Project design document form for small-scale CDM project activities

(Version 05.0)

PROJECT DESIGN DOCUMENT (PDD)	
Title of the project activity	Wind Power Project in Maharashtra State, India
Version number of the PDD	01.9
Completion date of the PDD	25/04/2015
Project participant(s)	Mahalaxmi Commercial Services Private Limited
Host Party	India
Sectoral scope and selected methodology(ies), and where applicable, selected standardized baseline(s)	**Sectoral Number - 1** **Sectoral Scope**- Energy Industries (renewable/non-renewable sources). AMS- I.D. Grid connected renewable electricity generation (Version 17)[1]
Estimated amount of annual average GHG emission reductions	16,223 tCO_2

[1] http://cdm.unfccc.int/methodologies/DB/RSCTZ8SKT4F7N1CFDXCSA7BDQ7FU1X

SECTION A. Description of project activity

A.1. Purpose and general description of project activity

The Project Participant, Mahalaxmi Commercial Services Private Limited, has proposed to develop a 10.5 MW wind power project at site-Jath, Taluka-Jath, District-Sangli, State-Maharashtra in India. The project activity will generate electricity utilising wind energy and will supply the generated electricity to the regional MSEDCL grid which is under purview NEWNE grid. Net electricity supplied to the grid by project activity is measured on continuous basis with the 0.2s accuracy meters[2]. In absence of the project activity equivalent amount of electricity would have otherwise been generated by existing and new power plants connected to the emission intensive NEWNE electricity grid. Thus the project activity would result in avoidance of Green House Gases (GHGs) emission and contribute to mitigation of global warming.

Details of commissioning date of all WTGs:

Sl. No:	Location	Capacity of WTG (MW)	Commissioning date*
1	JTH-247	2.1	08/06/2013
2	JTH-292	2.1	08/06/2013
3	JTH-293	2.1	08/06/2013
4	JTH-294	2.1	11/02/2014
5	JTH-300	2.1	11/02/2014

*Reference foot note no. 2 is applicable.

The Project Participant has placed the purchase orders to Suzlon Energy Limited and its group companies to supply and install the proposed wind power project. Suzlon shall also provide operation and maintenance services to the project activity.

1. Purpose of the Project Activity:

- To utilize renewable wind energy for generation of the electricity.
- To sell the generated electricity to Maharashtra State Electricity Distribution Company Limited (MSEDCL).
- To contribute in mitigating the climate change.

a. **Pre-project scenario:**

In the absence of the project activity, the equivalent amount of electricity would have been generated from the connected / new power plants in the NEWNE grid, which are / will be predominantly based on fossil fuels. The main emission source in the pre-project scenario is the power plants connected to the NEWNE grid and main greenhouse gas involved is CO_2.

b. **Project scenario:**

The project activity is a renewable source of power generation and would supply electricity to the NEWNE grid. The total planned capacity of the project activity is 10.5 MW. The project activity will use wind energy in producing electricity and no other input will be used, therefore, it will not produce any greenhouse gas emission during its lifetime.

c. **Baseline scenario:**

The baseline scenario is that the electricity delivered to the NEWNE grid by the project activity would have otherwise been generated by the operation of the grid-connected power plants and by the addition of new generation sources into the NEWNE grid. Hence, pre-project scenario and baseline scenario are the same.

2. **Reduction of GHGs emissions due to the project activity:**

[2] Commissioning certificates is provided for meter accuracy class and commissioning dates of WTGs.

The project activity essentially involves generation of electricity from wind energy. The employed WTGs use wind energy to produce electricity and do not use any other input-fuel for electricity generation. The operation of WTGs is emission free and no GHG emissions are produced during the lifetime of the project activity.

The project activity replaces anthropogenic emissions of greenhouse gases (GHGs) into the atmosphere, which is estimated to be approximately average 16,223 tonnes of CO2e per year, by displacing the equivalent amount of electricity generation through the operation of existing fuel mix in the grid comprising mainly fossil fuel based power plants and future capacity expansion connected to the grid.

The WTGs installed in the project activity are connected to the NEWNE grid. Therefore, the emission factor associated with the NEWNE grid is used to evaluate baseline emissions for the project activity. The project boundary composed of the WTGs, transformer, the metering equipment, substation, and the NEWNE grid, which is used to transmit the generated electricity.

The project activity does not result in any greenhouse gas emissions and it is a clean source of electricity. The technology is a clean technology as there are no GHG emissions associated with the electricity generation. Technology is indigenous, available within the country, and environmentally safe and sound.

3. Contribution of the project activity to sustainable development:

The National CDM Authority (NCDMA), which is the Designated National Authority (DNA) for the Government of India (GoI) in the Ministry of Environment and Forests (MoEF), has stipulated four indicators for sustainable development in the interim approval guidelines for Clean Development Mechanism (CDM) projects in India[3]. The Project Participant believes that the project activity has contributed to sustainable development in terms of the four indicators as follows:

I. Social well being:

There are several activities associated with the erection and commissioning of WTGs and this has resulted in generating employment for both skilled and unskilled manpower. People have been employed in both onsite and offsite activities thus creating direct and indirect employment opportunities that contribute up to some extent in poverty alleviation of the local community. The project activity also contributes in meeting the electricity deficit in India and hence improves quality of life of the people. Thus, the project activity has contributed to social well- being.

II. Economic well being:

The project activity requires temporary and permanent, skilled and semi-skilled manpower at the wind power project site. Hence, this will create additional employment opportunities. It will also provide business opportunities for local vendors, contractors and suppliers.

III. Environmental well being:

The project activity reduces the emissions of local and global pollutants. It also conserves the non-renewable energy resources as the project activity does not consume any non-renewable resource for generating the electricity. There is no solid waste from the project activity that generally happens in the case of most of the other sources of power. Thus, the project activity contributes to environmental well-being without causing any negative impact on the surrounding environment.

IV. Technical well being

The investment in renewable technologies like wind will boost the sector and propel R&D in this field thus helping in evolution of better and more efficient technologies.

Thus, the project activity contributes towards the sustainable development of the region

[3] http://envfor.nic.in/division/clean-development-mechanism-interim-approval-criteria

A.2. Location of project activity

A.2.1. Host Party

India

A.2.2. Region/State/Province etc.

Maharashtra

A.2.3. City/Town/Community etc.

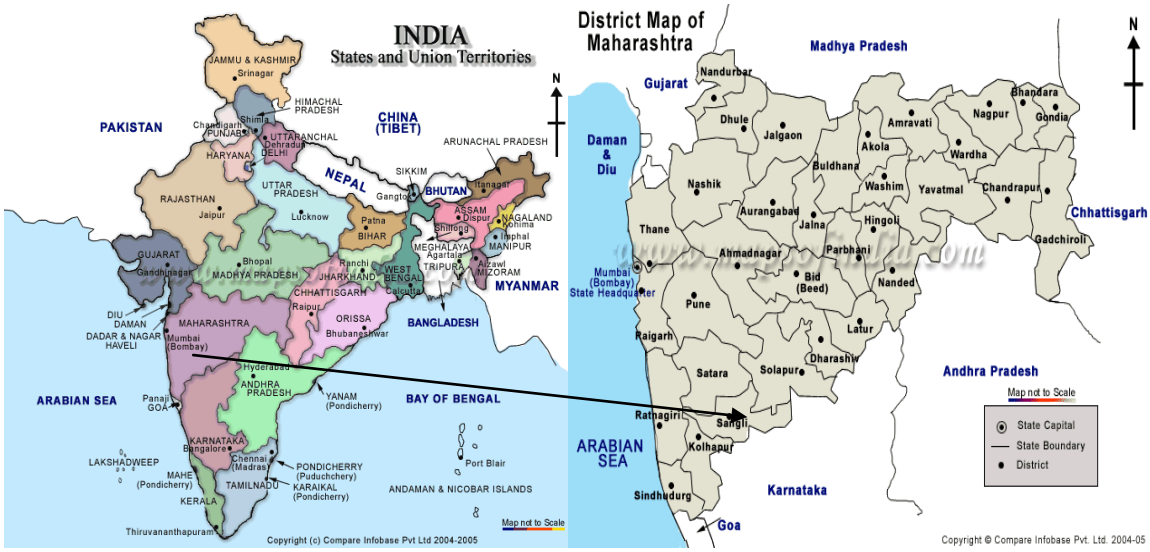
District - Sangli
Taluka – Jath
Villages – Mendhegiri, Muchandi

A.2.4. Physical/Geographical location

The project activity is located at Jath site, District-Sangli, State-Maharashtra. The latitude and longitude of each WTG are as follows:

Survey Field No. / Gat No.	Latitude	Longitude	Location
59	N16 ° 58 ' 46.3 "	E 75 ° 14 ' 31.3 "	Loc. No. JTH - 292 Village-Mendhegiri, Taluka - Jath, District - Sangli (Maharashtra)
128/1 & 128/2	N16 ° 59 ' 40.4"	E 75 ° 13 ' 46.5 "	Loc. No. JTH - 293 Village-Mendhegiri, Taluka - Jath, District - Sangli (Maharashtra)
109	N16 ° 59 ' 50.5"	E 75 ° 14 ' 10.4 "	Loc. No. JTH - 247 Village-Mendhegiri, Taluka - Jath, District - Sangli (Maharashtra)
32	N17 ° 00 ' 9"	E 75 ° 17 ' 00.9 "	Loc. No. 300, Village - Muchandi, Taluka - Jath, District - Sangli (Maharashtra)
91	N16 ° 58 ' 56.5 "	E 75 ° 14 ' 18.9 "	Loc. No. 294, Village-Mendhegiri, Taluka - Jath, District - Sangli (Maharashtra)

Geographical location can be viewed in the following maps:



A.3. Technologies and/or measures

The capacity of the project activity is 10.50 MW, which is less than the maximum qualifying capacity of 15 MW for small scale activity. Hence, the project activity has been considered as a small scale CDM project activity and UNFCCC indicative simplified modalities and procedures are applied.

According to APPENDIXB [4] of "Simplified modalities and procedures for small-scale clean development mechanism project activities" the type and category of project activity are given below:

Project type: I. Renewable energy projects
Project category: D. Electricity generation for a system.

The project activity will generate electrical energy by utilising wind energy and supply the generated electricity to the regional NEWNE grid. The project activity uses wind energy in producing electricity and no other input is being used, therefore, it will not produce any GHG emission during its lifetime. In absence of the project activity equivalent amount of electricity would have otherwise been generated by existing and new power plants connected to the emission intensive NEWNE electricity grid. Thus the project activity would result in avoidance of Green House Gases (GHGs) emission and contribute to mitigation of global warming.

