Wind Power Project by M/s Chhotabhai Jethabhai Patel & Co. (CJP) at Sinnar, Maharashtra

Document Prepared By

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India

Project Title	Wind Power Project by M/s Chhotabhai Jethabhai Patel & Co. (CJP) at Sinnar, Maharashtra
Version	02
Date of Issue	02-July-2011
Project ID	-
Monitoring Period	30-March-2009 to 15-September-2010
Prepared By	Kishor Deshmukh (Senior Consultant) Sayali Mandsorwale (Project Consultant) Satyajit Thakur (Project Consultant)
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Table of Contents

1 PROJECT DETAILS

1.1 Summary Description of Project

The project activity is a grid connected wind power generation based in Adwadi (Sinnar), Maharashtra, India. The project activity consists of one wind turbine of capacity 1.5 MW. The project activity is connected to the NEWNE Grid of India. The wind technology is supplied by Suzlon Energy Limited. The class of the wind turbine is S-82 which is technologically safe in its operation.

The project activity is registered under Clean Development Mechanism (CDM). The details[1] of the project are given below:

- Project Title : Wind Power Project by M/s Chhotabhai Jethabhai Patel & Co. (CJP) at Sinnar, Maharashtra
- CDM Registration No. : 3550
- Registration Date : 16/09/2010
- Activity Scale : Small
- Baseline and Monitoring Methodology : AMS- I.D., Version- 13
- Sectoral Scope : 01

The document reports the Voluntary Emission Reductions achieved by the project activity prior to CDM registration. The voluntary emission reductions have been considered from the commissioning of the project to a day before CDM registration date i.e. from 30/03/2009 – 15/09/2010 (including both days). The project activity has achieved emission reductions of 5084 tCO_2e during this monitoring period.

1.2 Sectoral Scope and Project Type

Sectoral Scope : 01 Energy Industries (renewable-/non-renewable sources)
Project Type : Type I – Renewable Energy Projects
Project Category[2] : I.D. – Grid connected renewable electricity generation

The project activity is not a grouped project.

1.3 Project Proponent

Contact Information of the project proponent:

This project activity is owned & promoted by M/s Chhotabhai Jethabhai Patel & Co. The contact details of the project participant are given below:

Organization:	M/s Chhotabhai Jethabhai Patel & Co.
Street/P.O.Box:	Motapore
Building:	C. J. House
City:	Nadiad
State/Region:	Gujarat

[1] http://cdm.unfccc.int/Projects/DB/RINA1269594627.46/view
[2] http://cdm.unfccc.int/filestorage/C/D/M/CDMWF_AM_PHPV5WESACMBTJ2YY54GAJYSIEI3HD/AMS_I.D_rev_ver13.pdf?t=cEl8MTMwMTM4Mzc4MC40Ng==|sA4YtkfnZHsg3GhNl5cZjYtlFII=

Postfix/ZIP:	387001
Country:	India
Telephone:	(0268) 2562633/34/35
FAX:	(0268) 2562637
E-Mail:	ceejaygroup@yahoo.co.in
URL:	NA
Represented by:	
Title:	General Manager
Salutation:	Mr.
Last Name:	Shah
Middle Name:	T.
First Name:	D.
Department:	Finance
Mobile:	09913000227
Direct FAX:	NA
Direct tel:	NA
Personal E-Mail:	-

Roles & Responsibilities of the project proponent:

Sr. No.	Role/Monitoring Team	Responsibility
1.	Project Head	• Overall performance monitoring • Project execution • Monthly review of project operations
2.	Project Coordinator	• Data Archival • Site visit for actual project monitoring Storage of data • Coordination with O & M Contractor for day to-day operations • Invoice preparation & follow ups • Coordination with Suzlon for regular calibration of meters • Reporting to Project Head • Online project monitoring • Feedback and corrective action wherever necessary • Follow up of project operation as per PPA.

1.4 Other Entities Involved in the Project

Not Applicable.

1.5 Project Start Date

30/03/2009[3] (Commissioning date of the project activity)

1.6 Project Crediting Period

VCS Crediting period[4] : From 30/03/2009 to 29/03/2019
Total number of years : 10 years *(Renewable Once)*

1.7 Project Location

[3] Commissioning certificate issued by MSEDCL O & M Rural Circle, Nashik dated 02/04/2009
[4] As the project is registered under CDM mechanism on 16/09/2010, the PP will not take VCS benefit from 16/09/2010 to 29/03/2019.

