is responsible for the project management. He is responsible to plan and allocate the annual budget for operation, estimation of the likely operating cost, electricity dispatch, organizing third party contractors, revenue collection from BESCOM etc. The Director checks the monthly electricity generated and annual emission reduction calculations. Operation and maintenance of wind generators is done by Suzlon Infrastructure Services Limited and they are responsible to Director.

Head- Wind Power Projects: Head- Wind Power Projects is assisting to director for completing the task discussed above. He is responsible for the electricity generations at the individual wind turbine installations. He crosschecks the log book regularly and report to Director for any abnormality.

Shift In-charge: Shift in charge is responsible for recording the electricity meter reading in the KPTCL meter.

Record Handling: O & M contractors collect daily report with all the related parameters. All the records is given to Director on every month. The Director has final responsibility for record keeping. The O&M personnel are qualified engineers and are trained at the WTG manufacturing facility of Suzlon Energy Limited at Daman & Pondicherry for operating and ensuring best performance of the WTGs. The general conditions set out for metering, recording, meter readings, meter inspections, Test & Checking and communication is as per the PPA (power purchase agreement) with KPTCL.

1. **Metering:** The Delivered Energy is metered by the Parties at the high voltage side of the step up transformer installed at the Receiving Station. The electricity generated by the Project is metered by the Parties at the high voltage side of the step up transformer installed at the Project Site. The WTGs of a single customer (SRPL in this case) at a particular site are connected to a Vacuum Circuit Breaker metering yard (VCB) which in turn connects to a feeder that ultimately leads to the shared main KPTCL meter at the substation maintained by Suzlon Power Infrastructure Limited . Data monitoring takes place at the VCB metering yard and WEG (through SCADA system). The

electricity metered at the KPTCL meter is proportionally divided among the customers connected to the meter on the basis of the prorata readings taken at the VCB end. The emission reduction calculations are done on the basis of the KPTCL Main meter reading.

