



**CLEAN DEVELOPMENT MECHANISM
PROJECT DESIGN DOCUMENT FORM (CDM-PDD)
Version 03 - in effect as of: 28 July 2006**

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**SECTION A. General description of project activity.****A.1. Title of the project activity:**

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Sinner wind power project in Maharashtra.

Version number: 01

Date: 05/04/12

A.2. Description of the project activity:

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Bindu Vayu Urja Private Limited is setting up a 29.4 MW Wind Power Plant in Sinner, in the state of Maharashtra in India. The project would be using 14 Wind Turbine Generators of Suzlon (Model no: S95_80) each with capacity of 2.1 MW. The project would be generating around 44,220 MWh of electricity per annum. The electricity would be exported to the Maharashtra State Electricity Distribution Company Limited. The clean electricity generated from the project would aid in sustainable development of that region. It would also help in reducing green house gas emissions by generating clean and green electricity.

In absence of this project an equivalent amount of electricity would be consumed from the grid which is dominated by thermal based power plants.

Contribution towards Sustainable Development

Ministry of Environment and Forests, Govt. of India has specified the social well being, economic well being, environmental well being and technological well being as the four indicators for sustainable development in host country approval eligibility criteria for Clean Development Mechanism (CDM) projects.

Social Well Being

The project activity will generate many direct and indirect employment opportunities. During construction period, the skilled and unskilled labourers will be required. The operation of this plant also creates new employment opportunities for the region. It will increase income security of vulnerable sections of the rural communities in the vicinity of the project site through redistribution of benefits on account of the new direct and indirect employment opportunities associated with the project. The project activity will indirectly help in infrastructure development in the neighbouring villages like better roads, telecommunication etc.

BVUPL will use at a minimum, 2% of the revenues accrued from the sale of Certified Emission Reductions (CERs) on an annual basis for community related activities. These may include providing assistance for development of public amenities in the surrounding areas such as water distribution/sanitation facilities/building of School and Hospital/ free distribution of educational books and school uniforms/annual eye camps/health check up centres for villagers etc. However the exact activity would be discussed with Village Panchayat and would subsequently be finalized.

If the activity undertaken involves capital expenditure exceeding the minimum requirement of 2%, the additional expenditure made would be set off against the requirements for the subsequent years. Such expenditure would be made within one year after the realization of revenues from the sale of the CERs.

**Environmental Well Being**

The electricity generated by the project activity will be supplied to NEWNE grid, which otherwise would have been generated by fossil fuel fired power plants in the grid. The project activity will help in reduction of the greenhouse gas emissions and air pollutants (especially NO_x and SO₂).

The project activity also helps in conservation of depleting fossil fuels such as coal, oil, natural gas which at present are predominantly used for power generation. The project activity being wind power project will have minimum environmental impact.

Economic Well Being

The construction of the windpower project will create employment opportunities and may create opportunities for the allied sectors that supply services to the local population that is expected to increase once the project is operational. This will eventually raise the economic standards of the people residing near the project activity.

Technological Well Being

The project activity will be making use of the reliable and proven technology available locally to ensure that only an environmentally safe technology is being implemented in the proposed project activity.

There would be no transfer of technology taking place.

A.3. Project participants:

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Name of Party involved (*) (host) indicates a Host Party)	Private and/or public entity(ies) project participants (*) (as applicable)	Kindly indicate if the Party involved wishes to be considered as project participant (Yes/No)
Government of India (host)	Bindu Vayu Urja Private Limited (BVUPL) (Private entity)	No

**A.4. Technical description of the project activity:****A.4.1. Location of the project activity:**

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A.4.1.1. Host Party(ies):

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India

A.4.1.2. Region/State/Province etc.:

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Maharashtra.

A.4.1.3. City/Town/Community etc.:

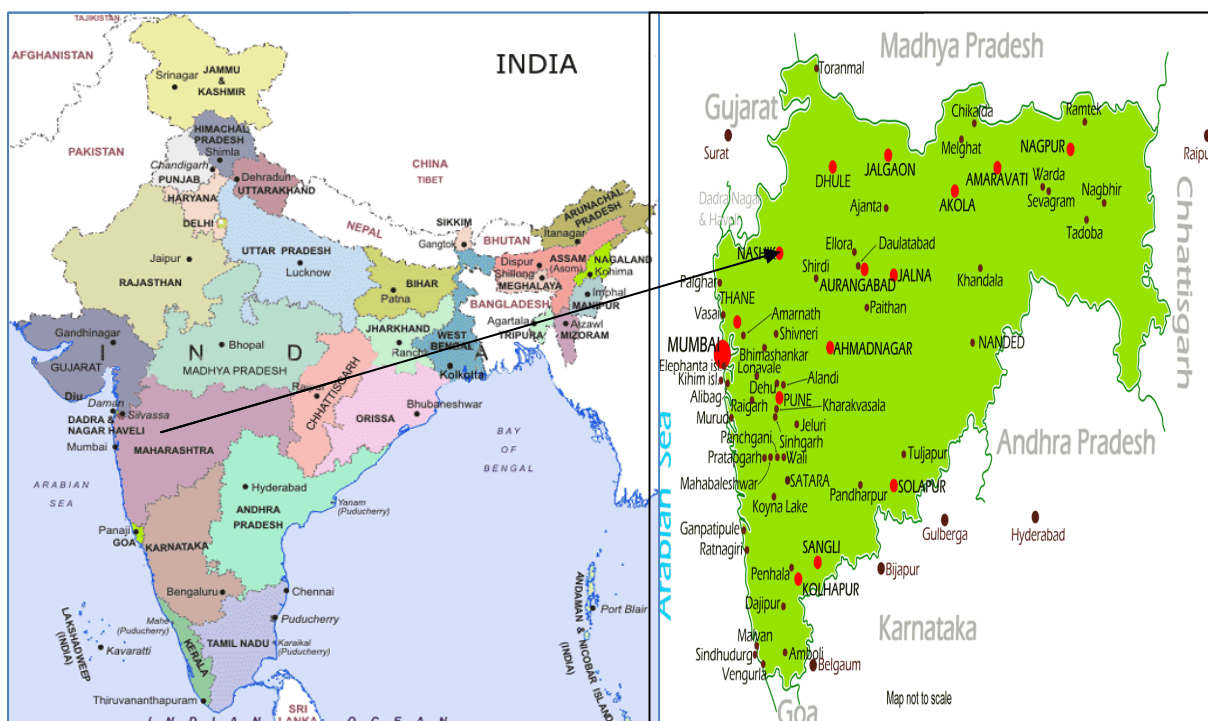
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Sinner, Maharashtra

A.4.1.4. Details of physical location, including information allowing the unique identification of this project activity (maximum one page):

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The project is located in Sinner village in Nashik district, in the state of Maharashtra in India





The project consists of 14 WTGs of 2.1 MW each. The latitude and longitude of each WTG is given below:

Sl.No	WTG-No	State	Longitude	Latitude
1	ADW-06	Maharashtra	19° 42' 47.89"	73° 54' 12.71"
2	ADW-07	Maharashtra	19° 42' 37.7"	73° 54' 27.87"
3	ADW-09	Maharashtra	19° 43' 13.9"	73° 58' 5.2"
4	ADW-10	Maharashtra	19° 43' 25.4"	73° 58' 0.3"
5	ADW-11	Maharashtra	19° 43' 50.5"	73° 58' 20.6"
6	ADW-12	Maharashtra	19° 44' 1.7"	73° 58' 16.1"
7	ADW-28	Maharashtra	19° 43' 31.7"	74° 0' 13.3"
8	ADW-29	Maharashtra	19° 43' 19.7"	74° 0' 18.4"
9	ADW-30	Maharashtra	19° 43' 6.9"	74° 0' 20.9"
10	ADW-39	Maharashtra	19° 43' 36.58"	73° 57' 56.29"
11	S01	Maharashtra	19° 51' 48.62"	73° 55' 45.31"
12	S03	Maharashtra	19° 51' 26.34"	73° 55' 45.94"
13	S04	Maharashtra	19° 51' 37.33"	73° 55' 44.77"
14	S023	Maharashtra	19° 49' 0.8"	73° 55' 16.5"

A.4.2. Category(ies) of project activity:

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The project activity falls under the category described under CDM as “Sectoral Scope Number 1: Energy Industries – Renewable Sources¹

A.4.3. Technology to be employed by the project activity:

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Pre project scenario:

The project is a greenfield project. In absence of the project an equivalent amount of electricity would have been consumed from the NEWNE grid, which is connected to fossil fuel based power plants.