All WTGs involved in the project activity are developed and supplied by Suzlon Energy Limited, which is a well-known Indian supplier of wind turbines and so far has installed different capacities of WTGs in various countries. Suzlon Energy Limited, a SUZLON Group Company, will provide all operations and maintenance services to the project activity.

TECHNOLOGY
The use of wind energy to generate electricity involves the conversion of power contained in masses of moving air into rotating shaft power. The conversion process utilises aerodynamic forces (lift and/or drag) to produce a net positive turning moment on a shaft, resulting in the production of mechanical power which can be converted to electrical power.

The efficiency of wind turbines differs from location to location significantly due to various factors / parameters like latitude, land-sea disposition, altitude and season. In India the factor which mostly

[4] http://cdm.unfccc.int/Reference/COPMOP/08a01.pdf#page=43

governs the availability of wind energy at a particular site is its geographical location with respect to the monsoon wind. The availability of wind speed data is a basic requirement for determining the feasibility of wind power generation at any site. As the distribution of wind speed is highly uneven over the country, the Govt. agencies undertake the assessment of the wind energy resource over different regions before any plan of harnessing the wind energy is drawn for implementation.

The project activity involves WTGs made by Suzlon, model S88, rated capacity 2100 kW. The technical details of the WTGs are provided below:

SUZLON MEGAWATT SERIES (S88: 2.1 MW)[5]:
S88-2.1 MW is designed for a medium wind speed regime. Its wind turbine concept is based on a robust design with pitch regulated blade operation, a 3-stage gearbox with 2100 kW rating and flexible coupling to the asynchronous induction generator. The Suzlon flexi-slip system provides efficient control of the load and power control and the turbine operation is efficiently controlled by the Suzlon controller.

Operating Data:	
Rated Power	2.1 MW
Cut-in wind speed	4 m/s
Rated wind speed	14 m/s
Cut-out wind speed	25 m/s
Hub Height	79 m
Wind Class	IEC-IIA
Rotational speed	15 to 17.6 rpm
Rotor:	
Pitch system	Pitch regulated, electrical
Diameter	88 m
Swept Area	6,082 m2
Blade material type	Epoxy bundled fibre glass
Generator:	
Type	Asynchronous slip ring type induction generator
Rated Power	2,100 kW
Rated Voltage	690 / 600 V
Frequency	50/60 Hz
Protection	IP 54, IP 23 for slip ring unit
Cooling system	Air cooled
Insulation	Class H
Slip control	Unique Flexi-Slip providing slip up to 16.67%

[5] http://www.suzlon.com/pdf/S88%20product%20brochure.pdf

Braking System:	
Aerodynamic brake	3 Independent systems with blade pitching mechanism
Mechanical brake	Hydraulic fail-safe disc brake system
Gear box:	
Type	3 stage (1 planetary and 2 helical)
Ratio	1:98.8/1:118.1
Nominal load	2,200 kW
Yaw system:	
Type	Driven by 3 electrical driven planetary drives
Bearings	Polyamide slide
Certifications:	
Design standards	GL 2003
Quality	ISO 9001:2000, ISO 9001:2008, ISO 14001:2004 & OHSAS 18001:2007
Tower:	
Type	Tubular Tower (4 sections)
Corrosion Protection	Epoxy/PU coated

The electricity production through wind turbines depends on several external factors including wind speed and the grid availability factors.

The wind turbines have an average lifetime of 20 years as specified by the WTGs supplier. The wind turbines constituting the project activity are newly commissioned. The baseline scenario is the grid based electricity system, which is same as that of the pre-project scenario.

The electricity generation from wind energy is a clean technology as there are no GHG emissions associated with it. Technology is indigenous, available within the country, and environmentally safe and sound.

A.4. Parties and project participants

Party involved (host) indicates host Party	Private and/or public entity(ies) project participants (as applicable)	Indicate if the Party involved wishes to be considered as project participant (Yes/No)
India (host)	Mahalaxmi Commercial Services Private Limited (Private Entity)	No

A.5. Public funding of project activity

There is no public funding from Annex-I countries and also there is no diversion of Official Development Assistance (ODA) for the project activity.

A.6. Debundling for project activity

According to paragraph 2 of "Guidelines on assessment of de-bundling for SSC project activities[6]" EB 54, Annex 13, a small-scale project activity shall be deemed to be a de-bundled component of a large project activity if there is a registered small-scale CDM project activity or an application to register another small-scale CDM project activity:

- With the same project participants;
- In the same project category and technology/measure; and
- Registered within the previous 2 years; and
- Whose project boundary is within 1 km of the project boundary of the proposed small-scale activity at the closest point.

The Project Participant has neither registered nor applied for registration of any other small-scale CDM project activity. Also, the project activity does not fall under any of the above mentioned criterion, hence it is not a de-bundled component of a large scale project activity.

SECTION B. Application of selected approved baseline and monitoring methodology and standardized baseline

B.1. Reference of methodology and standardized baseline

Methodology Title: AMS I.D.: "Grid connected renewable electricity generation" – Version 17.0
Reference: I.D./Version 17, Sectoral Scope: 01, EB 61
http://cdm.unfccc.int/methodologies/DB/RSCTZ8SKT4F7N1CFDXCSA7BDQ7FU1X
Methodological Tool: "Tool to calculate the emission factor for an electricity system" – Version, 04.0
Reference:
http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-07-v4.0.pdf

B.2. Project activity eligibility

The project activity is of type (I) - renewable energy projects, as it generates electricity from renewable wind energy. The electricity generated from the project activity is being supplied to the electricity distribution system, NEWNE grid. Hence, the project activity falls in the project category – D: electricity generation for a system.

The capacity of the project activity is 10.5 MW which is less than the maximum qualifying capacity of 15 MW for a small-scale CDM project activity under type-I. The capacity of the project activity will remain within the limit of 15 MW during the whole crediting period. Hence, the project activity falls under the small-scale category.

The project activity comprises renewable energy generation units i.e. WTGs and supplies the electricity to the NEWNE grid for selling to the MSEDCL, an electricity distribution company.

[6] http://cdm.unfccc.int/Reference/Guidclarif/ssc/methSSC_guid17.pdf

Hence, approved baseline and monitoring methodology, AMS I.D, is applied to the project activity. The justification for applying AMS I.D is provided below:

<table>
<tr><th>S. No.</th><th>Methodological Applicability Criteria</th><th>Applicability to the Project Activity</th></tr>
<tr><td>1.</td><td>This methodology comprises renewable energy generation units, such as photovoltaic, hydro, tidal/wave, wind, geothermal and renewable biomass:

(a) Supplying electricity to a national or a regional grid; or
(b) Supplying electricity to an identified consumer facility via national/regional grid through a contractual arrangement such as wheeling.</td><td>The project activity comprises renewable energy generation units, i.e. WTGs and supplies the electricity to the NEWNE grid. Hence, this applicability criterion of I.D. is satisfied.</td></tr>
<tr><td>2.</td><td>Illustration of respective situations under which each of the methodology (i.e. AMS-I.D, AMS-I.F and AMS-I.A) applies is included in Table 2 of the methodology as given below:
Table 2
<table>
<tr><th></th><th>Project Type</th><th>AMS-I.A</th><th>AMS-I.D</th><th>AMS-I.F</th></tr>
<tr><td>1.</td><td>Project supplies electricity to a national/regional grid</td><td></td><td>√</td><td></td></tr>
<tr><td>2.</td><td>Project displaces grid electricity consumption (e.g. grid import) and/or captive fossil fu l e ectricity generation at the user end (excess electricity may be supplied t a grid)</td><td></td><td></td><td>√</td></tr>
<tr><td>3.</td><td>Project supplies electricity to an identified consumer facility via national / regional grid (through a contractual arrangement such as wheeling</td><td></td><td>√</td><td></td></tr>
<tr><td>4.</td><td>Project supplies electricity to a mini grid system where in the baseline all generators use exclusively fuel oil and/or diesel fuel</td><td></td><td></td><td>√</td></tr>
<tr><td>5.</td><td>Project supplies electricity to household users (included in the</td><td>√</td><td></td><td></td></tr>
</table></td><td>The proposed project activity will supply the generated electricity to NEWNE regional grid. Hence as per the situations mentioned in the Table 2, the project activity only complies with applicability conditions of AMS I.D methodology as per project type 1.</td></tr>
</table>

	project boundary) located in off grid areas	
3.	This methodology is applicable to project activities that (a) install a new power plant at a site where there was no renewable energy power plant operating prior to the implementation of the project activity (Greenfield plant); (b) involve a capacity addition; (c) involve a retrofit of (an) existing plant(s); or (d) involve a replacement of (an) existing plant(s).	The project activity involves installation of a new wind power project at a site where there was no renewable energy power plant operating prior to the implementation of the project activity (Greenfield Plant). Hence, the criterion is applicable to the project activity.
4.	Hydro power plants with reservoirs that satisfy at least one of the following conditions are eligible to apply this methodology: • The project activity is implemented in an existing reservoir with no change in the volume of reservoir; • The project activity is implemented in an existing reservoir, where the volume of reservoir is increased and the power density of the project activity, as per definitions given in the Project Emissions section, is greater than 4 W/m^2; • The project activity results in new reservoirs and the power density of the power plant, as per definitions given in the Project Emissions section, is greater than 4 W/m^2.	The project activity is a renewable wind energy based power project. Hence, the criterion is not applicable to the project activity.
5.	If the new unit has both renewable and non-renewable components (e.g., a wind/diesel unit), the eligibility limit of 15 MW for a small-scale CDM project activity applies only to the renewable component. If the new unit co-fires fossil fuel, the capacity of the entire unit shall not exceed the limit of 15 MW.	The project activity has only renewable energy component i.e. wind. There is neither non-renewable component added nor co-firing is required in the project activity. The capacity of the renewable wind power project activity is 10.5 MW that is less than 15 MW. Hence, this criterion is satisfied.
6.	Combined heat and power (co-generation) systems are not eligible under this category.	The project activity is a renewable wind energy based power project not a co-generation system. Therefore, this criterion is not applicable to the project activity.
7.	In the case of project activities that involve the addition of renewable energy generation units at an existing renewable power generation facility, the added capacity of the units added by the project should be lower than 15 MW and should be physically distinct from the existing units.	The project activity is a green field project hence it does not involve the addition of renewable energy generation units at an existing renewable power generation facility. The capacity of the project activity is 10.5 MW. Therefore, this criterion is not applicable to the project activity.
8.	In the case of retrofit or replacement, to qualify as a small-scale project, the total output of the retrofitted or replacement unit shall not exceed the limit of 15 MW.	The project activity is a green field project hence there is no retrofit or replacement. Therefore, this criterion is not applicable to the project activity.

