**PROJECT DESIGN DOCUMENT FORM
FOR CDM PROJECT ACTIVITIES (F-CDM-PDD)
Version 04.1**

PROJECT DESIGN DOCUMENT (PDD)

Title of the project activity	Wind Energy Project in Gujarat
Version number of the PDD	6.0
Completion date of the PDD	23/07/2013
Project participant(s)	Vish Wind Infrastructure LLP
Host Party(ies)	India
Sectoral scope and selected methodology(ies)	Scope Number 1, Sectoral Scope - Energy industries (renewable/ non-renewable sources). Approved consolidated baseline methodology, ACM0002 (Version 13.0.0, EB 67)
Estimated amount of annual average GHG emission reductions	101,234

SECTION A. Description of project activity

A.1. Purpose and general description of project activity

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Vish Wind Infrastructure LLP ("VWIL") is developing 50.4 MW wind power project at Kutch and Lalpur sites of Kutch and Jamnagar districts respectively, in the state of Gujarat in India. The project consists of 63 machines of Enercon make E-53 type Wind Energy Converters (WECs) of 800 KW capacities each. Annually, the project is expected to generate and supply 106,696.80 MWh of electricity to the state electricity grid, which is a part of the NEWNE (Northern, Eastern, Western and North-Eastern) grid in India. The project will thus address the demand –supply gap in the state of Gujarat and will assist the sustainable growth, conservation of resources and reduction of greenhouse gas emissions by using renewable energy source like wind energy.

Purpose of the project activity:

The purpose of the project activity is to generate emission free and environment friendly electricity from the wind energy potential available in the region. The amount of electricity generated from the project activity will be supplied to the Western regional Grid of India, which is a part of the Integrated NEWNE grid of India.

The project activity will contribute towards reduction of greenhouse gas (G HG) emission from the atmosphere, which is estimated to be approximately 101,234 tCO2e per year, by displacing an equivalent amount of electricity generation through the operation of existing fuel mix in the grid comprising mainly fossil fuel based power plants. Thus, the project will not only reduce the demand-supply gap of the respective grid, but also will help in reducing other pollutants like SOx, NOx, etc. from the atmosphere.

In the absence of the project activity the equivalent amount of electricity would have been generated from the connected/ new power plants in the 'Northern Eastern Western North-Eastern' NEWNE grid, which are/ will be predominantly based on fossil fuels . This is also the pre-project scenario.

The technology employed for the project is well proven and safe. Enercon (India) Limited (hereinafter referred as "Enercon") is the equipment supplier and the Operation and Maintenance contractor for the Project.

Contribution to Sustainable Development

The four indicators of sustainable development have been stipulated by the National CDM Authority (NCDMA), the Designated National Authority (DNA) for Government of India (GoI), under their approval guidelines for Clean Development Mechanism (CDM) projects from India[1]. The project activity will contribute towards the sustainable development indicators as follows:

Social well being:

- The project activity will contribute to socio-economic development through improving the infrastructure for road network and other mode of communications in the remote part of the state during both the construction and operational period.

Environmental well being:

[1] http://www.cdmindia.gov.in/approval_process.php

- The project activity will utilize renewable energy source for electricity generation instead of fossil fuel based electricity generation which would have emitted gaseous, liquid and/or solid effluents/wastes. Thus, the project causes no negative impact on the surrounding environment and contributes to environmental well-being.

- The project activity will contribute towards reduction of the GHG emissions as well as emission of pollutants like SOx, Suspended Particulate Matters (SPMs) etc. by avoiding equivalent amount of power generation from fossil fuel based power plants.

Economic well being:

- The project will generate electricity utilizing renewable source like wind, thus will increase the contribution of renewable based power generation in the region and will also help in reducing the demand - supply gap of the respective grid.

- The project activity involves substantial amount of investment, thus will contribute towards generation of direct and indirect employment opportunities as per the requirement of the skilled and semi-skilled manpower.

- Use of a renewable source of energy reduces the dependence on imported fossil fuels and associated price variation, thereby leading to increased energy security.

Technological well being:

- Increased interest in wind energy projects will further push R&D efforts by technology providers to develop more efficient and better machinery in future.

In addition to this, the project proponent (PP) will contribute 2% of the CDM revenue realized from the CDM project activity for sustainable development including society / community development. The PP is aware about the guideline of Indian DNA on commitment of 2% of the CDM revenues towards sustainable development and a formal undertaking will be submitted accordingly to the DNA.

A.2. Location of project activity

A.2.1. Host Party(ies)

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India

A.2.2. Region/State/Province etc.

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Western Region/State - Gujarat

A.2.3. City/Town/Community etc.

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District: Kutch and Jamnagar

A.2.4. Physical/Geographical location

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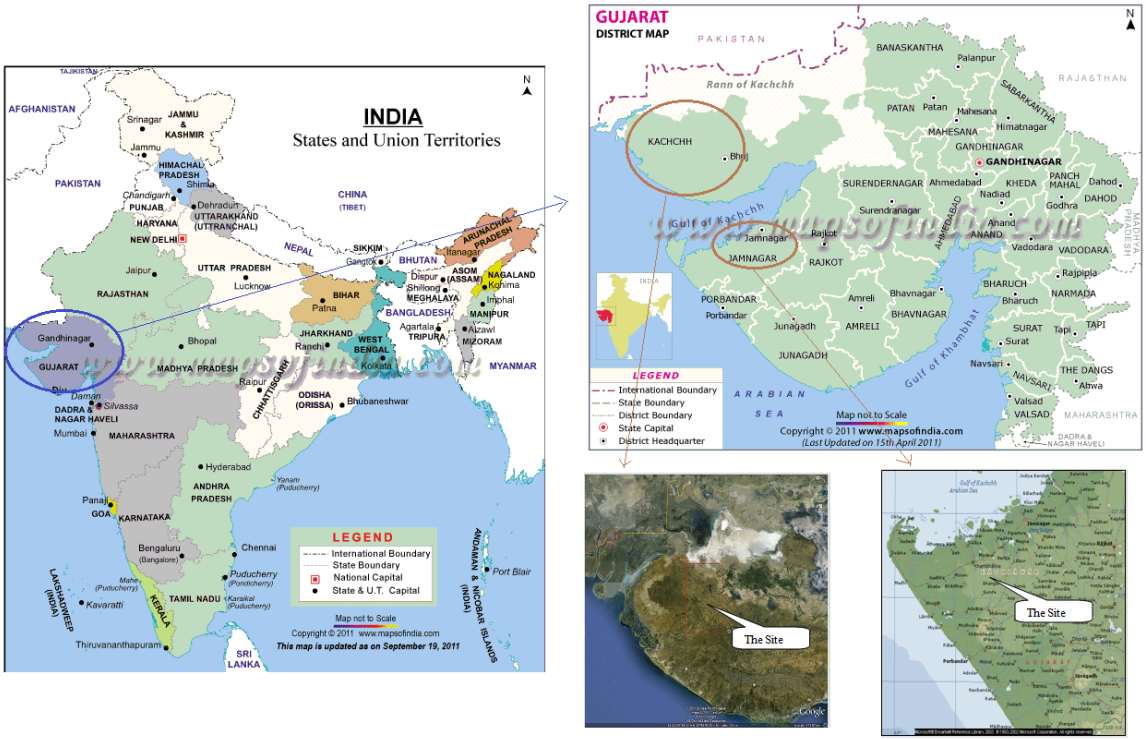
The project activity is located at Kutch and Lalpur site in Kutch & Jamnagar district respectively, in the state of Gujarat, India. The nearest railway station and airport for Kutch site is Rajkot and the nearest railway station and airport for Lalpur site is Jamnagar. The latitude and longitude details along of each WEGs is provided in Annex 1.

The location of the project site has been shown below:



A.3. Technologies and/or measures

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The project activity involves 63 numbers wind energy converters (WECs) of Enercon make (800 KW, E-53) with internal electrical lines connecting the project activity with local evacuation facility. The WECs generate 3-phase power at 400V, which is stepped up to 33 KV. The project activity can operate in the frequency range of 48.5–51.5 Hz and in the voltage range of 400 V ± 12.5%. The average life time of the WEC is around 20 years as per the equipment supplier specifications. The other salient features of the state-of-art-technology are:

Turbine model	Enercon (E- 53)
Rated power	800 KW
Rotor diameter	52.9 m
Hub height	75 m (Concrete)
Turbine Type	Direct driven, horizontal axis wind turbine with variable rotor speed
Power regulation	Independent pitch system for each blade.
Cut in wind speed	2.5 *m/s*
Rated wind speed	12 *m/s*
Cutout Wind speed	28-34 m/s
Extreme Wind Speed	59.5 *m/s*
Rated rotational speed	29 rpm
Operating range rot. speed	12-29 rpm

Orientation	Upwind
No of Blades	3
Blade Material	Glass Fiber Epoxy reinforced
Gear box type	Gear less
Generator type	Synchronous generator
Braking	Aerodynamic
Output Voltage	400 V
Yaw System	Active yawing with 4 electric yaw drives with brake motor
Tower	74 m (concrete)

The project activity is new 50.4 MW wind power project, which consists of 63 machines of Enercon make E-53 type Wind Energy Converters (WECs) of 800 KW capacities each. 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[2], hence baseline scenario of the project activity is the grid based electricity system, which is also the pre-project scenario.

Since the project activity involves power generation from wind, it does not involve any GHG emissions for generating electricity

A.4. Parties and project participants

Party involved (host) indicates a 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)	Vish Wind Infrastructure LLP (Private entity)	No

A.5. Public funding of project activity

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There is no public funding from Annex 1 countries and no diversion of Official Development Assistance (ODA) is involved in the project activity.

SECTION B. Application of selected approved baseline and monitoring methodology

B.1. Reference of methodology

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Title: "Consolidated baseline and monitoring methodology for Grid-connected electricity generation from renewable sources"

Reference: Approved consolidated baseline methodology, ACM0002 (Version 13.0.0, EB 67)

The selected methodology also refers to the following methodological tools as used:

[2] http://www.cea.nic.in/executive_summary.html

- Tool to calculate the emission factor for an electricity system – Version 2.2.1
- Tool for the demonstration and assessment of additionality – Version 06.0.0

Further information regarding the methodology / tools can be obtained at:
http://cdm.unfccc.int/methodologies/PAmethodologies/approved

B.2. Applicability of methodology

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The project activity is a wind based power project connected to the state grid, which forms part of the NEWNE 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 grid.

Therefore, the approved consolidated baseline and monitoring methodology applicable for the project activity is ACM0002, Version 13.0.0 and have been justified below:

Para No.	Applicability Criteria	Applicability to the Project Activity
1.	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, • Wave power plant/unit • Tidal power plant/unit.	The project activity is the installation of new grid connected renewable power generation from wind.
2.	In the case of capacity additions, retrofits or replacements: 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 expansion or retrofit of the plant has been undertaken between the start of this minimum historical reference period and the implementation of the project activity;	This condition is not relevant, as the project activity does not involve capacity additions, retrofits or replacements.
3.	In case of hydro power plants: • The project activity is implemented in an existing single or multiple reservoirs, with no change in the volume of any of reservoirs. • 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 definitions given in the Project	This condition is not relevant, as the project activity is not a hydro power plant.

	Emissions section, is greater than 4 W/m^2. • The project activity results in new single or multiple reservoirs and the power density of each reservoir the power plant, as per definitions given in the project emissions section, is greater than 4 W/m^2.	
4.	In case of hydro power plants using multiple reservoirs where the power density of any of the reservoirs is lower than 4 W/m^2 all the following conditions must apply: • The power density calculated for the entire project activity using equation 5 is greater than 4 W/m^2; • Multiple reservoirs and hydro power plants located at the same river and where are designed together to function as an integrated project that collectively constitute the generation capacity of the combined power plant; • Water flow between multiple reservoirs is not used by any other hydropower unit which is not a part of the project activity; • Total installed capacity of the power units, which are driven using water from the reservoirs with power density lower than 4 W/m2, is lower than 15MW; Total installed capacity of the power units, which are driven using water from reservoirs with power density lower than 4 W/m2, is less than 10% of the total installed capacity of the project activity from multiple reservoirs.	This condition is not relevant, as the project activity is not a hydro power plant and doesn't use multiple reservoirs where the power density of any of the reservoirs is lower than 4 W/m^2.
5.	The methodology is not applicable to the following: • 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; • Hydro power plants that result in new single reservoir or in the increase in existing single reservoir where the power density of the	The project activity does not involve any of the given criteria, hence, the methodology is applicable for the project activity.