Technology employed in baseline scenario:

In the absence of the project activity, equivalent energy would be generated in power plants connected to the NEWNE Grid of India. Details on grid-connected power plants are given in the CEA CO2 baseline database (Version 7), based on which the combined margin emission factor is determined.

Technology employed in project scenario:

Power generation using wind is achieved by deploying sixteen wind turbine generators (WTGs). Wind power generation is an environmentally safe and sound technology. The WTGs are supplied by Suzlon Energy Limited to the project participant. The components are manufactured in India and assembled at the project site. There is no transfer of technology from outside the host country for this project activity.

¹<http://cdm.unfccc.int/DOE/scopes.html>



The S95- 2.1 MW is best suited to Class IIA medium wind speed sites. Most winds around the world fall in this class.

Technical specifications of the WTGs are detailed below:

OPERATING DATA	
Rated power	2100 kw
Cut-in wind speed	3.5 metre/second
Rated wind speed	11 metre/second
Cut-off wind speed	25 metre/second
Wind class	IEC IIA
ROTOR DATA	
Diameter	95 metre
Swept area	7085 metre ²
GENERATOR	
Type	Asynchronous 3 phase induction generator with slip rings operated with rotor circuit inverter system.
Frequency	50/60 Hz
TOWER	
Type	Tubular steel tower
Tower Height	80m

In the absence of the project activity, equivalent energy would be generated in power plants connected to the NEWNE Grid of India. Details on grid-connected power plants are given in the CEA CO₂ baseline database (Version 7), based on which the combined margin emission factor is determined.

A.4.4. Estimated amount of emission reductions over the chosen crediting period:

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Years	Annual estimation of emission reductions in tonnes of CO ₂ e
2013-2014	42129
2014-2015	42129
2015-2016	42129
2016-2017	42129
2017-2018	42129
2018-2019	42129
2019-2020	42129
2020-2021	42129
2021-2022	42129
2022-2023	42129
Total estimated reductions (tonnes of CO₂ e)	421290
Total number of crediting years	10
Annual average over the crediting period of estimated reductions (tonnes of CO₂ e)	42129

**A.4.5. Public funding of the project activity:**

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No public funding has been availed for this project.

SECTION B. Application of a baseline and monitoring methodology**B.1. Title and reference of the approved baseline and monitoring methodology applied to the project activity:**

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

Reference: Approved consolidated baseline methodology ACM0002 (Version 12.3.0, EB 66)

ACM0002 draws upon the following tools which have been used in the PDD:

- Tool to calculate the emission factor for an electricity system – Version 2.2.1 (EB 63 annex 19)
- Tool for the demonstration and assessment of additionality – Version 6.0.0 (EB 65 annex 21)

Further information with regards to the methodology / tools can be obtained at:

<http://cdm.unfccc.int/methodologies/DB/C505BVV9P8VSNNV3LTK1BP3OR24Y5L>

B.2. Justification of the choice of the methodology and why it is applicable to the project activity:

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The project activity is wind based renewable energy source, zero emission power project connected to the Maharashtra state grid, which forms part of the NEWNE regional electricity grid. The project activity will displace fossil fuel based electricity generation that would have otherwise been provided by the operation and expansion of the fossil fuel based power plants in NEWNE electricity grid. The approved consolidated baseline and monitoring methodology ACM0002 Version 12.3.0 is the choice of the baseline and monitoring methodology and it is applicable because:

Serial number	Applicability condition of ACM0002	Applicability of project
1	This methodology is applicable to grid-connected renewable power generation project activities that (a) install a new power plant at a site where no renewable power plant was operated 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 is grid-connected renewable power generation project activities that install a new power plant at a site where no renewable power plant was operated prior to the implementation of the project activity. Therefore, confirms to the said criteria
2	The project activity is the installation, capacity addition, retrofit or replacement of a power plant/unit of one of the following types: hydro power plant/unit (either with a run-of-river reservoir or an accumulation reservoir), wind power plant/unit, geothermal power plant/unit, solar power plant/unit,	The project activity is grid connected renewable power generation from wind



	wave power plant/unit or tidal power plant/unit;	
3	<p>In the case of capacity additions, retrofits or replacements (except for capacity addition projects for which the electricity generation of the existing power plant(s) or unit(s) is not affected): the existing plant started commercial operation prior to the start of a minimum historical reference period of five years, used for the calculation of baseline emissions and defined in the baseline emission section, and no capacity addition or retrofit of the plant has been undertaken between the start of this minimum historical reference period and the implementation of the project activity;</p>	Not applicable to the project as it is not a capacity addition or retrofit project.
4	<p>In case of hydro power plants:</p> <ul style="list-style-type: none"> • At least one of the following conditions must apply: <ul style="list-style-type: none"> ➤ The project activity is implemented in an existing single or multiple reservoirs, with no change in the volume of any of the reservoirs; or ➤ The project activity is implemented in an existing single or multiple reservoirs, where the volume of any of reservoirs is increased and the power density of each reservoir, as per the definitions given in the Project Emissions section, is greater than 4 W/m² after the implementation of the project activity; or ➤ The project activity results in new single or multiple reservoirs and the power density of each reservoir, as per the definitions given in the Project Emissions section, is greater than 4 W/m² after the implementation of the project activity. <p>In case of hydro power plants using multiple reservoirs where the power density of any of the reservoirs is lower than 4 W/m² after the implementation of the project activity all of the following conditions must apply: The power density calculated for the entire</p>	Not applicable to the project case as the project is not a hydro power project.



	<p>project activity using equation 5 is greater than 4 W/m²;</p> <ul style="list-style-type: none">➤ All reservoirs and hydro power plants are located at the same river and were designed together to function as an integrated project that collectively constitutes the generation capacity of the combined power plant;➤ The water flow between the multiple reservoirs is not used by any other hydropower unit which is not a part of the project activity;➤ The total installed capacity of the power units, which are driven using water from the reservoirs with a power density lower than 4 W/m², is lower than 15 MW;➤ The total installed capacity of the power units, which are driven using water from reservoirs with a power density lower than 4 W/m², is less than 10% of the total installed capacity of the project activity from multiple reservoirs.	
5	<p>The methodology is not applicable to the following:</p> <ul style="list-style-type: none">➤ Project activities that involve switching from fossil fuels to renewable energy sources at the site of the project activity, since in this case the baseline may be the continued use of fossil fuels at the site➤ Biomass fired power plants; <p>A hydro power plant that results in the creation of a new single reservoir or in the increase in an existing single reservoir where the power density of the reservoir is less than 4 W/m²</p>	<p>The project is a wind power project hence the applicability of the methodology is not affected.</p>
6	<p>In the case of retrofits, replacements, or capacity additions, this methodology is only applicable if the most plausible baseline scenario, as a result of the identification of</p>	<p>This is not applicable to the project as this is not a retrofit project.</p>



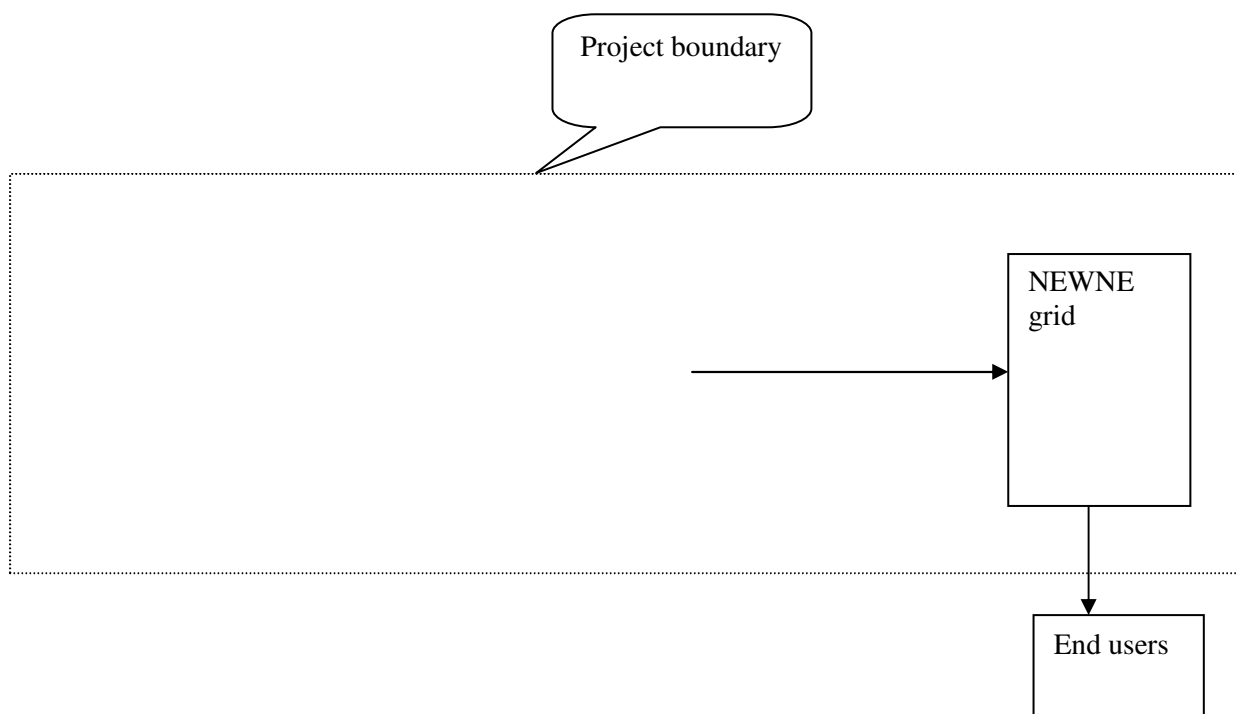
	baseline scenario, is the continuation of the current situation, i.e. to use the power generation equipment that was already in use prior to the implementation of the project activity and undertaking business as usual maintenance. In addition, the applicability conditions included in the tools referred to above apply.	
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B.3. Description of the sources and gases included in the project boundary:

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According to the applicable methodology, spatial extent of this project activity includes the project site and all the power plants connected physically to the electricity system that the CDM power project is connected to. The project activity is connected to the network of state transmission utility which falls in NEWNE grid. Thus the project boundary includes all the power plants physically connected to the NEWNE grid.

Schematic of the Project Boundary is given below:



The baseline study of southern grid shows that the main sources of GHG emissions in the baseline are CO₂ emissions from the conventional power generating systems, the other emissions are that of CH₄ and N₂O but both emissions were conservative and are excluded for simplification of the project. The project activity is the emission free electricity generation from renewable sources and hence emits no gases in the atmosphere.



Following table indicates the sources and gases included in the project boundary:

Following table indicates the sources and gases included in the project boundary:Source		Gas	Included?	Justification / Explanation
Baseline	Grid connected electricity generation	CO ₂	Yes	In the baseline scenario the electricity would have been sourced from the NEWNE grid which in turn would be connected to fossil fuel fired power plants which emit CO ₂ . Main emission source
		CH ₄	No	No methane generation is expected to be emitted.
		N ₂ O	No	No nitrous oxide generation is expected to be emitted. Minor emission source
Project activity	Greenfield wind energy conversion System	CO ₂	Yes	The project activity does not emit any emissions.
		CH ₄	No	No methane generation is expected to be emitted.
		N ₂ O	No	No nitrous oxide generation is expected to be emitted.



B.4. Description of how the baseline scenario is identified and description of the identified baseline scenario:

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According to the applied methodology ACM0002, if the project activity is the installation of a new grid-connected renewable power plant/ unit, the baseline scenario is the following:

“Electricity delivered to the grid by the project would have otherwise been generated by the operation of Grid-connected power plants and by the addition of new generation sources, as reflected in the combined margin (CM) calculations described in the “Tool to calculate the emission factor for an electricity system – Version 2.2.1”.

The proposed project activity is the installation of 14 WEC's of Suzlon's make S95_80 of 2.1 MW each contributing 29.4 MW of power to the NEWNE grid; the project activity is the installation of a new grid connected power plant hence as per the applied methodology the baseline scenario is the emissions generated by the operation of grid-connected power plants and by the addition of new generation sources as reflected in the combined margin (CM) calculations described in Section B.6 of the PDD.

The Indian grid system is defined below:

Electricity Grid (Present)	Electricity Grid (Earlier)	Geographical Areas Covered
NEWNE Grid	Northern	Chandigarh, Delhi, Haryana, Himachal Pradesh, Jammu and Kashmir, Punjab, Rajasthan, Uttar Pradesh, Uttarakhand
	Western	Chhattisgarh, Gujarat, Daman & Diu, Dadar & Nagar Haveli, Madhya Pradesh, Maharashtra, Goa
	Eastern	Bihar, Jharkhand, Orissa, West Bengal, Sikkim, Andaman-Nicobar
	North-Eastern	Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland, Tripura
Southern Grid	Southern	Andhra Pradesh, Karnataka, Kerala, Tamil Nadu, Pondicherry, Lakshadweep

Maharashtra state falls under NEWNE grid.

The installed electricity in India as on 31st August, 2011 is given below.²

²http://www.cea.nic.in/reports/monthly/executive_rep/aug11/8.pdf



SL. NO.	REGION	THERMAL				Nuclear	HYDRO (Renewable)	R.E.S.@ (MNRE)	TOTAL
		COAL	GAS	DSL	TOTAL				
1	Northern	24232.50	4134.76	12.99	28380.25	1620.00	14422.75	3509.56	47932.56
2	Western	33105.50	7903.81	17.48	41026.79	1840.00	7447.50	5937.60	56251.89
3	Southern	20982.50	4690.78	939.32	26612.60	1320.00	11338.03	10128.96	49399.59
4	Eastern	21122.88	190.00	17.20	21330.08	0.00	3882.12	356.42	25568.62
5	N. Eastern	60.00	787.00	142.74	989.74	0.00	1116.00	223.60	2329.34
6	Islands	0.00	0.00	70.02	70.02	0.00	0.00	6.10	76.12
7	All India	99503.38	17706.35	1199.75	118409.48	4780.00	38206.40	20162.24	181558.12

It is evident from the above table that the installed capacity in India is predominantly thermal power plants; thermal power generation is GHG intensive and is a major source of CO₂ emissions. In the absence of the project activity equivalent amount of electricity would have been generated from the existing grid connected power plants and planned capacity additions which are also largely fossil fuel based. Thus generation from the project displaces the electricity generated from existing and planned power plant capacities in the NEWNE grid whose emission intensities are represented by the Combined Margin Emission Factor of the NEWNE Grid. The project activity would reduce 42,034 tCO₂ e annually.

The baseline emissions and emission reductions from the project activity are estimated by multiplying the amount of electricity exported by the project activity to the NEWNE grid with the emission factor of the NEWNE grid calculated as the combined margin (CM) of the operating margin (OM) and build margin (BM) emission factors.

Variable	Data source
EG _{PJ_Add,y}	Records maintained by project proponents
Parameter	Data Source
EF _{Grid, OM, y} = Operating Margin Emission Factor (tCO ₂ /MWh)	CEA Database for CO ₂ emission factor, version 7
EF _{grid, BM, y} = Build Margin Emission Factor (tCO ₂ /MWh)	CEA Database for CO ₂ emission factor, version 7
EF _{Grid,CM, y} – Grid Emission Factor	Calculated as the weighted average of the operating margin and build margin