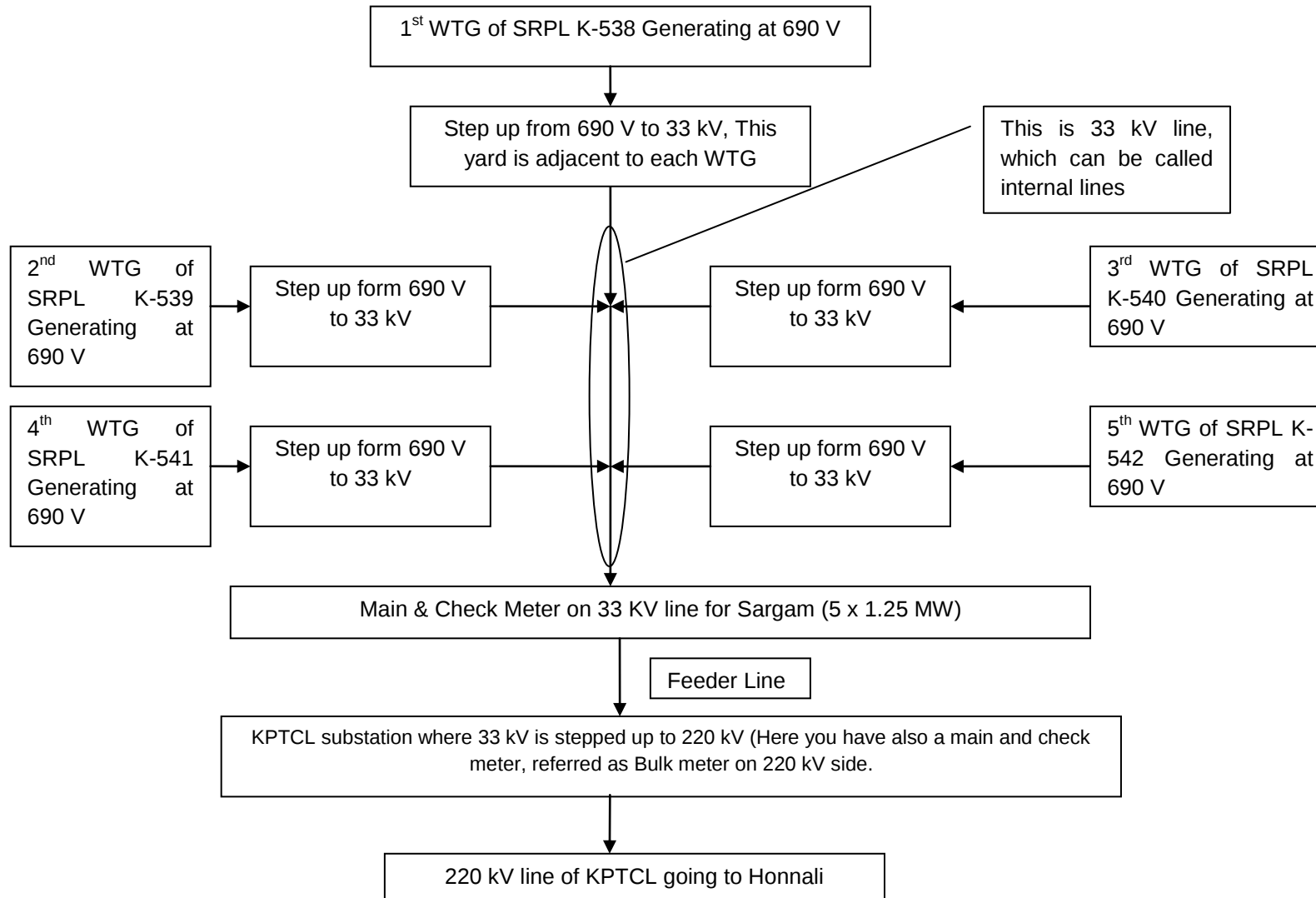
2. **Metering Equipment:** Metering equipment are electronic trivector meters of accuracy class 0.2% required for the Project (both main and check meters). Dedicated core of both CT's and PT's of required accuracy is made available by the Company to Corporation. The metering equipment is maintained in accordance with electricity standards. This equipment has the capability of recording a month's reading.
3. **Meter Readings:** The monthly meter readings (both main and check meters) at the Project Site and the Receiving Station is taken simultaneously and jointly by the Parties on the first day of the following month. The recorded metering data is downloaded through meter recording Instrument by KPTCL officer as and when required.
4. **Inspection of Energy Meters:** All the main and check energy meters (export and import) and all associated instruments, transformers installed at the Project are of 0.2% accuracy class. Each meter is jointly inspected and sealed on behalf of the Parties and cannot not be interfered with by either Party except in the presence of the other Party or its accredited representatives.