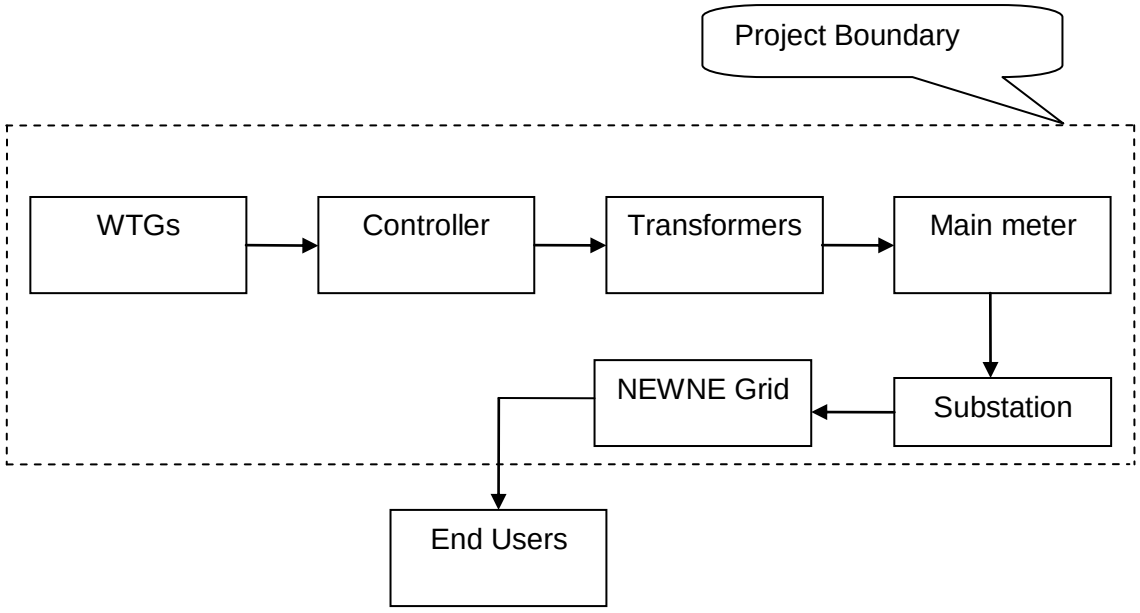
As per this discussion it is clear that the methodology AMS I.D., version 17, is applicable to the project activity.

Applicability of Methodological Tool: “Tool to calculate the emission factor for an electricity system” – Version, 04.

Since project activity supplies electricity to grid, Tool to calculate the emission factor for an electricity system is used to calculate baseline emissions and resulting emission reductions.

B.3. Project boundary

As per para 9 of the applied small scale methodology, AMS I.D., version 17, the spatial extent of the project boundary includes the project power plant and all power plants connected physically to the electricity system that the CDM project power plant is connected to. Thus, the project boundary of the project activity includes wind energy generators, dedicated metering system of PP WTGs and the NEWNE grid as shown below:



B.4. Establishment and description of baseline scenario

Pre-project scenario:

In the absence of the project activity, the equivalent amount of electricity would have been generated from the connected / new power plants in the NEWNE grid, which are / will be predominantly based on fossil fuels. The main emission source in the pre-project scenario is the power plants connected to the NEWNE grid and main greenhouse gas involved is CO_2.

Project scenario:
The project activity is a renewable source of electricity generation and will supply the electricity to the NEWNE grid. The project activity is a wind power plant of capacity 10.5 MW. The project activity uses wind energy in producing electricity and no other input is being used, therefore, it will not produce any GHG emission during its lifetime.

Baseline scenario:

As per para 10 of AMS I. D., Version 17, "*The baseline scenario is that the electricity delivered to the grid by the project activity would have otherwise been generated by the operation of grid connected power plants and by the addition of new generation sources into the grid*".

The proposed project activity will supply electricity to the NEWNE Grid and completely complies with the para of 10 of AMS I.D., version 17. Therefore, the baseline scenario is the electricity delivered to the NEWNE grid by the project activity would have otherwise been generated by the operation of the grid-connected power plants and by the addition of new generation sources into the NEWNE grid. Hence, pre-project scenario and baseline scenario are the same.

As per the para 11 of AMS I.D., version 17, the baseline emissions are the product of electrical energy baseline $EG_{BL,y}$ expressed in MWh of electricity produced by the renewable generating unit multiplied by the grid emission factor.

The baseline emissions can be evaluated as below:

$$BE_y = EG_{BL,y} \times EF_{CO2,grid,y} \quad \text{....(1)}$$

Where:

BE_y = Baseline Emissions in year *y* (tCO_2)

$EG_{BL,y}$ = Quantity of net electricity supplied to the grid as a result of the implementation of the CDM project activity in year *y* (MWh)

$EF_{CO2,grid,y}$ = CO_2 Emission Factor of the grid in year y (tCO_2e/MWh)

The energy supplied to the grid will be recorded for the entire year and this record will provide the data for electrical energy baseline $EG_{BL,y}$. The Host Country has published the CO_2 Baseline Database for calculation of emission factors for the national grid. This latest version[7] available during PDD submission for validation to DOE is available on the Central Electricity Authority (CEA) website and same has been taken as reference for the calculation of **$EF_{CO2,grid,y}$.**

Emission factor of the grid has been calculated as per the procedures provided in AMS I.D. As per paragraph 12 of AMS I.D. version 17, the Emission Factor is calculated in a transparent and conservative manner as follows:

(a) 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

(b) The weighted average emissions (in tCO_2e/MWh) of the current generation mix. The data of the year in which project generation occurs must be used.

Calculations are based on data from an official source (where available) and made publicly available.

The Project Participant used option (a) to calculate emission factor of the NEWNE grid. The baseline emission factor of the NEWNE grid is calculated as per methodological tool "Tool to calculate the emission factor for an electricity system[8]", version 04.0 as follows:

Step 1: Identify the relevant electricity systems:

Historically, the Indian power system was divided into five independent regional grids, namely Northern, Eastern, Western, Southern, and North-Eastern. Each grid covered several states as shown below in the table. Since August 2006, however, all regional grids except the Southern Grid

[7] CEA database, version 8.0 http://www.cea.nic.in/reports/planning/cdm_co2/cdm_co2.htm

[8] http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-07-v4.0.pdf/history_view

have been integrated and are operating in synchronous mode. Consequently, the Northern, Eastern, Western and North-Eastern grids are treated as a single grid named as NEWNE grid[9].

Geographical scope of the two electricity grids

S. No.	Electricity Grid (Present)	Electricity Grid (Earlier)	Geographical Areas Covered
1.	**NEWNE Grid**	Northern	Chandigarh, Delhi, Haryana, Himachal Pradesh, Jammu and Kashmir, Punjab, Rajasthan, Uttar Pradesh, Uttarakhand
		Eastern	Bihar, Jharkhand, Orissa, West Bengal, Sikkim, Andaman-Nicobar
		Western	Chhattisgarh, Gujarat, Daman & Diu, Dadar & Nagar Haveli, Madhya Pradesh, Maharashtra, Goa
		North-Eastern	Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland, Tripura
2.	**Southern Grid**	Southern	Andhra Pradesh, Karnataka, Kerala, Tamil Nadu, Pondicherry, Lakshadweep

CEA considers both Indian electricity systems, NEWNE & Southern, to calculate weighted average emission rate, simple operating margin, build margin, and combined margin CO_2 emission factor.

The project activity is located in the state of Maharashtra and connected to the NEWNE grid of India. Therefore, relevant electricity system for the project activity is NEWNE grid.

Step 2: Choose whether to include off-grid power plants in the project electricity system (optional):
Project Participant may choose between the following two options to calculate the operating margin and build margin emission factor:

Option I: Only grid power plants are included in the calculation.
Option II: Both grid power plants and off-grid power plants are included in the calculation.

Option I corresponds to the procedure contained in earlier versions of this tool. Option II allows the inclusion of off-grid power generation in the grid emission factor. Option II aims to reflect that in some countries off-grid power generation is significant and can partially be displaced by CDM project activities, e.g. if off-grid power plants are operated due to an unreliable and unstable electricity grid. Option II requires collecting data on off-grid power generation and can only be used if the conditions outlined therein are met. Option II may be chosen only for the operating margin emission factor or for both the build margin and the operating margin emission factor but not only for the build margin emission factor.

The Project Participant selected "Option I: Only grid power plants are included in the calculation" to calculate the operating margin and build margin emission factor.

Step 3: Select a method to determine the operating margin (OM):
The calculation of the operating margin emission factor ($EF_{grid,OM,y}$) can be carried out using one of the following methods:

(a) Simple OM; or
(b) Simple adjusted OM; or

[9] http://www.cea.nic.in/reports/planning/cdm_co2/user_guide_ver8.pdf Page 4 Table 2

(c) Dispatch data analysis OM; or
(d) Average OM.

Any of the four methods can be used. However, the simple OM method (option a) can only be used if low-cost/must-run resources constitute less than 50% of total grid generation in: 1) average of the five most recent years, or 2) based on long-term averages for hydroelectricity production.

The percentage share of power generation from low cost / must run power plants for the five most recent years in the Indian grids, NEWNE & Southern, is as follows (CEA database, version 8.0[10]):

Share of Must-Run (Hydro/Nuclear) (% of Net Generation)					
	2007-08	**2008-09**	**2009-10**	**2010-11**	**2011-12**
NEWNE	19.0%	17.4%	15.9%	17.6%	19.2%
Southern	27.1%	22.8%	20.6%	21.0%	21.0%
India	21.0%	18.7%	17.1%	18.4%	19.6%

The average percentage of power generation by low cost / must run plants in the NEWNE grid for latest five years is 18.9% that is much below than 50%. Therefore, simple OM method (option a) is used by the PP for calculating simple Operating Margin.

For the simple OM the emissions factor can be calculated using either of the two following data vintages:

• *Ex ante* option: If the *ex ante* option is chosen, the emission factor is determined once at the validation stage, thus no monitoring and recalculation of the emissions factor during the crediting period is required. For grid power plants, use a 3-year generation-weighted average, based on the most recent data available at the time of submission of the CDM-PDD to the DOE for validation. For off-grid power plants, use a single calendar year within the 5 most recent calendar years prior to the time of submission of the CDM-PDD for validation.