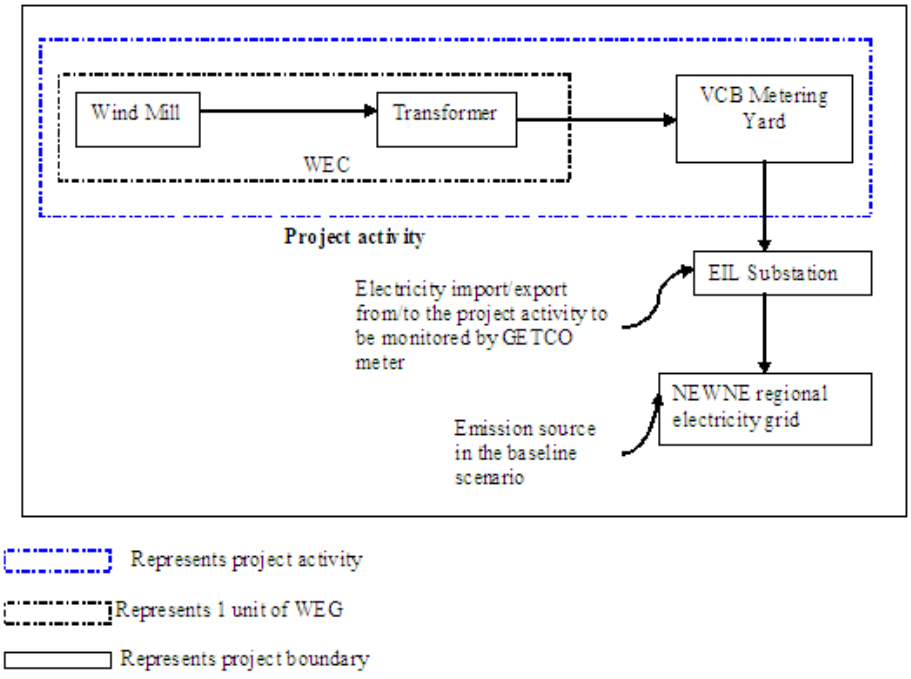
	power plant is less than 4 W/m^2.	
6.	In the case of retrofits, replacements, or capacity additions, this methodology is only applicable if the most plausible baseline scenario, as a result of the identification of baseline scenario, is "the continuation of the current situation, i.e. to use the power generation equipment that was already in use prior to the implementation of the project activity and undertaking business as usual maintenance".	The project activity is a new wind power plant. No replacement, modification or retrofit measures are implemented here. Hence, this criterion is also not relevant to the project activity.

The description provided in table above shows that the project activity satisfies the applicability criteria of the methodology ACM0002, version 13.0.0.

B.3. Project boundary

According to the applicable methodology, the spatial extent of this project activity includes the project site and all the power plants connected physically to the electricity system (grid) that the CDM power project is connected to. Therefore, the project boundary includes all the 63 WECs of VWIL along with the WECs of the other customers connected to the sub-station and the metering points. The project activity is further connected to the network of state transmission utility which falls under the network of NEWNE grid. Thus, the project boundary also includes all the power plants physically connected to the NEWNE grid.

Project boundary:



The baseline study of NEWNE grid shows that the main sources of GHG emissions under the baseline scenario are CO_2 emissions from the conventional power generating systems. Other emissions are that of CH_4 and N_2O but both emissions have been excluded for simplification. The project activity generates emission free electricity from renewable sources and hence, emits no greenhouse gases in the atmosphere. The following table indicates the sources and gases included in the project boundary:

Source		GHGs	Included?	Justification/Explanation
Baseline scenario	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.
		CH_4	No	No methane is expected to be emitted.
		N_2O	No	No nitrous oxide is expected to be emitted.
Project scenario	Greenfield wind energy conversion system	CO_2	No	The project activity does not emit any emissions.
		CH_4	No	No methane is expected to be emitted.
		N_2O	No	No nitrous oxide is expected to be emitted.

B.4. Establishment and description of baseline scenario

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According to the applied methodology ACM 0002, version 13.0.0, 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 of an electricity system"'.

The proposed project activity is installation of new grid connected power plant, located in the state of Gujarat and the power generated from the project activity will be supplied to the NEWNE Grid.

The details of India grid system is described in the table below:

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
		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
2.	Southern Grid	Southern	Andhra Pradesh, Karnataka, Kerala, Tamil Nadu, Pondicherry, Lakshadweep

The power sector in India including the NEWNE region largely comprises thermal power stations[3]; Sector- wise installed capacity (MW) as on 31.03.2010 can be seen from the table below[4]:

Sector	Hydro (MW)	Thermal (MW)				Nuclear (MW)	Renewable (MW)	Total (MW)
		Coal	Gas	Diesel	Total			
State	27,065	44,977	4,046.12	602.61	49,625.73	0	2701	79,391.85
Central	8,565.40	31,165	6,702.23	0	37,867.23	4,560	0	50,992.63
Private	1,233.00	8,056.38	6,307.50	597.14	14,961.02	0	12,819.99	29,014.01
All India	36,863.40	84,198.38	17,055.85	1,199.75	102,453.98	4,560	15,521.11	159,398.49

It is evident from the above table that the installed capacities in India are predominantly thermal power plants. Thermal power generation is GHG intensive and is a major source of CO_2 emissions. Therefore, in absence of the project activity, the amount of electricity generated would have been generated by the operation of grid-connected power plants and by addition of new generation sources, which are largely based on fossil fuels. Thus, generation from the project activity 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.

Therefore, as per the methodology, the baseline emission and the emission reduction from project activity have been calculated based on the amount of electricity to be supplied by the project activity to the grid and the Emission Factor of the NEWNE grid, i.e. Combined Margin emission factor. The Combined Margin (CM) Emission Factor has been calculated as the combination of Operating Margin (OM) and Build Margin (BM) emission factors with the weight age value of 0.75 and 0.25 respectively from the publicly available official database of Central Electricity Authority (CEA), Government of India.

Parameters	Nomenclature	Source
$EF_{grid\ CM,\ y}$	CO_2 emission factor of NEWNE grid (Combined Margin Emission factor)	Calculated as the weighted average of the operating margin & build margin values, sourced from Baseline CO_2 Emission Database, Version 6.0, 1st March, 2011, published by Central Electricity Authority (CEA), Government of India
$EF_{OM,\ y}$	Operating Margin Emission Factor (tCO_2/MWh)	Baseline CO_2 Emission Database , Version 6.0, 1st March, 2011, published by Central Electricity Authority (CEA), Government of India
$EF_{BM,\ y}$	Build Margin Emission Factor (tCO_2/MWh)	Baseline CO_2 Emission Database , Version 6.0, 1st March, 2011, published by Central Electricity Authority (CEA), Government of India
EGy (Variable)	Quantity of net electricity generation supplied to the grid by the project activity in a year y (MWh)	GEDA sharing certificate

B.5. Demonstration of additionality

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[3] http://www.cea.nic.in/

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

The project activity has been conceived as a CDM project since its inception. As per EB 49, Annex 22, B. New project activities, Point 2,

"The Board decided that for project activities with a starting date on or after 02 August 2008, the project participant must inform a Host Party DNA and the UNFCCC secretariat in writing of the commencement of the project activity and of their intention to seek CDM status".

The start date for the project activity is 02nd April, 2011, which is after 02 August, 2008, hence, the project proponent has given prior CDM intimation to National CDM Authority (NCDMA), Ministry of Environment & Forests (MoEF), Government of India as well as UNFCCC on 6th July, 2011 and 30th June, 2011 respectively and has received the acknowledgement from NCDMA & UNFCCC[5].

Furthermore, the following chronology of events and the real action taken towards availing the CDM benefits shows serious CDM consideration during the investment period of the project activity:

S. No.	Event	Approval Date
1.	Offer letter received from the equipment supplier	07 February, 2011
2.	Board Meeting Resolution	01 April, 2011
3.	Purchase Order placed (Project Start Date)	02 April, 2011
4.	Prior Intimation of the commencement of the project activity in writing to UNFCCC[6]& NCDMA (DNA)	30th June, 2011 & 6th July, 2011
5.	Local Stakeholders' consultation	15th& 16th July, 2011

Additionality

The latest Additionality tool, "Tool for the demonstration and assessment of Additionality", version 6.0.0, EB 65, Annex 21, has been used to demonstrate project additionality.

Step 1: Identification of alternatives to the project activity consistent with current laws and regulations

Sub-step 1a: Define alternatives to the project activity:

As per the methodology ACM0002, version 13.0.0, the alternative for the project activity is generation of equivalent amount of electricity by operation of grid-connected power plants and by addition of new generation sources.

Accordingly, the realistic and credible alternatives to the project activity are:

(a) The proposed project is undertaken without being registered as a CDM activity.

(b) No project activity, in which case the equivalent amount of electricity being generated through operation of grid-connected power plants and addition of new generation sources, i.e. continuation of the current situation.

[5]The acknowledgement from UNFCCC & NCDMA will be provided to the DOE for verification.
[6]http://cdm.unfccc.int/Projects/PriorCDM/notifications/index_html

Outcome of Step 1a: Alternatives (a) and (b) above have been identified as realistic and credible alternative scenario (s) to the project activity.

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

Both the alternatives are in compliance with all applicable legal and regulatory requirements.

Outcome of Step 1b: Identification of the realistic and credible alternative scenario (s) to the project activity that 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.

Step 2: Investment Analysis

Sub-step 2a: Determine appropriate analysis method:

As per "Tool for the demonstration and assessment of additionality" (version 06.0.0), for financial evaluation of the project, the following three options can be applied:

1. Option I: Simple Cost Analysis
2. Option II: Investment Comparison Analysis
3. Option III: Benchmark Analysis

The simple cost analysis is not applicable as the project activity will result into financial return from the sale of the electricity apart from the revenue availed from CDM. As per paragraph 19 of the "*Guidance on the assessment of investment analysis"*, (Annex 5, EB 62), if the alternative to the project activity is the supply of electricity from a grid, this is not to be considered as an investment. The alternative to the project activity is continuation of current situation i.e. no project activity, in that case equivalent amount of electricity would have been produced by the grid electricity system. This option will not require capital investment. Therefore, Investment comparison analysis (Option II) is not applicable.
Hence, Option III: *Benchmark Analysis* has been selected for investment analysis by the project proponent.

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

The Project Proponent proposes to use **Option III – Benchmark Analysis** and the financial indicator is identified as *post-tax* equity IRR.

The guidance to investment analysis issued in EB 62, Annex 5 (paragraph 12) states that in cases where a benchmark approach is used the applied benchmark shall be appropriate to the type of IRR calculated. Required/expected returns on equity (Cost of Equity) are appropriate benchmarks for equity IRR.

As per ACM 0002 version 13.0.0, the additionality of the project shall be conducted using "tool for demonstration and assessment of additionality" version 6.0.0. The tool for demonstration and assessment of additionality [para-29, sub step 2(b)] states that, the financial/economic analysis shall be based on parameters that are standard in the market, considering the specific characteristics of the project type but not linked to the subjective profitability expectation or risk profile of a particular project developer. Accordingly, the cost of Equity applicable to the project type has been considered as the benchmark to be compared against equity IRR.

Further as per para 15 of "Guidelines on the assessment of investment analysis" annex 5 of EB 62,version 5.0;

If the benchmark is based on parameters that are standard in the market, 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, based on data sources which can be clearly validated by the DOE, while properly justifying all underlying factors". The project participant has chosen option a (values as provided in Appendix A of the guidance on assessment of investment analysis version 5) for calculating cost of equity benchmark.

The rating of Baa3 was available to Indian bonds (http://banking.contify.com/story/moodys-assign-baa3-rating-to-exim-banks-us110-mln-bonds-2011-03-31) as on 31 March 2011. It may be noted that PP has used the value of 11.75% which is equivalent to rating of Baa3 for bonds issued by Moody. Therefore investment guidance which is effective from the date of its issuance; the default values can be used by the PP for the specific Bond rating issued by Moody's. The bond rating for India Issued by Moody is Baa3 and therefore as per guidance the countries that have rating of Baa3 can use the default values of 11.75% in case of sectoral scopes that falls under group 1. Therefore the benchmark chosen is also in line with para 6 of EB 62 annex 5 which calls for using data that was available to PP in context of decision making.

As per para 7 of the appendix A, "*in situations where an investment analysis is carried out in nominal terms, 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*".

The crediting period for the project activity is 10 years and the mean WPI and CPI inflation rate are 5.30% and 6.5%. Conservatively, PP has selected 5.30% inflation rate based on data published by RBI.

As the analysis has been carried out in nominal terms, the default value of expected return on equity (given in real terms in EB 62 Annex 13) has been adjusted with the inflation. The inflation value has been taken as per the forecast by the Reserve Bank of India (RBI).

The benchmark has been calculated as:

Nominal Benchmark = {(1+ Real Benchmark[7])*(1+Expected Inflation Rate[8]) – 1}
= {(1+11.75%)*(1+5.3%) – 1}
= 17.67%

Hence, the benchmark Cost of equity for the project is calculated as 17.67%.

