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

PROJECT DESIGN DOCUMENT (PDD)

Title of the project activity	Wind Power Project at Rajkot, Gujarat
Version number of the PDD	6.0
Completion date of the PDD	22/10/2012
Project participant(s)	ReNew Wind Energy (Rajkot) Private Limited
Host Party(ies)	India
Sectoral scope and selected methodology(ies)	**Sectoral Scope :** 1 Energy industries (renewable / non renewable sources) **Type and Category:** ACM 0002 "Consolidated baseline methodology for grid-connected electricity generation from renewable sources" (Version 12.3.0)
Estimated amount of annual average GHG emission reductions	48,338

SECTION A. Description of project activity
A.1. Purpose and general description of project activity
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Introduction:
ReNew Wind Energy (Rajkot) Private Limited (RNWERPL), the Project Proponent (PP), is setting up wind power project of 25.2 MW capacity at Villages: Godladha, Madhavipur, Kalasar, Devpara and Madava of Rajkot district in Gujarat. The project consists of installation of 12 Suzlon make wind turbines of 2.1 MW capacity each.

Purpose of the Project activity:
The purpose of the project activity is to generate electricity using wind as renewable energy source and helping in reducing usage of fossil fuels which are used for electricity generation. This would reduce the dependency on fossil fuels and reduce the Green House Gas (GHG) emissions.

Baseline Scenario:

The Project activity would use wind energy to generate electricity from the project and export it to NEWNE (Northern, Eastern, Western and North-Eastern) grid of India. Hence, it reduces the dependency on fossils fuels which are pre-dominantly used for electricity generation in India and helps reduction of climate change impacts.

The baseline scenario for the project activity as per the applied methodology ACM0002 version 12.3.0) is :*"Electricity delivered to the grid by the project activity would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources, as reflected in the combined margin (CM) calculations described in the "Tool to calculate the emission factor for an electricity system."*The same has been described in detail in PDD section B.4.

Scenario existing prior to the prior to implementation of project activity

As the project activity is a greenfield project, there was no power plant existing at the project site prior to the installation of the project activity (i.e. in the pre-project scenario)

Contribution to Sustainable Development:
National CDM Authority (Indian DNA), Ministry of Environment & Forests, Government of India has stipulated the following indicators for sustainable development in the interim approval guidelines for CDM projects[1]:

Social well-being:
Since, the project activity is in a rural area of Gujarat, it will help in the overall development of the region. The project activity will result in generation of direct and indirect employment opportunities for the local people residing nearby villages in Rajkot, both during construction and operation phases of the project activity.

Economic well-being:
The project will create a business opportunity for local stakeholders such as suppliers, manufacturers, contractors etc in Rajkot region of Gujarat.
Environmental well-being:

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

Since, the project uses wind as renewable source for power generation; it does not lead to any green house gas emission. It will avoid the fossil fuel consumption in the NEWNE grid and in turn it will result in SO_x, NO_x particulate matter emission reduction.

Technological well-being:
The technology that is being used in the project activity is environmentally safe and sound. The project demonstrates harnessing wind power potential in Gujarat and encourages setting up such projects in near future.

Proposed action plan for Action Plan for Sustainable Development:
RNWERPL plans to use 2% of the net revenues accrued from the sale of Certified Emission Reductions (CERs) of this Project activity post its accrual in areas related to sustainable development. Detailed Credible Monitorable action plan is described in Annex 5 of this CDM PDD.

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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State: Gujarat
District: Rajkot

A.2.3. City/Town/Community etc.
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Villages: Godladha, Madhavipur, Kalasar, Devpara and Madava

A.2.4. Physical/Geographical location

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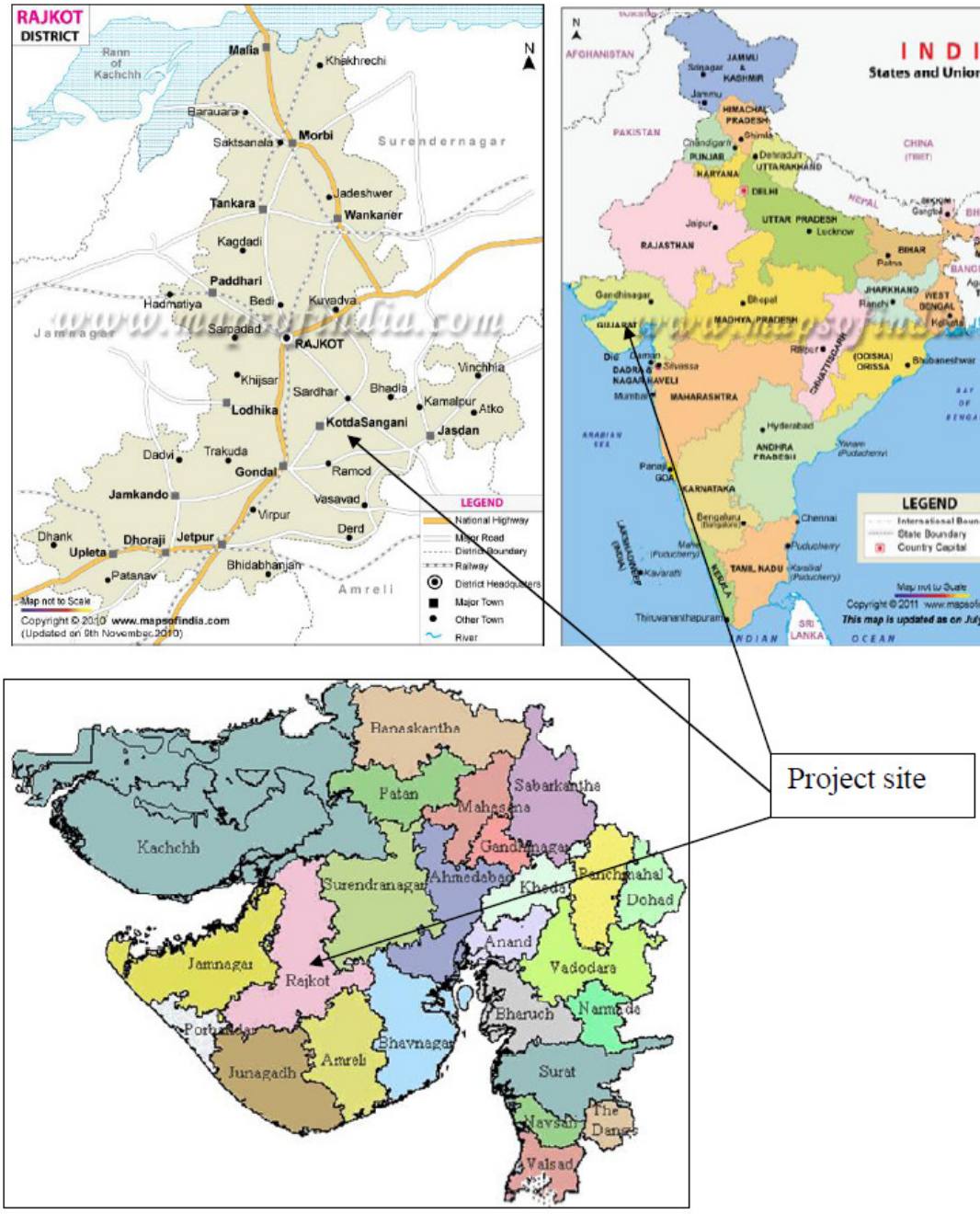

Note: **Wind turbine-wise detailed co-ordinates have been tabulated in Appendix 2 of this PDD.**

A.3. Technologies and/or measures

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The project consists of installation of 12 Suzlon make wind turbines of 2.1 MW capacity each. The technical specifications of the S-88 model wind turbine are mentioned below:

Description	Specifications
Wind speed at rated output	14 m/s
Cut in speed	4 m/s
Cut out speed	25 m/s
Hub height	79 metre
Power regulation	Pitch
Rotor diameter	88 metre
Swept area	6082 m^2
Generator type	Asynchronous slip ring type induction generator
Generator rated power output	2100 kW
Voltage	690 V
Expected Operational Life	25 years

These turbines are supplied by Suzlon Ltd and are designed for particular wind conditions. The technology for the same is environmentally safe and sound and there is no technology transfer to the host party involved in the same. Lifetime of the WTGs is expected to be 25 years as per data shared by the technology supplier.

As per the Energy Estimate report issued by a third party agency, the project activity is expected to supply 50.733 GWh of energy to the NEWNE Grid of India each year. This translates into a Plant Load Factor (PLF) of 22.98%. Also, this is expected to result in emission reductions of 48,338 tCO_2e per year of operation.