• *Ex post* option: If the *ex post* option is chosen, the emission factor is determined for the year in which the project activity displaces grid electricity, requiring the emissions factor to be updated annually during monitoring. If the data required to calculate the emission factor for year *y* is usually only available later than six months after the end of year *y*, alternatively the emission factor of the previous year *y-1* may be used. If the data is usually only available 18 months after the end of year *y*, the emission factor of the year preceding the previous year *y-2* may be used. The same data vintage (*y*, *y-1* or *y-2*) should be used throughout all crediting periods.

The Project Participant has used ex-ante option for calculating simple OM.

Step 4: Calculate the operating margin emission factor according to the selected method:
Selected method: Simple OM method.

The simple OM emission factor is calculated as the generation-weighted average CO_2 emissions per unit net electricity generation (tCO_2/MWh) of all generating power plants serving the system, not including low-cost/must-run power plants/units. The simple OM may be calculated:

Option A: Based on the net electricity generation and a CO_2 emission factor of each power unit; or
Option B: Based on the total net electricity generation of all power plants serving the system and the fuel types and total fuel consumption of the project electricity system.

Option B can only be used if:

[10] http://www.cea.nic.in/reports/planning/cdm_co2/cdm_co2.htm version 8.0

(a) The necessary data for Option A is not available; and
(b) Only nuclear and renewable power generation are considered as low-cost/must-run power sources and the quantity of electricity supplied to the grid by these sources is known; and
(c) Off-grid power plants are not included in the calculation (i.e., if Option I has been chosen in Step 2).

Option A has been used by the PP to calculate simple OM emission factor, which is calculated based on the net electricity generation of each power unit and an emission factor for each power unit, as follows:

$$EF_{grid,\ OM\ simple,\ y} = [\Sigma_m\ EG_{m,y} \times EF_{EL,m,y}] / \Sigma_m\ EG_{m,y} \quad \ldots.(2)$$

Where

$EF_{grid,OMsimple,y}$	=	Simple operating margin CO_2 emission factor in year *y* (tCO_2/MWh)
$EG_{m,y}$	=	Net quantity of electricity generated and delivered to the grid by power unit *m* in year *y* (MWh)
$EF_{EL,m,y}$	=	CO_2 emission factor of power unit *m* in year *y* (tCO2/MWh)
m	=	All power units serving the grid in year *y* except low-cost / must-run power units
y	=	The relevant year as per the data vintage chosen in Step 3.

Determination of $EF_{EL,m,y}$: The PP has determined the emission factor of each power unit *m* using Option A1 as given below:

• **Option A1.** If for a power unit *m* data on fuel consumption and electricity generation is available, the emission factor ($EF_{EL,m,y}$) is determined as follows:

$$EF_{EL,m,\ y} = [\Sigma_i\ FC_{i,m,y} \times NCV_{i,y} \times EF_{CO2,\ i,\ y}] / EG_{m,\ y} \quad \ldots.(3)$$

Where:

$EF_{EL,\ m,\ y}$	=	CO_2 emission factor of power unit *m* in year *y* (tCO_2/MWh)
$FC_{i,\ m,\ y}$	=	Amount of fossil fuel type i consumed by power unit m in year y (mass or volume unit)
$NCV_{i,\ y}$	=	Net calorific value (energy content) of fossil fuel type i in year y (GJ / mass or volume unit)
$EF_{CO2,\ i,\ y}$	=	CO_2 emission factor of fossil fuel type i in year y (tCO_2/GJ)
$EG_{m,\ y}$	=	Net quantity of electricity generated and delivered to the grid by power unit *m* in year *y* (MWh)
m	=	All power units serving the grid in year *y* except low-cost/must-run power units
i	=	All fossil fuel types combusted in power unit m in year *y*
y	=	The relevant year as per the data vintage chosen in Step 3

$EF_{grid,\ OM\ simple,\ y}$ = 0.9723 tCO_2/MWh

Step 5: Calculate the build margin (BM) emission factor:
In terms of vintage of data, project participants can choose between one of the following two options:

Option 1: For the first crediting period, calculate the build margin emission factor *ex ante* based on the most recent information available on units already built for sample group *m* at the time of CDM-PDD submission to the DOE for validation. For the second crediting period, the build margin emission factor should be updated based on the most recent information available on units already built at the time of submission of the request for renewal of the crediting period to the DOE. For the

third crediting period, the build margin emission factor calculated for the second crediting period should be used. This option does not require monitoring the emission factor during the crediting period.

Option 2: For the first crediting period, the build margin emission factor shall be updated annually, *ex post*, including those units built up to the year of registration of the project activity or, if information up to the year of registration is not yet available, including those units built up to the latest year for which information is available. For the second crediting period, the build margin emissions factor shall be calculated *ex ante*, as described in Option 1 above. For the third crediting period, the build margin emission factor calculated for the second crediting period should be used.

The Project Participant selected Option 1 to calculate the build margin emission factor *ex ante* based on the most recent information available on units already built for sample group *m* at the time of CDM-PDD submission to the DOE for validation. The sample group m consists of the 20 % of power plants supplying electricity to grid that have been built most recently, since it comprises of larger annual power generation. Further, none of the power plant capacity additions in the sample group have been registered as CDM project activities.

The sample group of power units *m* used to calculate the build margin has been determined by the PP as per the following procedure, consistent with the data vintage selected above:

(a) Identify the set of five power units, excluding power units registered as CDM project activities, that started to supply electricity to the grid most recently ($SET_{5\text{-units}}$) and determine their annual electricity generation ($AEG_{SET\text{-}5\text{-}units}$, in MWh);

(b) Determine the annual electricity generation of the project electricity system, excluding power units registered as CDM project activities (AEG_{total}, in MWh). Identify the set of power units, excluding power units registered as CDM project activities, that started to supply electricity to the grid most recently and that comprise 20% of AEG_{total} (if 20% falls on part of the generation of a unit, the generation of that unit is fully included in the calculation) ($SET_{\geq 20\%}$) and determine their annual electricity generation ($AEG_{SET\text{-}\geq 20\%}$, in MWh);

(c) From $SET_{5\text{-units}}$ and $SET_{\geq 20\%}$ select the set of power units that comprises the larger annual electricity generation (SET_{sample});

Identify the date when the power units in SET_{sample} started to supply electricity to the grid. If none of the power units in SET_{sample} started to supply electricity to the grid more than 10 years ago, then use SET_{sample} to calculate the build margin.

The build margin emissions factor is the generation-weighted average emission factor (tCO_2/MWh) of all power units *m* during the most recent year *y* for which power generation data is available, calculated as follows:

$$EF_{grid,BM,y} = [\Sigma_m EG_{m,y} \times EF_{EL,m,y}] / \Sigma_m EG_{m,y} \quad \ldots.(4)$$

Where

$EF_{grid,BM,y}$	=	Build margin CO_2 emission factor in year *y* (tCO_2/MWh)
$EG_{m,y}$	=	Net quantity of electricity generated and delivered to the grid by power unit *m* in year *y* (MWh)
$EF_{EL,m,y}$	=	CO_2 emission factor of power unit *m* in year *y* (tCO_2/MWh)
m	=	Power units included in the build margin
y	=	Most recent historical year for which power generation data is available

The CO_2 emission factor of each power unit *m* ($EF_{EL,m,y}$) is determined as per the guidance in Step 4 (a) for the simple OM, using options A1, A2 or A3, using for *y* the most recent historical year for

which power generation data is available, and using for *m* the power units included in the build margin.

The value of $EF_{BM, y}$ has been taken from CEA data (Version 8.0) as latest value (2011-12) of build margin for NEWNE grid as follows:

Build margin CO_2 emission factor for NEWNE Grid:

$EF_{grid,BM, y} = EF_{NEWNE,BM, (2011-12)} = 0.9164\ tCO_2/MWh$ ….(5)

Step 6: Calculate the combined margin emissions factor:

The Project Participant has evaluated weighted average combined margin emissions factor as follows:

$$EF_{grid,CM, y} = EF_{grid, OM, y} \times w_{OM} + EF_{grid, BM, y} \times w_{BM} \quad \text{….(6)}$$

Where

$EF_{grid,CM,y}$	=	Combined margin CO_2 emission factor in year *y* (tCO_2/MWh)
$EF_{grid,OM,y}$	=	Operating margin CO_2 emission factor in year *y* (tCO_2/MWh)
$EF_{grid,BM,y}$	=	Build margin CO_2 emission factor in year *y* (tCO_2/MWh)
w_{OM}	=	Weighting of operating margin emissions factor (%)
w_{BM}	=	Weighting of build margin emissions factor (%)

The following default values can be used for w_{OM} and w_{BM}:

• Wind and solar power generation project activities: w_{OM} = 0.75 and w_{BM} = 0.25 (owing to their intermittent and non-dispatchable nature) for the first crediting period and for subsequent crediting periods;

• All other projects: w_{OM} = 0.5 and w_{BM} = 0.5 for the first crediting period, and w_{OM} = 0.75 and w_{BM} = 0.25 for the second and third crediting period, unless otherwise specified in the approved methodology which refers to this tool.

The project activity is a wind power generation project activity.

Therefore, w_{OM} = 0.75 and w_{BM} = 0.25 are used to calculate combined margin.

Combined margin CO_2 emission factor for NEWNE grid:

$EF_{grid, CM, y} = 0.9723 * 0.75 + 0.9164 * 0.25 = 0.9582\ tCO_2/MWh$ ….(7)

Combined margin CO_2 emission factor for NEWNE grid ($EF_{grid, CM, y}$) = 0.9582 tCO_2/MWh

The emission factor calculated ex-ante and will remain same throughout the crediting period.

The baseline emissions will be calculated as a product of measured value of $EG_{BL, y}$ and emission factor evaluated ex-ante in equation (1).

B.5. Demonstration of additionality

National policies and circumstances relevant to the baseline of the project activity:

The Government of India introduced an Electricity Act[11] on 26/05/2003 to consolidate the laws relating to generation, transmission, distribution, trading and use of electricity and generally for taking measures conducive to development of electricity industry, promoting competition therein, protecting interest of consumers and supply of electricity to all areas, rationalisation of electricity tariff, ensuring transparent policies regarding subsidies, promotion of efficient and environmentally

[11] http://www.aegcl.co.in/INDIAN%20ELECTRICITY%20ACT%202003.pdf

benign policies constitution of Central Electricity Authority, Regulatory Commissions and establishment of Appellate Tribunal and for matters connected therewith or incidental thereto.