Sub-step 2c: Calculation and comparison of financial indicators (only applicable to Options II and III):

The major financial assumptions/ parameters that have been taken into consideration for estimation of the post - tax equity IRR for the project activity are as follows:

Assumptions for Financial Model

[7] Default value for expected return on equity of 11.75% published by UNFCCC under investment guidance version 5.0 has been used by PP.

[8] Expected Inflation rate for over 10 years period has been published by RBI (http://rbidocs.rbi.org.in/rdocs/Publications/PDFs/PREERE14020210.pdf). As per investment guidance, inflation rate shall be obtained from the inflation forecast of the central bank of the host country for the duration of the crediting period. The crediting period for the project activity is 10 years and the mean WPI and CPI inflation rate are 5.30% and 6.5%. Conservatively, PP has selected 5.30% inflation rate based on data published by RBI.

Capacity of Machines in kW		800	*WEG supplier offer dated 07 Feb 2011*
Number of Machines		63	*WEG supplier offer dated 07 Feb 2011*
Project Capacity in MW		50.40	*WEG supplier offer dated 07 Feb 2011*
Expected project commissioning date		Sep - 2011	*WEG supplier offer dated 07 Feb 2011*
Project Cost per MW (INR. In Millions)		59.34	*Calculated*
Operations			
PLF	Lalpur	23.8%	*Third party PLF report*
	Kutch	24.5%	
Insurance Charges @ % of capital cost		0.12%	*Normative*
Operation & Maintenance Cost base year @ % of capital cost		1.30%	*WEG supplier offer dated 07 Feb 2011*
% of escalation per annum on O & M Charges		6.0%	*WEG supplier offer dated 07 Feb 2011*
Service Tax on O & M expenses		10.3%	*http://www.simpletaxindia.org/2011/02/service-tax-rate-chart-exemption-limit.html*
Tariff			
Base year Tariff for 20 years - INR./KWh		3.56	*GERC order Dated 30.01.2010*
Project Cost		**INR Million**	
Land and Infrastructure, Generator & Electrical Equipments, Mechanical Equipments, Civil Works, Instrumentation & Control, Other Project expenses etc.			
Total Project Cost		2990.61	*WEG supplier offer dated 07 Feb 2011*
Means of Finance		**INR Million**	
Own Source		897.18	*Debt: Equity (70:30)*
Term Loan		2,093.43	
Total Source			
Terms of Loan			
Interest Rate		11.50%	http://www.pfc.gov.in/writereaddata/userfiles/file/LendingRates/interest_circular_23032011.pdf
Tenure (years)		10	
Income Tax Depreciation Rate (Written Down Value basis)			
Depreciation as per IT Act		80%	http://paryca.org/images/Tax_%20matters/DepreciationRates%20as%20per%20IT%20act.pdf
Additional depreciation		20%	http://www.knowledgebible.com/forum/showthread.php/1318-Additional-Depreciation

Total depreciation on Wind Energy Generators	**100%**	http://taxguru.in/income-tax/understanding-deprecation-section-32-income-tax-act-1961-latest-case-laws.html
Book Depreciation Rate (Straight Line Method basis)		
On all assets	4.50%	*Straight line Method Adopted*
Book Depreciation up to (% of asset value)	90%	*10% salvage has been applied and balance 90% is depreciated*
Income Tax		
Income Tax rate	30.90%	*http://www.llponline.in/tax_llp.php*
Working capital		
Receivables (no of days)	30	*Billing Cycle*
O & m expenses (no of days)	90	*WEG supplier offer dated 07 Feb 2011*

The post- tax equity IRR for the project has been estimated as 7.86%.

Sub-step 2d: Sensitivity analysis (only applicable to Options II and III):

The sensitivity analysis has been done to further illustrate that in favourable scenario also, the financial attractiveness of the project will remain critical under reasonable variations of the critical assumptions as explained below.

As per "Guidance on the Assessment of Investment Analysis", EB 62, Annex 5, paragraph 20 & 21, sensitivity analysis is required to be conducted for those variables which constitute more than 20% of the project cost or revenue. Therefore, the following parameters have been considered for sensitivity analysis:

- Capital Cost
- Tariff
- Plant Load Factor
- O&M cost

Capital Cost

In accordance with the investment guidance, the additionality for the project activity is demonstrated at the time of decision making. The project proponent has considered it appropriate to conduct the sensitivity at the variation of +/- 10% of the project cost.

	10% decrease in Capital Cost	Base case	10% increase in Capital Cost
Post tax Equity IRR	12.15%	7.86%	4.75%

The equity IRR crosses the benchmark at capital cost variation of 18.64% for the project. The actual project cost is INR 2,772 Million as per purchase order which essentially means that variation in project cost provided in the supplier offer and purchase order is less than 10%. Therefore, the negative variation of 18.64% is not realistic.

Tariff

The projects developed under APPC tariff (Average Pooled Power Purchase Cost) structure are eligible for RECs (Renewable Energy Certificates). The project activity under consideration has been proposed under APPC tariff structure. As per paragraph 6 of Annex 3 EB 22, national and/or sectoral policies or regulations that give comparative advantages to less emissions intensive technologies over more emissions-intensive technologies can be termed as E- policies. The national policy on REC provides comparative advantage to less carbon intensive technologies and it came in existence after 11 November 2001. Therefore, REC is an E- policy.

As per paragraph 3 of Annex 32 Eb 53, the assessment has to be conducted to gauge the impact of national and sectoral policies for suitability of tariff and to judge whether the policy/policies are E+ policies or E- policies. Considering the fact that REC is an E- policy, PP has not considered REC impact during the investment analysis and has used tariff of 3.56 INR/kWh approved by GERC (Gujarat Electricity Regulatory Commission) which would have otherwise been used for demonstrating additionality in the absence of the E- policy. Since tariff approved by GERC is fixed for 20 years, it is not appropriate to conduct sensitivity on tariff. However, PP has conducted the sensitivity analysis for traiff and the equity IRR crosses the benchmark at tariff of INR 4.690/ kWh (variation of 31.75% in tariff) for the project, which is not realistic.

Plant Load Factor

The PLF value estimated by the third party is 24.5% for Kutch site and 23.8% for Lalpur site respectively. The project proponent has conducted sensitivity at a variation of 10% over the base case.

	10% decrease over the PLF estimated by Third party	PLF (base case)	10% increase over PLF estimated by Third party
Post tax Equity IRR	4.80%	7.86%	10.93%

The equity IRR crosses the benchmark at effective PLF of 31.35% (variation of 31.74% in PLF) for Lalpur site and at effective PLF of 32.28 % (variation of 31.74% in PLF) for Kutch site for the project activity. The PLF provided by third party is 24.5% for Kutch site and 23.8% for Lalpur site respectively, therefore, the variation of 31.74% over the PLF provided by the third party is not realistic.

O&M Cost:

The Sensitivity in O&M cost has been conducted after taking into consideration +/-10% variation in O&M Cost.

	10% decrease in O&M cost and at the escalation of 5%	Base case	10% increase in O&M cost and at the escalation of 5%
Post tax Equity IRR	8.72%	7.86%	7.79%

The project does not cross the benchmark even at 100% variation in O & M cost.

Outcome of Step 2: From the above analysis, it can be seen that the equity IRR of the project activity remains well below the benchmark even under the sensitivity analysis. Therefore, it can be concluded that the proposed CDM project activity is unlikely to be the most financially/economically attractive and hence, additional.

Step 3: Barrier analysis

Barrier analysis has not been used.

Step 4: Common practice analysis

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

The description of common practice test (Step 4 of Additionality tool version 06.0.0, EB 65, annex 21) requires analysis of other similar activities that are operational and that are 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 .

The project activity is a 50.4 MW wind power project set up by Vish Wind in Gujarat to generate and supply electricity to the Gujarat state grid. The project is a large scale CDM activity. The applicable tariff for the project has been determined by the Gujarat Electricity Regulatory Commission.

As per paragraph 6 of Annex 21, EB 65, the project activity falls under the following measure:
"(b) Switch of technology with or without change of energy source (including energy efficiency improvement as well as use of renewable energies);"

The applicable geographical area as per latest guidance on common practice can be taken as host country. The guideline provides four step approaches for common practice for measures that are listed in paragraph 6 of Annex 21, EB 65:

Step 1: Calculate applicable output range as +/-50% of the design output or capacity of the proposed project activity.

The proposed project activity is 50.4 MW wind power project in the state of Gujarat. Therefore the applicable output range will be from 25.2 MW to 75.6 MW.

Step 2: In the applicable geographical area, identify all plants that deliver the same output or capacity, within the applicable output range calculated in Step 1, as the proposed project activity and have started commercial operation before the start date of the project. Note their number N_{all}. Registered CDM project activities and project activities undergoing validation shall not be included in this step.

The Host country, i.e., India has been considered as the applicable geographical area for this project as per the default option as mentioned in the Tool "Demonstration and assessment of additionality", Version 6.0.0. For the analysis all the power plants in the host country India have been considered for the common practice analysis. All the available projects are filtered based on the same applicable output range of 25.2MW to 75.6 MW calculated in Step 1, based on which, thermal, hydro, nuclear & wind projects and others have been considered for the analysis.
In this step all plants (N_{all}) that deliver the same output or capacity, within the applicable output range calculated in Step 1, as the proposed project activity and have started commercial operation before the start date of the project have been identified and listed below:-

Technology Area	Projects excluding CDM projects in applicable cap range (25.2 MW to 75.6 MW), (N_{all})*
Thermal	8
Hydro	51

Nuclear	0
Wind**	2
Total	**61**

** Registered CDM project activities and project activities undergoing validation are not included. List of power plants (N_{all}) in applicable cap range (25.2 MW to 75.6 MW) is provided under Annex 2 of PDD.*
*** Under the applicable cap range (25.2 to 75.6 MW), there are only 2 wind power projects which are not either CDM registered or under CDM validation.*

It can be seen that , N_{all} = *Thermal projects + Hydro Projects + Nuclear Projects*[9] *+ Wind Projects*[10]

= *8+51+0+2*

= *61*

Step 3: Within plants identified in Step 2, identify those that apply technologies different that the technology applied in the proposed project activity. Note their number N_{diff}.

As per para 9 of tool for "Demonstration and assessment of additionality", Version 6.0.0., 'Different technologies in the context of common practice are technologies that deliver the same output and differ by at least one of the following (as appropriate in the context of the measure applied in the proposed CDM project and applicable geographical area),.

The technologies that are different than the technology applied in the proposed project activity can be distinguished based on the following:

(a) Energy source/fuel;
(b) Feed stock;
(c) Size of installation (power capacity):
  (i) Micro (as defined in paragraph 24 of Decision 2/CMP.5 and paragraph 39 of Decision 3/CMP.6);
  (ii) Small (as defined in paragraph 28 of Decision 1/CMP.2);
  (iii) Large;
(d) Investment climate in the date of the investment decision, inter alia:
  (i) Access to technology;
  (ii) Subsidies or other financial flows;
  (iii) Promotional policies;
  (iv) Legal regulations;
(e) Other features, inter alia:
  (i) Unit cost of output (unit costs are considered different if they differ by at least 20 %);

The proposed project activity is wind power project and therefore the technologies that are based on other energy sources such as thermal, hydro solar and nuclear can be termed as different technology.

[9] For the data of thermal, hydro & nuclear power projects, 'CO2 Baseline Database', version 6.0 published by CEA Dated 'March 2011', has been used, which was available at the time of investment decision of project activity. Web link: http://cea.nic.in/reports/planning/cdm_co2/Database_publishing_ver6.zip

[10] Source, Wind Power Directory, dated July, 2011

Out of the total 442 project, the projects which use energy resource (thermal, hydro & nuclear) other then wind, are of different technology and part of $N_{diff.}$ = 59

Thus the total no of project under different technology are;

Technology Area	Projects excluding CDM projects in applicable cap range (25.2 MW to 75.6 MW), (N_{all})*	N_{diff}
Thermal	8	8
Hydro	51	51
Nuclear	0	0
Wind	2	0
Total	**61**	**59**

N_{diff} = *8+51+0+0*

= *59*

Hence,

N_{all}-N_{diff} = 61-59

= 2

Step 4: Calculate factor F=1-N_{diff}/N_{all} representing the share of plants using technology similar to the technology used in t\he proposed project activity in all plants that deliver the same output or capacity as the proposed project activity.

F = 1-N_{diff}/N_{all}

F = 1- (59/61)

= 0.0327

The proposed project activity is a common practice within a sector in the applicable geographical area if both the following conditions are fulfilled:

(a) the factor F is greater than 0.2, and
(b) N_{all}-N_{diff} is greater than 3.

Outcome of Step 4: The proposed project is not common practice as the factor F<0.2 (as calculated above F= 0.0327) and N_{all}- N_{diff} <3 ((as calculated above N_{all}- N_{diff} = 2), thus satisfying the criteria mentioned in the methodological tool "Demonstration and assessment of additionality", Version 06.0.0.