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)	Private entity- ReNew Wind Energy (Rajkot) Private Limited	No

A.5. Public funding of project activity

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There is no public funding involved from parties included in the Annex I for the implementation of 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 methodology for grid-connected electricity generation from renewable sources" ACM0002 (Version 12.3.0)

Reference:

ACM0002 (Version 12.3.0) draws upon the following tools which have been used in the PDD:

1. Tool to calculate the emission factor for an electricity system (Version 02.2.1)
2. Tool for demonstration and assessment of additionality (Version 6.1.0)

B.2. Applicability of methodology

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Sr. No	Applicability criterion	Justification
1	This methodology is applicable to grid-connected renewable power generation project activities that : (a) install a new power plant at a site where no renewable power plant was operated prior to the implementation of the project activity (greenfield plant); (b) involve a capacity addition; (c) involve a retrofit of (an) existing plant(s); or (d) involve a replacement of (an) existing plant(s).	The project activity is a greenfield plant grid-connected renewable power generation project. Hence, it meets the applicability criteria
2	The methodology is applicable under the following conditions: • 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 or tidal power plant/unit; • In the case of capacity additions, retrofits or replacements (except for capacity addition projects for which the electricity generation of the existing power plant(s) or unit(s) is not affected): the existing plant started commercial operation prior to the start of a minimum historical reference period of five years, used for the calculation of baseline emissions and defined in the baseline emission section, and no capacity addition or retrofit of the plant has been undertaken between the start of this minimum historical reference period and the implementation of the project activity;	The Project activity involves installation of a new power plant at a site where no renewable power plant was operated prior to the implementation of the project activity (Greenfield plant). Hence, it meets the requirement.
3	In case of hydro power plants: At least one of the following conditions must apply:	Not applicable to the Project activity as the Project activity involves installation of a wind

	• The project activity is implemented in an existing single or multiple reservoirs, with no change in the volume of any of the reservoirs; or • The project activity is implemented in an existing single or multiple reservoirs, where the volume of any of reservoirs is increased and the power density of each reservoir, as per the definitions given in the Project Emissions section, is greater than 4 W/m^2 after the implementation of the project activity; or • The project activity results in new single or multiple reservoirs and the power density of each reservoir, as per the definitions given in the Project Emissions section, is greater than 4 W/m^2 after the implementation of the project activity.	power plant.
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 after the implementation of the project activity all of the following conditions must apply: • The power density calculated for the entire project activity using equation 5 is greater than 4 W/m^2; • All reservoirs and hydro power plants are located at the same river and were designed together to function as an integrated project that collectively constitutes the generation capacity of the combined power plant; • The water flow between the multiple reservoirs is not used by any other hydropower unit which is not a part of the project activity; • The total installed capacity of the power units, which are driven using water from the reservoirs with a power density lower than 4 W/m^2, is lower than 15 MW; • The total installed capacity of the power units, which are driven using water from reservoirs with a power density lower than 4 W/m^2, is less than 10% of the total installed capacity of the project activity from multiple reservoirs.	Not applicable to the Project activity as the Project activity involves installation of a wind power plant.
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;	The Project activity is installation of a wind power plant and hence does not involve the following- • Switching from fossil fuels to renewable energy sources at the sites • Biomass fired power plants • Hydro power plants

	A hydro power plant that results in the creation of a new single reservoir or in the increase in an existing single reservoir where the power density of the reservoir is less than 4 W/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 greenfield installation of a wind power project and does not classify as a retrofit, replacement, or capacity addition. Hence this condition is not applicable to the project activity.

Hence, as per the justifications presented in the table above, it can be concluded that the proposed project activity satisfies all the necessary/relevant applicability criteria of ACM0002, version 12.3.0.

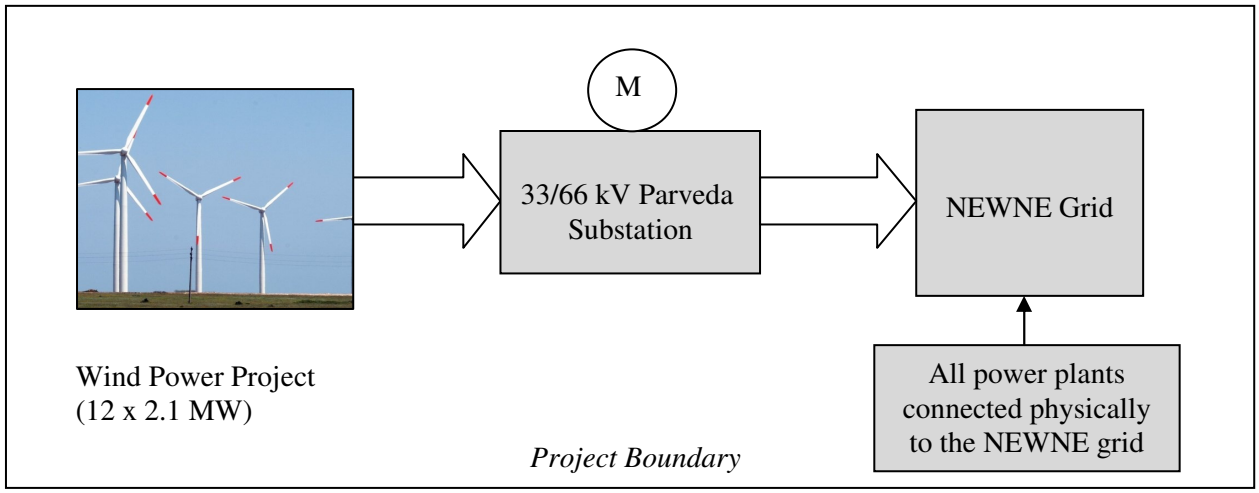
B.3. Project boundary

Source		**GHGs**	**Included?**	**Justification/Explanation**
Baseline scenario	CO_2 emissions from electricity generation in fossil fuel fired power plants that are displaced due to the project activity	CO_2	Yes	In the baseline scenario, electricity would be sourced from the NEWNE Grid which in turn would have been connected to fossil fuel fired power plants which emit CO_2.
		CH_4	No	No methane emission is expected. Hence excluded.
		N_2O	No	No nitrous oxide emission is expected. Hence excluded.
Project scenario	Greenfield wind energy conversion system	CO_2	No	The project activity is not expected to emit any carbon dioxide. Further, the net electricity exported (after offsetting imports) by the project activity would be used to estimate emission reductions and hence this source of emission is excluded.
		CH_4	No	No methane emission is expected. Hence excluded.

		N_2O	No	No nitrous oxide emission is expected. Hence excluded.

Project Boundary Diagram:

The spatial extent of the project boundary includes the project power plant and all power plants connected physically to the electricity system that the CDM project power plant is connected to.



M: Metering Point

A note on the Metering Arrangement has been included in Appendix 3 of the PDD.

B.4. Establishment and description of baseline scenario

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The Project activity is the installation of a wind energy project which is a Greenfield project and does not involve any modifications or replacements and capacity additions.

ACM0002 version 12.3.0 clearly states that if the Project activity is the installation of a new grid-connected renewable power plant/ unit, the baseline scenario is the following:

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

Electricity generated from the Project activity will be supplied to the NEWNE grid. In the absence of Project activity, quantity of the electricity that would be delivered by the Project activity to the NEWNE grid would be sourced from the existing grid-connected power plants and future capacity additions to meet the growing electricity requirements. Hence, generation mix of NEWNE grid is considered as the baseline scenario.

All data used to establish the baseline scenario are tabulated below[2].

Particulars	2008-09	2009-10	2010-11
Simple Margin (tCO2/MWh)	1.0066	0.9777	0.9707
Net Generation in OM (GWh)	421,803	458,043	476,987

[2] As per CEA CO_2 baseline database Version 07 available at http://www.cea.nic.in/reports/planning/cdm_co2/user_guide_ver7.pdf

Net electricity imports (GWh)	5,897	5341.1	5610
Net generation incl imports (GWh)	427,700	463,384	482,597
Weightage of operating margin emissions factor	0.75		
Weightage of build margin emissions factor	0.25		

B.5. Demonstration of additionality

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The demonstration of additionality for the proposed Project activity is being carried out in accordance with the additionality tool provided by the UNFCCC i.e. "*Tool for demonstration and assessment of Additionality"* Version 6.1.0. The tool provides a step-wise approach to demonstrate additionality which is displayed below:

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

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

Identify realistic and credible alternative(s) available to the project participants or similar project developers that provide outputs or services comparable with the proposed CDM project activity.

The project proponent is setting up wind power project of 25.2 MW capacity in Rajkot district of Gujarat. It consists of installation of 12 Suzlon make wind turbines of 2.1 MW capacity each. As the purpose of the Project activity is to generate electrical power to be fed to the grid, the following alternatives are considered:

Alternative 1: The proposed project activity not undertaken as a CDM project activity.

The project proponent could proceed with the implementation of the project without CDM benefits. The electricity produced from the renewable energy project would have been sold to the grid. This is in compliance with all applicable legal and regulatory requirements and can be a part of the baseline. However, the Project activity is not feasible without CDM revenues. This argument has been discussed in step 2 of the Additionality section.

Alternative 2: No proposed project activity and equivalent amount of energy would have been produced by the grid electricity system through its currently running power plants and by new capacity addition to the grid i.e. Continuation of the present situation.

The project proponent would have continued without investment in project activity with usual business activities. The grid would continue with the fossil fuel based power projects and this would result in GHG emissions. Hence, the new capacity add-on from a fossil fuel based power plant is appropriate, realistic & credible baseline alternative for the project activity.

Outcome of Sub-step 1a: All the realistic alternatives for the project activity have been enlisted above.

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

The alternative(s) shall be in compliance with all applicable legal and regulatory requirements, even if these laws and regulations have objectives other than GHG reductions, e.g. to mitigate local air pollution. (This sub-step does not consider national and local policies that do not have legally-binding status.).

The relevant national laws and regulations pertaining to generation of energy in India are:

- Electricity Act 2003
- National Electricity Policy 2005
- Tariff Policy 2006

The Project activity conforms to all the applicable laws and regulations in India:

- Power generation using wind energy is not a legal requirement or a mandatory option. There are state and sectoral policies, framed primarily to encourage wind power projects. These policies have also been drafted realizing the extent of risks involved in the projects and to attract private investments.

