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

PROJECT DESIGN DOCUMENT (PDD)

Title of the project activity	1.65 MW Wind Power Project by G. R. Engineering Pvt. Ltd.
Version number of the PDD	02.3
Completion date of the PDD	22/12/2012
Project participant(s)	G.R. Engineering Pvt. Ltd.
Host Party(ies)	India
Sectoral scope(s) and selected methodology(ies)	Sectoral Scope: 01– Energy industries (renewable - / non-renewable sources) Category: Type I D - Grid connected renewable electricity generation. Version 17
Estimated amount of annual average GHG emission reductions	2,756 t CO_2e

SECTION A. Description of project activity

A.1. Purpose and general description of project activity

Background:

The project activity involves the installation of one Wind Electric Generator (WEG) with a total capacity of 1.65 MW located at Village Vandhiya Taluka Bhachau, District Kutch, Gujarat, India by G.R. Engineering Pvt. Ltd. The wind farm harnesses wind energy potential in the Kutch district and intends to promote renewable energy by addressing the causative factors of low utilisation of renewable energy resources.

WEG is connected to the regional grid and as per the Power Purchase Agreement ("PPA") the generated electricity is being sold to Gujarat Urja Vikas Nigam Limited (GUVNL). Vestas Wind Technology India Pvt. Ltd. is the equipment supplier and operations & maintenance contractor for the project activity.

The project activity is expected to result in an annual generation of 2891 MWh resulting in a total reduction of 2,756 tonnes of CO_2 per year. Details of the number of WEGs, Size and Location are given in Table 1:

Table 1: Details of Project Participants

Project Participant	Capacity	Project Start Date[1]	Commissioning Date	CPP[2]/ IPP[3]
M/s G.R. Engineering Pvt. Ltd.	1.65 MW	25 June, 2010	29 September, 2010	IPP

Pre-Project Scenario:

Since the project activity is a Greenfield installation, there is no pre-project scenario. In the absence of the project activity, equivalent energy would be generated in power plants connected to the Integrated NEWNE grid of India, which consists primarily of thermal power plants.

Baseline Scenario:

Using power from the grid would be the most plausible option which is later on described in the section B.4.

Purpose of the project activity:

The project activity aims to reduce greenhouse gas emissions through export of power to the grid. The project activity employs WEG of 1.65 MW to achieve the purpose of renewable power generation. The project is expected to generate 2891MWh of electricity per year and export the generated electricity to the GUVNL[4]. Since the project activity is a Greenfield installation, there is no pre-project scenario.

In the absence of the project activity, equivalent energy would be generated in power plants connected to the Integrated Northern, Eastern, Western, and North-Eastern (NEWNE) grid of India, which consists primarily of thermal power plants.

Project activity's contribution to sustainable development

The project activity contributes in the following ways to the sustainable development:

Social well-being: The project activity contributes to the sustainable development by harnessing wind

[1] Project start date is taken as the date of purchase order

[2] CPP – Captive Power Producer – Power producer opts to wheel the power generated at WEG to its own manufacturing unit

[3] IPP – Independent Power Producer – Power Producer opts to sale the power generated at WEG to State Electricity Board

[4] GUVNL – Gujarat Urja Vikas Nigam Limited

potential in Gujarat thereby decreasing the gap between demand and supply. The project activity directly contributes to the development of the area. It increases the average income of the local people and also the downstream activities associated with the Erection and commissioning (E&C) of wind power plants such as transportation, communication etc. The project activity thus strengthens the rural economy.

Economic well-being: The project activity also generates direct and indirect employment opportunities for skilled/semi-skilled manpower, during the construction and operational phase of the project. Indirect employment has been generated for the equipment supplier, contractors, and technical consultants. The project activity indirectly supports creation of local infrastructure like roads and other basic civic amenities leads to the economic development around the project area.

Environmental well-being: The project activity is displacing the grid electricity which is mostly fossil fuel based with wind power which is eco-friendly source of energy. Thus, the project activity results in reduction of GHGs. This contributes to the environmental well-being.

Technological well-being: The project activity leads to increase in utilization of renewable energy resources for power generation and contributes to the energy security in the country.