The project activity is located at Adwadi village (Location No. AD-24), Sinnar Taluka, Nashik District, Maharashtra, India. The details of the project location are given below:

Capacity	Location No.	Location	Gut No.	Latitude	Longitude	Date of Commissioning
1× 1.5 MW	AD- 24	Adwadi	389	N19° 43' 22.8''	E73° 55' 22.2''	30/03/2009

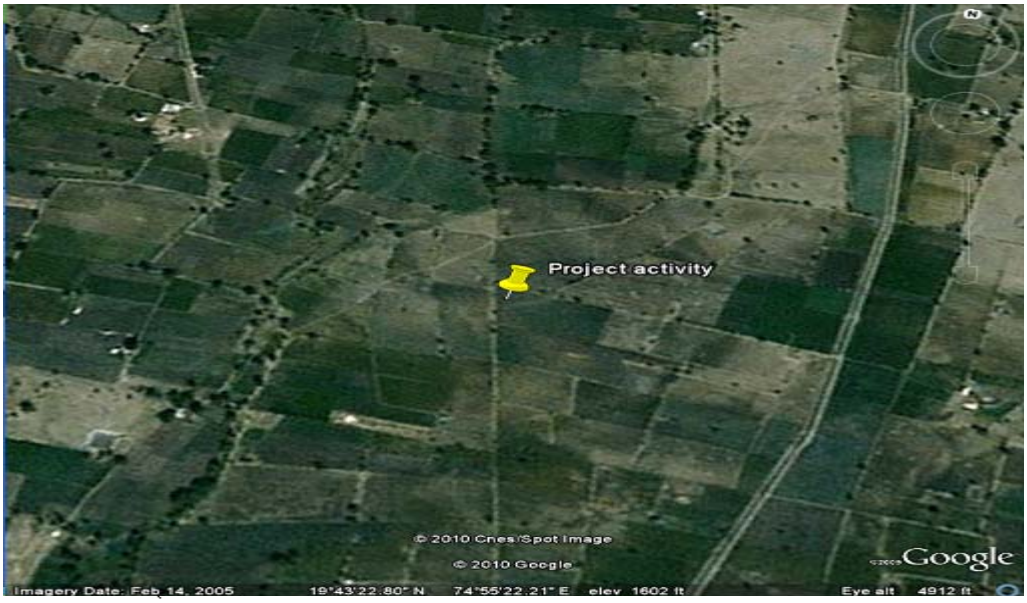

Figure 01: Project Location on Map

1.8 Title and Reference of Methodology

The approved baseline and monitoring methodology for small scale project activity, AMS- I.D.[5] (Version- 13, EB- 36), has been applied to this wind power project activity. The title and reference of the approved baseline and monitoring methodology applied to the small-scale project activity is as below –

Title of Methodology : Grid connected renewable electricity generation
Reference : AMS-I.D.
Version Number : 13

2 IMPLEMENTATION STATUS

2.1 Implementation Status of the Project Activity

Implementation Status:

The operation of project activity was commenced from 30/03/2009 (Commissioning date of the WTG). The project is connected to NEWNE Grid through Khaprale substation. Project is supplying generated electricity to the NEWNE Grid. Till date project has completed approximately 2 years of operational life. The operation of the project activity is managed by the O & M contractor M/s Suzlon. Overall, the project activity has been running successfully.

Project Operation/Special Events:

There have been no events which have affected the GHG emission reductions and monitoring. The project operation has been monitored in accordance with the requirements of the applicable monitoring methodology AMS- I.D. (Version- 13, EB- 36) as described in the registered CDM Project Design Document. The project activity has been shifted from Khaprale feeder 2 to Khaprale feeder 3. The shifting has been done by MSEDCL in order to accommodate the WTG/load in the wind farm. This has not affected quality of monitoring plan. PP has maintained the feeder change record. The details of the down time for the project activity during the monitoring period are summarized below:

Sr. No.	Year of Operation	Down time, Hrs
1.	2009	91.90
2.	2010	28.20
Total	30 Mar 09 to 15 Sep 10	120.10

2.2 Deviations from the Monitoring Plan

There have been no deviations from the monitoring plan.

2.3 Grouped Project

Not applicable, as project is not a group project.

3 DATA AND PARAMETERS

[5] http://cdm.unfccc.int/filestorage/C/D/M/CDMWF_AM_PHPV5WESACMBTJ2YY54GAJYSIEI3HD/AMS_I.D_rev_ver13.pdf?t=ZUp8MTMwMTM4OTY5OC4wNw==|aFSVdJtgB316q4XgPcjw3BOWVyI=

3.1 Data and Parameters Available at Validation

Data Unit / Parameter:	$EF_{grid,OM,y}$
Data unit:	tCO_2/ MWh
Description:	CO_2 Operating Margin emission factor for the NEWNE Grid (Three years average-2005-2006, 2006-2007, 2007-2008)
Source of data:	CO_2 Baseline Database (Version: 4 , September 2008): http://www.cea.nic.in/planning/c%20and%20e/database_publishing_ver4.zip & CO_2 Baseline Database, User Guide (Version- 4, September 2008) http://www.cea.nic.in/planning/c%20and%20e/user_guide_ver4.pdf
Value applied:	1.0090 tCO_2 / MWh
Purpose of the data:	The data is used for calculation of grid emission factor and in turn baseline emissions.
Any comment:	This database is an official publication of Government of India for the purpose of CDM baselines. It is based on most recent data available to the Central Electricity Authority and hence considered authentic. As the calculation of baseline emission has been done *ex ante* its value will remain fixed for the entire crediting period.