- The Indian Electricity Act, 2003 (May 2007 Amendment) does not influence the choice of fuel used for power generation.

- There is no legal requirement on the choice of a particular technology for power generation.

  In addition to the above policies, a regulation on Renewable Energy Certificate (REC) for renewable energy generation was published by CERC in India on 14/01/2012[3]. As per this policy, Renewable Energy projects had the option to claim REC benefits if they opted for a lower fixed tariff (APPC) as compared to the preferential tariff that was available to such projects. However, as the REC mechanism was adopted on on 14/01/2010 and falls under EB22 para 7b states as under "(b) National and/or sectoral policies or regulations under paragraph 6 (b) that have been implemented since the adoption by the COP of the CDM M&P (decision 17/CP.7, 11 November 2001) need not be taken into account in developing a baseline scenario Therefore, REC is considered as 'E- ' policy with reference to EB16 Annex 3 and EB22 Annex 3. Thus policy this has not been considered further.

Outcome of Sub-step 1b: Hence, both the alternatives enlisted above are found to comply with the mandatory laws and regulations taking into account the enforcement of the legislations in the region or country and EB decisions on national and/or sectoral policies and regulations. Alternative 2 has been selected as the appropriate baseline alternative.

Step 2: Investment analysis

Determine whether the proposed project activity is economically or financially less attractive than at least one other alternative, identified in step 1, without the revenue from the sale of certified emission reductions (CERs). To conduct the investment analysis, use the following sub-steps:

Sub-step 2a: Determine appropriate analysis method

The Project activity envisages generation of revenues by exporting the electricity to NEWNE grid. Thus, simple cost analysis cannot be used as the analysis method as the sale of the units of generated electricity shall result in a revenue stream during the operations of the Project activity.

After eliminating Option I, the use of Benchmark analysis (Option III) is the method of analysis that has been selected as the most suitable method. This method determines the attractiveness of the project activity for the investors, as well as provides a measure of the viability of the investment to generate revenues during its operation, as compared with other avenues and investment options. Hence, the Benchmark analysis method is to be employed for analysis of the said project.

Sub-step 2b (Option III): Apply benchmark analysis

The investment analysis using Benchmark analysis approach (Option III) has been chosen. Further, this method illustrates the evaluation of the Project by the PP before the decision to undertake the project was taken and management approval granted.

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3 https://www.recregistryindia.in/pdf/REC_Regulation/2(a)CERC_Regulation_on_Renewable_Energy_Certificates_REC.pdf

Choice of Financial Indicator: As allowed by the Guidance on the Assessment of Investment Analysis (Version 5.0)[4], Equity Internal Rate of Return (IRR) was selected as the financial indicator to assess the attractiveness of the project.

Choice of Benchmark:
The Fisher equation[5] in financial mathematics and economics estimates the relationship between nominal and real interest rates under inflation. It is named after Irving Fisher who was famous for his works on the theory of interest. In finance, the Fisher equation is primarily used in yield to maturity calculations of bonds or IRR calculations of investments. In economics, this equation is used to predict nominal and real interest rate behavior.

Letting denote the nominal interest rate, R denote expected real rate of return, and let I denote the inflation rate, the Fisher equation is:

$r = (1+ I) * (1+ R) -1$

According to above discussion and as per Section IV Selection and Validation of Appropriate Benchmarks, Point 15 of Guidelines on the assessment of the investment analysis (Version 05, EB 62), the value for cost of equity is selected from Appendix. The value of Return on Equity for Group-1 projects in India is 11.75%.

As per paragraph 7 of Appendix of the above mentioned document,
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. If this information is not available, the target inflation rate of the central bank shall be used. If this information is also not available, then the average forecasted inflation rate for the host country published by the IMF (International Monetary Fund World Economic Outlook) or the World Bank for the next five years after the start of the project activity shall be used.

Thus, the inflation forecast value has been considered as 5.40%[6] forecasted value for the crediting period chosen by the Central Bank (Reserve Bank of India) of the host country.

Therefore substituting I = 5.40% and R = 11.75% in the above equation, we get

r = (1+0.054) * (1+ 0.1175) -1
i.e. r = 17.7845%

Thus, the benchmark for the project activity has been estimated as **17.78%**.

The Project Proponent has conducted financial analysis taking the Equity IRR as the financial indicator to prove additionality. The Equity IRR has been calculated to be **7.28%**

[4] http://cdm.unfccc.int/Reference/Guidclarif/reg/reg_guid03.pdf
[5] Aswath Damodaran, Book on Investment Valuation _2nd edition (Page 8 of Chapter 13)
[6] http://rbi.org.in/scripts/PublicationsView.aspx?id=13360

Key assumptions used for Equity IRR calculations are listed below:

Particulars	Value	Unit	Source
No. of wind turbines	12	Nos	Suzlon Offer
Capacity of each wind turbine	2.1	MW	Suzlon Offer
Capacity of the project	25.2	MW	Calculated
Net Generation	50.733[7]	Million kWh	Apportioned generation for 25.2 MW (Project capacity) from the Wind Assessment Study - AWS Truepower,LLC -Table 6 (Pg.19) which was carried out for 37.8 MW i.e. entire wind farm capacity.
Net Generation	4.23	Million kWh per Machine	Calculated
Net PLF	22.98%	%	Calculated
No. of wind turbines opting for Pref. Tariff Model	7	Nos	Assumed at the time of decision making
No. of wind turbines opting for Open Access Model	5	Nos	Assumed at the time of decision making
Project cost	1,464.996	INR Million	Calculated
Debt	70%	INR Million	GERC Wind Power Tariff Order (dt. 31-01-2010), Page 15
Debt Contribution	1025.50	INR Million	Calculated
Equity Contribution	439.50	INR Million	Calculated
Operation and Maintenance Cost (first year)	0.65	INR Million Per MW	GERC Wind Power Tariff Order (dt. 31-01-2010), Page 14
Escalation in O & M	5%	%	GERC Wind Power Tariff Order (dt. 31-01-2010), Page 14
Service Tax on O&M	10.30%	%	Indian IT Act
Open Access Tariff	3.90	Rs/kWh	Assumed at the time of decision making by PP based on an analysis carried out by third party
Preferential Tariff	3.56	Rs/kWh	http://www.gercin.org/renewablepdf/en_1303211765.pdf
Depreciation Rate (Companies Act) - Plant & Machinery	5.28%	%	The Companies Act,1956 - SCHEDULE XIV
IT Depreciation Rate - Plant & Machinery	7.69%	%	Indian IT Rules, Appendix IA
Income tax rate	33.22%	%	Indian IT Act for FY 2011-12

[7] Net Generation for Project activity has been calculated as = 76.1 * (25.2/37.8) = 50.733 GWh.

Interest rate	13.25%	%	SBI BPLR Minus 1% (as per GERC Tariff Order (dt. 31-01-2010)) Link: SBAR as on 11-July-2011 http://in.reuters.com/article/2012/01/09/india-plr-idINL3E8C962820120109
Debt repayment	10	Years	GERC Tariff Order (dt. 31-01-2010), Page 16
Salvage value	10%		GERC Tariff Order (dt. 31-01-2010), Page 22
MAT rate	20.01%		Indian IT Act for FY 2011-12
GBI	0.5	Rs/kWh	MNRE GBI Guidelines, Page 2
GBI cumulative cap	6.2	INR Million per MW	MNRE GBI Guidelines, Page 2
Max. GBI allowed in a year	1.55	INR Million per MW	MNRE GBI Guidelines, Page 2
Max. GBI allowed in a year	22.785	INR Million	Calculated
GBI cumulative cap	91.14	INR Million	Calculated
Max duration for GBI	10	Years	MNRE GBI Guidelines, Page 2

Sub-step 2c: **Sensitivity Analysis:**
As per guidance provided in the latest version of "Tool for the demonstration and assessment of additionality", the variables, including the initial investment cost, that constitute more than 20% of total project costs or total project revenues have been identified and subjected to a reasonable variation and the results of this variation have been presented below:

Change in net generation	**+10.00%**	**0.00%**	**-10.00%**	**Break-Even Point**	**53%**
Equity IRR	9.45%	7.28%	4.77%		17.94%
Change in Power Sale tariff	**+10.00%**	**0.00%**	**-10.00%**	**Break-Even Point**	**53%**
Equity IRR	9.43%	7. 28%	4.78%		17.85%
Change in O&M Cost	**+10.00%**	**0.00%**	**-10.00%**	**Break-Even Point**	**-394%**
Equity IRR	6.95%	7. 28%	7.60%		17.78%
Change in Total Project Cost	**+10.00%**	**0.00%**	**-10.00%**	**Break-Even Point**	**-37%**
Equity IRR	5.23%	7. 28%	9.42%		17.94%

The purpose of the sensitivity analysis is to demonstrate the sensitivity of the returns from the Project activity due to uncertainty in plant load factor, capital cost and O&M costs. This is an assessment of the

impact of variations in above parameters from the assumed/design values, and represents magnitude of effects of these variations on the returns from the Project activity.

It can be observed from above table that in various scenarios wherein there are changes in tariff and REC prices, O&M cost, net saleable units and project's capital cost, the Equity IRR does not cross the benchmark. Thus, it can be concluded that revenue from sale of CERs is important to alleviate this gap and hence the project has been considered to be additional.