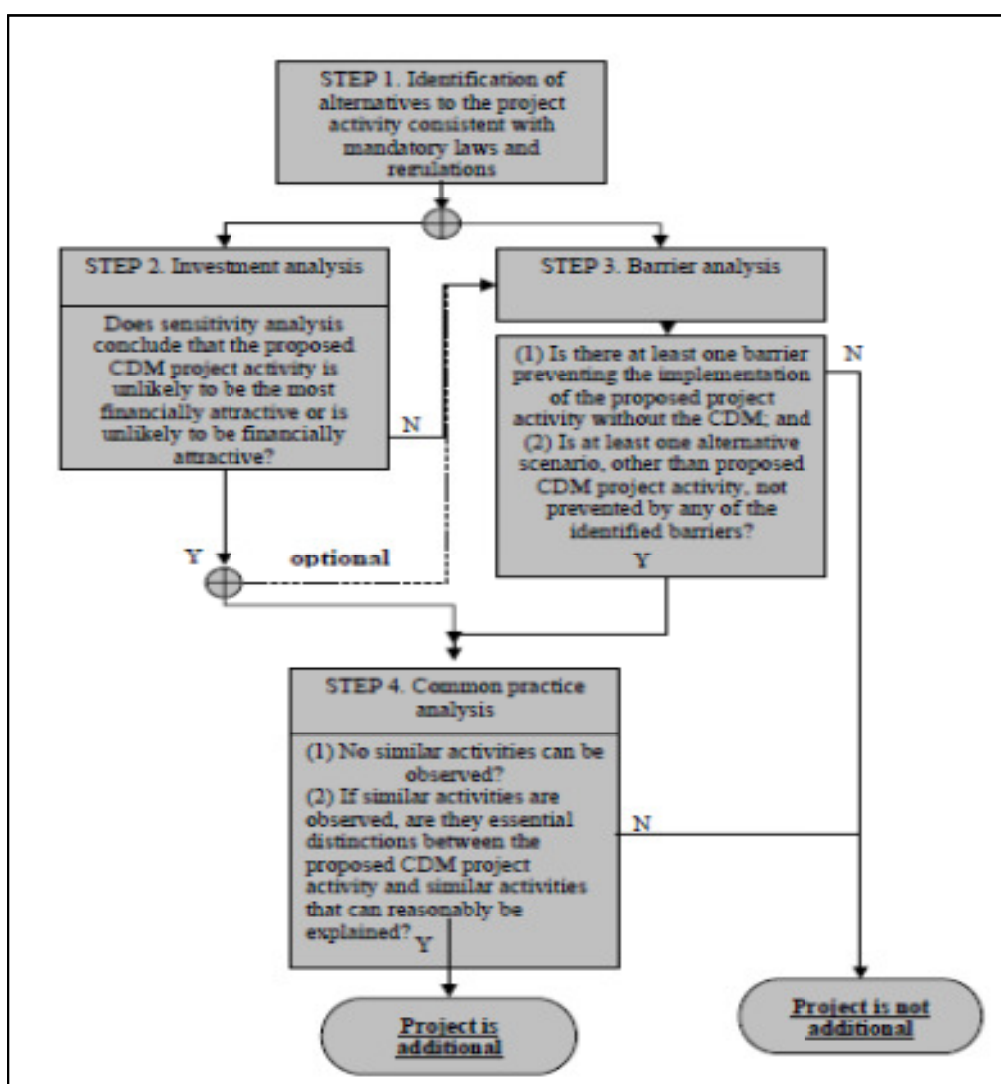


B.5. Description of how the anthropogenic emissions of GHG by sources are reduced below those that would have occurred in the absence of the registered CDM project activity (assessment and demonstration of additionality):

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The project activity is said to be additional if the anthropogenic emissions of GHG by source are reduced below those that would have occurred in the absence of the registered CDM project activity. As per the applied methodology, “*the additionality of the project activity shall be demonstrated and assessed using the latest version of the Tool for the demonstration and assessment of additionality*”.

The steps involved in demonstrating the additionality as per the latest version of the tool (Version 06.0.0 EB65) is as summarized below:



***Step 1: Identification of alternatives to the project activity consistent with current laws and regulations******Sub-step 1a: Define alternatives to the project activity:***

The alternatives available to the proposed project activity are as follows:

- a) The project activity being undertaken without taking in to consideration the CDM
In the absence of CDM, the project activity would have continued to generate electricity from wind and supply the same to the fossil fuel intensive regional grid. This is a realistic and credible alternative available to the project activity. However, without CDM revenues the project activity is not financially viable (explained in detail in step 2).
- b) Project activity being setting up using other renewable energy and/or fossil fuel
Setting up of a fossil fuel based or other renewable energy (hydro, solar etc) based power plant is an alternative available to the project proponent. As per the tool, *“a coal-fired power station or hydropower may not be an alternative for an independent power producer investing in wind energy”*. Therefore, this is not a realistic and credible alternative
- c) Continuation of current scenario i.e., either no project activity or any other alternatives undertaken
The Western Grid faces an energy shortage .Therefore; not having a project activity is not a realistic and credible option. Instead, the grid will continue to receive electricity from thermal power plants.

As per the applied methodology, *“If the project activity is the installation of a new grid-connected renewable power plant/unit, the baseline scenario is the following:*

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, as reflected in the combined margin (CM) calculations described in the .Tool to calculate the emission factor for an electricity system”.

Therefore, apart from continuation of the current scenario, the other alternative is the proposed project activity being undertaken without CDM

Sub-step 1b: Consistency with mandatory laws and regulations:

Undertaking the proposed project activity without CDM as well as the grid being fed with power plants is in compliance with all the laws and regulations.

Step 2: Investment analysis***Sub-step 2a: Determine appropriate analysis method***

In addition to the CDM revenue, the project activity generates revenue from the sale of electricity to the grid. Therefore, Simple Cost analysis is not an appropriate analysis method.



As per the Guidelines on the assessment of investment analysis³, Version 05 EB62 guidance 19 states “*If the proposed baseline scenario leaves the project participant no other choice than to make an investment to supply the same (or substitute) products or services, a benchmark analysis is not appropriate and an investment comparison analysis shall be used. If the alternative to the project activity is the supply of electricity from a grid this is not to be considered an investment and a benchmark approach is considered appropriate*”. The proposed project activity the baseline does not require investment, i.e., the project proponent can choose to invest or not to. Also continuing of current scenario is the supply of electricity from a grid. Therefore, benchmark analysis is the appropriate method.

The equity Internal Rate of Return (Equity IRR) has been chosen as the financial indicator for the investment analysis. While computing the equity IRR, only the portion of investment costs which is financed by equity should be considered as the net cash outflow. This is in conformance with guidance 10 of the Guidelines on the assessment of investment analysis.

Sub-step 2b: Option III. Apply benchmark analysis

As per guidance 12 of Guidelines on the assessment of investment analysis, “*Required/expected returns on equity are appropriate benchmarks for equity IRR*”. Therefore, the project proponent has chosen Cost of Equity as the benchmark to compare the equity IRR.

As per guidance 15 of Guidelines on the assessment of investment analysis, “*..... the cost of equity should be determined either by: (a) selecting the values provided in Appendix A; or by (b) calculating the cost of equity using best financial practices.....*”.

The project proponent has chosen option (a) to estimate the cost of equity. As per Appendix A, the project activity falls under Group 1 category of projects. The default value for the expected return on equity calculated after taxes is 11.75%. As per guidance 7 of Annex A, *project participants can convert the real term values provided in the table below to nominal values by adding the inflation rate. The inflation rate shall be obtained from the inflation forecast of the central bank of the host country for the duration of the crediting period.*

Reserve Bank of India (RBI), the central bank of India, provides the inflation forecast over the next ten years. The inflation expected over the next ten years (duration of crediting period) is 5.5⁴%.

The cost of equity is
$$= (1+11.75\%)*(1+5.5\%) - 1$$
$$= 17.90\%$$

Therefore, the benchmark computed for the project activity is 17.45%.

The parameters and assumptions used for Equity IRR calculations have been mentioned below

Assumptions:	Values	Data Source
Location - State	Maharashtra	Board resolution
Place	Sinner	Board resolution
No of WEGs	14	

³ http://cdm.unfccc.int/Reference/Guidclarif/reg/reg_guid03.pdf

⁴ <http://rbi.org.in/scripts/PublicationsView.aspx?id=13360>



Capacity of each WTG	2.1 MW	
Project Size	29.4 MW	
Cost per WEG	INR 125.5	Quotations from Suzlon dated 04/07/2011
Cost of Project per MW	INR 59.76	
Total Project Cost	INR 1757	
Means of Finance		
Debt	70%	
Equity	30%	
Operating Parameters		
Plant Load Factor (net of Transmission charges)	17.17%	Third party report
Total Generation for the project at above PLF	44.22 Million KWh p.a	
Grid Availability	100%	
Total generation after Line Loss	44.22 Million KWh p.a	
Life of the Wind Turbine	20 years	Suzlon's offers
O & M cost		Quotations from Suzlon
O & M Cost (in Lacs) from 3rd Year of operation incl Ser. Tx	INR 21.33 Lakhs p.a	
Annual escalation from 3rd year	5%	
Financial Parameters		
Interest on Term Loan		
Rupee Loan	12.85 %	RBI Prime Lending rate. Conformance with guidance 6 of investment analysis guidelines
Tariff	INR 4.67/KWh	MAHARASHTRA ELECTRICITY REGULATORY COMMISSION Tariff order dated 29/04/2011
Tariff escalation	0%	
Depreciation Rate		IT Act
As per companies Act		Companies Act
Plant and machinery - SLM	5.28%	
As per Income Tax Act		
Depreciation rate- first year	15%	
Taxation		
Corporate Tax	33.99%	IT Act
MAT	18%	IT Act

The equity IRR thus computed is 5.81%. Compared to the benchmark of 17.90%, it is evident that the project activity is not financially viable without the CDM benefits.