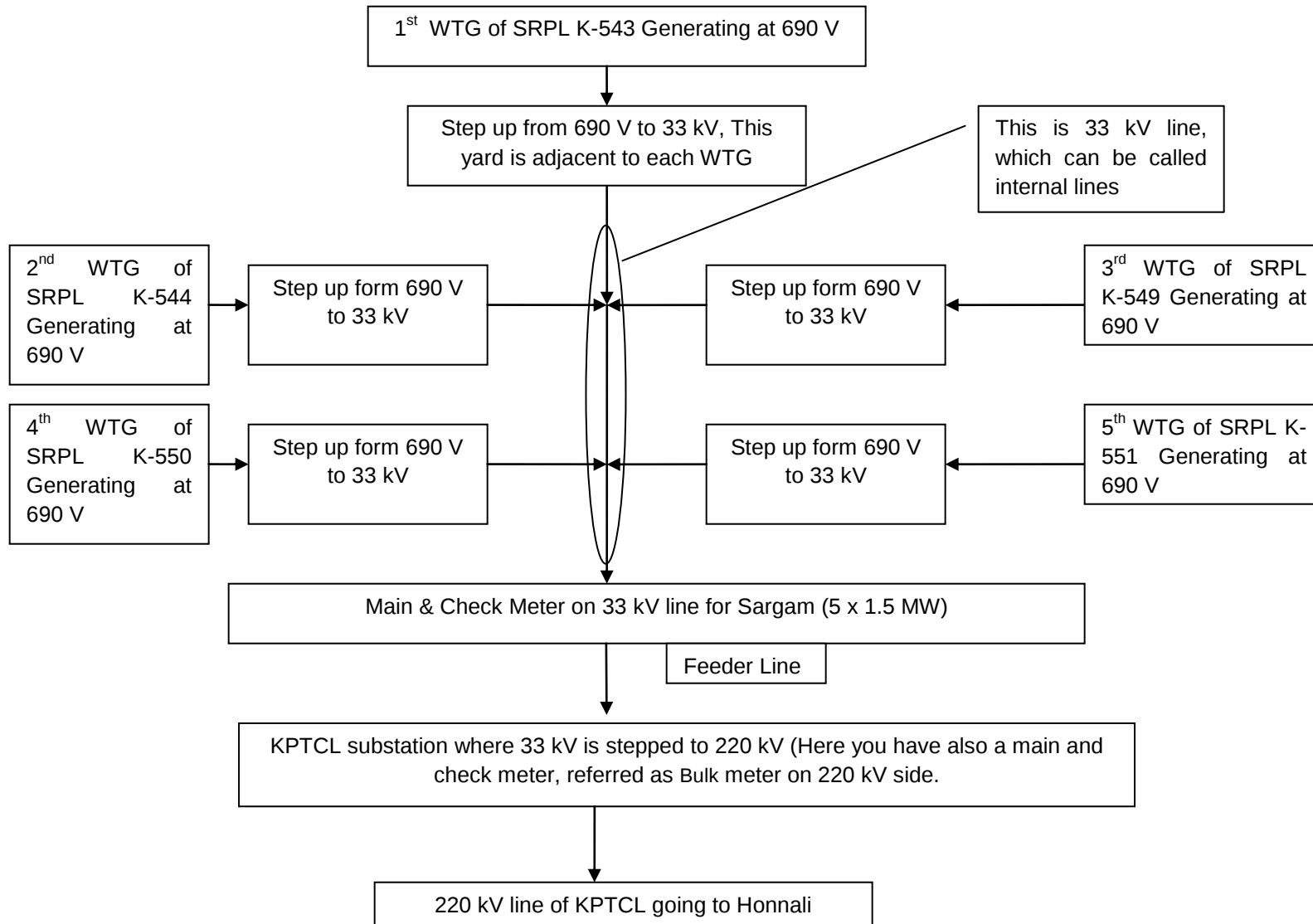
Data Adjustments and Uncertainties:

5. **Meter Test Checking:** All the main and check meters is tested for accuracy as per requirement with reference to a portable standard meter which is of the accuracy class of 0.1%. The portable standard meter is owned by the Corporation at its own cost and expense and tested and certified at least once every year or as per requirement against an accepted laboratory standard meter in accordance with electricity standards. The meters are deemed to be working satisfactorily if the errors are within specifications for meters of 0.2% accuracy class. The consumption registered by the main meters alone holds good for the purpose of billing as long as the error in the main meter is within the permissible limits.
 - a. If during the tests, the main meter is found to be within the permissible limit of error and the corresponding check meter is beyond the permissible limits, then billing will be as per the main meter as usual. The check meter shall, however, be calibrated immediately.
 - b. If during the tests, the main meter is found to be beyond permissible limits of error, but the corresponding check meter is found to be within permissible limits of error, then the billing for the month upto the date and time of such test shall be as per the check meter. The main meter shall be calibrated immediately and billing for the period thereafter till the next monthly meter reading shall be as per the calibrated main meter.
 - c. If during the quarterly tests, both the main meters and the corresponding check meters are found to be beyond the permissible limits of error, both the meters shall be immediately calibrated and the correction applied to the reading registered by the main meter to arrive at the correct reading of energy supplied for billing purposes for the period from the last month's meter reading upto the current test. Billing for the period thereafter till the next monthly meter reading shall be as per the calibrated main meter.
 - d. If during any of the monthly meter readings, the variation between the main meter and the check meter is more than that permissible for meters of 0.2 % accuracy class, all the meters shall be re-tested and calibrated immediately
6. **Records:** O&M Contractor Suzlon maintains an accurate and up-to-date operating log at the wind farm site with records of:
 - a. Main meter and Check meter readings and any other data mutually agreed.