Step 4 – Common practice Analysis

In the context of the present project activity, the following parameters are defined in line with paragraphs 5 – 10 of this approved methodological tool:

Measure: As per paragraph 6, 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);*"

Output: As per paragraph 7, "power generation" may be considered to be the output in the context of the project activity. Further as per Step 1 of paragraph 47 of the same tool, the applicable output range will be 12.6 MW to 37.8 MW, i.e. ±50% of installed capacity of the project activity (25.2MW)

As per paragraph 47 of the approved methodological tool , the following Stepwise approach has been followed by the project activity to demonstrate that it is not a Common Practice in the applicable geographical area:

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

The capacity of the project activity is 25.2 MW. The project capacity has been subject to the variation in the range of +/- 50%, the following table depicts the outcome of the variation applied. Hence, the applicable output range will be 12.6 MW to 37.8 MW, i.e. ±50% of installed capacity of the project activity

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 Nall. Registered CDM project activities shall not be included in this step.*

India has been considered applicable geographical area as a default, for the common practice analysis of project activity. All power plants generating electricity within the capacity range of 12.6 MW to 37.8 MW and having commercial operations date before project activity start date have been considered in this analysis. The power generation plants identified in this step are hydro, thermal, nuclear, biomass based, solar and wind power projects. The total number of power plants in the applicable output range = 320.

Category of Power plants	No. of Projects
Thermal	94
Hydro	209
Wind*	32

Nuclear	0
Solar	0
Biomass	123
Total (Nall)	458

Therefore N_{all} = 458

Note: Registered/under validation CDM project activities have been excluded in this step .The spreadsheet containing the list of the plants identified has been provided separately to the DOE.

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}.

In accordance with Guidelines on Common practice following criterion has been used to arrive at the number of different technology power plants;
Different technologies *in the context of the project activity*:

Energy Source / Fuel
The project activity involves electricity generation from wind. The other project activities using water (Hydro, Biomass, Solar), conventional fuels (Coal, Lignite, Natural Gas & Liquid Fuel based – i.e. Thermal) as energy sources for the generation of electricity respectively are considered as plants with different technologies and included under N_{diff}.

The N_{diff} value is thus arrived at as tabulated below:

Category of Power plants	**No. of Projects**
Thermal	94
Hydro	209
Wind	0
Nuclear	0
Solar	0
Biomass	123
Total (Ndiff)	426

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

Nall	458
Ndiff	426
Nall - Ndiff	32
F = 1-Ndiff/Nall	0.0699

The factor F and Nall-Ndiff is calculated and following values are arrived at;
F =0.0699
N_{all}-N_{diff} = 32

As value of F is less than 0.2 so it can be concluded that the project activity is not a common practice in the applicable geographical area.

The above discussions show that wind power development is not a common practice in the applicable geographical area and the Project activity is not financially attractive; hence the Project activity is additional.

In view of the above, the PP had considered CDM as a source of additional revenue to improve financial viability of the project while deciding to make invest in the Project activity.

The chronology of events related to the Project activity and the efforts of the PP to secure CDM funding for the Project activity are summarized below:

Sr. No.	Event	Date
1.	Board Decision making to invest in the project activity considering CDM revenue (Serious consideration of CDM)	10/08/2011
2.	Purchase order for wind turbines placed (Start date)	26/08/2011
3.	CDM Prior consideration notification to UNFCCC	07/11/2011
4.	CDM Prior consideration notification to host country DNA (MoEF)	09/11/2011
5.	Local stakeholder consultation meeting	23/11/2011
6.	Appointment of DoE	17/02/2012
7.	Commissioning date of the project	29/03/2012

B.6. Emission reductions
B.6.1. Explanation of methodological choices
>>

Baseline Emissions
As per the equation 6 of the methodology ACM 0002 (Version 12.3.0),

$$BE_y = EG_{PJ,y} \cdot EF_{grid,CM,y} \quad (1)$$

Where:
BE_y *Baseline emissions in year y (tCO_2e/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_2e/MWh)*

Calculation of $EG_{PJ,y}$
The methodology ACM 0002 (Version 12.3.0) has procedures for calculation of $EG_{PJ,y}$ for the following cases:

(a) Greenfield plants,
(b) Retrofits and replacements, and
(c) Capacity additions.

As all the three projects included in the proposed CDM project activity are Greenfield plants, option (a) as provided in the methodology ACM 0002 (Version 12.3.0) shall be applicable and is described below:

"If the project activity is the installation of a new grid-connected renewable power plant/unit at a site where no renewable power plant was operated prior to the implementation of the project activity, then:

$EG_{PJ,y} = EG_{facility,y}$ *(2)*

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)"*

Calculation of $EF_{grid, CM, y}$

The methodology ACM 0002 (Version 12.3.0) requires that the combined margin for the grid be calculated in accordance with the procedure provided in the *"Tool to calculate the emission factor for an electricity system"*.

As per version 02.2.1 of Tool to calculate emission factor for an electricity system, following steps are included in the calculation of the emission factor for the baseline scenario:

STEP 1: Identify the relevant electricity systems.
STEP 2: Choose whether to include off-grid power plants in the project electricity system (optional).
STEP 3: Select a method to determine the operating margin (OM).
STEP 4: Calculate the operating margin emission factor according to the selected method.
STEP 5: Calculate the build margin (BM) emission factor
STEP 6: Calculate the combined margin (CM) emissions factor.

The Central Electricity Authority (CEA) has published CO_2 baseline database in its version 7.0 (January, 2012). The values for OM, BM, CM are given excluding and including imports. For the present project activity, including imports are considered.

Step 1: Identifying the relevant electricity system

Grid/project electricity system is defined by the spatial extent of the power plants that are physically connected through transmission and distribution lines to the project activity (e.g. the renewable power plant location or the consumers where electricity is being saved) and that can be dispatched without significant transmission constraints.

The Southern grid and the NEWNE Grid form the two independent regional grids of India. As the project activity comprises the project activity located in the state of Gujarat, the NEWNE grid is applicable to the proposed CDM project.

Each state in a regional grid meets its own demand with its own generation facilities and also with allocation from power plants owned by the central sector. Depending on the demand and generation, there are electricity exports and imports between states in the regional grid. The volume of the net transfers between the regions in India is relatively small and electricity is largely produced and consumed within the same states. Consequently, it is appropriate to assume that the impacts of the project activity will be confined to the regional gird in which it is located. Hence for the purpose of estimation of the baseline emission factor, the NEWNE grid has been chosen as the relevant electricity system.

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

Off-grid power plants have not been included in the project electricity system

Step 3: Selection of an Operating Margin method

The project proponent wishes to use the Simple Operating Margin (OM) method for the estimation of the baseline. The use of the Simple OM method is justified as the share of the low cost/ run resources constitute less than 50% of the total grid generation.

The data pertaining to the total grid generation and the low/cost must run resources have been included in Annex 3.

	2006-07	2007-08	2008-09	2009-10	2010-11
NEWNE	18.5%	19.0%	17.4%	15.9%	17.6%
South	28.3%	27.1%	22.8%	20.6%	21.0%
India	20.9%	21.0%	18.7%	17.1%	18.4%

Note: As per the above information, it can be clearly established that the share of the low cost/ run resources constitute to less than 50% of the total grid generation.

With regards to data vintage, the project participant wishes to use the ex-ante option wherein the project proponent wishes to use the ex ante option wherein the emission factor is determined once at the validation stage, thus no monitoring and recalculation of the emissions factor during the crediting period is required.

Step 4: Calculation of the OM according to the Simple OM method

The simple OM emission factor is calculated as the generation-weighted average CO_2 emissions per unit net electricity generation (tCO_2e/MWh) of all generating power plants serving the system, not including low-cost / must-run power plants / units.

The data provided by the Central Electricity Authority (CEA), an official data source has been relied upon for the calculation of the OM. The same has been detailed in Annex 3. The latest version of the database, Version 7 (January, 2012) has been used. The OM calculations have been based upon generation data, fuel consumption and the Net Calorific value (NCV) of the fuel.

Option A has been chosen for calculating Operating Margin emission factor for the project. OM has been determined based on fuel consumption and net efficiency generation of each power plant/ unit, since fuel consumption data for each power plant/ unit is available.

Assumptions

The following assumptions have been made in case of unavailability of data at station level:

Net generation: In case of stations where only gross generation is available, CEA standard values for auxiliary consumption have been applied to calculate the net generation data.

NCV: Default NCV values for some thermal power stations have been used for cases where station specific data was unavailable.

The following assumptions have been in case of unavailability of data at unit level:

Net generation: The data is not monitored at a unit level and hence the following assumptions have been made:

1. The auxiliary consumption (in % of gross generation) of the unit was assumed to be equal to that of the respective stations in the following cases:
   - All units of a station fall into the build margin; or
   - All units of a station have the same installed capacity; or
   - The units in the station have different capacities but do not differ with respect the applicable standard auxiliary consumption.

2. In all other cases, standard values for auxiliary consumption adopted by CEA were applied.

Fuel consumption and NCV: Fuel consumption and NCV are generally not measured at unit level. Instead, the specific CO_2 emissions of the relevant units were directly calculated based on heat rates.