In compliance of the Electricity Act 2003 the Central Government notified the National Electricity Policy[12] on 12/02/2005. According to this policy, the generation of electricity from non-conventional sources would be promoted by the State Electricity Regulatory Commissions (SERCs) by providing suitable measures for connectivity with grid and sale of electricity to any person and also by specifying, for purchase of electricity from such sources, a percentage of the total consumption of electricity in the area of a distribution licensee. Such percentage for purchase of power from non-conventional sources should be made applicable for the tariffs to be determined by the SERCs at the earliest. Progressively the share of electricity from non-conventional sources would need to be increased as prescribed by State Electricity Regulatory Commissions. Considering the fact that it will take some time before non-conventional technologies compete, in terms of cost, with conventional sources, the Commission may determine an appropriate differential in prices to promote these technologies.

Electricity Act and National Electricity Policy both provide comparative advantage to less emissions intensive technologies or fuels (E-). The impacts of these policies have been excluded in establishing a baseline scenario as these are implemented since the adoption of the Marrakesh Accords (11/11/2001) and not provide perverse incentives to implement this type of project activity.

According to the "*Tool to calculate the emission factor for an electricity system (Version 04.0)* if the DNA of the host country has published a delineation of the project electricity system and connected electricity systems, these delineations should be used. The electricity generated by the project activity is being supplied to NEWNE grid. According to the delineation which is published by the CEA[13], NEWNE is considered as the "electricity system", which is defined as a part of the "project boundary" of the project activity.

The project activity is the installation of a new grid-connected renewable power plant/unit, and is not a modification/retrofit of an existing plant/unit. Baseline of project activity is NEWNE grid which is fed by both fossil fuels fired generating plants (using fossil fuels such as coal, natural gas, diesel, naphtha etc.) and non-fossil fuel based generating plants (such as hydro, nuclear, biomass and wind). The project activity belongs to power generation category and has consistency with mandatory national laws and regulation as per the followings:

- The implementation of the project activity is a voluntary initiative and it is not mandatory or a legal requirement.
- The Electricity Act, 2003 and National Electricity Policy, 2005 do not restrict or empower any authority to restrict the fuel choice for electricity generation.
- The applicable environmental regulations do not restrict the use of wind energy for electricity generation.
- There is no legal requirement on the choice of a particular technology for electricity generation.

Prior CDM consideration:

Prior consideration of CDM has been demonstrated below as per the Project Standard, Version 07, EB 65, Para 6.5"Demonstration of prior consideration of the Clean Dev elopement Mechanism, sub para 33,[14]". The project activity falls under category "Proposed project activities with a start date on or after 2 August 2008"

The Project Participant intimated on 19/06/2013 to UNFCCC through prescribed form, F-CDM-Prior Consideration, , within 180 days of starting the project activity, for seeking CDM status of the

[12] http://powermin.nic.in/whats_new/national_electricity_policy.htm

[13] http://www.cea.nic.in/reports/planning/cdm_co2/user_guide_ver8.pdf Page 4

[14] http://cdm.unfccc.int/Reference/Standards/index.html

project activity. The UNFCCC has webhosted the prior CDM consideration of the project activity on its website[15].

Demonstration of Additionality for the project activity:
The following two realistic and credible alternatives to the project activity are considered:

Alternative 1: Setting up the project activity without CDM benefits:
As per this alternative the Project Participant would have undertaken the project activity without CDM benefits.

There will not be GHG emissions through this alternative. This alternative may be a part of the baseline. However, this alternative faces investment barrier as shown by the investment analysis conducted below. Hence, it is unlikely to be the most economically attractive option.

Alternative 2: Continuation of the current situation (no project activity or other alternatives undertaken):
In this alternative equivalent amount of electricity would be produced by operation of current grid-connected power generating units and / or new power generating units coming up in the NEWNE grid. This is the most plausible alternative as baseline alternative for the project activity.

Alternatives 1 & 2 above have been identified as realistic and credible alternative scenario(s) to the project activity. There are no legal and regulatory requirements that prevent Alternatives 1 & 2 from occurring in India. Both alternatives are as per national policies as described above. Identified realistic and credible alternative scenario(s) to the project activity are in compliance with mandatory legislation and regulations taking into account the enforcement in the region or country and EB decisions on national and/or sectoral policies and regulations.

The implementation of project activity is a voluntary initiative and it is not mandatory or a legal requirement. For electricity generation, the electricity act 2003 does not restrict the developer or empower any authority to restrict the fuel choice, the applicable environmental regulations do not restrict the use of wind energy and there is no legal requirement on the choice of a particular technology.

Thus, considering that both the alternatives are in line with the applicable legal and regulatory requirements, the “no project option” i.e. continuation of current practice where in the equivalent amount of energy would have been produced by the project grid electricity system through its currently running power plants and by new capacity additions is the chosen baseline scenario which would have happened in the absence of the proposed project activity.

Paragraph 47, version 07, of the “Clean Development Mechanism project standard. PP can establish the baseline scenario of the proposed project activity in accordance with the selected methodology.

As per para 10 of AMS I. D., Version 17, “*The baseline scenario is that the electricity delivered to the grid by the project activity would have otherwise been generated by the operation of grid connected power plants and by the addition of new generation sources into the grid*”.

Since, the methodology has prescribed the same baseline scenario as chosen above, no further analysis is required.

The additionality of the project activity has been demonstrated as per “Guidelines on the demonstration of additionality of small scale project activities, EB 68, Annex 27[16]”. As per para 1 of the guidelines project participants shall provide an explanation to show that the project activity would not have occurred anyway due to at least one of the following barriers:

[15] http://cdm.unfccc.int/Projects/PriorCDM/notifications/index_html

[16] http://cdm.unfccc.int/Reference/Guidclarif/meth/methSSC_guid05.pdf

(a) Investment barrier
(b) Technological barrier
(c) Barrier due to prevailing practice
(d) Other barriers

The Project Participant identified "investment barrier" as the most relevant barrier faced by the project activity. The investment barrier faced by the project activity consists of barrier due to high capital cost and consequent impact on return.

Selection of financial indicator:

The Project Participant has invested in wind power project as part of its corporate responsibility towards cleaner energy. As per Para 12 of **"Guidance on the Assessment of Investment Analysis, Version 05, EB 62, Annex 5**[17]", a benchmark approach is suited to circumstances where the baseline doesn't require investment or is outside the direct control of the project developer, i.e. cases where the choice of the developer is to invest or not to invest. In the absence of the project activity, the equivalent amount of electricity would have been drawn from the NEWNE grid. Hence, use of benchmark analysis approach for demonstrating the additionality is justified

Selection of benchmark:

As per the Guidance on the Assessment of Investment Analysis, Version 05, EB 62, Annex 5, para 12 *Local commercial lending rates or weighted average costs of capital (WACC) are appropriate benchmarks for a project IRR. Required/expected returns on equity are appropriate benchmarks for an equity IRR. Benchmarks supplied by relevant national authorities are also appropriate if the DOE can validate that they are applicable to the project activity and the type of IRR calculation presented*.

Commercial lending available during the available during decision making was 12.5% [18] is considered as benchmark for the project activity.

Selection of Financial Indicator:
In order to analyse the financial viability of the project activity, the prime financial indicator that has been used is the Project IRR of the project activity. The project IRR is one of the most commonly used tools to assess the feasibility and viability of the projects. As the project is funded by both debt and equity, project IRR is considered an appropriate financial indicator for demonstrating the additionality of the project. PP has carried out financial analysis based on offer letters received from technology supplier in accordance with Version 05, EB 62, Annex 5, para 6.

Key Assumptions

	Value	Unit	Reference
Project cost	741.55	INR in Million	As per Offer letter for all WTG from technology supplier dated 14/12/2012
Operating & Maintenance Cost	12.5	INR in Millions	As per Offer letter for all WTG from technology supplier dated 14/12/2012
Escalation	5.72	%	As per offer letter from technology supplier. Free O&M for first 2 years and escalated from 4th year dated 14/12/2012

[17] http://cdm.unfccc.int/Reference/Guidclarif/reg/reg_guid03.pdf

[18] http://profit.ndtv.com/news/corporates/article-sbi-to-cut-lending-rates-on-sme-loans-by-up-to-2-soon-302702

Equity	25	%	Memorandum of information presented to board during board meeting on 26/12/2012
Debt	75	%	Memorandum of information presented to board during board meeting on 26/12/2012
Debt Rate	12.50	%	Memorandum of information presented to board during board meeting on 26/12/2012
Repayment period inclusive of moratorium	10	years	Memorandum of information presented to board during board meeting on 26/12/2012
Moratorium period	1	years	Memorandum of information presented to board during board meeting on 26/12/2012
Other expenses (administrative)	3	INR in Millions	Administration and Miscellaneous expenses were worked out by PP during investment decision and the same has been given in memorandum of information presented to board during board meeting on 26/12/2012
Escalation in other expenses	10	%	Administration and Miscellaneous expenses were worked out by PP during investment decision and the same has been given in memorandum of information presented to board during board meeting on 26/12/2012
Tax Rate	32.40	%	Income tax as per IT act, 2012-13[19] applicable during decision making
Tariff rate	5.67	INR/Kwh	MERC Tariff order 30/03/2012 for 13 years. Memorandum of information presented to board during board meeting on 26/12/2012
Tariff rate after 13th year till 20th year	4.05	INR/Kwh	Memorandum of information presented to board during board meeting on 26/12/2012
Insurance cost	0.2	%	0.2% of project cost in Memorandum of Information presented to board meeting on 26/12/2012
Depreciation - Plant and machinery	15.00	%	Applicable for wind power projects during decision making year FY 2012-13
Depreciation -Civil and infrastructure	10.00	%	Applicable for wind power projects during decision making year FY 2012-13
Service Tax	12.36	%	Service tax as per IT ACT 2012-13[20]
Capacity of each windmill	2.1	MW	As per Offer letter from technology supplier dated 14/12/2012
No. of wind mills	5	#	As per Offer letter from technology supplier dated 14/12/2012
PLF	18.50	%	Third Party PLF Assessment Report dated 12/12/2012
Run days	365	days	per annum
Derating	5	%	Memorandum of Information presented to board meeting on 26/12/2012
Run hours	24	hrs	per day

Project IRR works out to be 8.61%.