Sub-step 2c: Calculation and comparison of financial indicators



The Equity IRR for the project found to be 5.81% which is lower than benchmark of 17.90%. The summary of the investment is as follows

Sensitivity Analysis

As per guidance 20 of Guidelines on the assessment of investment analysis, “*Only variables, including the initial investment cost, that constitute more than 20% of either total project costs or total project revenues should be subjected to reasonable variation*”. The parameters therefore subjected to sensitivity analysis are:

- Project cost
- O&M cost
- PLF
- Power tariff

The results of sensitivity analysis are presented in the table below:

Parameter	Sensitivity applied	Equity IRR	Benchmark
Project Cost	10%	3.39%	17.90%
	-10%	8.89%	
O&M Cost	10%	5.5%	
	-10%	6.13%	
PLF	10%	8.46%	
	-10%	3.16%	
Power tariff	10%	6.62%	
	-10%	4.93%	

From above, it is evident that in no event the project IRR crosses the benchmark.

**Step 4: Common practice analysis**

Unless the proposed project type has demonstrated to be first-of-its kind (according to Sub-step 3a), and for measures different from those listed in paragraph 6 the above generic additionality tests shall be complemented with an analysis of the extent to which the proposed project type (e.g. technology or practice) has already diffused in the relevant sector and region.

The project activity is not first-of-its kind and also not a measure listed in paragraph 6 of the tool.

Sub-step 4a: Analyze other activities similar to the proposed project activity:

Projects are considered similar if they are in the same country/region and/or rely on a broadly similar technology, are of a similar scale, and take place in a comparable environment with respect to regulatory framework, investment climate, access to technology, access to financing, etc.

- Location – Wind power projects in the state of Maharashtra
- Capacity – Wind power projects of capacity greater than 15MW
- Project proponent – Project proponent investing in greater than 15MW as a single capacity
- Period of commissioning – project activities commissioned after the enactment of Indian Electricity Act 2003
- Regulatory framework – Maharashtra Electricity Regulatory Commission (MERC) has different policy compared to other ERCs. Only wind farms in Maharashtra have been considered

The list of such projects is given below:⁵

Sl.No	Ref.	Title	Project Proponent	Status
1		"Electricity generation from bundled wind energy project in Maharashtra aggregated by Resurge Energy Private Limited".	Resurge Energy Private Limited (Private Entity)	At Validation
2	2605	100 MW Wind Power Project by RS India Wind Energy Pvt. Ltd. at Matrewadi & Varekrwadi, Satara district in Maharashtra	RS India Wind Energy Pvt. Ltd	Registered
3	4543	15 MW bundled grid connected renewable energy project in Maharashtra, India	C. Mahendra Exports Limited	Registered
4	1778	15 MW Wind Energy Project in Maharashtra	M/s D. J. Malpani	Registered
5	593	15.4 MW wind farm at Satara District, Maharashtra.	Ellora Time Ltd	Registered
6	3854	20 MW Enercon Wind farms (SAI) Pvt. Limited in Maharashtra	Enercon Wind farms (SAI) Pvt. Limited	Registered
7		20.8 MW Grid connected wind electricity generation project at Dhule, Maharashtra	REI Agro Limited	At Validation
8	967	21 MW Bundled Wind Power Project in Vankuswade, Maharashtra	Vestas Wind Technology India Private Limited	Registered
9		25.5 MW Wind Energy Farm at Nandurbar Maharashtra by HZL	HZL	At Validation
10	1600	40 MW Grid Connected Wind Power Project	BP Energy India Private Limited	Registered
11	2819	50.4 MW Tata Wind Farm - in Maharashtra	Tata Wind Farm	Registered

⁵CDM pipeline database: <http://www.cdmpipeline.org/>



12	1115	75MW wind power project in Maharashtra by Essel Mining Industries Limited	Essel Mining Industries Limited	Registered
13	744	Bundled Wind Power Projects in Satara & Supa (Maharashtra in India) managed by Tata Motors Ltd.	Tata Motors Ltd	Registered
14		Electricity generation from bundled wind energy project activity aggregated by Resurge Energy Private Limited – VII	Resurge Energy Private Limited	At Validation
15	5353	Generation of electricity from bundled 25 MW wind energy project aggregated by Resurge Energy Private Limited	Resurge Energy Private Limited	Registered
16	4437	GREEN ENERGY TO GRID at Dhule, Maharashtra	MSPL Limited	Registered
17		Greenhouse Gas Emission Reductions Through Wind Energy Technology - Reliance Clean Power Pvt. Ltd.	Reliance Clean Power Pvt. Ltd	At Validation
18		Grid connected bundled wind power project in Maharashtra aggregated by Resurge Energy Private Limited	Resurge Energy Private Limited	At Validation
19	4450	Grid connected renewable energy project in India	Avon Cycle Limited, Eastman International, Ramesh Steels, Rita International, Maxwell Inc, Mukund Industries.	Registered
20		Grid connected wind power project in Maharashtra, India by Bhilwara	M/s Bhilwara Green Energy limited	At Validation
21		Renewable Wind Power generation for promoting energy security	Gangadhar Narsingdas Agrawal Group	At Validation
22		Renewable Wind Power Project by Ratnagiri Wind Power Projects Private Limited	Ratnagiri Wind Power Projects Private Limited	At Validation
23	3142	Roaring 40's Wind Farms (Khandke) Private Limited	Roaring 40s Wind Farms (Khandke) Private Limited	Registered
24	3298	Roaring 40s Wind Farms (Khandke) Private Limited - Phase II	Roaring 40s Wind Farms (Khandke) Private Limited	Registered
25		Wind based power generation by Panama Wind Energy Private Limited in Maharashtra, India	Panama Wind Energy Private Limited	At Validation
26	2092	Wind Electricity Generation Project	Reliance Innoventures Limited	Registered
27	3238	Wind power generation by Shree Naman Developers Ltd.	Shree Naman Developers Ltd	Registered
28		Wind power project at Jaibhim by SIIL	SIIL	At Validation
29		Wind Power Project at Peth Shivpur, Maharashtra	ReNew Wind Energy (Shivpur) Private Limited (RNWESPL)	At Validation
30		Wind Power Project at Satara in Maharashtra, India	Jindal Steel & Power Ltd	At Validation
31	1615	Wind power project by GFL in Gudhepanchgani	Gujarat Fluorochemicals Limited (GFL)	Registered
32	4848	Wind power project by PMPL in Maharashtra	Patnaik Minerals Private Limited	Registered
33		Wind power project in Maharashtra, India – Andhra Lake Phase - II	CLP Wind Farms (India) Private Limited	At Validation
34		Wind power project in Maharashtra, India - Andhra Lake Phase I	CLP Wind Farms (India) Private Limited	At Validation



From the above table, it is clear that all the projects have for gone for CDM benefits. Hence it can be said that wind projects in the region (without CDM benefits) is not a common practice.

Step 4b: Discuss any similar options that are occurring:

From the Sub-step 4a, it is observed that similar and operational projects are not “widely observed and commonly carried out” in the region and all the projects have been undertaken considering CDM revenues.

Serious CDM consideration

The chronology of events mentioned below highlights the various steps taken up by PP to secure the CDM revenue:

Activity	Date
Date of quotations received from Suzlon	4-July-2011
Board resolution	22-Jul-11
Purchase Order	5-Aug-11
Stake holder meeting	19-Oct-11
Prior consideration	7-Nov-11
DOE appointment date	02-Feb-2012

From above table, it could be seen that the gap between any two CDM activities is less than 2 years and hence the project activity conforms to the “Guidelines on the demonstration and assessment of prior consideration of the CDM” Annex 22 of EB 49.

Hence from the above analysis it can be concluded that the project activity is additional and the financial viability and sustainable operation is possible only with the benefits of CDM.