Calculation Approach
The Simple OM has been calculated using the following formula:

$$EF_{grid,OMsimple,y} = \frac{\sum_{i} \left(FC_{i,y} \times NCV_{i,y} \times EF_{CO2,i,y} \right)}{EG_{y}} \quad (3)$$

Where:

$EF_{grid, OM simple, y}$	Simple operating margin CO_2 emission factor in year *y* (tCO_2e/MWh)
$FC_{i, y}$	Amount of fossil fuel type *i* consumed in the project electricity system in year *y* (mass or volume unit)
$NCV_{i, y}$	Net calorific value (energy content) of fossil fuel type *i* in year *y* (GJ/mass or volume unit)
$EF_{CO2, i, y}$	CO_2 emission factor of fossil fuel type *i* in year *y* (tCO_2e/GJ)
EG_{y}	Net electricity generated and delivered to the grid by all power sources serving the system, not including low-cost/must-run power plants/units, in year *y* (MWh)
I	All fossil fuel types combusted in power sources in the project electricity system in year *y*
y	The relevant year as per the data vintage chosen in Step 3

As per Annex 3, the last 3 year generation values are 1.0066, 0.9777 and 0.9707.

The 3-year generation-weighted average was taken and the same has been derived as $EF_{grid,OM,y} = 0.9842$

Step 5: Calculate the build margin emission factor
The build margin emissions factor is the generation-weighted average emission factor (tCO_2e/MWh) of all power units m during the most recent year y for which power generation data is available and will be calculated as follows:

$$EF_{grid,BM,y} = \frac{\sum_{m} EG_{m,y} \times EF_{EL,m,y}}{\sum_{m} EG_{m,y}} \quad (4)$$

Where:

$EF_{grid, BM, y}$	Build margin CO_2 emission factor in year y (tCO_2e/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_2e/MWh)
m	Power units included in the build margin
y	Most recent historical year for which power generation data is available

As described above, the Build Margin would be calculated annually during the entire crediting period. For the purpose of ex-ante emission reduction calculations the most recent data available (from CEA for 2010-11) has been used and the build margin thus calculated is 0.8588

Therefore, $EF_{grid,BM,y} = 0.8587$

Step 6: Calculation of the combined Build Margin emission factor

The combined margin emission factor will be calculated as follows:

$$EF_{grid,CM,y} = EF_{grid,OM,y} \times w_{OM} + EF_{grid,BM,y} \times w_{BM} \quad (5)$$

Where,

$EF_{grid,BM,y}$ = Build margin CO_2 emission factor in year y (tCO_2e/MWh)
$EF_{grid,OM,y}$ = Operating margin CO_2 emission factor in year y (tCO_2e/MWh)
w_{OM} = Weightage of operating margin emissions factor (%)
w_{BM} = Weightage of build margin emissions factor (%)

As per the 'Tool to calculate the Emission Factor for an electricity system' version 02.2.1, the default values for w_{OM} and w_{BM} are taken as 0.75 and 0.25 respectively as per the guidance provided for wind project activities for the first crediting period and subsequent crediting periods.

Hence, the Baseline Emission Factor is calculated using the formula stated below:

$EF_{grid,CM,y} = w_{OM} * EF_{grid,OM,y} + w_{BM} * EF_{grid,BM,y}$

Project Emissions

As per the guidance provided in the methodology ACM 0002 (Version 12.3.0), "*For most renewable power generation project activities, $PE_y = 0$. However, some project activities may involve project emissions that can be significant. These emissions shall be accounted for as project emissions by using the following equation:*

$$PE_y = PE_{FF,y} + PE_{GP,y} + PE_{HP,y} \quad (6)$$

Where:

PE_y Project emissions in year y (tCO_2e/yr)
$PE_{FF,y}$ Project emissions from fossil fuel consumption in year y (tCO_2e/yr)
$PE_{GP,y}$ Project emissions from the operation of geothermal power plants due to the release of non-condensable gases in year y (tCO_2e/yr)
$PE_{HP,y}$ Project emissions from water reservoirs of hydro power plants in year y (tCO_2e/yr)

Leakage Emissions

The methodology ACM 0002 (Version 12.3.0) does not consider any leakage emissions.

Emission reductions

Emission reductions are calculated as follows:

$$ER_y = BE_y - PE_y \quad (7)$$

Where:

ER_y Emission reductions in year y (tCO_2e/yr)

BE_y	Baseline emissions in year y (tCO_2e/yr)
PE_y	Project emissions in year y (tCO_2e/yr)

B.6.2. Data and parameters fixed ex ante

Data / Parameter	$EF_{grid,OM,y}$
Unit	tCO_2e/MWh
Description	Simple operating margin for NEWNE grid
Source of data	CO_2 baseline database (Version 7.0) published by CEA in January 2012[8]
Value(s) applied	0.9842
Choice of data or Measurement methods and procedures	This value is calculated by taking weighted average of 3 years values for Simple Operating Margin of NEWNE grid viz. 2008-09 , 2009-10 and 2010-11
Purpose of data	Calculation of baseline emissions
Additional comment	Fixed ex-ante for entire crediting period

Data / Parameter	$EF_{grid,BM,y}$
Unit	tCO_2e/MWh
Description	Build margin for NEWNE grid
Source of data	CO_2 baseline database (Version 7.0) published by CEA in January 2012[9]
Value(s) applied	0.8587
Choice of data or Measurement methods and procedures	This value is taken from the latest value for Build Margin of NEWNE grid available at the time of web hosting of the PDD viz. 2010-11
Purpose of data	Calculation of baseline emissions
Additional comment	Fixed ex-ante for entire crediting period

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

Data / Parameter	$EF_{grid, CM, y}$
Unit	tCO_2e/MWh
Description	Emission factor for NEWNE grid
Source of data	Calculated as per the procedure described in PDD section B.6.1
Value(s) applied	0.9528
Choice of data or Measurement methods and procedures	This value is calculated using $EF_{grid,OM,y}$ and $EF_{grid,BM,y}$ values as per Version 02.2.1 of methodological tool to calculate the emission factor for an electricity system
Purpose of data	Calculation of baseline emissions
Additional comment	-

B.6.3. Ex ante calculation of emission reductions
>>

Detailed Calculations:
Baseline emissions (BE_y)

According to equation (1) of PDD section B.6.1, the baseline emissions are to be calculated as follows:

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

According to equation (5) of PDD section B.6.1, Combined margin CO_2 emission factor for grid connected power generation ($EF_{grid,CM,y}$) is calculated as follows:

$$EF_{grid, CM, y} = w_{OM} * EF_{grid, OM, y} + w_{BM} * EF_{grid, BM, y}$$
$$= 0.75 * 0.9842 + 0.25 * 0.8588$$
$$= 0.9528\ tCO_2e/MWh$$

Thus for ex-ante emission reduction calculations, the baseline emission factor for the grid = 0.9528 tCO_2e/MWh

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

$EG_{PJ,y} = \mathbf{EG_{facility,y}} = 50{,}733$ MWh

Hence, substituting values in equation 1, we get:

$BE_y = 50{,}733 * 0.9528$
$= 48{,}338\ tCO_2e$

Project activity emissions
The Project activity does not envisage any fossil fuel consumption. Therefore, the parameter $PE_{FF, y} = 0$ tCO_2e/ annum. Also, as the proposed CDM Project activity is not a geothermal project activity or a hydro project activity, hence, the Project emissions as per parameters $PE_{GP, y}$ and $PE_{HP, y}$ are also zero.

Therefore, $PE_y = 0\ tCO_2e/annum$

According to equation (7), overall **emission reductions** (ER_y) are,

$ER_y = BE_y – PE_y$
$= 48,338 - 0$
$= 48,338\ tCO_2e$

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	48,338	0	0	48,338
Year 2	48,338	0	0	48,338
Year 3	48,338	0	0	48,338
Year 4	48,338	0	0	48,338
Year 5	48,338	0	0	48,338
Year 6	48,338	0	0	48,338
Year 7	48,338	0	0	48,338
Total	**338,366**	0	0	**338,366**
Total number of crediting years	7 years			
Annual average over the crediting period	48,338	0	0	48,338

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

Data / Parameter	$EG_{facility,i,y}$
Unit	MWh/ year
Description	Quantity of net electricity generation supplied by the project WTGs connected to feeder i to the grid in period *y*
Source of data	Sum of net electricity generation values as per all the certificates for share of electricity generated by Wind farm provided by GETCO/SLDC[10] for the period y and for all the feeders to which WTGs of the project activity are connected. In cases where there are other (non-project) WTGs connected to the same feeder, appropriate apportioning mechanism specified in PDD section B.7.3 shall be applied. Also for cases when the start/end dates of monitoring period do not match with the start/end dates of certificates for share of electricity generated by Wind farm provided by GETCO/SLDC, appropriate apportioning mechanism specified in PDD section B.7.3 shall be applied.
Value(s) applied	50,733 MWh
Measurement methods and procedures	The net electricity generated and fed into the grid shall be directly referred from the respective certificates for share of electricity generated by Wind farm provided by GETCO/SLDC. The above values are calculated by specific apportioning mechanism. The same has been provided in appendix 5 of this PDD for reference. As Readings from both the WTG yard meters (tri-vector meters) as well as the ABT[11] meters installed at the 33/66 kV Parveda substation are used for arriving at the net electricity generation supplied by the project to the grid, their ,measurement methods and procedures are described below: Monitoring: Continuous measurement and at least monthly recording. Archiving: Electronic and Paper Data type: Measured & Calculated Responsibility: The O&M site-in-charge shall be responsible for the regular recording of data. For ABT meter: Accuracy Class: 0.2S (Active) and 0.5S (Reactive) For Tri-vector meter (installed at the yard near each WTG): Accuracy Class: 0.2S

[10] SLDC = State Load Dispatch Centre
[11] ABT = Availability Based Tariff

	Only in situations when the start/end dates of monitoring period do not match with the start/end dates of certificates for share of electricity generated by Wind farm provided by GETCO/SLDC, appropriate apportioning mechanism specified in PDD section B.7.2 shall be applied.
Monitoring frequency	Continuous measurement and at least monthly recording
QA/QC procedures	The Quantity of net electricity generation from the certificate for share of electricity can be cross-checked with the invoices for the sale of power by the project proponent. The meter(s) shall be calibrated and maintained by the state utility as per their own schedule and this frequency of meter calibration is not within the control of the Project Proponent. However, PP would ensure that calibration is carried out at least once in 3 years.
Purpose of data	Calculation of baseline emissions
Additional comment	The data will be kept for two years after the end of the crediting period or the last issuance of CERs for this project activity, whichever occurs later.