- b. Any unusual conditions found during operation/inspections
 - c. Chart and printout of event loggers, if any, for system disturbances/outages
 - d. All the records will be preserved for 2 years beyond the crediting period.
7. The billing is on monthly basis. The BESCO is billed by Sargam Retails Pvt Ltd based on statement given by BESCO at the end of each month for the energy supplied.

M/s Suzlon Infrastructure Services Limited (SEL) has a designated Site-In-Charge (O&M) on site who is responsible for monitoring the emission reductions of the project activity. The electrical layout of the WTGs is as follows:





On the 1st of every month, the KPTCL designated official arrives at the site and record the readings of meters placed at the 33/220 kV Sub-Station and as well as at the individual customer metering point. Keeping in view, the total generation supplied to Grid from the sub-station, the electricity generation data for every particular customer is computed on **Form B** as per the apportioning procedure mentioned below:

SRPL (Head- Wind Power Projects & Director) keeps the daily / monthly data generated from all the WEG's provided by Suzlon.

Internal audits & Performance review

The records are regularly audited and checked by the SRPL representatives during their site visit. The SRPL representative visits once in a year and audit the records. The SRPL representatives crosschecks the emissions reductions claimed in PDD with respect to actual emissions reduction. For any deviation from the actual emission reduction values and reported values corrective action is suggested by SRPL representatives to calculate the conservative emission reduction. All corrective actions is recorded in the log book. The person taking readings at site are adequately trained and go through training procedures regularly.

Apportioning Procedure:

The following generation apportioning procedure is followed, if the crediting period date of the project activity falls in – between the billing cycles of KPTCL:

Partial days generation of the Month at Controller (kWh): X

Total generation at Controller (kWh) for the same month: Y (kWh/month)

% Generation for partial days of generation (%): $Z = (X/Y) * 100$

Generation as per BULK metering point KPTCL generation report for the month: G (kWh/month)

Partial days of generation as per KPTCL generation report: $(G * Z / 100)$

Form B, which contains the generation data, is certified by the Site-in-Charge (O&M) for SEL and also by the Asst. Executive Engineer of KPTCL. The Form B is now forwarded to Executive Engineer of KPTCL and is certified thereof. Copies of this document are forwarded to the State Load Dispatch Center of Karnataka Power Transmission Company Limited (KPTCL), Asst. Electrical Engineer of KPTCL and the customer (in this case, Sargam Retails Pvt. Ltd. - SRPL). The monthly generation is derived from Form B and the same is used in monitoring report and during verification. Head - Wind power projects of SRPL is responsible for keeping the copies of Form B sent to SRPL from KPTCL.

4 QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS

4.1 Baseline Emissions

The baseline emission is calculated as $BE_y = EG_y * EF_y$

Where:

BE_y = Baseline Emissions due to displacement of electricity during the year y (in tons of CO²)

EG_y = Net units of electricity due to substituted in the grid during the year y (in MWh)

EF_y = Emission Factor of the grid (in tCO_2 / MWh) and y is any year within the crediting period of the project activity.

Net Electricity exported from the project activity = 56,373,581 kWh

$EF_y = 0.927 \text{ tCO}_2 / \text{MWh}$

Formula for Baseline Emissions:

Thus Baseline emissions = $(0.927 * 56,373,581) / 1000 = 52,258 \text{ tCO}_2\text{e}$

4.2 Project Emissions

The project activity being a wind project falls under the category of renewable energy project as defined in the methodology AMS I.D

For most renewable energy project activities $PE_y = 0$

Hence for the project activity, $PE_y = 0$

4.3 Leakage

The project activity does not involve transfer of the energy generating equipment as these are newly installed WTG's

Leakage Emissions $LE_y = 0$ (since there is no transfer of equipments from or to the project activity) as per AMS I. D.