**B.6. Emission reductions:****B.6.1. Explanation of methodological choices:**

>>

According to the approved methodology ACM0002 (Version 12.3.0) Emission Reductions are calculated as:

$$ER_y = BE_y - PE_y$$

Where,

ER_y = Emission reductions in year y (t CO₂e)

BE_y = Baseline emissions in year y (t CO₂)

PE_y = Project emissions in year y (t CO₂e)

Baseline Emissions:

Baseline emissions include only CO₂ emissions from electricity generation in fossil fuel fired power plants that are displaced due to the project activity. The methodology assumes that all project electricity generation above baseline levels would have been generated by existing grid-connected power plants and the addition of new grid-connected power plants. The baseline emissions are to be calculated as follows:

$$BE_y = EG_{PJ,y} \cdot EF_{grid,CM,y}$$

Where,

BE_y = Baseline emissions in year y (tCO₂)

$EG_{PJ,y}$ = Quantity of net electricity generation that is produced and fed into the grid as a result of the implementation of the CDM project activity in year y (MWh)

$EF_{grid,CM,y}$ = Combined margin CO₂ emission factor for grid connected power generation in year y calculated using the latest version of the “Tool to calculate the emission factor for an electricity system” (tCO₂/MWh)

Since the Project emissions and Leakages are zero, hence

$$EG_{PJ,y} = EG_{facility,y}$$

Where,

$EG_{PJ,y}$ = Quantity of net electricity generation that is produced and fed into the grid as a result of the implementation of the CDM project activity in year y (MWh/yr)

$EG_{facility,y}$ = Quantity of net electricity generation supplied by the project plant/unit to the grid in year y (MWh)

The proposed project activity is in the state of Maharashtra which falls under NEWNE grid, baseline emission factor is calculated as combined margin, consisting of a combination of operating margin and build margin factors according to the procedures prescribed in the latest tool for calculating the emission factor for an electricity system. The steps of calculation are as follows:

STEP 1: Identifying the relevant electricity systems:

The Indian electricity system is divided into two regional grids, viz. (1) Northern, Eastern, Western, North-Eastern and (2) Southern grid. Each grid covers several states. As the regional grids are interconnected, there is inter-state and inter-regional exchange. A small power exchange also takes place with neighbouring countries like Bhutan and Nepal. Power generation and supply within the regional grid is managed by Regional Load Dispatch Centre (RLDC). The Regional Power Committees (RPCs) provide a common platform for discussion and solution to the regional problems relating to the grid. Each state in a regional grid meets its demand with its own generation facilities and also with allocation from power plants owned by the Central Sector such as NTPC and NHPC etc. Specific quotas are allocated to each state from the Central Sector power plants. Depending on the demand and



generation, there are electricity exports and imports between states in the regional grid. The regional grid thus represents the largest electricity grid where power plants can be dispatched without significant constraints and thus, represents the “project electricity system” for the project activity. As the project activity is connected to the NEWNE electricity grid, the NEWNE grid is the “project electricity system”.

Step 2: Choose whether to include off-grid power plants in the project electricity system (optional)

Option I is opted for the project activity i.e. only grid power plants are included in the calculation.

Step 3: Select a method to determine the operating margin (OM):

According to the tool, the calculation of the operating margin emission factor is based on one of the following methods:

The calculation of the operating margin emission factor ($EF_{grid,OM,y}$) is based on one of the following methods:

- (a) Simple OM; or
- (b) Simple adjusted OM; or
- (c) Dispatch data analysis OM; or
- (d) Average OM.

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 details low cost/must-run given in the table below.⁶

Share of Must-Run (Hydro/Nuclear) (% of Net Generation)					
	2006-07	2007-08	2008-09	2009-10	2010-11
NEWNE	18.5%	19.0%	17.4%	15.9%	17.6%
South	28.3%	27.1%	22.8%	20.6%	21.0%
India	20.9%	21.0%	18.7%	17.1%	18.4%

The above data clearly shows that the percentage of total grid generation by low cost/must run plants (on the basis of average of five most recent years) for the Southern regional grid is less than 50 % of the total generation. Hence the Simple OM method can be used to calculate the Operating Margin Emission factor. The average operating margin method cannot be applied, as low cost/ must run resources in NEWNE grid constitute less than 50% of total grid generation.

The project proponents choose an ex ante option for calculation of the OM with 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, without requirement to monitor and recalculate the emissions factor during the crediting period.

STEP 4: Calculate the operating margin emission factor according to the selected method:

The simple OM emission factor is calculated as the generation-weighted average CO₂ emissions per unit net electricity generation (tCO₂/MWh) of all generating power plants serving the system, not including low-cost/must-run power plants/units.

As per ,Tool to calculate the emission factor for an electricity system “, Option A (“Based on the net electricity generation and a CO₂ emission factor of each power unit”) is used to calculate simple OM

⁶CEA Database version 7 (http://www.cea.nic.in/reports/planning/cdm_co2/cdm_co2.htm)



emission factor. Where Option A is used, the simple OM emission factor is calculated based on the electricity generation of each power unit and an emission factor for each power unit, as follows:

$$EF_{\text{grid,OMsimple},y} = \Sigma (EG_{m,y} \times EF_{\text{EL},m,y}) / \Sigma EG_{m,y}$$

Where

$EF_{\text{grid,OMsimple},y}$	=	Simple operating margin CO2 emission factor in year y (tCO2/MWh)
$EG_{m,y}$	=	Net quantity of electricity generated and delivered to the grid by power unit m in year y (MWh)
$EF_{\text{EL},m,y}$	=	CO2 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	=	Either the three most recent years for which data is available at the time of submission of the CDM PDD to the DOE for validation (ex ante option) or the applicable year during monitoring (ex post option), following the guidance on data vintage in step 2

The emission factor of each power unit m has been determined using Option B

$$EF_{\text{EL},m,y} = (\Sigma FC_{i,m,y} \times NCV_{i,y} \times EF_{\text{CO2},i,y}) / EG_{m,y}$$

Where,

$EF_{\text{EL},m,y}$	=	CO2 emission factor of power unit m in year y (tCO2/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)
$EF_{\text{CO2},i,y}$	=	CO2 emission factor of fossil fuel type i in year y (tCO2/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

The value of Operating Margin (OM) as obtained from CDM Database version 7 is as follows:

Simple Operating Margin (tCO2/MWh) (incl. Imports) (1) (2)					
	2006-07	2007-08	2008-09	2009-10	2010-11
NEWNE	1.01	1.00	1.01	0.98	0.97
South	1.00	0.99	0.97	0.94	0.94
India	1.01	1.00	1.00	0.97	0.96

Thus the simple operating margin CO2 emission factor for the recent years (2008-09, 2009-10, 2010-11) is **0.9851 tCO2/MWh**

STEP 5: Identify the group of power units to be included in the build margin:

The sample group of power units m used to calculate the build margin consists of either:

- (a) The set of five power units that have been built most recently, or



(b) The set of power capacity additions in the electricity system that comprise 20% of the system generation (in MWh) and that have been built most recently. Project Participant should use the set of power units that comprises the larger annual generation. Accordingly, the CEA database version 7 calculates the build margin as the average emissions intensity of the 20% most recent capacity additions in the grid based on net generation.

The build margin emission factor has been calculated 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. This option does not require monitoring the emission factor during the crediting period.

STEP 6: Calculate the build margin emission factor:

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

$$EF_{\text{grid,BM},y} = (\sum EG_{m,y} \times EF_{\text{EL},m,y}) / \sum EG_{m,y}$$

Where,

$EF_{\text{grid,BM},y}$	=	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)
$EF_{\text{EL},m,y}$	=	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 CO₂ emission factor of each power unit m ($EF_{\text{EL},m,y}$) is determined as per the procedures given in step 4 (a) for the simple OM, using option A1 for y most recent historical year for which power generation data is available, and using for m the power units included in the build margin.

The values of Build Margin as obtained from CDM Database version 7 are as follows:

Build Margin (tCO ₂ /MWh) (not adjusted for imports)					
	2006-07	2007-08	2008-09	2009-10	2010-11
NEWNE	0.63	0.60	0.68	0.81	0.86
South	0.70	0.71	0.82	0.76	0.73
India	0.65	0.63	0.71	0.80	0.83

For ex ante calculation the most recent data (2009-10) available has been used and the build margin thus calculated is **0.8587 tCO₂/MWh**

STEP 7: Calculate the combined margin emissions factor:

The emission factor EF_y of the grid is represented as a combination of the Operating Margin (OM) and the Build Margin (BM). Considering the emission factors for these two margins as $EF_{\text{grid,OM},y}$ and $EF_{\text{grid,BM},y}$, then the EF_y is given by:

$$EF_{\text{grid,CM},y} = EF_{\text{grid,OM},y} \times w_{\text{OM}} + EF_{\text{grid,BM},y} \times w_{\text{BM}}$$

Where,

$EF_{\text{grid,CM},y}$	=	Combined margin emissions factor
$EF_{\text{grid,OM},y}$	=	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 (%)

Where, $w_{OM} + w_{BM} = 1$

According to ACM0002 the weights for OM and BM are 0.75 and 0.25 respectively.

Using the values for operating and build margin emission factor provided in the CEA database and their respective weights for calculation of combined margin emission factor, the baseline carbon emission factor (CM) is 0.9527tCO₂e/MWh.