Sensitivity Analysis:

[19] http://www.zinzuwadiaco.com/wp-content/uploads/2013/03/Income-Tax-Slabs-FY-2012-13.pdf

[20] http://www.dbsgroup.in/uploads/downloads/Service%20tax%20Booklet%202012.pdf

Sensitivity analysis has been conducted to the project activity by considering critical factors to reasonable variation to test the robustness of the conclusion drawn above. As per the EB guidance on investment analysis, those parameters which contribute at least 20% either in cost or revenue streams should be considered for sensitivity analysis. These factors shall be subjected to a variation of ±10% from the base values.

Following factors have been considered critical and shall be used for sensitivity analysis.

1. Project Cost
2. Plant Load Factor i.e. power generation
3. O&M cost
4. Tariff for power sold to grid

In the table below sensitivity of project IRR with changes in these factors has been demonstrated

Sensitivity Analysis		
PLF	10%	10.58%
	-10%	6.47%
Project cost	10%	7.25%
	-10%	10.22%
O&M cost	10%	8.18%
	-10%	9.01%
Tariff	10%	10.58%
	-10%	6.47%

Project Cost:
10% decrease in project cost is not plausible scenario, as Purchase orders have been placed. Purchase order cost is less than 4.75% of proposal cost.
Plant Load Factor
PLF considered for financial analysis has been sourced from third party PLF assessment report. PLF report is prepared by wind resource expert and hence it is unlike scenario of increase in PLF moreover. Increase in PLF of 10% does not result in meeting benchmark value.
O&M cost:
O&M cost decrease by 10% is not plausible scenario. Considering the price hike of materials and man power decrease in O&M rate is not realistic option.

Tariff:

MERC tariff order dated 30/03/2012 was available during decision making time, INR 5.67 per kWh, recommended by MERC order dated 30/03/2012. But the WTGs of the project activity were commissioned in 2014 MERC issued another tariff order dated 22/03/2013 for the WTGs to be commissioned during the year 2013-14 and as per this order the new tariff @ INR 5.81 per kWh becomes applicable to the project activity and the PP has executed Power Purchase Agreement with Maharashtra State Electricity Corporation Limited with tariff rate INR 5.81 per KWh. Further PPA is executed with MSEDCL for 13 years; from 14th year PP has option to sell power to third party. As referred from crisil report[21], merchant power tariff would decline in future. Considering Project Participant prior experience in their group company wind power project and execution of PPA with third party in the State of Maharashtra, tariff of Rs. 4.05/Kwh is considered after 13th year and the same has been presented in Memorandum of Information presented to board. It should be noted that even with 10% increase in tariff from base value INR 5.67/KWh from first year to 13th year and INR 4.05 Rs/KWh from 14th year to 20th year, tariff works out to be INR 6.24/kWh and INR 4.46/kWh respectively, which is higher than the tariff, PP had executed with MSEDCL, IRR of the project works out to be 10.59% which is less than benchmark of 12.50%. Therefore, it can be concluded that even with new tariff the project activity will not be financially viable without CDM revenue.

[21] Report submitted to the DOE

As evident from above analysis, even in optimistic scenario, project IRR does not cross the benchmark value.

IRR touches the benchmark at

Parameter	Change in factor at which IRR touches the benchmark	Benchmark
PLF Change	20.5%	12.50%
O&M	-114%	
Project Cost	-21.50%	
Tariff rate	20.50%	

Increase in PLF of 20.50% means 22.298% PLF at which IRR touches the benchmark. As explained above PLF considered for financial analysis has been sourced from PLF assessment report provided by third party SR Energy consultants. Hence increase in PLF of 20.5% is not plausible option. O&M decrease by 114% means -1.8 Million INR for 5 WTGs which is not possible scenario. Decrease in project cost by -21.5% means is not plausible scenario, as purchase order has been placed already placed. Increase in tariff rate of 20.50% means 6.83 Rs/kWh for first 13 years and 4.88 Rs./kWh from 14th year to 20th year ,which is not practical for the reasons mentioned in Sensitivity analysis in tariff

Hence, it can be concluded that the project activity is additional. As the project activity is additional it is concluded that the project activity reduces the anthropogenic emissions of GHGs by sources below those that would have occurred in the absence of the small-scale CDM project activity.

B.6. Emission reductions

B.6.1. Explanation of methodological choices

Baseline emissions:

As per AMS I.D., Version 17, Paragraph 10, the baseline scenario is that the electricity delivered to the grid by the project activity would have otherwise been generated by the operation of grid connected power plants and by the addition of new generation sources into the grid.

Also, As per AMS I.D., Version 17, Paragraph 11, The baseline emissions are the product of electrical energy baseline $EG_{BL,y}$ expressed in MWh of electricity produced by the renewable generating unit multiplied by the grid emission factor.

$BE_y = EG_{BL,y} \times EF_{CO2,grid,y}$ (equation (1) of section B.4)

Calculation of the grid emissions factor:

The emission factor is calculated as per the paragraph 12 (a) as a conservative estimate of 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' Version 04.0. The calculations of operating margin and build margin have been carried out in section B.4 above and the calculated values are as follows:

$EF_{grid,OM,y} = 0.9723\ tCO_2/MWh$ (equation (2) of section B.4)
$EF_{grid,BM,y} = 0.9164\ tCO_2/MWh$ (equation (4) of section B.4)

As per Step 6 of "Tool to calculate the emission factor for an electricity system, version 04.0, the combined margin emission factor should be calculated on preference as the weighted average of the Operating Margin emission factor and the Build Margin emission factor as follows:

$EF_{grid,CM,y}$ = $EF_{grid,OM,y} \times w_{OM} + EF_{grid,BM,y} \times w_{BM}$ (equation (6) of section B.4)

For wind and solar projects, the default weights are as follows: $w_{OM} = 0.75$ and $w_{BM} = 0.25$.

The combined margin emission factor is calculated as,

$EF_{grid,CM,y} = 0.9723 * 0.75 + 0.9164 * 0.25 = 0.9582\ tCO_2/MWh$

Thus, the CM emissions factor ($EF_{grid,CM,y}$) for the project activity becomes
$EF_{grid,CM,y} = 0.9582\ tCO_2/MWh$

It is fixed ex-ante for the entire crediting period.

Net electricity supplied to the grid ($EG_{BL,y}$) is calculated as follows:

$EG_{BL,y} = EG_{export,y} - EG_{import,y}$ .....(9)

Where
$EG_{export,y}$ = Electricity exported to the grid by the project activity in year y (MWh)
$EG_{import,y}$ = Electricity imported by the project activity from the grid in year y (MWh)

The net electricity supplied to the NEWNE grid will displace an equivalent amount of electricity that would be generated by the NEWNE grid mix. Without the project activity, the same energy load would have been taken up by power plants of the project electricity system and equivalent CO_2 emissions would have been occurred due to combustion of fossil fuels. The net electricity supplied to the grid is considered for estimation of emission reductions.

Project emissions:
As per Paragraph 20 of the methodology, Project Emissions are to be considered only in case of geothermal power plants and from water reservoirs of hydro power projects. In the project activity there is no emissions resulting due to the project. Since present project is wind power project and not hydro or geothermal based Hence, Project Emission (PEy) = 0

Leakage:
As per the AMS I.D., if the energy generating equipment is transferred from another activity, leakage is to be considered. No equipment transfer of any type is taking place in the project activity, hence the leakage is considered as zero, $LE_y = 0$.

Emission Reductions:
The emission reductions, ER_y, due to project activity in year y are estimated as follows:

$ER_y = BE_y - PE_y - LE_y$ ….(10)

Where
ER_y = Emission reductions in year *y* (t CO_2e)
BE_y = Baseline Emissions in year *y* (t CO_2e)
PE_y = Project emissions in year *y* (t CO_2)
LE_y = Leakage emissions in year *y* (t CO_2)

In case of the project activity, $PE_y = 0$ & $LE_y = 0$, therefore,

$ER_y = BE_y$ ….(11)

B.6.2. Data and parameters fixed ex ante

Data / Parameter	**$EF_{grid,OM,y}$**
Unit	tCO_2/MWh
Description	Operating margin CO_2 emission factor for NEWNE grid in the year y
Source of data	"Baseline Carbon Dioxide Emission Database[22] Version 8.0" published by the Central Electricity Authority, Ministry of Power, Government of India.
Value(s) applied	0.9723 tCO_2/MWh
Choice of data or Measurement methods and procedures	Calculated using "Tool to calculate the emission factor for an electricity system, version 04.0 " as 3-year generation-weighted average of latest three years, 2009-2010, 2010-2011 and 2011-12 data obtained from "CO_2 Baseline Database for Indian Power Sector" version 8.0, published by the Central Electricity Authority, Ministry of Power, Government of India.
Purpose of data	Calculation of baseline emissions
Additional comment	Computed once during PDD finalization (ex-ante).

Data / Parameter	**$EF_{grid,BM,y}$**
Unit	tCO_2/MWh
Description	Build margin CO_2 emission factor for NEWNE grid in the year y
Source of data	"Baseline Carbon Dioxide Emission Database Version 8.0" published by the Central Electricity Authority, Ministry of Power, Government of India.
Value(s) applied	0.9164 tCO_2/MWh for the year 2011-12.
Choice of data or Measurement methods and procedures	Calculated using "Tool to calculate the emission factor for an electricity system, version 04.0".
Purpose of data	Calculation of baseline emissions
Additional comment	Computed once during PDD finalization (ex-ante).

Data / Parameter	$EF_{grid,CM,y}$
Unit	tCO_2/MWh
Description	Combined margin CO_2 emission factor for NEWNE grid in the year y
Source of data	Calculated weighted average combined margin using equation – $EF_{grid,CM,y} = EF_{grid,OM,y} \times w_{OM} + EF_{grid,BM,y} \times w_{BM}$ The default values for w_{OM} and w_{BM} are taken as applicable to wind power generation project activities as $w_{OM} = 0.75$ and $w_{BM} = 0.25$. Reference: Page 24 of "Tool to calculate the emission factor for an electricity system", Version 04.0[23].
Value(s) applied	0.9582 tCO_2/MWh

[22] http://www.cea.nic.in/reports/planning/cdm_co2/cdm_co2.htm version 8.0

[23] https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-07-v4.0.pdf/history_view

Choice of data or Measurement methods and procedures	Calculated ex ante as per "Tool to calculate the emission factor for an electricity system, ver. 04.0" as follows: $EF_{grid,CM,y} = 0.75x\ EF_{grid,OM,y} + 0.25x\ EF_{grid,BM,y}$
Purpose of data	Calculation of baseline emissions
Additional comment	Computed once during PDD finalization (ex-ante).