A.2. Location of project activity

A.2.1. Host Party(ies)

India

A.2.2. Region/State/Province etc.

District Kutch, Taluka- Bhachau, State Gujarat

A.2.3. City/Town/Community etc.

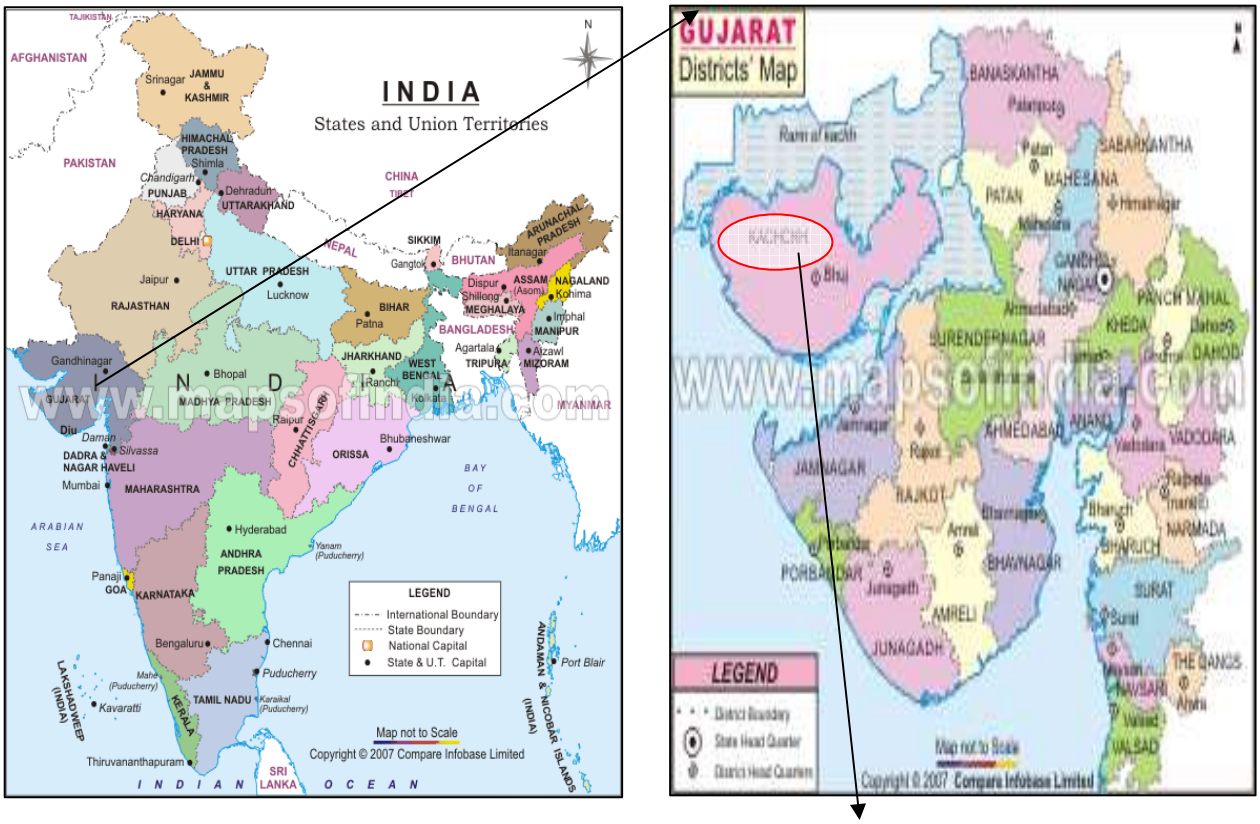
Village - Vandhiya

A.2.4. Physical/ Geographical location

The project activity is located at Vandhiya village of Kutch district of Gujarat. The wind site is developed by Vestas Wind Technology India Pvt Ltd. Nearest railway station and airport of the project activity is Bhuj. Table containing location details of WEGs is shown below:

GPS Coordinates of WEGs:

Sr. No.	Details of site of installation			WTG ID commissioning	GPS Coordinates
	Name of village	Taluka	District		
1	Vandhiya	Bhachau	Kutch	VWT/1650/10-11/1869	N 23° 13' 28.3" E 70° 38' 07.1"



A.3. 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: G.R. Engineering Pvt. Ltd.	No

A.4. Public funding of project activity

No Annex I Party public funding or official development Assistance (ODA) is involved in the project activity.