Data Unit / Parameter:	$EF_{grid, BM,y}$
Data unit:	tCO_2/ MWh
Description:	CO_2 Build Margin emission factor for the NEWNE Grid 2007-2008
Source of data:	CO_2 Baseline Database (Version: 4 , September 2008): http://www.cea.nic.in/planning/c%20and%20e/database_publishing_ver4.zip & CO_2 Baseline Database, User Guide (Version- 4, September 2008) http://www.cea.nic.in/planning/c%20and%20e/user_guide_ver4.pdf
Value applied:	0.59771 tCO_2 / MWh
Purpose of the data:	The data is used for calculation of grid emission factor and in turn baseline emissions.
Any comment:	This database is an official publication of Government of India for the purpose of CDM baselines. It is based on most recent data available to the Central Electricity Authority and hence considered authentic. As the calculation of baseline emission has been done ex ante its value will remain fixed for the entire crediting period.

Data Unit / Parameter:	$EF_{grid,CM,y}$
Data unit:	tCO_2 / MWh
Description:	$EF_{grid,CM,y}$ is the grid emission coefficient calculated in a transparent and conservative manner as Combined Margin (CM) which is the combination of Operation Margin (OM) and Build Margin (BM) (OM & BM have been calculated *ex-ante*) Grid emission factor calculation: $EF_{grid,CM,y} = 0.75 \times EF_{grid,OM,y} + 0.25 \times EF_{grid, BM,y}$ $= 0.75 \times 1.0090 + 0.25 \times 0.59771$ $= 0.90618\ tCO_2/MWh$
Source of data:	CO_2 Baseline Database (Version: 4 , September 2008): http://www.cea.nic.in/planning/c%20and%20e/database_publishing_ver4.zip & CO_2 Baseline Database, User Guide (Version- 4, September 2008) http://www.cea.nic.in/planning/c%20and%20e/user_guide_ver4.pdf
Value applied:	0.90618 tCO2/MWh
Purpose of the	The data is used for calculation of baseline emissions.

data:	
Any comment:	The calculation is done *ex ante*.

3.2 Data and Parameters Monitored

Data Unit / Parameter:	EG_y
Data unit:	MWh
Description:	EG_y is Net electricity delivered to the Grid (EG_y, MWh) by the project activity per annum. It is given by the following formula: Net electricity delivered to the Grid by the project activity in a given month = Export[6] – Import[7] The sum of all these monthly net readings in a given year y will give EG_y.
Source of data:	Monthly Joint Meter Readings Reports / Monthly credit notes/ Monthly invoice of sell
Description of measurement methods and procedures to be applied:	The project activity emission reductions is based on the Net electricity delivered to the Grid (EG_y, MWh) by the project activity per annum. The electricity from the project activity is evacuated to the sub-station through feeder. The electricity generated by the project activity is recorded by the Bulk meter at the sub-station. The 'Bulk meter', installed at the substation, contains a main meter and a check meter. These meters are sealed and are in the custody of MSEDCL. The state utility officials in the presence of representative/s of PP takes the Joint Meter Reading of these meters on a monthly basis as per PPA. The monthly JMRs for the project is prepared as per the PPA. The monthly JMRs have the parameters like import kWh, export kWh, Net export to the grid, reactive power etc. The monthly JMR Reports/ monthly invoices of sell is the basis for EG_y & consequently emission reduction by the project activity. Metering: Trivector meter Accuracy class: 0.2% Data Type: Electricity Frequency: Hourly measured Recording: Monthly Invoices/JMR Reports Archiving policy: Paper & Electronic Energy meter calibration frequency: Annual or as per the UNFCCC guidelines (at least once in three year, paragraph 12.c., EB 41 Report, Annex 20) Responsibility: Project Head is responsible for regular calibration of the meters.
Frequency of monitoring/recording:	Recording frequency: Monthly Measurement frequency: Continuous
Value	5612

[6] The Export is termed as *Import* by MSEDCL in JMR Reports and other documents like Power Purchase Agreement.
[7] The Import is termed as *Export* by MSEDCL in JMR Reports and other documents like Power Purchase Agreement.