4.4 Summary of GHG Emission Reductions and Removals

Total emission reductions: Emission reduction calculation is done based on following formula:

Emission reduction (ER_y) = Baseline Emissions (BE_y) – Project Emissions (PE_y) – Leakage Emissions (LE_y)

Total baseline emissions: 52,258 $tCO_2\text{e}$

Total project emissions: 0

Total leakage: 0

= 52,258 -0-0

= 52,258 $tCO_2\text{e}$

5 ADDITIONAL INFORMATION

Apportioning procedure for the current monitoring period:

The following generation apportioning procedure is followed, if the crediting period date of the project activity falls in – between the billing cycles of KPTCL:

Partial days generation of the Month at Controller (kWh): X

Total generation at Controller (kWh) for the same month: Y (kWh/month)

% Generation for partial days of generation (%): $Z = (X/Y) * 100$ Generation as per BULK metering point KPTCL generation report for the month: G (kWh/month)

Partial days of generation as per KPTCL generation report: $(G*Z/100)$

PP has incorporated the above apportioning procedure for the following period as described below:

Apportioning for the month of January (1.01.11 to 6.01.11) for 5 Nos x 1.25 MW		
Partial Days Generation for of the Month at Controller (1.01.11 to 6.01.11) (X)	kWh	120,295
Total generation at the controller (Y)	kWh/month	2,266,678
% Generation for partial days of generation (Z)	%	5.31
Generation as per Bulk Metering point BESCOM generation report for the month (1.01.11 to 31.01.11) (G)	kWh/month	832,534.4
Partial days of generation as per BESCOM generation report $(G*Z/100)$		44,183
Apportioning for the month of January (1.01.11 to 6.01.11) for 5 Nos x 1.5 MW		
Partial Days Generation for of the Month at Controller (1.01.11 to 6.01.11) (X)	kWh	223,022
Total generation at the controller (Y)	kWh/month	2,266,678
% Generation for partial days of generation (Z)	%	9.84
Generation as per Bulk Metering point BESCOM generation report for the month (1.01.11 to 31.01.11) (G)	kWh/month	1,374,423.5
Partial days of generation as per BESCOM generation report $(G*Z/100)$		135,232

The electricity exported by 1.25 MW x 5 Nos to the grid has been provided in the table below:

	Net Export to BESCOM (kWh)
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Year 2009	Electricity Exported	Electricity Imported	Transmission Loss	Net Quantity of Electricity supplied	Net Quantity of Electricity supplied as per Invoices	Net Quantity of Electricity supplied (Conservative of both)
Month	kWh	kWh	kWh	Export kWh - Import kWh - Transmission Loss kWh	kWh	kWh
March	900.00	0	141	759	759	759
April	322,650	900	9,052	312698	312581	312581
May	787,500	1,350	2,470	783680	783483	783483
June	1,062,000	1350	11,257	1049393	1049213	1049213
July	2,718,000	-	28,625	2689375	2689375	2689375
August	1,269,000	1,350	13,927	1253723	1253521	1253521
September	1,056,600	3,150	12,128	1041322	1040849	1040849
October	953,100	2,700	11,963	938437	938032	938032
November	965,700	1,350	10,087	954263	954061	954061
December	871,200	3,150	9,124	858926	858454	858454
Total				9882576	9880327	9880327
Year 2010						
January	542,250	3,150	6,594	532506	532034	532034
February	382,050	6,300	5,432	370318	369373	369373
March	462,150	4,500	6,861	450789	450115	450115
April	601,650	5,400	8,394	587856	587046	587046
May	1,249,650	2,250	16,117	1231283	1230945	1230945
June	1,642,500	450	18840.1	1623210	1623142	1623142
July	1,952,100	450	22,911	1928739	1928671	1928671
August	1,399,500	900	16275.94	1382324	1382189	1382189
September		2700	10498.11	911552	911147	911147

er	924,750					
October	688,950	2700	8174.48	678076	677671	677671
November	490,500	3150	7742.58	479607	479135	479135
December	659,700	3150	8000.57	648549	648077	648077
Total				10824809	10819544	10819544
Year 2011						
January	44,183	1800	9865.58	32518	32234	32234
				32518	3224	32234
Total	21,046,583	52,200	254,480	20,739,903	20,699,871	20732104
Total (In MW)	21,047	52	254	20,740	20,700	20732