Sub-step 4b Discuss any similar options that are occurring:

From sub-step 4a it is clear that all similar projects have been undertaken only as CDM projects. Hence it can be concluded that similar activities are not widely observed or commonly carried out. Thus Sub-step 4b is not applicable.

Therefore, the project activity is considered to be additional.

B.6. Emission reductions

B.6.1. Explanation of methodological choices

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According to the approved methodology ACM0002 (Version 13.0.0), the Emission Reduction (ER_y) has been calculated as:

$$\mathbf{ER_y = BE_y - PE_y}$$

Where:

ER_y	Emission reductions in year *y* (t CO_2e/yr)
BE_y	Baseline Emissions in year *y* (t CO_2e/yr)
PE_y	Project Emissions in year *y* (t CO_2e/yr)

Estimation of Baseline Emissions:

Baseline emissions include only CO_2 emissions from electricity generation in fossil fuel fired power plants that are displaced due to the project activity. The methodology assumes that in the absence of the project activity, equivalent amount of electricity would have been generated by existing grid-connected power plants and the addition of new grid-connected power plants. The baseline emissions have been calculated as follows:

$$BE_{y} = EG_{PJ, y} * EF_{grid, CM, y}$$

Where:

BE_y= Baseline emissions in year *y* (tCO_2/yr)

$EG_{PJ,y}$= 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)

$EF_{grid,CM,y}$= Combined margin CO_2 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", version 02.2.1 (tCO_2/MWh)

Since the project activity is the installation of a new grid connected renewable power plant (green field project), hence, $EG_{PJ,y}$ has been calculated as :

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

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/yr)

The proposed project activity is in the state of Gujarat, which falls under NEWNE grid. Therefore, the baseline emission factor is calculated as combined margin emission factor of the NEWNE grid, consisting of a combination of operating margin and build margin emission factors according to the procedures prescribed in the latest tool "Tool to calculate the emission factor for an electricity system", Version 2.2.1 (EB 63, Annex 19). The steps of calculation are as follows:

STEP 1: Identify the relevant electricity systems

The Indian Electricity Grid system is divided into two independent regional grids, namely Integrated Northern, Eastern, Western, and North-Eastern (NEWNE) grid and the Southern Grid as per recently published CO_2 Baseline Database for the Indian Power Sector, Version 6.0, March, 2011 by Central Electricity Authority (CEA), Government of India.

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 neighboring 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 generation from the power plants can be dispatched without significant constraints and thus, represents the "project electricity system" for the project activity. As the project is located under the network of NEWNE grid, NEWNE grid has been considered as the project electricity system.

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

As per the "Tool to calculate the emission factor emission factor for an electricity system" (Version 2.2.1), project participants may choose between the following two options to calculate the operating margin and build margin emission factor:

Option 1: Only grid power plants are included in the calculation
Option 2: Both grid power plants and off-grid power plants are included in the calculation

Option 1 has been followed 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, for calculation of operating margin four options are available:

Option 1: Simple OM; or

Option 2: Simple adjusted OM; or

Option 3: Dispatch data analysis OM; or

Option 4: Average OM.

As per the "Tool to calculate the emission factor for an electricity system" (Version 2.2.1), the simple OM method can be used only if the low-cost/must run resources constitute less than 50% of the total grid generation in: 1) average of the five most recent years, or 2) based on long term averages for hydroelectricity production.

The Share of Low Cost / Must-Run (% of Net Generation) in the generation profile of the different grids in India in the last five years is as follows:

	2005-06	2006-07	2007-08	2008-09	2009-10

NEWNE	18.0%	18.5%	19.0%	17.4%	15.9%
South	27.0%	28.3%	27.1%	22.8%	20.6%
India	20.1%	20.9%	21.0%	18.7%	17.1%

Source[11]: CO_2 Baseline Database for the Indian Power Sector – Central Electricity Authority (CEA)

In Integrated (NEWNE) Grid, the low-cost/must run resources vary from 15.9% to 19.0%[12] of the total net grid generation. Hence, simple OM has been opted. The average operating margin method cannot be applied, as low cost/ must run resources in NEWNE grid constitute less than 50% of the total grid generation.

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

The Central Electricity Authority (CEA) of India has published the official database on emission factors for all regional grids in India, in order to facilitate CDM project and offer consistent data for all project developers. Application of this officially published database represents the most accurate approach, hence, has been applied for the project activity.

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. It may be calculated:

- Based on the net electricity generation and a CO_2 emission factor of each power unit. (Option A), or
- 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)

The CEA database uses the option A, i.e. data on net electricity generation and CO_2 emission factor for each power unit, the average efficiency of each power unit and the fuel type (s) used in each power unit, to calculate the OM of the different regional grids.

The simple OM emission factor is calculated based on the net electricity generation of each power unit and an emission factor for each power unit, as follows:

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

Where:

$EF_{grid,OMsimple,y}$	Simple operating margin CO_2emission 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_2emission factor of power unit m in year y (tCO_2/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

The emission factor of each power unit m has been determined as follows:

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

[11] http://www.cea.nic.in/reports/planning/cdm_co2/Database_publishing_ver6.zip

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

Where:

$EF_{EL,m,y}$	CO_2emission 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_2emission 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

Therefore, in line with this, the simple OM emission factor values have been directly sourced from "CO_2 Baseline Database for the Indian Power Sector", Version 6.0, 1st March, 2011 published by Central Electricity Authority (CEA) of India. As per the "Tool to calculate the emission factor for an electricity system" (Version 2.2.1), the calculation of Operating Margin (OM) has been done following ex – ante approach based on the average of the most recent 3 years' (2007-08; 2008-09; 2009-10) Operating Margin (OM) emission factor values, which is available at the time of PDD submission for validation. Therefore, there is no requirement to monitor and recalculate this emission factor during the crediting period.

As per the version 6.0 [13]of CEA data base the Simple Operating Margin (tCO2/MWh) (including Imports) along with net Generation for NEWNE grid is as follows:-

Year	2007-08	2008-09	2009-10
Simple OM (including imports) (tCO_2 / MWh)	0.99990	1.00655	0.97774
Net Generation Total (MWh)	496.11903	510.69273	544.91516

Weighted Average Operating Margin *	0.99431

** Calculated as per Option A, i.e. generation weighted average CO2 emissions per unit electricity generation has been used*

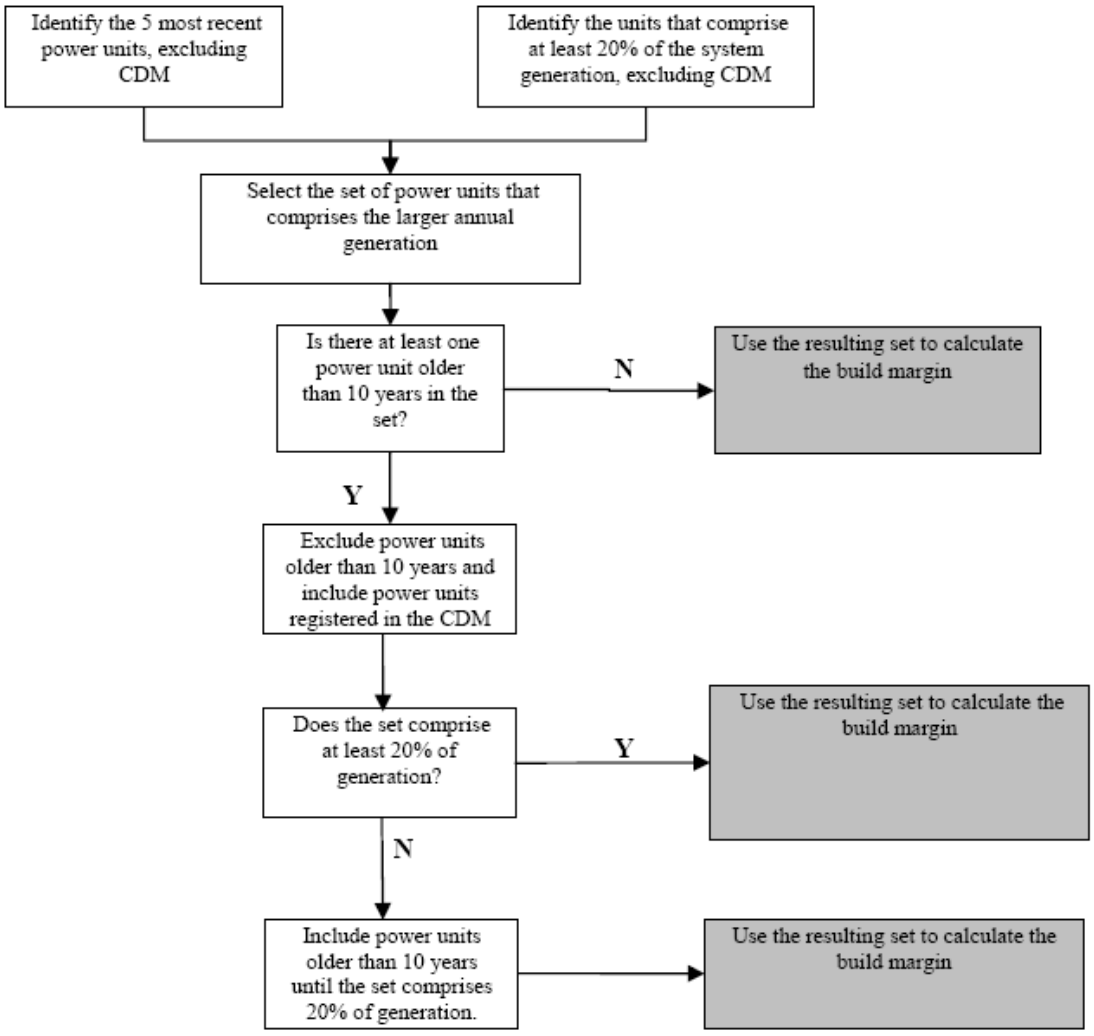
Step 5: Calculate the build margin (BM) emission factor

As per Option 1, for the first crediting period, 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. Capacity additions from retrofits of power plants have not been included in the calculation of the Build Margin emission factor.

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

[13] Central Electricity Authority: CO_2 Baseline Database, Version 6.0, 1st March, 2011; http://www.cea.nic.in/reports/planning/cdm_co2/cdm_co2.htm



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:

$$\mathbf{EF_{grid,BM,y} = (\Sigma\ EG_{m,y}\ x\ EF_{EL,m,}) / \Sigma\ EG_{m,y} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ (c)}$$

Where:

$EF_{grid,BM,y}$	Build margin CO_2emission 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_2emission factor of each power unit m ($EF_{EL,m,y}$) is determined as per the procedures given in step 4 (a) for the simple OM, using option A1 for *y*, the most recent historical year for which power generation data is available and using *m*, the power units included in the build margin.

The value of BM (not adjusted for imports) has been taken from "CO_2 Baseline Database for the Indian Power Sector", Version 6.0, 1st March, 2010 published by Central Electricity Authority (CEA), Government of India.

Year	2009-10
Build Margin CO_2 Emission Factor (tCO_2e / MWh)	0.81231

Step 6: Calculate the Combined Margin (CM) Emissions Factor

The CO_2 Emission Factor (baseline emission factor) is calculated as the combination of the OM and BM emission factors with the weightage value of 0.75 and 0.25 respectively. The resulting Combined Margin is fixed ex-ante for the duration of the whole crediting period:

$$\mathbf{EF_{grid,\,CM,\,y}} = EF_{grid,\,OM,\,y} \times W_{OM} + EF_{grid,\,BM,\,y} \times W_{BM}$$

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 emission factor (%)
W_{BM} = Weighting of build margin emission factor (%)

Combined Margin CO_2 Emission Factor (tCO_2 / MWh)	0.94881

Details of Baseline data:

Data of Operating Margin (OM) for the three financial years from 2007-08, 2008-09 and 2009-2010 and Build Margin (BM) for 2009-10 has been obtained from:

CO_2 Baseline Database for the Indian Power Sector; **Central Electricity Authority (CEA), Version 6**

The detailed excel sheet is available at:

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

Estimation of Project Emissions

The project activity involves harnessing of wind energy and its conversion to electricity. Hence, according to the methodology ACM0002, Version 13.0.0, there will be no project emissions, i.e. $PE_y = 0$.

Estimation of Leakage

As per the methodology ACM0002, Version 13.0.0, no leakage has been considered, therefore, $LE_y = 0$.