B.6.3. Ex ante calculation of emission reductions

Estimation of net electricity generation and emission reductions:

Installed capacity = 10.5 MW
Estimated PLF = 18.5 %
Operating hours in a year = 24 x 365 = 8,760 hours

Estimated Annual Electricity Generation (MWh)
= Installed Capacity (MW) x Operating Hours (h) x PLF (%)
= 10.50 x 8760 x 18.50 %
= 17,016 MWh

Assumption: Electricity imported = 0

Net Electricity Supplied to the NEWNE grid per year ($EG_{PJ,y}$)
= Electricity Generated – Electricity Imported
= 17,016 – 0 = 17,016 MWh

NEWNE grid emission factor ($EF_{grid,CM,y}$) = 0.9582 tCO_2 / MWh

Baseline emissions (BE_y) = $EG_{PJ,y}$ x $EF_{grid,CM,y}$ = 17,016 x 0.9582 = 16,305 tCO_2

As per equation (11) of section B.6.1: $ER_y = BE_y$

Therefore, annual emission reductions in NEWNE grid (ER_y) = BE_y = 16,305 tCO_2
However, as per section B.6.4 average annual emission reductions are
(ER_y) = BE_y = 16,223 tCO_2

B.6.4. Summary of ex ante estimates of emission reductions

Year	Baseline emissions (t CO_2e)	Project emissions (t CO_2e)	Leakage (t CO_2e)	Emission reductions (t CO_2e)
Year 1	16,305	0	0	16,305
Year 2	16,305	0	0	16,305
Year 3	16,305	0	0	16,305
Year 4	16,305	0	0	16,305
Year 5	16,305	0	0	16,305
Year 6	16,305	0	0	16,305
Year 7	16,305	0	0	16,305
Year 8	16,305	0	0	16,305
Year 9	16,305	0	0	16,305

Year 10	15,489[24]	0	0	15,489
Total	162,234	0	0	162,234
Total number of crediting years	10 years			
Annual average over the crediting period	16,223	0	0	16,223

B.7. Monitoring plan

B.7.1. Data and parameters to be monitored

Data / Parameter	$EG_{export, y}$
Unit	MWh (Mega-watt hour)
Description	Electricity exported to the grid by the project activity in year y (MWh)
Source of data	Joint Meter Reading Report (JMR)
Value(s) applied	17,016
Measurement methods and procedures	The main meter installed at the metering point is dedicated meter for Project Participant 5 WTGs together will measure the export of electricity on continuous basis. Main meter reading will be taken and verified, once in a month, jointly by the representatives of MSEDCL and the authorized representative of the contractor (Suzlon Energy Limited). Joint Meter Reading Report (JMR) is developed by MSEDCL. JMR contains data on export, import and net electricity supplied.
Monitoring frequency	Continuous monitoring, hourly measurement and monthly recording
QA/QC procedures	Energy meters class: 0.2 s Calibration Frequency: Once in a year. The data may be cross-checked with the invoices raised for sale of the electricity.
Purpose of data	Calculation of baseline emissions
Additional comment	Data shall be archived for the entire crediting period + 2 years

Data / Parameter	$EG_{import, y}$
Unit	MWh (Mega-watt hour)
Description	Electricity imported by the project activity from the grid in year y (MWh)
Source of data	Joint Meter Reading Report (JMR)
Value(s) applied	0
Measurement methods and procedures	The main meter installed at the common metering point is dedicated meter for Project Participant 5 WTGs together will measure the import of the electricity. Main meter readings will be taken and verified, once in a month, jointly by the representatives of MSEDCL and the authorized representative of the contractor (Suzlon Energy Limited). Joint Meter Reading Report (JMR) is developed by MSEDCL JMR contains data on export, import and net electricity supplied.
Monitoring frequency	Continuous monitoring, hourly measurement and monthly recording
QA/QC procedures	Energy meters class: 0.2 s Calibration Frequency: Once in a year. The data may be cross-checked with the invoices raised for sale of the electricity.
Purpose of data	Calculation of baseline emissions
Additional comment	Data shall be archived for the entire crediting period + 2 years

[24] Deration of 5% is considered from 11th year of operation which is in accordance with the Memorandum of information presented to board during board meeting on 26/12/2012. Please refer ER Excel sheet for calculation.

Data / Parameter	$EG_{BL, y}$
Unit	MWh (Mega-watt hour)
Description	Net electricity supplied to the grid by the project activity in year y
Source of data	Joint Meter Reading Report (JMR)
Value(s) applied	17,016
Measurement methods and procedures	Net electricity supplied to the grid will be calculated as $EG_{BL, y} = EG_{export, y} – EG_{import, y}$ Joint Meter Reading Report (JMR) is developed by MSEDCL for all connected WTGs after calculating net electricity supplied to the grid as per above mentioned formula. JMR contains data on export, import and net electricity supplied.
Monitoring frequency	Calculated value
QA/QC procedures	The data may be cross-checked with the invoices raised for sale of the electricity.
Purpose of data	Calculation of baseline emissions
Additional comment	Data shall be archived for the entire crediting period + 2 years

B.7.2. Sampling plan

No Sampling approach is required to determine data and parameters required for monitoring.

B.7.3. Other elements of monitoring plan

Monitoring of emission reductions will be carried out as per the baseline and monitoring methodology for the project activity i.e. AMS I.D. version 17, which requires monitoring of the following:

- Quantity of net electricity supplied to the grid from the project activity; and
- CO_2 emission factor of the grid electricity

The Project Participant selected *ex-ante* determination of the baseline hence the monitoring of operating margin emission factor and build margin emission factor are not required. Further, wind energy based electricity generation is not associated with any kind of leakages. Hence, the sole parameter for monitoring is the net electricity supplied to the grid by the project activity.
The general conditions set out for metering, recording, meter readings, meter inspections, test & checking and communication shall be as per the Power Purchase Agreement executed by the Project Participant with the state electricity utility, MSEDCL.

The Project Participant has undertaken maintenance and services agreement with Suzlon Energy Limited, the contractor. The performance of the WTGs, safety in operation and scheduled / breakdown maintenances are organized and monitored by the contractor. Hence the authority and responsibility of project management lies with the contractor.

Monitoring Plan:

Metering arrangement:
Measuring and metering arrangement has been done as per Wind Energy Purchase Agreement (WEPA) signed by the Project Participant with MSEDCL. The main meter and check meter installed at the Pacchapur feeder are connected with PP's 5 WTGs at the site. The main meter's readings are taken monthly by the representatives of MSEDCL and the Contractor (Suzlon Energy Limited). The project activity has the following metering systems:

Feeder	Connected WTGs of the project activity
Jath	JTH292, JTH293, JTH294, JTH247, JTH300

Main and Check meters:
The main and check meters are installed at Pacchapur feeder to record net electricity data are dedicated meters for project particpant's 5 WTGs of Mahalaxmi commercial services private limited. Hence there is no sampling approach required for monitoring net electricity generation supplied to grid.

Controller:
The controller installed on each WTG records gross generation of the electricity by that WTG. The controller is a micro- processor based intelligent device which has been specifically designed to control the wind turbines, where control functions, data collection and storage, real time monitoring, storage and other functions are integrated. The controller has three current inputs from CT and three voltage inputs from PT. The analogue values of the current/ voltage are converted into digital signal internally using A/D converters at very high sampling rate. A software program reads these values and displays instantaneous values of parameters such as voltage, current, frequency, power factor, kVA, kVAr and kWh. The instantaneous values are then time integrated displayed and stored. Woodward relay does not have a display and needs special protocol to view energy readings as this relay communicate digital signal through special communication protocol, hence it is not possible to calibrate. In case of any problem related to the controller, the WTG will automatically get shut down and the controller will be replaced by a new controller immediately.

Monitoring of electricity generation at the WTGs:
Power generated by the WTGs is monitored continuously and measured hourly at the Central Monitoring Station (CMS) of the technology supplier-Suzlon. The controller/CMS records the electricity generation daily at end of the day 00.00 hrs. This generation is then uploaded on the portal of the Project Participant, which remains there for three years. All WTGs are connected to the CMS located at the project site from where every connected WTG is accessible. In case of any connectivity issue, manual reading at the controller of the WTG is done. Monthly data are compiled and stored electronically.

Monitoring of electricity supplied to the grid by the WTGs:
The electricity supplied to the grid by the WTGs connected to each main / check meter is recorded monthly. The main/ check meter reading is taken and certified jointly by the representatives of MSEDCL and the contractor (Suzlon Energy Limited). The main meter readings are noted by the authorities of the state utility and sent to its office. Individual statements are generated by the office presented to the Project Participant in form of Joint Meter Reading Report (JMR). The Project Participant generates the invoice as per JMR for the electricity sold. The main meter readings as mentioned in the joint meter reading report shall form the basis of estimation of emission reductions in the project activity.

The main meter readings can be cross-checked with the invoices raised.

Procedure for apportioning of electricity supplied to the grid where dates of monitoring period are not matching with dates of joint meter reading reports:
There are instances when the claim of emission reductions will be in middle of any month and apportioning will have to be done to arrive at electricity supplied reading for that certain period. The following apportioning procedure will be followed, if the crediting period date of the project activity falls in between the meter reading cycles:

The apportioning will be done as follows: The ratio of Electricity generated at controller of project activity WTGs for particular days of billing cycle to the electricity generated at controller of project activity WTGs for all days of billing cycle is obtained and this ratio will multiply to net electricity export by project activity for that particular billing cycle

The daily electricity generated at controller / CMS is measured by the contractor and sent to the project participant. In case of any problem related to the controller, the WTG will automatically get shut down and the controller will be replaced by a new controller immediately. Any change happening in controller will be reported in the concerned monitoring report during verification. Data will be used for deriving a ratio for apportioning.

Example: Let us assume,
X = Sum of the net electricity generation at controller of the WTG(s) of the project activity during the partial period of the corresponding period of main meter reading (kWh)

Y = Sum of the net electricity generation at controller of the WTG(s) of the project activity during the corresponding full period of main meter reading (kWh)

Therefore, ratio of the net electricity generation during the partial period (Z) = X/Y

If G = Net electricity supplied by the WTG(s) of the project activity to the grid during the corresponding full period of main meter reading as per credit notes (kWh).

Then net electricity supplied by the WTG(s) of the project activity to the grid during the partial period (for calculating emission reduction for partial period) = G*Z.