Error of 0.2% has been applied for that period

The electricity exported by 1.5 MW x 5 Nos to the grid has been provided in the table below:

	Net Export to BESCOM (kWh)					
Year 2009	Electricity Exported	Electricity Imported	Transmission Loss	Net Quantity of Electricity supplied	Net Quantity of Electricity supplied as per Invoices	Net Quantity of Electricity supplied (Conservative of both)
Month	kWh	kWh	kWh	Export kWh - Import kWh - Transmission Loss kWh	kWh	kWh
March	1575	525	246	803.6082	725.4	725.4
April	671,364	2,143	18,836	650385.2036	650101.4	650101.4
May	1,464,750	3,150	4,594	1457006.131	1456542.8	1456542.8
June	2,005,500	1050	21,257	1983192.871	1983077.8	1983077.8
July	3,787,875	-	39,893	3747982.2	3747982.2	3747982.2
August	2,214,975	2,625	24,309	2188041.4	2187647.61	2187647.6
September	1,880,550	4,200	21,586	1854763.7	1854133.7	1854133.7

October	1,548,750	4,200	19,440	1525110.5	1524480.5	1524480.5
November	1,824,900	2,100	19,062	1803738.4	1803423.4	1803423.4
December	1,518,825	3,675	15,906	1499244.1	1498692.9	1498692.9
				16710268.11	16706807.7	16706807.7
Year 2010						
January	948,675	4,725	11,536	932414.5	931705.4	931705.4
February	685,650	7,350	9,749	668551	667448.5	667448.5
March	954,975	6,300	14,177	934498.5	933553.5	933553.5
April	1,158,150	6,300	16,159	1135691.3	1134746.3	1134746.3
May	2,140,425	2,625	27,606	2110194.3	2109800.6	2109800.6
June	2,688,000	1,050	30,832	2656117.6	2655960.1	2655960.1
July	3,026,100	1,050	35,517	2989533.2	2989375.7	2989375.7
August	2,410,800	2,625	28,037	2380137.8	2379744.1	2379744.1
September	1,688,925	4,200	19,173	1665551.7	1664921.7	1664921.7
October	1,341,375	4,200	15,916	1321259.4	1320629.4	1320629.4
November	868,350	6,300	13,707	848343	847398.0	847398.0
December	1,205,400	4,725	14,618.60	1,186,056.4	1185347.7	1185347.7
				18,828,348.7	18820631.0	18820631.0
Year 2011						
January	135,232	4,200	16,301.50	114,730.2	114038.2	114038.2
				114,730.2	114038.2	114038.2
Total	36171121	79318	438455.687	35653347	35641477	35641477
Total (In MW)	36171	79	438	35653	35641	35641

Error of 0.2% has been applied for that period

Comparison of the actual emission reductions during the monitoring period with the estimated value as per the CDM registered:

PP is claiming emission reduction for 647 days (31th March 2009 to 6th January 2011). As per the registered

PDD the estimated emission reduction for a period of 365 days is 26,475 tCO₂. Thus for 647 days the estimated emission reduction (as per registered PDD) would be 46,930 tCO₂. There is an increment of 11% of the estimated CER as in PDD to actual.

The electricity generation from wind turbine is based on three parameters viz.

- Wind availability,
- Grid availability
- and Machine availability.

The peak season in Karnataka is from May to September and in this monitoring period there are two peak seasons one in 2009 and another in 2010. It can be seen from the above table that the generation has increased during this period. This justifies the increase in emission reduction.

Wind availability is totally seasonal and nature driven. Grid availability and Machine availability is also a variable component. PP has no control over these parameters. Thus the increase in the generation is directly proportional to these above parameters.