<table>
<tr><td>monitored:</td><td></td></tr>
<tr><td>Monitoring equipment:</td><td>The project activity was connected to Khaprale sub station through feeder 2 of at the time of the commissioning. It was shifted to feeder 3 on 28th May 2009. The details of the respective metering equipments are given below:
<table>
<tr><th>Feeder No.</th><th>Meter type</th><th>Meters</th><th>Accuracy class</th><th>Serial No.</th></tr>
<tr><td rowspan="2">2</td><td rowspan="4">Tri Vector Energy Meters</td><td>Main Meter</td><td>0.2%</td><td>04932444</td></tr>
<tr><td>Check Meter</td><td>0.2%</td><td>04932442</td></tr>
<tr><td rowspan="2">3</td><td>Main Meter</td><td>0.2%</td><td>04932446</td></tr>
<tr><td>Check Meter</td><td>0.2%</td><td>04961749</td></tr>
</table></td></tr>
<tr><td>QA/QC procedures to be applied:</td><td>The meters shall be approved, tested & sealed by the MSEDCL. The meters are in the custody of MSEDCL. The calibration of the meters will be carried out by MSEDCL annually/or at least once in three years, as per UNFCCC guidelines. Other than periodic calibration of the meters, the reading of both meters will be matched every month. In case of failure of main meter during the monitoring the metering of the electricity will be done as per the Power Purchase Agreement.

The emission reductions is based on the monthly JMR reports which will be further cross checked with monthly invoices of sell.

Calibration details:

Substation Feeder: Khaprale 2
Date of last calibration: 24/12/2009[8]
Calibration frequency: Annual

Substation Feeder: Khaprale 3
Date of last calibration: 05/06/2010[9]
Calibration frequency: Annual</td></tr>
<tr><td>Calculation method:</td><td>Please refer calculation method given above in “Description” of the monitored parameter ‘EG_y’.</td></tr>
<tr><td>Any comment:</td><td>Data will be archived for two years after the end of crediting period or of the last issuance of CERs for this project activity, whichever occurs later.</td></tr>
</table>

3.3 Description of the Monitoring Plan

Monitoring Plan:

The monitoring of project activity is done as per approved small scale methodology AMS- I.D. (Version- 13, EB- 36). As per paragraph 13 of the approved methodology *“Monitoring shall consist of metering the electricity generated by the renewable technology”.*

Thus as per above paragraph, PP requires monitoring of Net electricity delivered to the Grid (EGy, MWh) by the project activity per annum which is recorded in the monthly JMR Reports/ monthly invoices of sell, which will also be the basis of emission reduction calculation during entire crediting period.

[8] The calibration details of the main meter (Sr. No. 04932444) can be referred from the MSEDCL Calibration Report dated 11/02/2010. The calibration of the check meter Sr. No. 04932442 was done on 22/09/2007. The details are further elaborated under CAR 07
[9] MSEDCL Calibration Report dated 18/06/2010

Monitoring of the project activity:

The monitoring of the project activity is given as below:

- The project activity has two independent monitoring/measurements of generated electricity from the wind turbine.
- The primary monitoring is done at the individual WTG. The WTG is equipped with an integrated electronic controller, which displays generated electricity on its screen. This controller is connected to the Central Monitoring Station (CMS) of Suzlon Energy Limited through SCADA. The generation data of individual machine can be monitored as a real-time parameter at CMS. Furthermore, the WTG controller is a micro-processor based intelligent controller which has been specially designed for control of wind turbines & which is self calibrated. It uses a Woodward multi function relay that has three current inputs from CT and three direct voltage inputs (690 Volts). The analog values of current / voltage 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, kVARh, and kWh. These instantaneous values are then time integrated and displayed / stored. Woodward relay is having no display and needs special protocol to view energy readings as this relay is communicating digital signal through special communication protocol hence, it is not possible to calibrate. In case of malfunctioning of the controller, the WTG is programmed for automatic shut-down. The probability of error in controller panel meter is negligible.
- The secondary recording of the electricity delivered to the grid is carried out jointly at the sub-station bulk meter.
- The joint measurement is carried out once in a month in presence of both parties (the developer's representative and officials of MSEDCL) as per the Power Purchase Agreement (section 11.05, sub-point a).
- The meters shall be approved, tested & sealed by the MSEDCL. The meters are in the custody of MSEDCL. The calibration of the meters will be carried out by MSEDCL annually/or at least once in three years, as per UNFCCC guidelines (at least once in three year, paragraph 12.c., EB 41 Report, Annex 20).
- Other than periodic calibration of the meters, the reading of both meters will be matched every month. In case of failure of main meter during the monitoring, the metering of the electricity will be done as per the Power Purchase Agreement.
- The monthly electricity data shall be collected & recorded in the form of JMR reports & invoices of sell by PP.
- The invoices of sell shall be cross-checked for accuracy with the monthly JMR reports.
- PP receives monthly JMR reports for the monthly generations of the project activity. These monthly JMR reports are based on the apportioning logic applied by the State Utility Company, MSEDCL. The State Utility Company, MSEDCL is responsible for the apportioning of the electricity. The apportioning is not in the scope and control of PP or O & M Contractor. Apportioning is done and certified by MSEDCL. Please refer Power purchase Agreement (section 11.05, sub-point b & c). It is based on electricity generation data from CMS & recorded electricity data by the bulk meter at the substation.
- The monthly JMR reports for the project activity is the basis for the calculation of annual emission reductions achieved by the project activity.
- Data will be archived for two years after the end of crediting period or of the last issuance of CERs for this project activity, whichever occurs later. The data will be archived in paper as well as in the electronic format.