Data / Parameter	$EG_{WTG\_yard,i,y}$
Unit	MWh/year
Description	Sum of electricity generation measured at individual yard meters of all project WTGs that are connected to feeder i during period y
Source of data	Yard meter readings of project activity WTGs
Value(s) applied	-
Measurement methods and procedures	This parameter would only be used for calculation of $EG_{facility,i,y}$ in cases when the start/end dates of monitoring period do not match with the start/end dates of certificate for share of electricity generated by Wind farm provided by GETCO/SLDC or if there are both project and non-project WTGs connected to a particular feeder i. This parameter is the sum of electricity measured at yard meters of all the project WTGs on a continuous basis. These meter readings will be recorded at on a daily basis. O&M contactor will have the responsibility of monitoring this parameter. This value will be used in an appropriate apportioning formula specified in PDD section B.7.3 to calculate quantity of net electricity generation supplied by the project to the grid. Monitoring: Continuous measurement and at daily recording. Archiving: Electronic and/or Paper Data type: Measured & Calculated Note: Accuracy Class of all the meters have been specified in appendix 5 of this PDD
Monitoring frequency	Continuous measurement and daily recording
QA/QC procedures	The yard meters installed near individual WTGs will be tested at least once in a year and calibrated (if required).
Purpose of data	Calculation of baseline emissions
Additional comment	The data will be kept for two years after the end of the crediting period or the last issuance of CERs for this project activity, whichever occurs later.

Data / Parameter	$EG_{Allyard,i,y}$
Unit	MWh/year
Description	Sum of electricity generation measured at individual yard meters of all project and non-project WTGs that are connected to feeder i during period y
Source of data	Yard meter readings of project & non-project activity WTGs
Value(s) applied	-
Measurement methods and procedures	This parameter would only be used for calculation of $EG_{facility,i,y}$ in cases when the start/end dates of monitoring period do not match with the start/end dates of certificate for share of electricity generated by Wind farm provided by GETCO/SLDC or if there are both project and non-project WTGs connected to a particular feeder i. This parameter is the sum of electricity measured at yard meters of the project and non-project WTGs on a continuous basis. These meter readings will be recorded at on a daily basis. O&M contactor will have the responsibility of monitoring this parameter. This value will be used in an appropriate apportioning formula specified in PDD section B.7.3 to calculate quantity of net electricity generation supplied by the project to the grid. Monitoring: Continuous measurement and at daily recording. Archiving: Electronic and/or Paper Data type: Measured & Calculated **Note:** Accuracy Class of all the meters have been specified in appendix 5 of this PDD
Monitoring frequency	Continuous measurement and daily recording
QA/QC procedures	The yard meters installed near individual WTGs will be tested at least once in a year and calibrated (if required). **Note:** The project proponent does not have any control over the yard meter readings of other project developers and therefore the values certified by the O&M contractor/GETCO/SLDC will be directly used for the purpose of calculation.
Purpose of data	Calculation of baseline emissions
Additional comment	The data will be kept for two years after the end of the crediting period or the last issuance of CERs for this project activity, whichever occurs later.

B.7.2. Sampling plan

>>

Since the data and parameters monitored in section B.7.1 above are not determined by a sampling approach, the sampling plan is not provided.

B.7.3. Other elements of monitoring plan

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In Monitoring &Verification protocol, the objective is to have clear, credible and accurate monitoring, evaluation and verification procedures. This involves recording, data collection of all wind turbines, metering of electricity generated at substation, on daily basis as well as on monthly basis. The general conditions for metering, recording, meter readings, meter inspections, Test & Checking and communication shall be as per the Power Purchase Agreement with the state utility.

Procedure for apportioning of electricity:

1. In case the start/end dates of monitoring period do not match with the start/end dates of Joint Meter Reading Sheets / Generation reports issued by GETCO/SLDC, following apportioning procedure will be applied for the first and the last monitoring period within a particular crediting period:

   Apportioning will be carried out based on ratio of generation data recorded using WTG yard meter installed near each WTG. The emission reductions of that particular period (between the start/end date of monitoring period and the end/start of the billing period) will be calculated based on percentage generation of that particular period at WTG using yard meter data multiplied with the total units generated in the month as per the Certificate for share of electricity generated by Wind farm provided by GETCO/SLDC. The calculation formula has been furnished below:

   Generation from all project WTGs for the period y1= $EG_{WTGyard,i,y1}$
   Generation from all project WTGs for the period y2 = $EG_{WTGyard,i,y2}$

   Net energy supplied used for calculation of emission reduction for the monitoring period y1

   $$\sum_{i=1}^{N} ((EG_{facility,i,y2}) * (EG_{WTGyard,i,y1} / EG_{WTGyard,i,y2}))$$

   Where:
   y1 = No. of days within a billing period up to which generation is considered for emission reduction calculation
   y2 = No. of days in the billing period
   N = No. of feeders to which project WTGs are connected to.

2. In case if there are project and non-project WTGs connected to a particular feeder i, the quantity of net electricity supplied by project WTGs to the grid connected to that particular feeder will be calculated based on the formula specified below:

   Total generation from all project WTG(s) connected to the feeder i in period y = $EG_{WTGyard,i,y}$

   Total generation from all project and non-project WTGs connected to the feeder i in period y = $EG_{Allyard,i,y}$

Quantity of net electricity supplied by all (project and non-project) WTGs connected to feeder i to the grid in period $y = EG_{facility,i,y}$

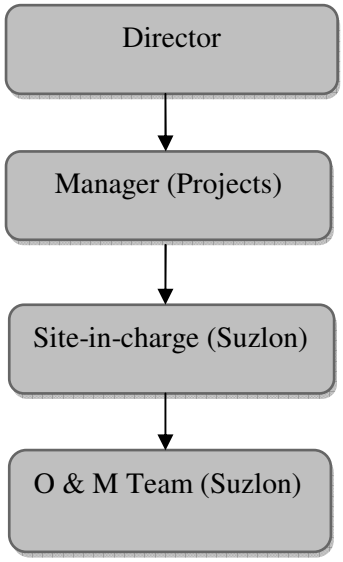
Net electricity supplied by the project WTGs connected to feeder i to the grid in period y =

$$\sum_{i=1}^{N} ((EG_{facility,i,y}) * (EG_{WTGyard,i,y} / EG_{Allyard,i,y}))$$

Where:
N = No. of feeders to which project WTGs are connected to.

3. In cases where both scenarios mentioned above exist at the same time (i.e. both project and non-project WTGs connected to the same feeder(s) and the start/end date of the monitoring periods do not match with those of the JMR readings), firstly the apportioning as per point # 2 above will be applied for the billing period y2 to estimate the Net electricity supplied by the project WTGs connected to feeder Z to the grid in period y2. Then this value would replace ($EG_{facility,y2}$) in the formula specified under point # 1 above to arrive at the Net energy export used for calculation of emission reduction for the monitoring period y1.

The project proponent proposes following arrangements in order to carry out metering and O & M activities for all wind turbines:



At 33 kV/66 kV Parveda substation (Currently managed by Suzlon), there are two feeders; Feeder 1 and Feeder 2. Main meter, check meter and ABT meters are located at this substation.

The detailed monitoring, recording and apportioning procedure has been described in appendix 3 of this PDD. The meter readings will be reported to the site-in-charge and the compiled reports will be sent to the Manager (Projects) and Director. The Manager will monitor overall activity of the project and report to the Director. As per O & M schedule, the operation and maintenance activities will be carried out by trained and qualified technical staff of Suzlon.

Each party shall maintain complete and accurate records and all other data required by each of them for the purposes of proper administration and the operation of the project.

SECTION C. Duration and crediting period

C.1. Duration of project activity

C.1.1. Start date of project activity

>>

26/08/2011 (Placement of purchase order to technology supplier)

C.1.2. Expected operational lifetime of project activity

>>

25 years-0 months

C.2. Crediting period of project activity

C.2.1. Type of crediting period

>>

Renewable crediting period. This is the first crediting period.

C.2.2. Start date of crediting period

>>

15/11/2012 or the date of registration of project activity with UNFCCC, whichever is later.

C.2.3. Length of crediting period

7 years- 0 months

SECTION D. Environmental impacts

D.1. Analysis of environmental impacts

>>

As per the Schedule 1 of the EIA notification dated 1/12/2009[12], given by the Ministry of Environment and Forests under the Environment (Protection) Act 1986, the proposed Project activity does not fall under the list of activities requiring EIA as the environmental impacts for such project are not considered as significant by the host Party or Project Proponent.

D.2. Environmental impact assessment

>>

Not applicable as the environmental impacts for such project are not considered as significant by the host Party or Project Proponent.

[12] http://moef.nic.in/downloads/rules-and-regulations/3067.pdf

SECTION E. Local stakeholder consultation

E.1. Solicitation of comments from local stakeholders

>>

RNWERPL had identified stakeholders for their wind power project in Rajkot district of Gujarat. The meeting was conducted on 23/11/2011 near the project site at Jasdhan, Rajkot.