B.6.2. Data and parameters fixed ex ante

Data / Parameter	$EF_{grid, CM, y}$
Unit	tCO_2 / MWh
Description	Combined margin emission factor of NEWNE grid
Source of data	Combined Margin emission factor of the NEWNE Grid has been calculated based on "Baseline Carbon Dioxide Emission Database", Version 6.0, 1st March, 2011 by Central Electricity Authority (CEA); (Source: http://www.cea.nic.in/reports/planning/cdm_co2/cdm_co2.htm)
Value(s) applied	0.94881
Choice of data or Measurement methods and procedures	The Combined Margin (CM) Emission Factor has been calculated (for the year 2009-10) as a weighted sum of Operating Margin emission factor and Build Margin emission factor taking the weight age value as 0.75 and 0.25 respectively as per the "Tool to calculate the emission factor for an electricity system" and on the basis of the data available at the time of PDD submission from the publicly available official database on emission factors for all regional grids in India. The detailed calculation and value of CM have been explained in the section B.6.1 and Appendix 4 of the PDD respectively.
Purpose of data	Calculation of baseline emissions
Additional comment	This value is calculated on ex-ante basis and will remain fixed for the entire crediting period.

Data / Parameter	$EF_{grid, OM, y}$
Unit	tCO_2 / MWh
Description	Operating margin emission factor of NEWNE Grid
Source of data	Values of Operating Margin emission factor of the NEWNE Grid has been taken from "Baseline Carbon Dioxide Emission Database" Version 6.0, 1stMarch, 2011, by Central Electricity Authority (CEA); (Source: http://www.cea.nic.in/reports/planning/cdm_co2/cdm_co2.htm)
Value(s) applied	0.99431
Choice of data or Measurement methods and procedures	Operating Margin (OM) emission factor has been calculated as per Option A, i.e. generation weighted average CO2 emissions per unit electricity generation using the most recent 3 years' (2007-08; 2008-09; 2009-10) Operating Margin (OM) emission factor values from the Baseline Carbon Dioxide Emission Database, Version 6.0, 1st March, 2011 published by the Central Electricity Authority (CEA), Government of India. The database is the publicly available official database on emission factors for all regional grids in India. The detailed calculation and value of OM have been explained in the section B.6.1 and Appendix 4 of the PDD respectively.
Purpose of data	Calculation of baseline emissions
Additional comment	This value is calculated on ex-ante basis and will remain fixed for the entire crediting period.

Data / Parameter	$EF_{grid, BM, y}$
Unit	tCO_2 / MWh
Description	Build margin emission factor of NEWNE grid
Source of data	Value of Build Margin emission factor of the NEWNE Grid has been taken from "Baseline Carbon Dioxide Emission Database" Version 6.0, 1st March, 2011, by Central Electricity Authority (CEA); (Source: http://www.cea.nic.in/reports/planning/cdm_co2/cdm_co2.htm)
Value(s) applied	0.81231
Choice of data or Measurement methods and procedures	Most recent value of Build Margin (BM) Emission Factor (for the year 2009-10) from the CO_2 Baseline Database, Version 6.0, 1st March, 2011, Central Electricity Authority, Government of India, has been used. This database is the publicly available official database on emission factors for all regional grids in India.The detailed calculation and value of BM have been explained in the section B.6.1 and Appendix 4 of the PDD respectively.
Purpose of data	Calculation of baseline emissions
Additional comment	This value is calculated on ex-ante basis and will remain fixed for the entire crediting period.

B.6.3. Ex ante calculation of emission reductions

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Ex-ante calculation of emission reductions is equal to ex-ante calculation of baseline emissions as project emissions and leakage are nil.

The Baseline emission for the project activity has been calculated as below:

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

Where:

BE_y = Baseline emissions in year *y* (tCO_2/yr)

$EG_{PJ,y}$ = 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)

$EF_{grid,CM,y}$= Combined margin CO_2 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" (tCO_2/MWh)

Baseline emission factor (Combined Margin) ($EF_{grid, CM, y}$) = 0.94881 tCO_2e/MWh

Since, the project activity is the installation of a new grid - connected renewable power plant,

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

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

Therefore, annual electricity supplied to the grid by the project ($EG_{facility,y}$) has been calculated as:

$EG_{facility,y}$ = (24 MW x 23.8% + 26.4 MW x 24.5%) x 8,760 hours
= 106, 696.80 MWh/yr

As,

$EG_{PJ,y}$ = $EG_{facility,y}$,
$EG_{PJ,y}$ = 106, 696.80 MWh/yr

Therefore, annual Baseline Emissions (BE_y) = $EG_{PJ,y} * EF_{grid,CM,y}$
= $EG_{facility,y} * EF_{grid,CM,y}$
= 106, 696.80 MWh x 0.94881 tCO_2e/MWh
= 101, 234 tCO_2e/yr

Therefore, the Emission Reductions (ERy) for project activity have been calculated as:

$ER_y = BE_y – PE_y$

Where,

ER_y = Emission reductions in year, y (tCO2e/y)
BE_y= Baseline Emissions in year, y (tCO2e/y)
PE_y = Project Emissions in year, y (tCO2e/y)

Since, Project emissions $PE_y = 0$,

Hence $ER_y = BE_y$

Hence emission reduction (ER_y) = BE_y
= 101, 234 tCO_2e/yr

Emission Reductions (ER_y) = BE_y= 101,234 tCO_2e/yr.

The emission reductions per year are estimated to be 101, 234 tCO_2e/yr.

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*	101,234	0	0	101,234
Year 2	101,234	0	0	101,234
Year 3	101,234	0	0	101,234
Year 4	101,234	0	0	101,234
Year 5	101,234	0	0	101,234
Year 6	101,234	0	0	101,234
Year 7	101,234	0	0	101,234
Year 8	101,234	0	0	101,234
Year 9	101,234	0	0	101,234
Year 10	101,234	0	0	101,234
Total	1, 012, 340	0	0	1, 012, 340
Total number of crediting years	10			
Annual average over the crediting period	101,234	0	0	101,234

* Year 1st begins from 01/10/2012 or date of registration of project with UNFCCC whichever is later, and each year extends for 12 months.

B.7. Monitoring plan
B.7.1. Data and parameters to be monitored

Data / Parameter	$EG_{facility,y}$
Unit	MWh (Mega-watt hour)
Description	Quantity of net electricity generation supplied by the project activity to the grid in year *y*.
Source of data	'Certificate for Share of Electricity Generated by Wind farm' prepared & issued by SLDC/GETCO (Gujarat Energy Transmission Corporation Limited) based on the meter reading recorded at cluster meters (installed at project site) & main meter (ABT meter) installed at Enercon sub-station.
Value(s) applied	= 106696.80 MWh/year
Measurement methods and procedures	The procedure for metering will be as per the provisions of the power purchases agreement. The project activity will have various clusters and each cluster has exclusive dedicated metering arrangement at project site. These cluster meters will be sealed by GEDA (Gujarat Energy Development Agency) and will also be tested once in three years as per the metering code prevalent in the state of Gujarat and GETCO notification (dated 21.02.2011 & 04.01.2012) in the state of Gujarat. All these cluster meters are connected to the main meter (revenue meter/ billing meter/ABT meter) at the Enercon substation, maintained by Enercon. There is one check meter (also known as GETCO meter) installed along with main meter at Enercon sub-station. Both meters (main & check) at sub-station have been installed and are in the custody of GETCO; main meter is referred as ABT meter and check meter is referred as the GETCO meter. In further section of the PDD, these meters are referred as main and check meter only. The joint meter reading at Enercon sub-station & cluster metering points is taken jointly by the representatives of Enercon and GEDA/GETCO in the form of JMR. The net electricity supplied to the grid by the wind farm is calculated by GEDA on the basis of main meter reading (export & import) and the meter readings taken at individual cluster meters (export & import) after adjusting transmission loss. For adjustment of transmission loss, the electricity metered at the main meter is proportionally divided by GEDA among the customers connected to the main meter/revenue meter on the basis of the pro rata readings taken at the cluster meters. The joint meter reading is taken by GEDA/GETCO officials in the presence of Enercon officials in the form of JMR on monthly basis. All the JMR are available exclusively with the with GEDA/GETCO officials and PP doesn't have a copy of same and based on the JMR readings at cluster meter & main meter, GETCO issues the share certificates to PP. The net electricity exported by the project activity is taken directly from the share certificate issued by GETCO on monthly basis. The apportioning procedure is performed by GEDA personnel based on the data received from clusters meters on monthly basis and the PP has no role. **<u>Measurement & Recording of electricity:</u>** -All the cluster meters and sub-station meters (main & check meters) are

	electronic and two-way (bi-directional) meters that measure both export and import of electricity and provide net electricity exported to the grid. -All the cluster meters and sub-station meters (main & check meters) measure the electricity (export & Import) on continuous basis and are recorded by state utility on monthly basis. Please refer section B.7.2 & annex 4 for detailed description of measurement methods and procedures. Further all the reading of export & import recorded at all the cluster meters and sub-station meters (main & check meter) are available exclusively with GETCO officials and based on these reading, GETCO provides 'Certificate for Share of Electricity Generated by Wind farm' to PP, which provides quantity of net electricity generation supplied by the project activity to the grid In addition to above there is a possibility for the PP to record the values of $EG_{Cluster, Export}$ & $EG_{Cluster, Import.}$ However, it would be impossible for the PP to collect information of $EG_{Cluster, WF, Export}$ & $EG_{Cluster, WF, Import.}$which is exclusively available with GETCO. Thus even if $EG_{Cluster, Export}$ and $EG_{Cluster, Import}$ is monitored, it has no value if the values $EG_{Cluster, WF, Export}$ and $EG_{Cluster, WF, Import}$ are not monitored. Hence only quantity of net electricity generation supplied by the project activity to the grid ($\mathbf{EG_{facility, y}}$) could be monitored by the PP and this value will be sourced from 'Certificate for Share of Electricity Generated by Wind farm' prepared & issued by SLDC/GETCO.
Monitoring frequency	Monthly
QA/QC procedures	All the meters will be tested by the state utility once in three years as per the metering code prevalent in the state of Gujarat and GETCO notification. The PP has no control on the same. The detailed QA/QC procedures have been mentioned in Section B.7.2 below. The Net Quantity of Electricity exported to the grid as per Share certificate issued by GETCO can be cross verified by the sale invoice.
Purpose of data	For baseline emission calcualtions
Additional comment	The data will be archived for the entire crediting period plus two years.

B.7.2. Sampling plan

>>

Not Applicable

B.7.3. Other elements of monitoring plan

>>

The approved monitoring methodology (ACM0002, version 13.0.0) applicable for the project activity requires monitoring of the following:

- Net electricity supplied from the project activity; and
- Operating margin emission factor and build margin emission factor of the grid.

Since, the ex-ante approach has been followed for the project activity, monitoring of the emission factor value is not required. The sole parameter to be monitored is the amount of net electricity supplied by the project activity to the grid.

Measurement procedures of the net electricity supplied to the grid by the project activity:

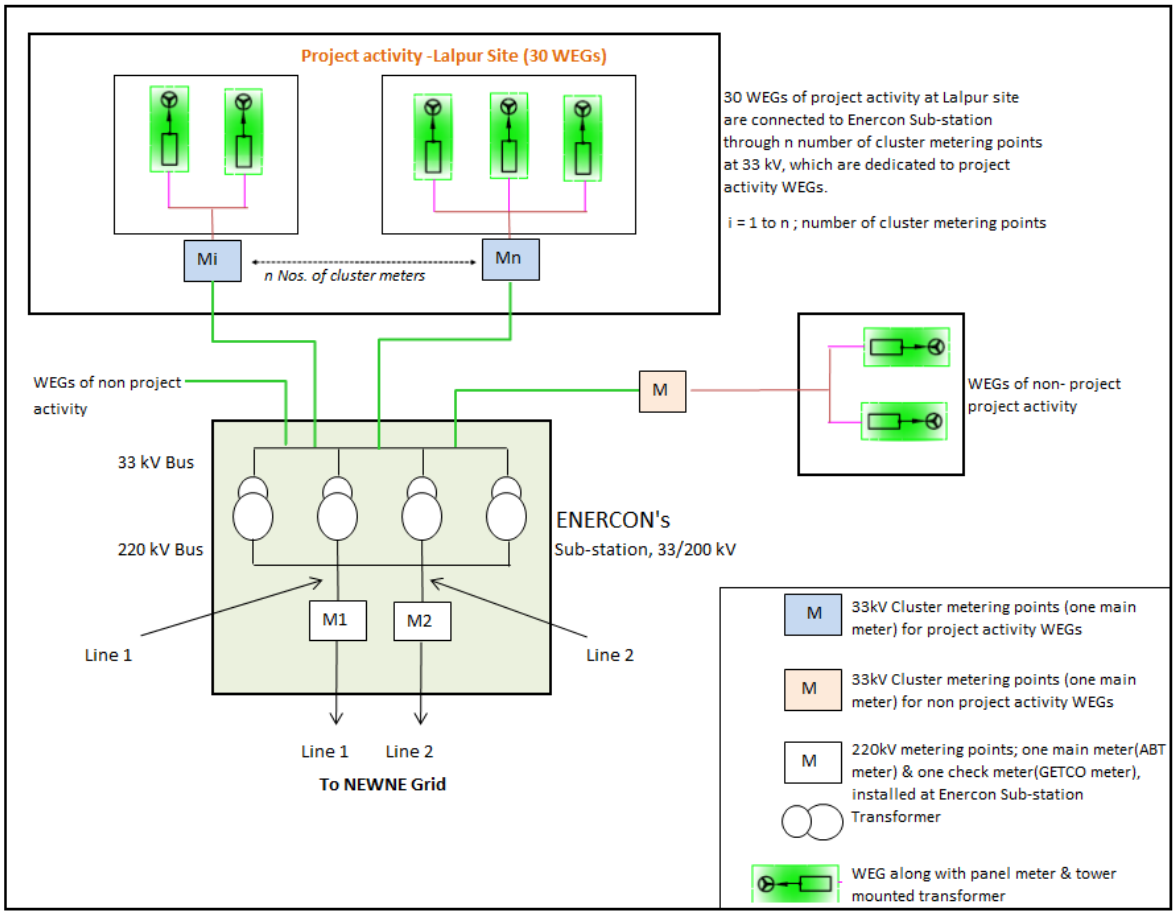
The project activity will have various clusters and each cluster has exclusively dedicated metering arrangement at project site. These cluster meters will be sealed by GEDA (Gujarat Energy Development Agency) and will also be tested once in three years. The Joint meter reading at cluster metering point is taken by the representatives GEDA/GETCO in the presence of Enercon officials in the form of JMR.