Suzlon Energy Limited is providing O & M services to the project promoter. The O & M management structure is as follows:

Routine maintenance services:

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

- Tower torquing
- Blade cleaning
- Nacelle torquing and cleaning
- Transformer oil filtration
- Control panel & LT panel maintenance
- Site and transformer yard maintenance

Security services:

This service includes watch and ward and security of the wind turbines and the equipment.

Management services:

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

Technical services:

– Visual inspection of the WTGs and all parts thereof.
- Technical assistance including checking of various technical, safety and operational parameters of the equipment, trouble shooting and relevant technical services

Emergency Preparedness Plan:

Project activity is having well design Onsite Emergency Plan (OEP). As per Onsite Emergency Plan (OEP) the identified emergencies are:

1. Fire / explosion at office, guest house, canteen and WTG panel
2. Emergency at height Fall
3. Calamities
4. Communicable diseases
5. Food Poisoning
6. Snake Bite
7. Road Accident
8. Electrical short circuit at panel / HT Yard
9. Oil Spillage

Out of above emergencies Fire / explosion at office, guest house, canteen may cause unintended emissions during the project operations. This emergency is handled by O & M contractor as below:

1. On receiving information quickly rush to the emergency spot with fire extinguisher & operate the fire extinguisher to bring the fire under control.
2. If the fire is out of control inform Site/ Section in charge to inform fire brigade for further control & help.

Moreover, sudden mechanical failure of WTG including metering equipments may also occur during project operation this will be tackled by the onsite O & M Team. The Central Monitoring Station (CMS) monitors the wind farm operations on continuous basis. After receiving the

emergency/malfunction call from the Central Monitoring Station (CMS) the O & M team rush to the spot and cures the faults. The team is equipped with necessary skills & equipment to handle such situations. The fault in the metering system is determined by the State Utility/representative of PP (O & M contractor) during the regular inspection of the the system or during the periodic testing or monthly meter reading matching. The malfunctioning of the electrical and metering system is tackled by PP & the State Utility (MSEDCL) as per the Power Purchase Agreement. Please refer clause 9.06 (a), 10.1 (b & c). of the Power Purchase Agreement.

Identify organizational structure, responsibilities and competencies:

Training Needs:

CJP has appointed Suzlon Energy Limited as the Operation & Maintenance contractor for this project activity. Suzlon Energy Limited is well known for its well managed wind project operations in wind power industry through out the world. It is an ISO certified company. The training activity to the employees is an integral part of the ISO system. It has trained its man power to carry out day to-day activity at the project site. It provides regular training to its employees. The training to the employees working at the project site involves following areas.

- Operation & maintenance
- Trouble shootings
- Preventive maintenance
- Safety techniques
- Onsite Emergency Plan (OEP)

The O & M contractor is well equipped with standard equipments to carry out necessary O & M operations.

Project Monitoring Team:

Sr. No.	Monitoring Team	Responsibility
1	Project Head (CJP)	• Overall performance monitoring • Project execution • Monthly review of project operations
2	Project Coordinator (CJP)	• Data Archival • Site visit for actual project monitoring Storage of data • Coordination with O & M Contractor for day to-day operations • Invoice preparation & follow ups • Coordination with Suzlon for regular calibration of meters • Reporting to Project Head • Online project monitoring • Feedback and corrective action wherever necessary • Follow up of project operation as per PPA.
3	O & M Contractor (Suzlon)	
3.1	Suzlon Mumbai Office	• Focal point between PP and O & M team at project site • Daily Generation Report to PP • Storage of data • Coordinating with PP/Consultant/Auditors during their site visit for validation/annual verification • Coordinating with MSEDCL for monthly JMR reports • Complying as per O & M Agreement with the PP • Requesting/coordinating MSEDCL for annual calibration behalf of PP

3.2	Sinnar Site Team	• Day-to-day operation and maintenance • Data monitoring & recording • Storage of data • Monthly Joint meter reading with MSEDCL • Maintenance of monitoring equipment and installations • Day-to-day records handling Monitoring, measurement and reporting, calibration of monitoring equipment • Handling of emergency situations, monitoring data adjustments & uncertainties, review of reports/data etc • Monitoring of project activity through facility at CMS, site visits

Organizational Structure:

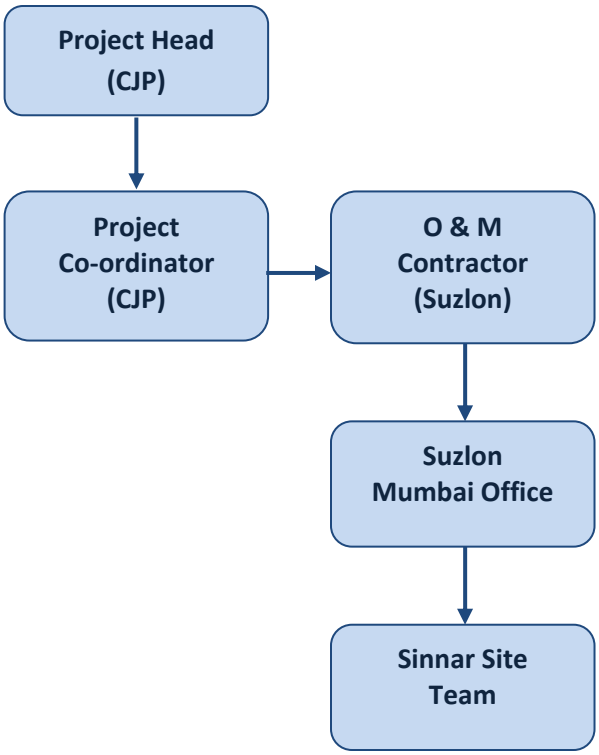

Figure 02: Organization Structure

Describe methods for generating, recording, storing, aggregating, collating and reporting data on monitored parameters:

The methods for generating, recording, storing, aggregating, collating and reporting data on monitored parameters is detailed under the section 3.2 of the monitoring report. The line diagram illustrating the GHG collection and management system is given below:

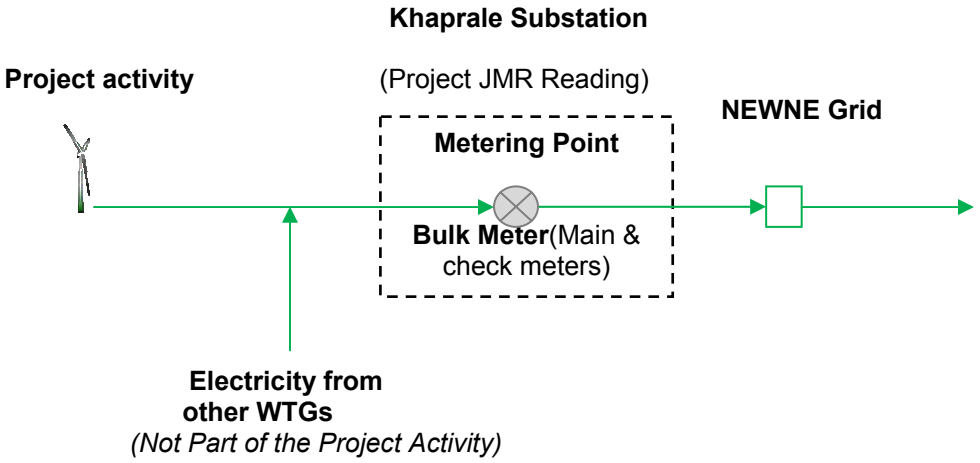

Figure 03: Indicative line diagram for GHG collection & management system

Describe procedures for handling internal auditing and non-conformities:

The Project Promoter is responsible for the internal audit. It is done on yearly basis. Following are some important steps in internal audit process:

- Data collection regarding project activity results and performance
- Analysis of the data
- Cross checking with the expected results/expectations/standards
- Arriving at the conclusion
- Deciding on the methods to fix them
- Seek for necessary corrective actions if any
- Inform the concerned authority for corrective measure
- Cross checking final output
- Records

4 QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS

4.1 Baseline Emissions

Baseline methodology for project category I.D has been detailed in paragraphs 7-11 of the approved small scale methodology AMS I.D. (Version- 13, EB- 36) Paragraph 9 of the approved methodology applies to this project activity, which states that:

For all other systems, the baseline is the kWh produced by the renewable generating unit multiplied by an emission coefficient (measured in kg CO_2e/kWh) calculated in a transparent and conservative manner as:

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

OR

2. The weighted average emissions (in kg CO_2e/kWh) of the current generation mix.

Grid emission coefficient ($EF_{grid, CM, y}$, tCO_2/MWh):

The grid emission coefficient for the project activity has been calculated *ex ante* under section B.6.1 of the registered PDD. The value of the *ex-ante* grid emission factor is 0.90618 tCO_2/MWh.

Net electricity delivered to the Grid (EG_y, MWh) by the project activity:

Sr. No.	Monitoring Period	Net electricity delivered to the Grid by the project activity, (EG_y, MWh)
1.	30/03/2009 – 31/12/2009	3114
2.	01/01/2010 – 15/09/2010	2498
Total	30/03/2009 – 15/09/2010	5612

Further multiplication of electricity generated in MWh with grid emission coefficient will give the estimated value of baseline emission as given below.