Estimation of Project Emissions

The project activity involves harnessing of wind energy and its conversion to electricity. Hence according to ACM0002 Version 12.3.0, there will be no project emissions in the project activity.

Estimation of Leakage Emissions

As per ACM0002 Version 12.3.0, no leakage has been considered for the calculation of emission factor.

B.6.2. Data and parameters that are available at validation:

(Copy this table for each data and parameter)

Data / Parameter:	$EF_{grid, OM, y}$
Data unit:	tCO ₂ e/MWh
Description:	Operating Margin Emission Factor of Southern Regional Electricity Grid
Source of data used:	“Last 3 years average from CO ₂ Baseline Database for Indian Power Sector”, version 7 published by the Central Electricity Authority, Ministry of Power, Government of India.
Value applied:	0.9851
Justification of the choice of data or description of measurement methods and procedures actually applied :	Operating Margin Emission Factor has been calculated by the Central Electricity Authority using the simple OM approach in accordance with ACM0002.
Any comment:	The value is calculated on ex-ante basis and it will remain same throughout the crediting period.

Data / Parameter:	$EF_{grid, BM, y}$
Data unit:	tCO ₂ e/MWh
Description:	Build Margin Emission Factor of Southern Regional Electricity Grid
Source of data used:	Latest Build Margin taken from CO ₂ Baseline Database for Indian Power Sector” version 7 published by the Central Electricity Authority, Ministry of Power, Government of India.
Value applied:	0.8587
Justification of the choice of data or description of measurement methods and procedures actually	Build Margin Emission Factor has been calculated by the Central Electricity Authority in accordance with ACM0002



applied :	
Any comment:	The value is calculated on ex-ante basis and it will remain same throughout the crediting period.

Data / Parameter:	$EF_{grid,CM,y}$
Data unit:	tCO ₂ e/MWh
Description:	Combined Margin Emission Factor of Southern Regional Electricity Grid
Source of data used:	Calculated from the Operating Margin and Build Margin.
Value applied:	0.9527
Justification of the choice of data or description of measurement methods and procedures actually applied :	Build Margin Emission Factor has been calculated by the Central Electricity Authority in accordance with ACM0002
Any comment:	The value is calculated on ex-ante basis and it will remain same throughout the crediting period.

B.6.3. Ex-ante calculation of emission reductions:

>>

Installed Capacity	=	29.40
PLF	=	17.17 %
Net Generation	=	Installed Capacity *PLF
	=	44,220MWh
Baseline emission factor	=	0.9527
Baseline emissions	=	Net Generation * Baseline emission factor
		42,129tCO ₂ equivalent
Project emissions	=	0
Leakage	=	0
Emission reduction per annum	=	42,129 tCO ₂ equivalent

**B.6.4 Summary of the ex-ante estimation of emission reductions:**

>>

Year	Estimation of project activity emissions (tonnes of CO ₂ e)	Estimation of baseline emissions (tonnes of CO ₂ e)	Estimation of leakage (tonnes of CO ₂ e)	Estimation of overall emission reductions (tonnes of CO ₂ e)
2013-2014	0	42129	0	42129
2014-2015	0	42129	0	42129
2015-2016	0	42129	0	42129
2016-2017	0	42129	0	42129
2017-2018	0	42129	0	42129
2018-2019	0	42129	0	42129
2019-2020	0	42129	0	42129
2020-2021	0	42129	0	42129
2021-2022	0	42129	0	42129
2022-2023	0	42129	0	42129
Total (tonnes of CO₂ e)	0	4,21,290	0	4,21,290

B.7. Application of the monitoring methodology and description of the monitoring plan:

Data / Parameter:	EG _{pj,y}
Data unit:	MWh/yr
Description:	Net Electricity export to the grid by the project activity in the year y
Source of data to be used:	Calculated
Value of data applied for the purpose of calculating expected emission reductions in section B.5	44220
Description of measurement methods and procedures to be applied:	Delivered/Net electricity supplied to the MSEDCL will be calculated based on the difference between measured values of “export” and “import” on the MSEDCL meter and the percentage transmission loss incurred in the transmission line between the project and the interconnection point (i.e. sub-station). The meter reading is taken by MSEDCL official. Refer to Annex 4 of the PDD for more details on apportioning and accounting of transmission loss percentage.
QA/QC procedures to be applied:	The quantity of net electricity supplied will be cross-verified from the invoices

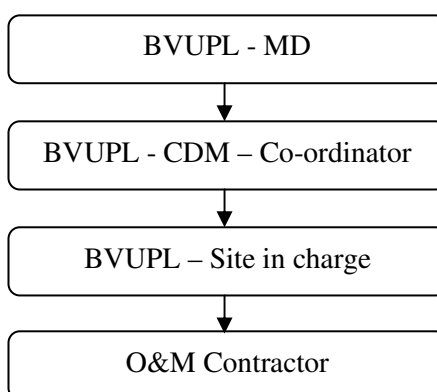


	raised on MSEDCL by the project proponent and the readings available from the meter available at site. The meters will be calibrated annually as per the metering code.
Any comment:	Date will be archived for crediting period plus two years after the end of Crediting period.

B.7.2. Description of the monitoring plan:

>>

The organisational structure of this CDM project activity is as follows.



The project proponent has entered into agreement with the WTG- Supplier – Suzlon Energy Limited for the operation and maintenance of WTGs. The WTG supplier has dedicated and technically well equipped O&M team for day to day Operation and maintenance of each WTG. O&M contractor will provide a monthly report, which includes wind data, generation data, major breakdown events and machine availability. Project Manager is responsible for recording of monthly Joint Meter Readings of export and import. Monthly power export and import data will be sent regularly to CDM coordinator of BVUPL.

**B.8. Date of completion of the application of the baseline study and monitoring methodology and the name of the responsible person(s)/entity(ies):**

>>

Date of completion of the application of baseline study and monitoring methodology: 05/04/2012.

Name of the responsible entity: Bindu Vayu Urja Private Limited (BVUPL)

SECTION C. Duration of the project activity / crediting period**C.1. Duration of the project activity:****C.1.1. Starting date of the project activity:**

>>

05/08/2011

C.1.2. Expected operational lifetime of the project activity:

>>

20 years.

C.2. Choice of the crediting period and related information:**C.2.1. Renewable crediting period:****C.2.1.1. Starting date of the first crediting period:**

>>

Not applicable

C.2.1.2. Length of the first crediting period:

>>

Not applicable

C.2.2. Fixed crediting period:**C.2.2.1. Starting date:**

>>

01/09/2012 Date of commissioning or date of registration with UNFCCC, whichever is later

C.2.2.2. Length:

>>

10 years.

SECTION D. Environmental impacts

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D.1. Documentation on the analysis of the environmental impacts, including transboundary impacts:

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As per the Schedule 1 of Ministry of Environment and Forests (Government of India) notification dated January 27, 1994 and EIA Notification (S.O 1533) dated 14th September 2006, a list of activities that require undertaking environmental impact assessment studies⁸ has been provided. EIA is not a regulatory requirement in India for wind energy projects and PP does not expect any adverse impacts of the proposed CDM project activity on the environment.



D.2. If environmental impacts are considered significant by the project participants or the host Party, please provide conclusions and all references to support documentation of an environmental impact assessment undertaken in accordance with the procedures as required by the host Party:

>>

The project activity does not fall under the purview of the Environmental Impact Assessment (EIA) notification of the Ministry of Environment and Forest, Government of India. Hence, EIA is not required by the host party.

SECTION E. Stakeholders' comments

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E.1. Brief description how comments by local stakeholders have been invited and compiled:

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The Stakeholder meeting was conducted on 19/10/2011 at the site office in Sinner. The invitations were sent out 10 days before the actual Stakeholder meeting was conducted. Mr Suhas Guruji explained the benefits of Wind Power generation to the local people. The stakeholders consisted of local farmers from nearby villages, O&M Contractors as they are the key stakeholders. The stakeholders were provided with a questionnaire which was translated by Mr.Suhas Guruji for the convenience of the local stakeholders.

E.2. Summary of the comments received:

>>

The comments were received in a questionnaire and the attendance was taken in an attendance sheet. A compilation of the comments are given below:

Name of Stakeholder	Comments
Nandu Dawre	What are the benefits of wind energy generation?
Sopan Pandit	What would be the impact of the project on the local agriculture?
Sampat Dawre	How the project would benefit the local villagers?
Sanjay Wagh	Will there be any impact on the local climate?
Roshan Bhosale	What would be the environmental impact of the power plant?