Troubleshooting Contingency Plan:
If electricity readings at the main meter in any month differs from the readings of the check meter by more than ± 0.2 s both the meters shall be tested. If on such testing the main meter error is found to exceed the permissible limit but check meter reading error found within the limit, the check meter reading will be used in calculating the electricity supplied. If error in both main and check meters are found beyond permissible limits, the main and the check meters shall be immediately repaired and recalibrated and correction will be applied, as agreed between the parties, to the monthly main meter readings to arrive at the correct energy for billing purpose for the period of the month up to the time of such test repair and recalibration. The correction factor means the percentage of error between standard check meter and main meter. The meters will be used only after calibration.

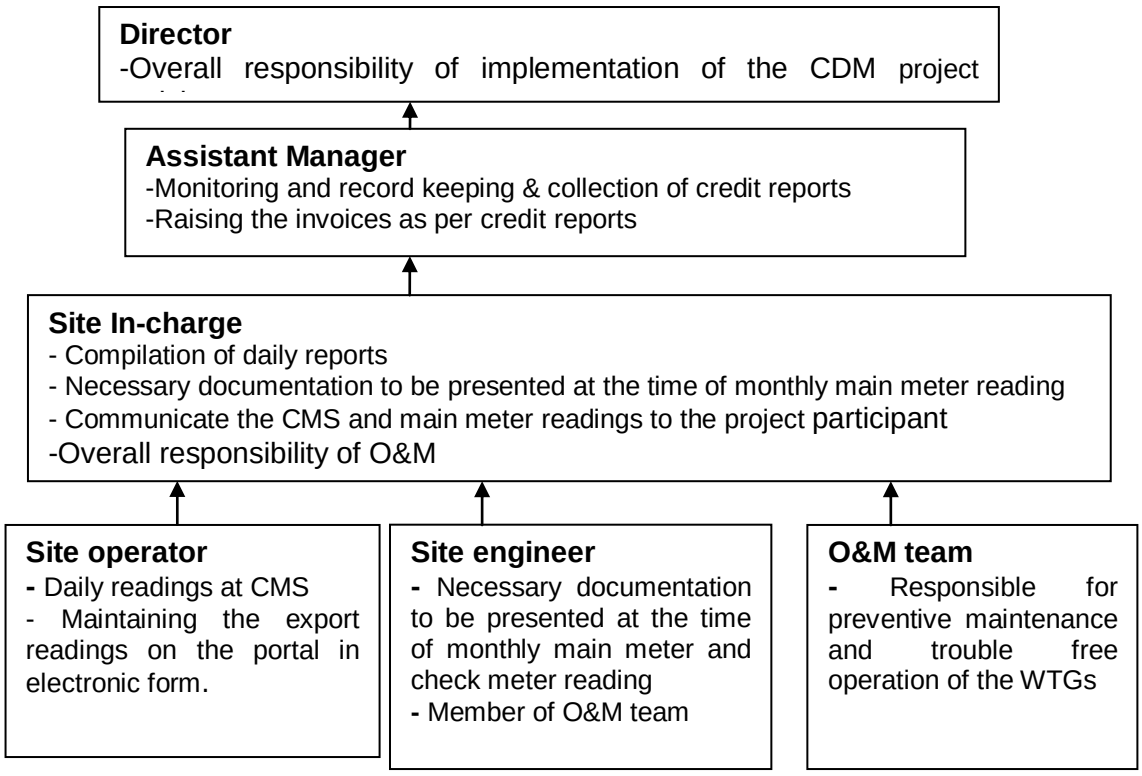
QA/QC procedures:
The energy main/ check meter installed at the project site is having the accuracy class of 0.2 s. The main/ check meter shall be jointly inspected and sealed by the utility and shall not be interfered by either utility or Project Participant except in the presence of the accredited representatives of both utility and Suzlon Energy Limited. The meters are calibrated by the state electricity utility once in a year. The meter accuracy class and calibration frequency is under jurisdiction of state electricity board and PP does not have any control on it. Thus there may change in accuracy class or calibration frequency of meters in future.

Data archiving:

Monthly data shall be archived and stored for the entire crediting period plus two years.

Training
The monitoring personnel will be trained for performing daily operation and maintenance aspects of the wind farm. The training and maintenance will ensure preventive maintenance and operation control of the wind farm.

Operational and Organisation Structure of Monitoring



B.7.4. Date of completion of application of methodology and standardized baseline and contact information of responsible persons/ entities

Date of completion of study on application of the selected methodology: 09/11/2013
Contact information of the person/entity responsible for the application of the selected methodology is given below

Mr. Siddesh Kumar Sharma
Director-Marketing and Advertisement
Mahalaxmi Commercial Services Private Limited
Baidyanath Bhawan, Great Nag Road,
Nagpur- 440 009
Maharashtra
Contact number: +91-9823099399
Email : pranavketan@hotmail.com

The person(s)/ entity is also a project participant(s) in the Appendix 1 below.

SECTION C. Duration and crediting period

C.1. Duration of project activity

C.1.1. Start date of project activity

28/12/2012[25]

C.1.2. Expected operational lifetime of project activity

20 years – 0 months

C.2. Crediting period of project activity

C.2.1. Type of crediting period

Fixed

C.2.2. Start date of crediting period

01/03/2015 or date of registration whichever is later.

C.2.3. Length of crediting period

10 years- 0 months

SECTION D. Environmental impacts

D.1. Analysis of environmental impacts

Wind power is one of the cleanest sources of renewable energy, with no associated emissions and waste products. As per the Schedule 1 of notification issued by Ministry of Environment and Forests (MoEF), Government of India on September 14, 2006[26] (Category A), and amendment notification released on December 24 2013 (Category B[27]), Forty-Eight activities are required to undertake environmental impact assessment studies. The proposed project activity does not fall under the list of activities requiring EIA as it will not involve any negative environmental impacts. Thus, no detailed EIA study was conducted.

SECTION E. Local stakeholder consultation

E.1. Solicitation of comments from local stakeholders

The local stakeholders were invited for the meeting on 16/09/2013 through a public notice and personal letters. The meeting was held at Jath site in Sangli district of Maharashtra on 24/09/2013. The local stakeholders' consultation meeting was attended by around 40 people including local villagers, Sarpanch, employees of Suzlon, representatives of the project participants, etc.

Mr. Prasanna Sutaone and Mr. Vinayak Chalake, representatives of Suzlon, delivered a short speech on global warming, greenhouse gases, Clean Development Mechanism and wind power project to the local stakeholders. Later a brief session on question and answer was held in which the local villagers raised their queries regarding the project activity and answered by the representatives of Suzlon/ project owners in local language. In the end, the stakeholders were requested to make their comments (if any) regarding the project activity. No comment was received from any stakeholder.

[25] Purchase order of WTGs provided for documentary evidence of start date.

[26] http://envfor.nic.in/legis/eia/so1533.pdf

[27] http://envfor.nic.in/sites/default/files/ia-24122013.pdf

The minutes of the meetings were written

E.2. Summary of comments received

No comment was received from any local stakeholder.

The local stakeholders appreciated the project activity as it generates environment friendly electricity and conserves the very scarce natural resources, and also provides the employment opportunities to the local people

E.3. Report on consideration of comments received

The local stakeholders present in the meetings supported the project activity. No adverse comment was received in any of the stakeholders' consultation meeting. Hence no account of comments was taken and no need to modify the project activity was felt.

SECTION F. Approval and authorization

Host Country Approval has been accorded to the project titled Wind Power Project in Maharashtra State, India is received from Government of India, Ministry of Environment and Forests. The same has been communicated to Project Participant via letter no No: 4/17/2014 –CCC dated 25/04/2014.

Appendix 1. Contact information of project participants and responsible persons/ entities

Project participant and/or responsible person/ entity	☒ Project participant ☒ Responsible person/ entity for application of the selected methodology (ies) and, where applicable, the selected standardized baselines to the project activity
Organization name	Mahalaxmi Commercial Services Private Limited
Street/P.O. Box	Baidyanath Bhawan, Great Nag Road,
Building	-
City	Nagpur
State/Region	Maharashtra
Postcode	440 009
Country	India
Telephone	+91 712 6644920, +91-22-6644949
Fax	+91 712 2743453
E-mail	pranavketan@hotmail.com
Website	-
Contact person	-
Title	Director
Salutation	Mr.
Last name	Sharma
Middle name	Kumar
First name	Siddesh
Department	Marketing and Advertisement
Mobile	+91-9823099399
Direct fax	+91 712 2743453
Direct tel.	91 712 6644920, +91-22-6644949
Personal e-mail	pranavketan@hotmail.com

Appendix 2. Affirmation regarding public funding

- No Public Funding from Annex-I countries for the project activity.
- No Official Development Assistance (ODA) funding for the project activity.

Appendix 3. Applicability of methodology and standardized baseline

Please refer section B.2. of the PDD

Appendix 4. Further background information on ex ante calculation of emission reductions

Please refer Section B.6.3 of the PDD

Appendix 5. Further background information on monitoring plan

Monitoring plan is provided in section B.7.3 of the PDD.

Appendix 6. Summary of post registration changes

Not Applicable

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Document information

Version	*Date*	*Description*
05.0	25 June 2014	Revisions to: • Include the Attachment: Instructions for filling out the project design document form for small-scale CDM project activities (these instructions supersede the "Guidelines for completing the project design document form for small-scale CDM project activities" (Version 01.1)); • Include provisions related to standardized baselines; • Add contact information on a responsible person(s)/ entity(ies) for the application of the methodology (ies) to the project activity in B.7.4 and Appendix 1; • Change the reference number from *F-CDM-SSC-PDD* to *CDM-PDD-SSC-FORM*; • Editorial improvement.
04.1	11 April 2012	Editorial revision to change history box by adding EB meeting and annex numbers in the Date column.
04.0	13 March 2012	EB 66, Annex 9 Revision required to ensure consistency with the “Guidelines for completing the project design document form for small-scale CDM project activities”
03.0	15 December 2006	EB 28, Annex 34 • The Board agreed to revise the CDM project design document for small-scale activities (CDM-SSC-PDD), taking into account CDM-PDD and CDM-NM.
02.0	08 July 2005	EB 20, Annex 14 • The Board agreed to revise the CDM SSC PDD to reflect guidance and clarifications provided by the Board since version 01 of this document. • As a consequence, the guidelines for completing CDM SSC PDD have been revised accordingly to version 2. The latest version can be found at <http://cdm.unfccc.int/Reference/Documents>.
01.0	21 January 2003	EB 07, Annex 05 Initial adoption.

Decision Class: Regulatory
Document Type: Form
Business Function: Registration
Keywords: project design document, SSC project activities