All these cluster meters are connected to the main & check meters at the Enercon substation, maintained by Enercon. The joint meter reading at main & check meters at sub-stations is taken by the representatives GEDA/GETCO in the presence of Enercon officials in the form of JMR. Cluster meters & substation meters (main & check meter) will be tested once in three years.

All the JMR are available exclusively with the with GEDA/GETCO officials and PP doesn't have a copy of same and based on the JMR readings at cluster meter & main meter, GETCO issues the share certificates to PP.

The 63 WEGs of project activity will be located at two different sites. 30 WEGs of project activity will be installed at Lalpur site, district Jamnagar while 33 WEGs of the project activity will be installed at Kutch site, district Kutch of Gujarat state. Metering arrangement of project activity at both the site (lalpur & kutch) is shown below:-

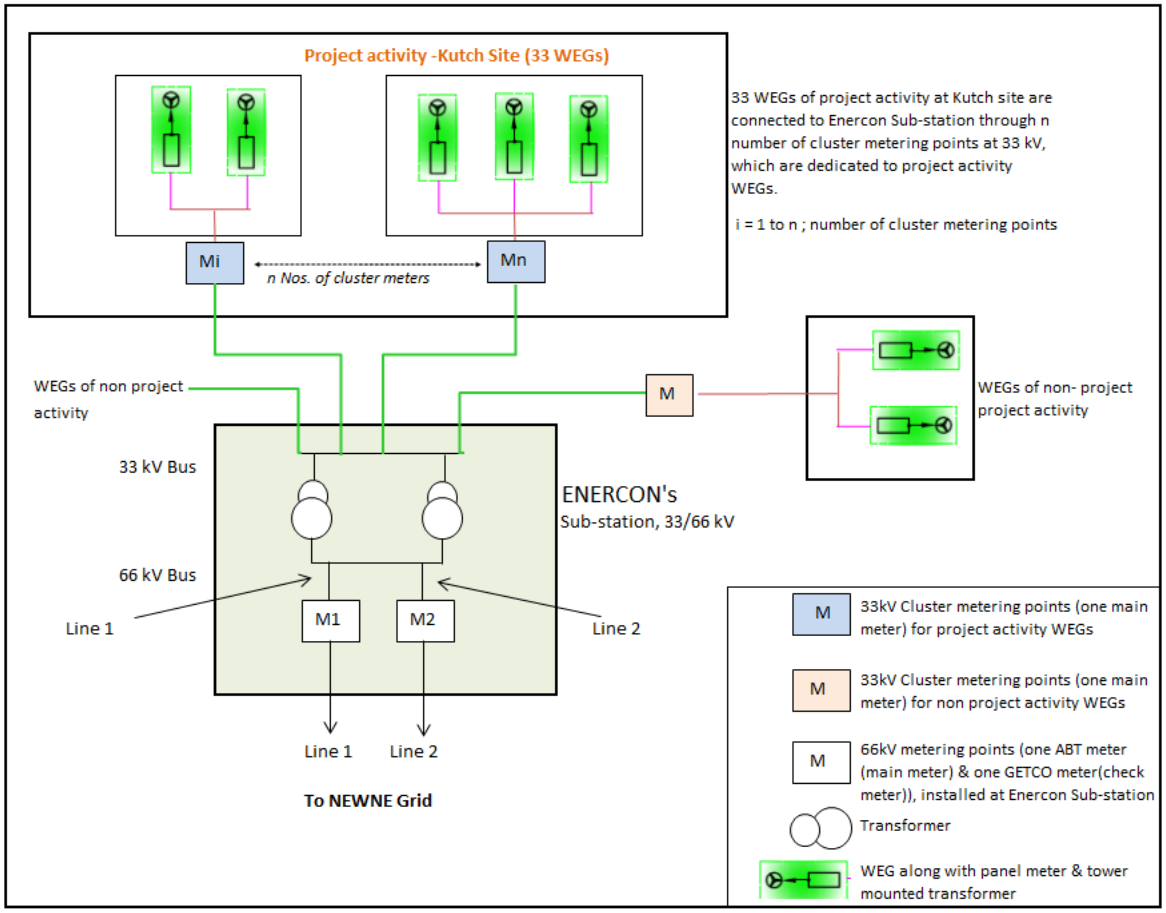
1) Layout of Metering arrangement for project activity installed at Lalpur site is as follows:-



From the above layout it is clear that project activity WEGs (30Nos) installed at Lalpur site are connected to various clusters and each cluster have exclusive dedicated metering arrangement at 33kV at project site. These cluster meters will be sealed by GEDA. The monthly meter readings at each cluster will be taken jointly by Enercon and officials of GEDA.

All these cluster meters for the project activity and non project activity (non project activity WEGs also have dedicated clusters) are connected at 220kV Enercon sub-station through 33kV bus. At Enercon sub-station electricity is stepped up from 33 kV to 220kV. Output of 220kV at sub-station is connected to line 1 & line 2[14]. At each line there is a set of one main & one check meter at Enercon substation. The main & check meter reading is taken by the representatives GEDA/GETCO in the presence of Enercon officials in the form of JMR. Main & Check meter will be tested once in three years.

2) Layout of Metering arrangement for project activity installed at Kutch site is as follows:-



From the above layout it is clear that project activity WEGs (33Nos) installed at Kutch site are connected to various clusters and each cluster have exclusive dedicated metering arrangement at 33kV at project site. These cluster meters will be sealed by GEDA. The monthly meter readings at each cluster will be taken jointly by Enercon and officials of GEDA.

[14] Configuration of line can be changed in future depending on load on sub-station, which is out of PP control.

All these cluster meters for the project activity and non project activity (non project activity WEGs also have dedicated clusters) are connected at 66 kV Enercon sub-station through 33kV bus. At Enercon sub-station electricity is stepped up from 33kV to 66 kV. Output of 66 kV at sub-station is connected to line 1 & line 2[15]. At each line there is a set of one main & one check meter at Enercon substation. The main & check meter reading is taken by the representatives GEDA/GETCO in the presence of Enercon officials in the form of JMR. Main & Check meter will be tested once in three years.

GEDA then apportions the net electricity supplied to the grid at the individual Enercon substations by all the project owners after adjusting transmission loss to the meter readings taken at dedicated cluster meters of different project owners. The electricity from Enercon substation is finally supplied to the utility's substation.

The net electricity generated by the project owner will be taken directly from the share certificate as provided by GETCO (after apportionment) to the project proponent and will be used for calculation of emission reduction.

The apportionment for the project activity will be done as follows:

$EG_{ABT, Export}$ = Electricity exported, as recorded by the main meter at Enercon substation

$EG_{ABT, Import}$ = Electricity imported, as recorded by the main meter at Enercon substation

$EG_{Cluster, Export}$ = Electricity exported by the project activity, as measured at Cluster Meter

$EG_{Cluster, Import}$ = Electricity imported by the project activity, as measured at Cluster Meter

$EG_{Cluster, WF, Export}$ = Electricity exported by all the project owners connected to Enercon substation, as measured at Cluster Meter

$EG_{Cluster, WF, Import}$ = Electricity imported by all the project owners connected to Enercon substation, as measured at Cluster Meter

$EG_{facility,Export,y}$ = Electricity exported by the project activity to the grid, calculated

$EG_{facility,Import,y}$ = Electricity imported from the project activity to the grid, calculated

$EG_{facility,y}$ = Quantity of net electricity generation supplied by the project activity to the grid., calculated

Electricity Exported to the Grid by the project activity

$$EG_{facility,Export,y} = EG_{ABT, Export} \times EG_{Cluster, Export} / EG_{Cluster, WF, Export}$$

Electricity Imported from the Grid by the project activity

$$EG_{facility,Import,} = EG_{ABT, Import} \times EG_{Cluster, Import} / EG_{Cluster, WF, Import}$$

[15] Configuration of line can be changed in future depending on load on sub-station, which is out of PP control.

Net Electricity Exported to the grid by the project activity

$$EG_{facility,y} = EG_{facility,Export,y} - EG_{facility,Import}$$

The apportionment procedure for the project activity is done by GEDA (Gujarat Energy Development Agency) based on the meter readings of the various cluster meters of various project owners connected to Enercon substation and main meter reading recorded at Enercon substation, connecting all the machines of the project activity and other project developers. The meter readings at cluster meters and at Enercon substation are directly monitored and hence, the apportioning of the electricity is done based on the meter reading that are directly measured.

In addition to above there is a possibility for the PP to record the values of $EG_{Cluster, Export}$ & $EG_{Cluster, Import.}$
However, it would be impossible for the PP to collect information of $EG_{Cluster, WF, Export}$ & $EG_{Cluster, WF, Import.}$ Thus even if $EG_{Cluster, Export}$ and $EG_{Cluster, Import}$ is monitored it has no value if the values $EG_{Cluster, WF, Export}$ and $EG_{Cluster, WF, Import}$ are not monitored. Hence only quantity of net electricity generation supplied by the project activity to the grid (**$EG_{facility, y}$**) by the project activity could be monitored by the PP and this value will be sourced from 'Certificate for Share of Electricity Generated by Wind farm' prepared & issued by SLDC/GETCO

QA/ QC procedures:

If during meter testing, the main meter at the Enercon substation is found beyond the permissible limit of error, the meter reading will be taken from the check meter. In case both the main & check meters are found beyond the permissible limit of error then meter reading will be taken from the main meter located at the utility substation after addition of average historical transmission losses and the meters (main & check) will be calibrated by the state utility.

If during meter testing, the cluster meters are found beyond the permissible limit of error, the sum of panel meter (LCS meter) readings located at each wind turbine of the project activity will be provided to GEDA for purpose of apportioning of the net electricity supplied to the grid. Enercon will provide the LCS data (sourced from online SCADA system) to GETCO for the period during which cluster meters are found beyond the permissible limit of error.

The LCS meters do not require calibration as the energy readings of electricity generated at the LCS meter is cross verified by the energy calculated by inverting system installed in the WEGs. In case, there is any mismatch in the energy values recorded by the LCS meter and the energy values calculated by the inverting system, the machine will stop working and generate the error report.

Procedure to deal with data uncertainty:

During the meter testing, if the meter is found to be outside the permissible limits of the error and if that meter readings have been used in JMR, the (–ve) error value would be applied to net electricity supplied value will be applied to all the JMR values since the date of last calibration. The meter would be replaced immediately with new calibrated meter.

Action plan for monitoring of 2% CER revenue contributed towards sustainable development

Vish Wind Infrastructure LLP. is committed to contribute a minimum of 2% of the CER revenue accrued every year for sustainable development activities for the local population. The table below provides an estimation of the revenue that would be committed every year for sustainable development activities.

Year	Estimation of total emission reduction (tCO_{2e})	Estimated CER Price* (Euro)	Exchange rate (Euro to INR)	Estimation of CER Revenue generated by the project (INR)	Estimation of minimum revenue commitment for sustainable development (INR)
1	101,234	20.00	62.04	125,611,147	2,512,223
2	101,234	20.00	62.04	125,611,147	2,512,223
3	101,234	20.00	62.04	125,611,147	2,512,223
4	101,234	20.00	62.04	125,611,147	2,512,223
5	101,234	20.00	62.04	125,611,147	2,512,223
6	101,234	20.00	62.04	125,611,147	2,512,223
7	101,234	20.00	62.04	125,611,147	2,512,223
8	101,234	20.00	62.04	125,611,147	2,512,223
9	101,234	20.00	62.04	125,611,147	2,512,223
10	101,234	20.00	62.04	125,611,147	2,512,223

Please note that:-

(i) Estimation of CER revenue has been done based on the envisaged price of CER (20 Euro) at the time of revenue realization and the present conversion rate from Euro to INR (1 Euro=62.04 Rs. Dated 07-feb -2011)

(ii) The revenue committed will vary every year as per the actual CERs generated, the CER price that is actually transacted and the prevailing exchange rate at the time of transaction.