Baseline emission (tCO_2) = Grid emission coefficient ($EF_{grid, CM, y}$, tCO_2/MWh) × Net electricity delivered to the Grid (EG_y, MWh) by the project per annum

Sr. No.	Monitoring Period	Net electricity delivered to the Grid by the project activity, (EG_y, MWh)	Grid emission coefficient ($EF_{grid, CM, y}$, tCO_2/MWh)	Baseline emissions (BE_y) tCO_2
1.	30/03/2009 – 31/12/2009	3114	0.90618	2821
2.	01/01/2010 – 15/09/2010	2498	0.90618	2263
Total	30/03/2009 – 15/09/2010	5612	0.90618	5084

Thus, the baseline emissions (BE_y) by the project activity are 5084 tCO_2e during the monitoring period 30/03/2009 - 15/09/2010.

4.2 Project Emissions

As wind power generation is a renewable project activity, the project emissions for project activity are taken as zero tonnes of CO_2 (ACM0002, Version- 09, EB- 45). Moreover, during the construction work, the project activity has caused project emission due to vehicular movement. But this can be neglected as the emissions are very less & were temporary.

4.3 Leakage

According to paragraph 12 of AMS-I.D. (Version-13, EB-36) *'If the energy generating equipment is transferred from another activity or if the existing equipment is transferred to another activity, leakage is to be considered.'*

The leakages are taken as zero tonnes of CO_2, as there is no transfer of energy generating equipments from another activity nor the existing equipments are transferred to another activity.

4.4 Summary of GHG Emission Reductions and Removals

The emission reductions (ER_y) are calculated as per following formula:

$ER_y = BE_y – PE_y - LE_y$

Where

ER_y = Emission reductions in year y (tCO_2/y)
BE_y = Baseline Emission in year y (tCO_2/y)
PE_y = Project Emission in year y (tCO_2/y)

LE_y = Leakage Emission in year y (tCO_2/y)

As for wind power project activity the leakages & project emissions are considered as zero, the emission reductions of the project activity are equal to the baseline emissions. Thus,

$ER_y = BE_y$

Emission reductions (ER_y) by the project activity are:

Sr. No.	Monitoring Period	Baseline Emissions, tCO_2	Project Emissions, tCO_2	Leakage Emissions, tCO_2	Emission Reductions, tCO_2
1.	30/03/2009 – 31/12/2009	2821	0	0	2821
2.	01/01/2010 – 15/09/2010	2263	0	0	2263
Total	**30/03/2009 – 15/09/2010**	**5084**	**0**	**0**	**5084**

Thus, the project activity has achieved total emission reductions (ER_y) of 5084 tCO_2e during the monitoring period 30/03/2009 - 15/09/2010.

5 ADDITIONAL INFORMATION

Monthly Electricity Data & Emission Reductions

Year – 2009

Wind Power Project by M/s Chhotabhai Jethabhai Patel & Co. (CJP) at Sinnar, Maharashtra							
State		**Maharashtra**					
Grid		**NEWNE**					
Capacity (MW)		**1.5 MW**					
Location		**Adwadi (Nashik)**					
Location No.		**AD-24**					
Period		**30/03/2009 - 31/12/2009**					
Sr. No.	**Month**	**Import kWh**	**Export kWh**	**Net Import kWh**	**Adjustment of net electricity inline with the monitoring period, kWh**	**Application of EB 52 Annex 60, kWh**	**Conservative value applied for emission reduction calculation, kWh**
1	January	***Not Applicable***					
2	February						
3	March	4126	153	3973	NA	3964	3964
4	April	366736	505	366231	NA	365496	365496
5	May	550116	109	550007	NA	548906	548906
6	June	447560	617	446943	NA	446046	446046
7	July	617531	251	617280	NA	616044	616044
8	August	461365	479	460886	NA	459962	459962
9	September	304956	888	304068	NA	303456	303456
10	October	182520	934	181586	NA	181219	181219
11	November	137599	730	136869	NA	136592	136592
12	December	53949	657	53292	NA	53182	53182
Total, kWh		**3126458**	**5323**	**3121135**	0	**3114867**	**3114867**

Total, MWh	**3114**
Grid emission factor (tCO_2/MWh)	**0.90618**
Baseline emissions (BE_y), tCO_2	**2821**
Project emissions (PE_y), tCO_2	**0**
Leakage emissions (LE_y), tCO_2	**0**
Emission Reductions (ER_y), tCO_2	**2821**