E.3. Report on how due account was taken of any comments received:

>>

Clarifications to all the comments were given in the following manner:

Name of Stakeholder	Comments	Responses
Nandu Dawre	What are the benefits of wind energy generation?	Wind energy uses wind energy to generate electricity. Thus electricity generation from wind does not lead to any harmful emissions into the atmosphere.
Sopan Pandit	What would be the impact of the project on the local agriculture?	As the project is not located on any agricultural field, the impact on local agriculture is minimum.
Sampat Dawre	How the project would benefit the local villagers?	There would be local employment generation and also



		electricity supply to the local villages
Sanjay Wagh	What would be the environmental impact of the power plant?	Environmental impact due to wind energy is minimum as there are no harmful emissions of any gases.
Roshan Bhosale	Will there be any impact on the local climate ?	As wind energy is a clean source of electricity, there would be no impact on the local climate.

**Annex 1****CONTACT INFORMATION ON PARTICIPANTS IN THE PROJECT ACTIVITY**

Organization:	Bindu Vayu Urja Private Limited(BVUPL)
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E-Mail:	
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Represented by:	
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Salutation:	Mr.
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Middle name:	
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Mobile:	
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Annex 2

INFORMATION REGARDING PUBLIC FUNDING

NO PUBLIC FUNDING HAS BEEN AVAILABLE FOR THE PROJECT

**Annex 3****BASELINE INFORMATION**

As per the CEA Database version 7 the following data has been used to calculate the Combined Margin emission factor.

BASELINE INFORMATION

The latest data available for the financial year 2009-10 has been used for the estimation of the baseline emissions. The Central Electricity Authority (CEA) under the Ministry of Power, Government of India, has estimated the Build Margin and the Simple Operating Margin for the NEWNE grid, the details of which is available on the following website and is detailed below as well:

http://www.cea.nic.in/reports/planning/cdm_co2/cdm_co2.htm

Version 7.0 of the database has been used.

Gross Generation Total (GWh)					
	2006-07	2007-08	2008-09	2009-10	2010-11
NEWNE	499,380	531,539	548,956	586,311	622,447
South	161,897	167,379	167,587	180,638	185,257
India	661,277	698,918	716,543	766,950	807,704

Net Generation Total (GWh)					
	2006-07	2007-08	2008-09	2009-10	2010-11
NEWNE	465,361	496,119	510,693	544,915	579,181
South	152,206	157,247	157,336	169,765	173,925
India	617,567	653,366	668,029	714,680	753,106

Share of Must-Run (Hydro/Nuclear) (% of Net Generation)					
	2006-07	2007-08	2008-09	2009-10	2010-11
NEWNE	18.5%	19.0%	17.4%	15.9%	17.6%
South	28.3%	27.1%	22.8%	20.6%	21.0%
India	20.9%	21.0%	18.7%	17.1%	18.4%

Net Generation in Operating Margin (GWh)					
	2006-07	2007-08	2008-09	2009-10	2010-11
NEWNE	379,471	401,642	421,803	458,043	476,987
South	109,116	114,634	121,471	134,717	137,387
India	488,587	516,275	543,274	592,760	614,374

20% of Net Generation (GWh)					
	2006-07	2007-08	2008-09	2009-10	2010-11
NEWNE	93,072	99,224	102,139	108,983	115,836
South	30,441	31,449	31,467	33,953	34,785



India	123,513	130,673	133,606	142,936	150,621
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Net Generation in Build Margin (GWh)					
	2006-07	2007-08	2008-09	2009-10	2010-11
NEWNE	93,524	100,707	102,589	109,064	117,779
South	30,442	31,613	31,606	36,100	35,268
India	123,965	132,320	134,195	145,164	153,047

EMISSION DATA

Absolute Emissions Total (tCO ₂)					
	2006-07	2007-08	2008-09	2009-10	2010-11
NEWNE	385,692,794	406,861,785	430,502,442	453,067,520	468,438,871
South	109,020,456	113,586,133	117,880,640	126,786,215	129,093,636
India	494,713,250	520,447,919	548,383,082	579,853,735	597,532,507

Absolute Emissions OM (tCO ₂)					
	2006-07	2007-08	2008-09	2009-10	2010-11
NEWNE	385,692,794	406,861,785	430,502,442	453,067,520	468,438,871
South	109,020,456	113,586,133	117,880,640	126,786,215	129,093,636
India	494,713,250	520,447,919	548,383,082	579,853,735	597,532,507

Absolute Emissions BM (tCO ₂)					
	2006-07	2007-08	2008-09	2009-10	2010-11
NEWNE	59,042,467	60,193,616	69,297,387	88,593,337	101,146,601
South	21,348,182	22,550,310	25,851,338	27,558,555	25,882,886
India	80,390,649	82,743,926	95,148,726	116,151,892	127,029,488

EMISSION FACTORS

Simple Operating Margin (tCO ₂ /MWh)					
	2006-07	2007-08	2008-09	2009-10	2010-11
NEWNE	1.01	1.00	1.01	0.98	0.97
South	1.00	0.99	0.97	0.94	0.94
India	1.01	1.00	1.00	0.97	0.96

Build Margin (tCO ₂ /MWh) (not adjusted for imports)					
	2006-07	2007-08	2008-09	2009-10	2010-11
NEWNE	0.63	0.60	0.68	0.81	0.86
South	0.70	0.71	0.82	0.76	0.73
India	0.65	0.63	0.71	0.80	0.83



Annex 4

MONITORING INFORMATION

The Operation & Maintenance of the project will be done by Suzlon Energy Limited. As per the monitoring plan, the electricity exported to the grid through the project activity and the electricity imported from the grid will be monitored. The metering system shall comprise of a main and check meter at each WEG that measure export and import of electricity. The energy meters will be sealed in the presence of the representatives of the power producer and the state electricity board. The O&M personnel will be responsible for recording the generation data from each WEG on daily basis at the site. This is done through a Central Monitoring System (CMS) available at the project site. Monthly readings of energy meters are recorded by the officials from the state grid in the presence of representatives from the project proponent.

Export and Import readings recorded at main meter are considered for billing purpose and estimation of emission reductions. In case of failure of main meter, readings of check meter are used. A bulk meter consisting of main meter and check meter are installed at the nearby substation to measure total quantity of electricity exported and imported for the project activity. The difference between the sum of individual meters reading and the bulk meter reading will be the basis for the calculation of line loss. Net quantity of electricity exported by the project is calculated as the net of sum of export from individual meters, sum of import from individual meters and line losses. These readings are further used for billing purposes and the same will be used for the calculation of the emission reductions.

The energy meter will be tested and calibrated at least once in five years. The testing and calibration of the meter will be jointly conducted by authorised representatives of BVUPL and the State Electricity Board and the results and correction so arrived at mutually will be applicable and binding on both the parties. During the test calibration, if there are errors beyond permissible limit, the bills shall be revised for the previous three months or for the exact period if known and agreed upon by both the parties, by applying correction as determined by the meter testing wing of the state transmission utility / distribution licensee to the consumption registered by the meters with lesser error.

All the data items monitored under the monitoring plan will be kept for 2 years after the end of crediting period or till the last issuance of CERs for this project activity whichever occurs later.

Monitoring plan for 2% CER revenues:

The project proponent will contribute 2% of net revenue realised from sale of CERs towards sustainable development initiatives. The details of such expenditure made would be included in the monitoring report for the period following the transaction and the format is as follows:



Action Plan for expenditure incurred through 2% of CER revenues									
Financial Year (A)	Activity (B)	Issued CERs (C)	CER Price (D)	Total CDM Amount (E=CxD)	Expenditure in Current year (F)	Expenditure Carried forward (G)	Net Expenditure for Current Year (H = F+G)	Expenditure as % of CDM amount for current year (I = H/E)	Reference Documentation (J)
<i>Indicates the year for which the assessment is being provided</i>	<i>Provides details of the social/ community activities on which the expenditure has been incurred</i>	<i>Quantity of CERs issued for the assessment year</i>	<i>CER price at which the transaction has happened</i>	<i>Total amount CDM amount received</i>	<i>Expenditure made on the social/ community development activity in the current assessment year</i>	<i>Additional expenditure incurred on capital goods in the previous assessment years being carried forward to the current assessment year</i>	<i>Net Expenditure on social/ community development activity for the current year</i>	<i>Indicates the % of the total CDM amount spent on social/community development activity</i>	<i>Indicates the documentation to be provided to the DOE during the verification to evidence the amount spent on social/community development activity</i>

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