The PP had identified the local stakeholders who may be impacted by the project activity and invited them via invitation letters. The category of stakeholders invited is listed below:

1. Representatives from Suzlon
2. Employees of RNWERPL
3. Contractors and Vendors
4. Villagers from nearby villages in Rajkot

E.2. Summary of comments received

>>

Meeting started with introductory speech by a local social leader. He introduced all attendees and the meeting agenda. The Project Proponent mentioned the meeting agenda then explained about Technical aspects of Project to stakeholders. He also explained about social, environmental & economical benefits of the Project. He also elaborated about CDM & its requirement. After detailed elaboration on Project, the meeting was open for discussion and feedback from stakeholders.

The villagers raised query that whether local villages would get electricity generated from the project. The Project Proponent answered that electricity generated would be exported to the grid of the State and the same cannot be distributed to the local villages due to technical difficulties. Then, villagers asked about any other benefits that local villages would receive. The project proponent replied that the project would help the local villagers in terms of direct and indirect employment generation. The project would also bring infrastructure facilities viz. Road in nearby villages.

To sum up the local villagers have given very positive response. They are one of the direct as well as indirect beneficiaries of the project. The construction and continuous operation of the project is providing employment opportunities for them. They have also express their support to project as it does not require any major displacement nor create any inconvenience to the local population. Wind being clean technology this will help in bridging the gap of power demand & generation with no pollution.

E.3. Report on consideration of comments received

>>

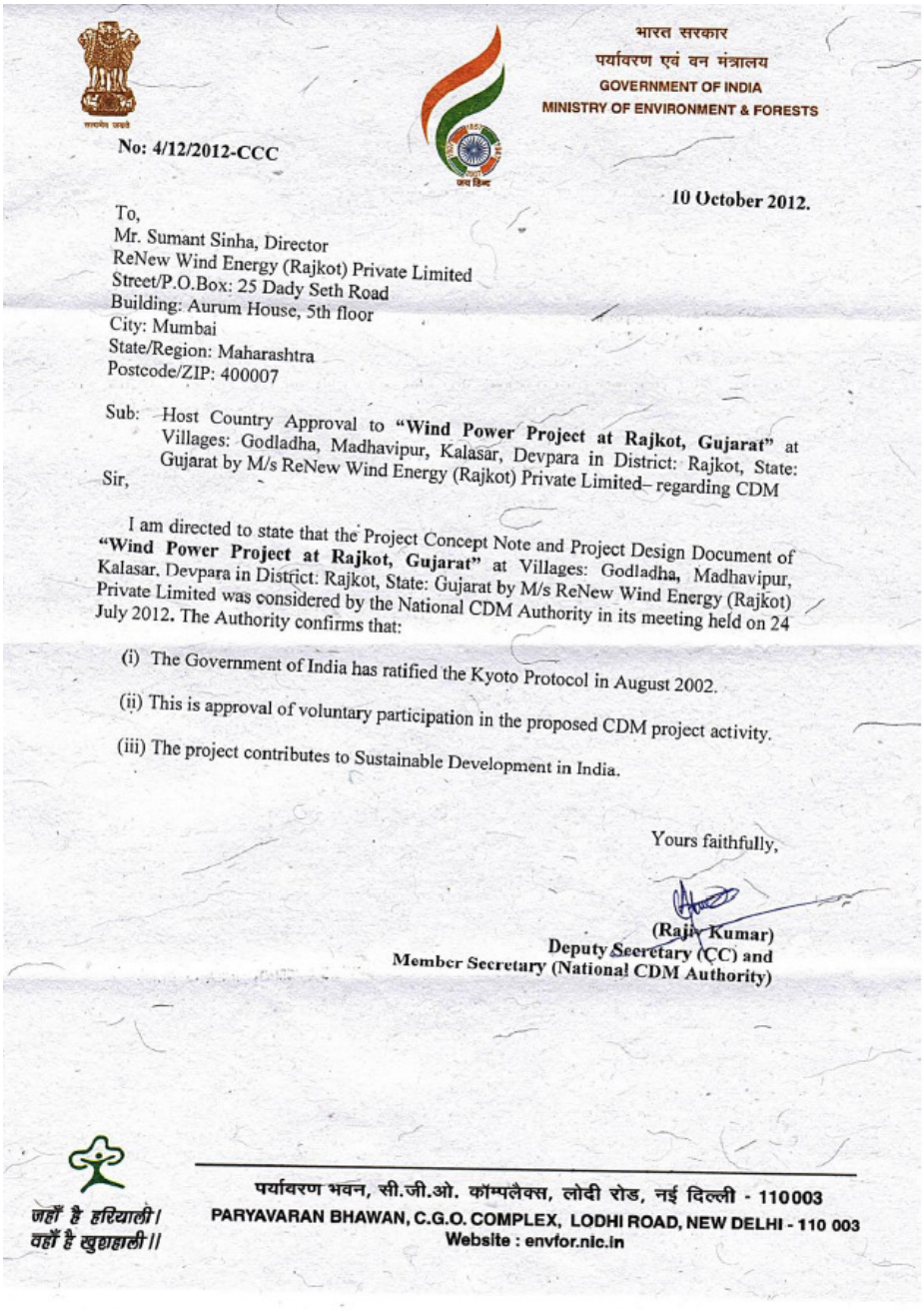
There was no negative feedback from any of the stakeholders who attended the meeting. They in fact supported the initiative taken by the project proponent for carrying out such an activity in the region. Hence, there is no need to take due account of the comments.

SECTION F. Approval and authorization

>>

The letter of approval from the host country Designated National Authority (DNA) for the project activity was not available at the time of submitting the PDD to the validating DOE.

The PP had made an application for receipt of letter of approval and authorization from the host country DNA and has attended the National CDM Authority (NCDMA) meeting dated 24/07/2012. The PP has now received approval and authorization from the NCDMA vide its letter No. 4/12/2012-CCC dated 10/10/2012. A copy of the same has been provided below:



भारत सरकार
पर्यावरण एवं वन मंत्रालय
GOVERNMENT OF INDIA
MINISTRY OF ENVIRONMENT & FORESTS

No: 4/12/2012-CCC

10 October 2012.

To,
Mr. Sumant Sinha, Director
ReNew Wind Energy (Rajkot) Private Limited
Street/P.O.Box: 25 Dady Seth Road
Building: Aurum House, 5th floor
City: Mumbai
State/Region: Maharashtra
Postcode/ZIP: 400007

Sub: Host Country Approval to **"Wind Power Project at Rajkot, Gujarat"** at Villages: Godladha, Madhavipur, Kalasar, Devpara in District: Rajkot, State: Gujarat by M/s ReNew Wind Energy (Rajkot) Private Limited– regarding CDM

Sir,

I am directed to state that the Project Concept Note and Project Design Document of **"Wind Power Project at Rajkot, Gujarat"** at Villages: Godladha, Madhavipur, Kalasar, Devpara in District: Rajkot, State: Gujarat by M/s ReNew Wind Energy (Rajkot) Private Limited was considered by the National CDM Authority in its meeting held on 24 July 2012. The Authority confirms that:

(i) The Government of India has ratified the Kyoto Protocol in August 2002.

(ii) This is approval of voluntary participation in the proposed CDM project activity.

(iii) The project contributes to Sustainable Development in India.

Yours faithfully,

(Rajiv Kumar)
Deputy Secretary (CC) and
Member Secretary (National CDM Authority)

जहाँ है हरियाली।
वहाँ है खुशहाली॥

पर्यावरण भवन, सी.जी.ओ. कॉम्पलैक्स, लोदी रोड, नई दिल्ली - 110003
PARYAVARAN BHAWAN, C.G.O. COMPLEX, LODHI ROAD, NEW DELHI - 110 003
Website : envfor.nic.in

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Sir,

Kindly refer to Ministry's letter No.: 4/12/2012-CCC dated 10 October 2012 conveying Host Country Approval to your CDM project to **"Wind Power Project at Rajkot, Gujarat"** at Villages: Godladha, Madhavipur, Kalasar, Devpara in District: Rajkot, State: Gujarat by M/s ReNew Wind Energy (Rajkot) Private Limited.

Please note that the following conditions shall also be complied with:

(i) M/s ReNew Wind Energy (Rajkot) Private Limited shall not sell the CERs to any agency/ company/ organization, which purchases the CERs using ODA Funds.

(ii) M/s ReNew Wind Energy (Rajkot) Private Limited shall inform the National CDM Authority regarding all transaction details of CERs including the name and address of the party to which CERs were sold within 30 days of transfer of the CERs.

(iii) M/s ReNew Wind Energy (Rajkot) Private Limited shall furnish expeditiously any information, during the lifetime of the project as requested by the National CDM Authority.

(iv) M/s ReNew Wind Energy (Rajkot) Private Limited shall obtain all statutory clearances and other approvals as required from the competent authorities for setting up of the project.

(v) All transactions shall be subject to supervision of the Executive Board of the CDM, under the authority and guidance of the COP/MOP.

(vi) This approval is not transferable. The authority reserves the right to revoke this Host Country Approval if the conditions stipulated in this approval are not complied with to the satisfaction of the National CDM Authority.