Year – 2010

Wind Power Project by M/s Chhotabhai Jethabhai Patel & Co. (CJP) at Sinnar, Maharashtra							
State		**Maharashtra**					
Grid		**NEWNE**					
Capacity (MW)		**1.5 MW**					
Location		**Adwadi (Nashik)**					
Location No.		**AD-24**					
Period		**01/01/2010 - 15/09/2010**					
Sr. No.	**Month**	**Import kWh**	**Export kWh**	**Net Import kWh**	**Adjustment of net electricity inline with the monitoring period, kWh**	**Application of EB 52 Annex 60, kWh**	**Conservative value applied for emission reduction calculation, kWh**
1	January	36645	375	36270	NA	36195	36195
2	February	53047	937	52110	NA	52002	52002
3	March	223103	821	222282	NA	221834	221834
4	April	326162	251	325911	NA	325258	325258
5	May	543443	171	543272	NA	542184	542184
6	June	275553	636	274917	NA	274364	274364
7	July	452998	123	452875	NA	NA	452875
8	August	397394	352	397042	NA	NA	397042
9	September	254048	536	253512	196,489[10]	NA	196489
10	October	***Not Applicable***					
11	November						
12	December						
Total, kWh		**2562393**	**4202**	**2558191**	**196489**	**1451837**	**2498243**
Total, MWh				**2498**			
Grid emission factor (tCO_2/MWh)				**0.90618**			
Baseline emissions (BE_y), tCO_2				**2263**			
Project emissions (PE_y), tCO_2				**0**			
Leakage emissions (LE_y), tCO_2				**0**			
Emission Reductions (ER_y), tCO_2				**2263**			

[10]The MSEDCL credit note is available for entire month of September 2010 which covers period from 01 September 2010 till 01 October 2010. But as the date of CDM registration is 16 September 2010, the net import kWh value from 01 September 2010 to 15 September 2010 is conservatively obtained by subtracting controller generation for the period 16 September 2010 till 01 October 2010 (i.e. 57,023 kWh) from Net import recorded in the monthly MSEDCL credit note for September 2010 (i.e. 253,512 kWh) i.e. Net import kWh value from 01 September 2010 to 15 September 2010 = 253,512 - 57,023 = 196,489 kWh

Summary of Emission Reductions

Monitoring Period: 30/03/2009 – 15/09/2010			
Sr. No.	**Parameters**	**Crediting year**	
		2009	**2010**
1	Net electricity delivered to the Grid (EGy, MWh) by the project activity	3114	2498
2	Grid emission coefficient ($EF_{grid, CM, y}$, tCO_2/MWh)	0.90618	0.90618
3	Baseline emissions (BE_y) tCO_2	2821	2263
4	Project Emissions (PE_y), tCO_2	0	0
5	Leakage Emissions (LE_y), tCO_2	0	0
6	Emission Reductions (ER_y), tCO_2	2821	2263
7	**Total Emission Reductions during 30/03/2009 – 15/09/2010, tCO_2**	**5084**	

Comparison of Actual Emission Reductions with the Estimated Emission Reductions in the Registered CDM PDD:

Monitoring Period: 30/03/2009 – 15/09/2010		
Sr. No.	**Parameters**	**Value**
1.	**Actual Emission Reductions during 30/03/2009 – 15/09/2010, tCO_2**	**5084**
2.	**Estimated Emission Reductions during 30/03/2009 – 15/09/2010, tCO_2 as per registered CDM PDD, tCO_2**	**4340**
3.	**Difference, tCO_2**	**744**

As compared to the estimated emission reductions in the registered PDD, the actual emission reductions are more by 14.63%. This is due to the number of wind seasons/off seasons falling in the monitoring period under consideration. The project activity is located in the State of Maharashtra which has good windy season during May to September[11] whereas rest of the year (October to April) is a lean season. The monitoring period (30 March 2009 to 15 September 2010) has accommodated two windy seasons and but only one lean season. It has resulted into increased value of generation, till September 2011, as compared to that estimated in the registered CDM-PDD. Furthermore, the calculation of the monthly generation in CDM PDD is based on yearly average.

Application Of Guidelines For Assessing Compliance With The Calibration Frequency Requirements (EB 52, Annex 60):

The correction factor as per *Guidelines For Assessing Compliance With The Calibration Frequency Requirements (EB 52, Annex 60)* is applied by PP conservatively for the period March 2009 to June 2010. The details are given below:

Sr. No.	WEG Location No.	Period for which correction applied as per EB 52, Annex 60	Basis for application of correction factor

[11] http://www.mercindia.org.in/pdf/Annexures.pdf pg 113 point 10.

1	AD-24	March 2009 to May 2009[12]	Delay in calibration of the meters. 0.2% error is applied on conservative basis considering *Calibration report dated 11/02/2010* for Khaprale II.
2.		May 2009 to June 2010	Delay in calibration of the meters. 0.2% error is applied on conservative basis. Considering *Calibration report dated 18/06/2010* for Khaprale III.

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[12] WTG was shifted to Khaprale feeder 3 on 28th May 2009 from Khaprale feeder 2. Please refer feeder shifting communication by MSEDCL