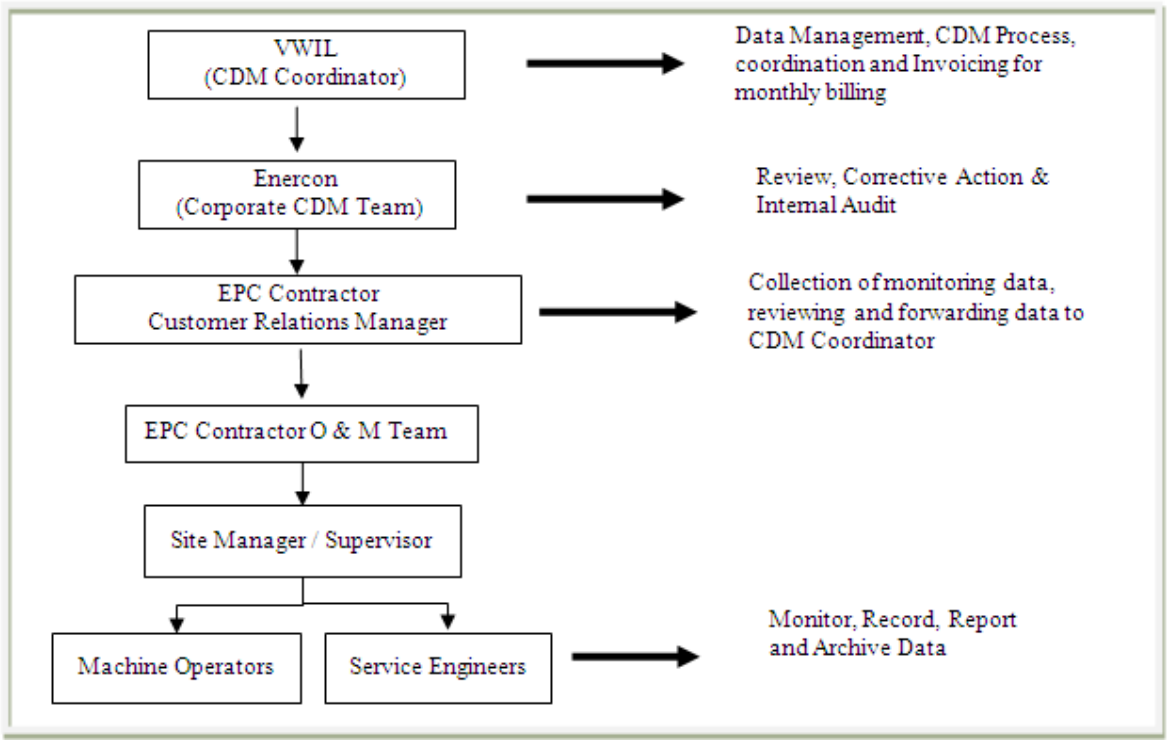
VWILLP will undertake an annual review process of the actual CERs accrued and the price transacted. On the basis of the actual price and exchange rate, VWILLP will commit 2% of the revenue for sustainable development activities in the local areas.

As part of the annual review, VWILLPwill undertake informal discussions with the locals at the project site and commit the revenue towards society / community developmental activities in areas that are of most concern to the local population. These areas could include health, education, sanitation, skill development, infrastructure development, etc. The annual review process will detail the exact activities that would be undertaken using the 2% revenue and the detailed mode of implementation of the proposed activity.

VWILLP commits that a CSR team will be appointed to oversee the activities towards sustainable development and also that the activities are undertaken and concluded in a timely manner each year

Enercon (India) Limited (EIL) is the O & M contractor for the project activity and will be responsible for maintaining all the monitoring data on behalf of Vish Wind Infrastructure LLP (VWILLP) for the project activity.

The following management structure has been formed for implementation of the monitoring plan and management of the monitored data:



Enercon is an ISO 9001:2008 certified Quality Management system from Germanischer Lloyd. Enercon follows the documentation practices to ensure the reliability and availability of the data for all the activities as required starting from the identification of the site, wind resource assessment, logistics, finance, construction, commissioning and operation of the wind power project. The accuracy of the monitoring parameter is ensured by adhering to the calibration and testing of the metering equipment as mentioned above.

Training and maintenance requirements:

Training on the machine is an essential pre-requisite, to ensure necessary safety of man and machine. Further, in order to maximize the output from the Wind Energy Converters (WECs), it is extremely essential, that the engineers and technicians understand the machines and keep them in good health. In order to ensure that Enercon's service staff is deft at handling technical snags on top of the turbine, the necessity of ensuring that they are capable of climbing the tower with absolute ease and comfort has been established. The Enercon Training Academy provides need-based training to meet the training requirements of Enercon projects. The training is contemporary, which results in imparting focused knowledge leading to value addition to the attitude and skills of all trainees.

SECTION C. Duration and crediting period
C.1. Duration of project activity
C.1.1. Start date of project activity
>>
02/04/2011 (date of placement of purchase order).

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
>>
The project proponent has selected the fixed crediting period for the project activity.

C.2.2. Start date of crediting period
>>
01/10/2012 or date of registration of project with UNFCCC whichever is later.

C.2.3. Length of crediting period
10 years and 0 months

SECTION D. Environmental impacts
D.1. Analysis of environmental impacts
>>

There is no mention of acquiring Environmental Clearance for Wind Power projects in the latest Notification of Ministry of Environment and Forests (MoEF), Government of India, dated 1st December, 2009[16]. In 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 acquiring environmental clearance[17] has been provided. According to those notifications, Environmental Impact Assessment (EIA) is not a regulatory requirement in India for wind energy projects and the PP does not expect any adverse impacts of the proposed CDM project activity on the environment.

D.2. Environmental impact assessment
>>

The project activity does not fall under the list of the projects requiring Environmental clearance as mentioned in the notification of the Ministry of Environment and Forest, Government of India. Hence, Environmental Impact assessment (EIA) is not required by the host party.

[16] MoEF Notification S. O 3067 (E) dated, 1st December, 2009;http://moef.nic.in/downloads/rules-and-regulations/3067.pdf, Source of Earlier Notification - http://envfor.nic.in/legis/eia/so1533.pdf;
[17] http://envfor.nic.in/legis/eia/so1533.pdf

SECTION E. Local stakeholder consultation

E.1. Solicitation of comments from local stakeholders

>>

The comments from local stakeholders were invited through local stakeholders' meeting conducted at Jamnagar and Kutch district in Gujarat on 15th July, 2011 & 16th July, 2011 respectively. A local newspaper advertisement was placed in Nobat newspaper on 28th June, 2011 and Kutch Uday newspaper on 29th June, 2011, inviting the local stakeholders for the meeting. In the meeting, the representatives from nearby villages, CDM representative (Ms. Mallika Bose) on behalf of Vish Wind Infrastructure LLP and representative of Enercon (India) Limited (Mr. Manoj Panda, Mr. Suraj, Mr. Joyesh) were present.

The agenda of the meeting were as follows:

1. Welcome address and introduction
2. Company profile & project description
3. CDM - social issues and environmental issues
4. Queries from the stakeholders and response by respective authorized persons
5. Vote of thanks

E.2. Summary of comments received

>>

The main purpose of the stakeholders' meeting was to:

- Describe the project activity and its benefits to the local villagers
- Interactive session for clarifying the doubts/issues raised by the stakeholders
- Get feedback about the project activity from the stakeholders, who were present in the meeting.

The summary of the queries[18] raised by the local stakeholders in both the meetings held on 15th & 16th July, 2011 are as follows:

- How the project is going to benefit the local people?
- Whether the project is going to affect the land used for grazing?
- Whether the electricity generated from this project will be directly fed to the local community?
- Whether this project will contribute towards land appreciation or will cause any harm to the property value?
- Whether there is enough safety measurement available?

E.3. Report on consideration of comments received

>>

The queries raised by the stakeholders present during the meetings were addressed by the representatives of Enercon and CDM representatives on behalf of VWIL:

1) Comments received and responses given during the meeting held on 15th July, 2011:

S. No.	Comments/ Queries/ Views	Responses
1.	Mr. Osmaan Bhai enquired how the project will be useful to the	Ms. Mallika Bose explained that through setting up the project, the infrastructure development will

[18] The detailed minutes of the meeting are available with the Project proponent and will be provided to the DOE during validation.

	local villagers?	take place. There will be increased the job opportunities, improved distribution of power to the nearby villages. She also informed that the electricity generated will be supplied to the state electricity grid, which will further be distributed as per the state policy.
2.	Mr. Diptesh Bhai asked about the earthing arrangement of Wind Energy Machines and whether this has any affects / impacts on the animals or people of the nearby area?	Mr. Manoj Panda explained that the electricity will pass through the earthing arrangement located in the land / field and it will not have any impact/ effect on the animals or people of nearby area.
3.	Mr. Patel enquired that whether the project will have any impact on the grazing land or whether the company will restrict the cattle to come to the grazing lands?	Mr. Manoj Panda replied that cattle are grazing in the area as usual.

2) Comments received and responses given during the meeting held on 16th July, 2011:

S. No.	Comments/ Queries/ Views	Responses
	Mr. Kamlesh Bhai enquired about the concept of the CDM and its procedures?	Ms. Mallika Bose has explained the general concept of CDM & the procedures, briefed about Kyoto Protocol.
	Mr. Raju Bhai enquired about the advantages of the wind power projects that will benefit the stakeholders?	Mr. Manoj Panda has responded that the project will provide employment opportunities (security jobs) to the local villagers during the construction and operational period.
	Mr. Raju Bhai also asked whether this project will contribute towards land appreciation or will cause any harm to the property value?	Mr. Panda has responded that there would not be any negative impact on the property values due to the presence of wind farms. In fact the development of wind farms will subsequently increase the property value resulting to the overall development in the region.
	Mr. Hari enquired that whether there is any effect on the cattle grazing near the wind farms?	Mr. Manoj Panda explained that there will be no effect on the grazing land near to the wind farms.
	Mr. Kamlesh also enquired whether there are enough safety measurements taken by Enercon?	Mr. Suraj replied that all the safety issues have been taken care of. Standard protocols are in place to take care of all the safety issues.
	Mr. Diptesh Bhai enquired whether the electricity generated from this project will be directly fed to the local community?	Mr. Manoj Panda has informed that the amount of electricity generated by the project activity will be supplied to the state electricity grid, which will further distribute the electricity as per the State policy.

During the meeting, no adverse comments were received and the meeting has ended on a positive note.

SECTION F. Approval and authorization

>>

PP has the approval of authorization from host country (India) dated 15 December 2011 at the time of submitting the PDD to the validating DOE.

- - - - -

Appendix 1: Contact information of project participants

Organization name	Vish Wind Infrastructure LLP
Street/P.O. Box	A-9, Veera Industrial Estate, Veera Desai Road, Andheri (W)
Building	Enercon Tower
City	Mumbai
State/Region	Maharashtra
Postcode	400 053
Country	India
Telephone	+91-22 - 6692 4848
Fax	+91-22 - 67040473
E-mail	yogesh.mehra@enerconindia.net
Website	www.enerconindia.net
Contact person	
Title	Designated Partner
Salutation	Mr.
Last name	Mehra
Middle name	
First name	Yogesh
Department	Corporate
Mobile	
Direct fax	+91-22-6692 4848
Direct tel.	+91-22-67040473
Personal e-mail	yogesh.mehra@enerconindia.net

Appendix 2: Affirmation regarding public funding

The project activity does not involve any public funding from parties from Annex 1 countries.

Appendix 3: Applicability of selected methodology

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

The Operating Margin data for the most recent three years and the Build Margin data for the NEWNE Grid as published in the "Baseline Carbon dioxide Emission Database" , Version 6.0, 1stMarch, 2011, published by Central Electricity Authority (CEA), Government of India have been used for the estimation of the Baseline Emission. The Operating Margin data for the most recent three years and the Build Margin data for the NEWNE are as follows:

Simple Operating Margin		
	NEWNE Grid (tCO2e/MWh)	**Net Generation Total (MWh)**
Simple Operating Margin – 2007-08	0.99990	496.119
Simple Operating Margin – 2008-09	1.00655	510.693
Simple Operating Margin – 2009-10	0.97774	544.915
Weighted Average Operating Margin *		0.99431

** Calculated as per Option A, i.e. generation weighted average CO2 emissions per unit electricity generation has been used*

Build Margin	
	NEWNE Grid (tCO2e/MWh)
Build Margin- 2009-10	0.81231

Combined Margin Calculations		
	Weights	**NEWNE Grid (tCO2e/MWh)**
Weighted Average Operating Margin	0.75	0.99431
Build Margin	0.25	0.81231
Combined Margin		**0.94881**

Appendix 5: Further background information on monitoring plan

Detailed metering information has been provided in the section B.7.3.