Yours faithfully,

(Rajiv Kumar)
Deputy Secretary (CC) and
Member Secretary (National CDM Authority)

जहाँ है हरियाली।
वहाँ है खुशहाली।।

पर्यावरण भवन, सी.जी.ओ. कॉम्पलैक्स, लोदी रोड, नई दिल्ली - 110 510
PARYAVARAN BHAWAN, C.G.O. COMPLEX, LODHI ROAD, NEW DELHI - 110 510

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Appendix 1: Contact information of project participants

Organization name	ReNew Wind Energy (Rajkot) Private Limited
Street/P.O. Box	MG Road
Building	601-604 6th Floor DLF Corporate Park
City	Gurgaon
State/Region	Haryana
Postcode	122001
Country	India
Telephone	+91- 124 – 4896670
Fax	-
E-mail	parag@renewpower.in
Website	http://renewpower.in/
Contact person	
Title	Chief Operating Officer
Salutation	Mr.
Last name	Sharma
Middle name	-
First name	Parag
Department	-
Mobile	-
Direct fax	+91- 124 – 4896680
Direct tel.	-
Personal e-mail	parag@renewpower.in

Appendix 2: Affirmation regarding public funding

There is no public funding involved from parties included in the Annex I for the implementation of the Project activity.

Appendix 3: Applicability of selected methodology

Refer section B.2 of the PDD.

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

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

http://www.cea.nic.in/reports/planning/cdm_co2/cdm_co2.htm
Version 7.0 of the database has been used.

Weighted Average Emission Rate (tCO2/MWh) (incl. Imports) (2)

	2006-07	2007-08	2008-09	2009-10	2010-11
NEWNE	0.8245	0.8127	0.8334	0.8234	0.8010
South	0.7163	0.7223	0.7597	0.7483	0.7524
India	0.7972	0.7902	0.8137	0.8053	0.7876

Simple Operating Margin (tCO2/MWh) (incl. Imports) (1) (2)

	2006-07	2007-08	2008-09	2009-10	2010-11
NEWNE	1.0085	0.9999	1.0066	0.9777	0.9707
South	0.9991	0.9909	0.9729	0.9415	0.9419
India	1.0064	0.9980	0.9986	0.9695	0.9638

Build Margin (tCO2/MWh) (not adjusted for imports)

	2006-07	2007-08	2008-09	2009-10	2010-11
NEWNE	0.6313	0.5977	0.6755	0.8123	0.8588
South	0.7013	0.7133	0.8179	0.7634	0.7339
India	0.6485	0.6253	0.7090	0.8001	0.8300

Combined Margin in tCO2/MWh (incl. Imports) (1) (2)

	2006-07	2007-08	2008-09	2009-10	2010-11
NEWNE	0.8199	0.7988	0.8410	0.8950	0.9147
South	0.8502	0.8521	0.8954	0.8525	0.8379
India	0.8275	0.8117	0.8538	0.8848	0.8969

Refer to PDD section B.6.3 for further information on ex ante calculation of emission reductions

Appendix 5: Further background information on monitoring plan

Note on the metering arrangement and apportioning procedure for the project activity

- Electricity measurement in the state of Gujarat initiates with recording of electricity generation at the dedicated meter installed at the respective WTG's yard which measures the export/import of electricity from the particular WTG. At the time of Joint Meter Reading (JMR), at the net generation (Export-import) reading from the yard meter of all respective WTGs connected to a particular common substation is measured in the presence of representative of both GEDA (Gujarat Energy Development Agency) and the power producer. The measured value are recorded and summarized in the monthly generation report.

- Parallel to the above process, Main meter readings are measured (Export- Import) and recorded at the substation or the delivery point in presence of representative of State Electricity utility, GEDA and the power producer as per the section 7.1 of PPA to assess the net power supplied to grid.

- In addition to this, GETCO carries out ABT meter generation data down loading on weekly basis. Net electricity so generated and calculated is being apportioned amongst the customer.

- Apportioning procedure is carried out by the GEDA to calculate the net electricity supplied to the grid from a particular WTG.

- According to the procedure the ratio of net electricity generation at the yard meter of a particular WTG (A) to the sum of net electricity generation of all the WTGs at the yard meter (B) is calculated. Net electricity supplied to grid from a particular WTG (D) is calculated as the product of this ratio and the value of net electricity (Export-Import) supplied to the grid measured at Main metering system/Backup metering system(C) (ABT metering system).

- Final certificate is being issued by SLDC based on the data provided by the GETCO (base on ABT meter) and apportioning process done by GEDA.

$$D = (A/B)*C$$

The metering details for all the WTGs (Yard meters) are listed below:

Metering details

ReNew Wind Energy (Rajkot) Pvt. Ltd.

Loc. No.	Name of Customer	EB Meter No.	Class	make
G-34	ReNew Wind Energy (Rajkot) Pvt. Ltd.	GJU-64014	.2S	Secure
G-36	ReNew Wind Energy (Rajkot) Pvt. Ltd.	GJU-64011	.2S	Secure
G-37	ReNew Wind Energy (Rajkot) Pvt. Ltd.	GJU-63931	.2S	Secure
G-38	ReNew Wind Energy (Rajkot) Pvt. Ltd.	GJU-64012	.2S	Secure
G-39	ReNew Wind Energy (Rajkot) Pvt. Ltd.	GJU-64013	.2S	Secure
G-41	ReNew Wind Energy (Rajkot) Pvt. Ltd.	GJU-64020	.2S	Secure
G-42	ReNew Wind Energy (Rajkot) Pvt. Ltd.	GJU-63930	.2S	Secure
G-46	ReNew Wind Energy (Rajkot) Pvt. Ltd.	GJU-63935	.2S	Secure
G-55	ReNew Wind Energy (Rajkot) Pvt. Ltd.	GJU-63928	.2S	Secure
G-56	ReNew Wind Energy (Rajkot) Pvt. Ltd.	GJU-63929	.2S	Secure
G-68	ReNew Wind Energy (Rajkot) Pvt. Ltd.	GJU-64019	.2S	Secure
G-112	ReNew Wind Energy (Rajkot) Pvt. Ltd.	GJU-63934	.2S	Secure

The metering details for the meters installed at 33/66 kV Parveda substation are listed below:

Main meter Sr.No.	Class	Make
SR.NO. - LINE1-GJU62666	.2s	Secure
LINE2-GJU62668	.2s	Secure

ABT Meter Sr.No.		Class	Make
Line 1 Sr.No.GJ-1045-A	Active	.2s	L&T
	Reactive	.5s	
Line 2 Sr.No. GJ-1046-A	Active	.2s	L&T
	Reactive	.5s	

Note: In addition to the two main meters, there are two check meters installed. Both the check meters are of accuracy class .2S and are of Make: Secure

Appendix 6: Summary of post registration changes

None.

Annexure 1

Proposed action plan for Action Plan for Sustainable Development

ReNew POWER

SUSTAINABLE DEVELOPMENT PLAN

The Company will contribute 2% of its net CER revenue realized to sustainable development of the region where the project activity is being carried out. The following table lists the sustainable development scope and the monitoring action plan of the scope.

S No	Activity	Monitoring action plan
1	**Health of the Community:** Under this, medical counseling sessions, health camps will be held to create awareness among the people residing in the region. The Company will conduct these camps with local NGOs involved in such activities. The Company will provide funding to these initiatives in partnership with local bodies. Under this, following activities will be carried out. • Medical camps • Distribution of Free Medicine for critical diseases • Free surgeries and sponsoring medical expenses.	The company will ensure that health initiatives will be taken regularly in the region. All the events related to health programmes conducted by the Company will be recorded and documented.
2	**Education:** The Company will conduct activities/programmes related to education in the region. The main focus will be on children education. Under this, following activities will be carried out by the Company. • Funding for education infrastructure in Schools	The Company will maintain all records of receipts from the dealers/suppliers. Regular visits will be organized to monitor the status of the programmes.

RENEW WIND ENERGY (RAJKOT) PVT. LTD.

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	• Encouraging girl child for education • Adult education programme • Computer Literacy • Scholarships to Meritorious students, their educational expenses	

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Ph: - +91 22 61919700 Fax: - +91 22 61919720

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

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Annexure **2**

Wind turbine-wise detailed geographical co-ordinates have been tabulated below:

Location No.	Village/Taluka/District/State	Geographical Coordinates
G 034	Godladhar/Jasdan/Rajkot/Gujarat	N22 02 39.2 E71 18 58.5
G 036	Godladhar/Jasdan/Rajkot/Gujarat	N22 03 01.8, E71 18 08.2
G 037	Madhavipur/Jasdan/Rajkot/Gujarat	N22 03 33.6 , E71 18 01.5
G 038	Godladhar/Jasdan/Rajkot/Gujarat	N22 02 52.1 E71 18 58.9
G 039	Godladhar/Jasdan/Rajkot/Gujarat	N22 03 14.8 E71 18 45.6
G 041	Madhavipur/Jasdan/Rajkot/Gujarat	N22 03 47.3, E71 17 49.0
G 042	Madhavipur/Jasdan/Rajkot/Gujarat	N22 03 45.5, E71 18 10.6
G 046	Kalasar /Jasdan/Rajkot/Gujarat	N22 05 06.0, E71 16 42.6
G 055	Devpara /Jasdan/Rajkot/Gujarat	N22 06 04.6, E71 14 19.7
G 056	Devpara /Jasdan/Rajkot/Gujarat	N22 06 18.1, E71 14 15.1
G 068	Madava /Jasdan/Rajkot/Gujarat	N22 08 36.6, E71 14 06.0
G 112	Kalasar/Jasdan/Rajkot/Gujarat	N22 04 54.0, E71 16 18.0