Meter Reading

- The net electricity supplied to the grid will be taken directly from the share certificate for net electricity generated provided by GETCO.
    - The meter reading is taken jointly at Enercon sub-station & cluster metering points by representatives of Enercon and GEDA/GETCO located at Enercon substation. The main & check meters are connected to the wind turbines of the project activity and the wind turbines of the other project owners. Therefore GETCO provides the share certificate that apportions the net electricity generated by the project owners.
    - The Cluster meters are provided exclusively to all the project owners having installed wind turbines at the wind farm

Testing

- Both Main meter (accuracy class 0.2) & Check meter (accuracy class 0.2) at both Enercon Substations (220kV &66kV) will be tested once in three years.
- All cluster meters (accuracy class 0.2) connected to the WEGs of project activity will be tested once in three years as per the provisions fixed with utility.

Data recording

- The meter recording at the sub-station meters (main & check meter) at Enercon substation and the cluster meters of the project activity will be continuously monitored and will be recorded on monthly basis.
- The sub-station meters (main & check) & all the cluster meters are electronic and two-way (bi-directional) meters that measure both export and import of electricity and provide net electricity exported to the grid.
- All the monitored data will be recorded and filed electronically and in hard format for 2 years beyond the crediting period i.e. 10+2 years.

Appendix 6: Summary of post registration changes

Not applicable

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History of the document

Version	Date	Nature of revision
04.1	11 April 2012	Editorial revision to change version 02 line in history box from Annex 06 to Annex 06b.
04.0	EB 66 13 March 2012	Revision required to ensure consistency with the "Guidelines for completing the project design document form for CDM project activities" (EB 66, Annex 8).
03	EB 25, Annex 15 26 July 2006	
02	EB 14, Annex 06b 14 June 2004	
01	EB 05, Paragraph 12 03 August 2002	Initial adoption.
Decision Class: Regulatory **Document Type:** Form **Business Function:** Registration		

Annex1: Latitude – Longitude details of individual WEGs

1) Lat-Log details for Kutch Site (District Kutch, State- Gujarat):-

WEG Sr. No.	WEG ID NO	Site	Village	Taluka	Latitude (N)	Longitude (E)
1	EIL/800/11-12/2469	Kutch	Khombhadi Nani	Nakhatrana	23.41978	69.13057
2	EIL/800/11-12/2470		Khombhadi Nani	Nakhatrana	23.41771	69.13119
3	EIL/800/11-12/2471		Khombhadi Nani	Nakhatrana	23.41545	69.13154
4	EIL/800/11-12/2472		Khombhadi Nani	Nakhatrana	23.41463	69.13608
5	EIL/800/11-12/2475		Khombhadi Nani	Nakhatrana	23.42289	69.13727
6	EIL/800/11-12/2476		Khombhadi Nani	Nakhatrana	23.43353	69.13148
7	EIL/800/11-12/2473		Khombhadi Nani	Nakhatrana	23.43568	69.13101
8	EIL/800/11-12/2474		Khombhadi Nani	Nakhatrana	23.43891	69.13204
9	EIL/800/11-12/2477		Khombhadi Nani	Nakhatrana	23.44566	69.11901
10	EIL/800/11-12/2478		Khombhadi Nani	Nakhatrana	23.44863	69.11686
11	EIL/800/11-12/2479		Khombhadi Nani	Nakhatrana	23.45061	69.11676
12	EIL/800/11-12/2483		Vigodi	Nakhatrana	23.47575	69.10385
13	EIL/800/11-12/2587		Rampar Sarva	Nakhatrana	23.46789	69.08344
14	EIL/800/11-12/2494		Rampar Sarva	Nakhatrana	23.46995	69.08482
15	EIL/800/11-12/2484		Vigodi	Nakhatrana	23.47102	69.08219
16	EIL/800/11-12/2485		Vigodi	Nakhatrana	23.47334	69.08353
17	EIL/800/11-12/2486		Vigodi	Nakhatrana	23.47239	69.08706
18	EIL/800/11-12/2487		Vigodi	Nakhatrana	23.47539	69.08330
19	EIL/800/11-12/2488		Vigodi	Nakhatrana	23.47627	69.08049
20	EIL/800/11-12/2489		Vigodi	Nakhatrana	23.47745	69.08687
21	EIL/800/11-12/2490		Vigodi	Nakhatrana	23.47913	69.08449
22	EIL/800/11-12/2491		Vigodi	Nakhatrana	23.48041	69.07762
23	EIL/800/11-12/2492		Vigodi	Nakhatrana	23.48258	69.06526
24	EIL/800/11-12/2493		Vigodi	Nakhatrana	23.48057	69.06784
25	EIL/800/11-12/2590		Khirsara (Netra)	Nakhatrana	23.47881	69.06922
26	EIL/800/11-12/2591		Khirsara (Netra)	Nakhatrana	23.47680	69.07072
27	EIL/800/11-12/2589		Rampar Sarva	Nakhatrana	23.44230	69.07665
28	EIL/800/11-12/2495		Rampar Sarva	Nakhatrana	23.44020	69.07735
29	EIL/800/11-12/2496		Rampar Sarva	Nakhatrana	23.43439	69.08006
30	EIL/800/11-12/2497		Bandiya	Abdasa	23.41617	69.02001
31	EIL/800/11-12/2480		Khombhadi Nani	Nakhatrana	23.43155	69.13112
32	EIL/800/11-12/2481		Khombhadi Nani	Nakhatrana	23.42959	69.13235
33	EIL/800/11-12/2482		Khombhadi Nani	Nakhatrana	23.44340	69.11945

2) Lat-Log details for Lalpur Site (District Jamnagar, State- Gujarat):-

WEG Sr. No.	WEG ID NO	Site	Village	Taluka	Latitude (N)	Longitude (E)
1	EIL/800/11-12/2161	Lalpur	Navi Pipar	Lalpur	22.15478	69.92386
2	EIL/800/11-12/2162		Navi Pipar	Lalpur	22.13751	69.91985
3	EIL/800/11-12/2163		Navi Pipar	Lalpur	22.13990	69.92042
4	EIL/800/11-12/2164		Navi Pipar	Lalpur	22.15693	69.90534
5	EIL/800/11-12/2165		Navi Pipar	Lalpur	22.15503	69.90582
6	EIL/800/11-12/2166		Govana	Lalpur	22.13969	69.89579
7	EIL/800/11-12/2167		Govana	Lalpur	22.14332	69.89474
8	EIL/800/11-12/2168		Govana	Lalpur	22.14399	69.89261
9	EIL/800/11-12/2169		Govana	Lalpur	22.14398	69.88783
10	EIL/800/11-12/2170		Govana	Lalpur	22.13915	69.87166
11	EIL/800/11-12/2171		Govana	Lalpur	22.15328	69.87057
12	EIL/800/11-12/2172		Govana	Lalpur	22.15533	69.87030
13	EIL/800/11-12/2173		Govana	Lalpur	22.15732	69.86990
14	EIL/800/11-12/2174		Govana	Lalpur	22.15861	69.86971
15	EIL/800/11-12/2175		Govana	Lalpur	22.16658	69.86708
16	EIL/800/11-12/2176		Govana	Lalpur	22.16880	69.86664
17	EIL/800/11-12/2177		Nani Rafudad	Lalpur	22.18928	69.84754
18	EIL/800/11-12/2178		Nani Rafudad	Lalpur	22.19097	69.84445
19	EIL/800/11-12/2179		Kan Virdi	Lalpur	22.19205	69.84194
20	EIL/800/11-12/2180		Kan Virdi	Lalpur	22.19757	69.84555
21	EIL/800/11-12/2181		Babarzar	Lalpur	22.17319	69.82554
22	EIL/800/11-12/2186		Sanosari	Lalpur	22.06414	69.88709
23	EIL/800/11-12/2187		Sanosari	Lalpur	22.06724	69.89168
24	EIL/800/11-12/2188		Sanosari	Lalpur	22.07579	69.89075
25	EIL/800/11-12/2182		Dharampur	Lalpur	22.12138	69.89119
26	EIL/800/11-12/2183		Dharampur	Lalpur	22.12647	69.89537
27	EIL/800/11-12/2185		Bhangor	Bhanvad	22.12911	69.89381
28	EIL/800/11-12/2184		Dharampur	Lalpur	22.13197	69.90297
29	EIL/800/11-12/2189		Sanosari	Lalpur	22.09688	69.90079
30	EIL/800/11-12/2190		Sanosari	Lalpur	22.09475	69.90079

Annex 2: List of power plants (Nall) in applicable cap range (25.2 MW to 75.6 MW)

S. No	Name	Capacity (MW)	State	Sector	Type
1	Pochampad	27	Andhra Pradesh	State	Hydro
2	Papanasam	28	Tamil Nadu	State	Hydro
3	Munirabad	28.3	Karnataka	State	Hydro
4	Bansagar (ii)	30	Madhya Pradesh	State	Hydro
5	Bhawani kattalai barrage	30	Tamil Nadu	State	Hydro
6	Kulhal	30	Uttarakhand	State	Hydro
7	Panniar	30	Kerala	State	Hydro
8	Parsen_s valle	30	Tamil Nadu	State	Hydro
9	Sarkarpathy	30	Tamil Nadu	State	Hydro
10	Matatilla	30.6	Uttar Pradesh	State	Hydro
11	Ghat prabha	32	Karnataka	State	Hydro
12	Poringalkuttu	32	Kerala	State	Hydro
13	Chenani i&iii	32.8	Jammu & Kashmir	State	Hydro
14	Dhakrani	34	Uttarakhand	State	Hydro
15	Jaldhaka i&ii	35	West Bengal	State	Hydro
16	Suruliyar	35	Tamil Nadu	State	Hydro
17	Moyar	36	Tamil Nadu	State	Hydro
18	Pallivasal	37.5	Kerala	State	Hydro
19	Bhadra	39.2	Karnataka	State	Hydro
20	Madhikheda	40	Madhya Pradesh	State	Hydro
21	Khatima	41.4	Uttarakhand	State	Hydro
22	Sivasamundrum	42	Karnataka	State	Hydro
23	Bhandardhara	44	Maharashtra	State	Hydro
24	Narimanglam	45	Kerala	State	Hydro
25	Rajghat (mp)	45	Madhya Pradesh	State	Hydro
26	Sengulam	48	Kerala	State	Hydro
27	Kakkad	50	Kerala	State	Hydro
28	Khandong	50	Meghalaya	Center	Hydro
29	Rammam	50	West Bengal	State	Hydro
30	Dhalipur	51	Uttarakhand	State	Hydro
31	Sholayar	54	Kerala	State	Hydro
32	Liganamakki	55	Karnataka	State	Hydro
33	Pykara	58.95	Tamil Nadu	State	Hydro
34	Aliyar	60	Tamil Nadu	State	Hydro
35	Bansagar (iii)	60	Madhya Pradesh	State	Hydro
36	Bassi	60	Himachal	State	Hydro
37	Giri bata	60	Himachal	State	Hydro
38	Kyredemkulai	60	Meghalaya	State	Hydro
39	N_sagar lbc	60	Andhra Pradesh	State	Hydro

40	Rangit-iii	60	Sikkim	Center	Hydro
41	Tillari	60	Maharashtra	State	Hydro
42	Vaitarna	60	Maharashtra	State	Hydro
43	Wy.canal a -d	62.4	Haryana	State	Hydro
44	Maithon	63.2	Jharkhand	Center	Hydro
45	Teesta i-iii	67.5	West Bengal	State	Hydro
46	Khara	72	Uttar Pradesh	State	Hydro
47	Khopoli	72	Maharashtra	Pvt	Hydro
48	T.b. dam	72	Andhra Pradesh	State	Hydro
49	Bhivpuri	75	Maharashtra	Pvt	Hydro
50	Doyang	75	Nagaland	Center	Hydro
51	Idamalayar	75	Kerala	State	Hydro
52	Bellary dg	25.2	Karnataka	Pvt	Thermal
53	Karaikal	32.5	Puducherry	State	Thermal
54	Leimakhong dg	36	Manipur	State	Thermal
55	Lvs power dg	36.8	Andhra Pradesh	Pvt	Thermal
56	Reliance energy	48	Goa	Pvt	Thermal
57	Chandrapur_oil	60	Assam	State	Thermal
58	R_gundem - b	62.5	Andhra Pradesh	State	Thermal
59	Valantharvi gt	67.6	Tamil Nadu	State	Thermal
60	Aban Loyd chiles O. Ltd.	31.57	Tamil Nadu	Pvt	Wind
61	NEPC Micon	43.85	Tamil Nadu	Pvt	Wind

No of Hyrdo project	51
No of Thermal project	8
No of Wind project	2
No of Nuclear project	0
Total	**61**