A.5. Debundling for project activity

Appendix C, paragraph 2 of the Simplified Modalities and Procedures for Small-Scale CDM project activities states "A proposed small-scale project activity shall be deemed to be a debundled component of

a large project activity if there is a registered small-scale CDM project activity or an application to register another small-scale CDM project activity:

With the same project participants: *Same Project Participant does not have any registered small scale CDM project activity. However, the PP has applied to register another CDM small –scale project activity of capacity of 1.65 MW as a part of bundled project titled "WAMS wind project"* http://cdm.unfccc.int/Projects/Validation/DB/LSKAFN40P852EFWKG0VZ5DJF48PHDF/view.html It is to be noted that the some total capacity of the existing project as well as the proposed project activity is 3.30 MW, which is lower than threshold capacity of 15 MW.

In the same project category and technology/measure : Existing *Project category and technology are the same for the existing project.*

Registered within the previous 2 years : Existing project of *of 1.65 MW has not been registered yet.*

Whose project boundary is within 1 km of the project boundary of the proposed small-scale activity at the closest point: *From the GPS co-ordinates of existing project (N23°12'29" E70°37'50"), it is confirmed that project boundary of existing project is not within 1 km of the project boundary of the proposed small –scale activity at the closest point.*

As mentioned above, the small scale project activity can be concluded to not be a debundled component of a larger project activity.

SECTION B. Application of selected approved baseline and monitoring methodology

B.1. Reference of methodology

Project has applied approved methodology available for small-scale CDM project at UNFCCC website under Appendix B of the simplified modalities and procedures for small-scale CDM project activities. Sectoral Scope 01-Energy Industries (Renewable/non-renewable sources)

Approved small-scale baseline methodology AMS-I.D., version 17: "Grid connected renewable electricity generation"[5]

The methodology AMS I.D refers to the latest approved versions of the following tool:

"Tool to calculate the emission factor for an electricity system." Version 02.2.1/EB 63/Annex 19

B.2. Project activity eligibility

Scope 01-Energy Industries (Renewable/non-renewable sources)

Approved small-scale baseline methodology AMS-I.D, version 17: "Grid connected renewable electricity generation"

[5] http://cdm.unfccc.int/methodologies/DB/RSCTZ8SKT4F7N1CFDXCSA7BDQ7FU1X/view.html

Criteria	Applicability Conditions	Justification
01	This methodology comprises renewable energy generation units, such as photovoltaic, hydro, tidal/wave, wind, geothermal and renewable biomass: Supplying electricity to a national or a regional grid; or Supplying electricity to an identified consumer facility via national/regional grid through a contractual arrangement such as wheeling.	The project activity falls under category a) i.e. is a renewable power generation unit which uses wind as the source of energy supplying the power to the regional grid. Hence, AMS I.D. is applicable for the project activity
02	This methodology is applicable to project activities that (a) install a new power plant at a site where there was no renewable energy power plant operating prior to the implementation of the project activity (Greenfield plant); (b) involve a capacity addition; (c) involve a retrofitof (an) existing plant(s); or (d) involve a replacement of (an) existing plant(s).	Project activity is (a) installation of a new power plant at the sites where there was no renewable energy power plant operating prior to the implementation of the project activity (Greenfield plant). Thus, AMS I D is applicable to the project activity.
03	Hydro power plants with reservoirs that satisfy at least one of the following conditions are eligible to apply this methodology: • The project activity is implemented in an existing reservoir with no change in the volume of reservoir; • The project activity is implemented in an existing reservoir, where the volume of reservoir is increased and the power density of the project activity, as per definitions given in the project emissions section, is greater than 4 W/m^2; • The project activity results in new reservoirs and the power density of the power plant, as per definitions given in the project emissions section, is greater than 4 W/m^2.	Project activity involves generation of electricity from wind power project. Hence this is not applicable.
04	In the case of biomass power plants, no other biomass types than renewable biomass are to	Project activity is a wind power project & hence not applicable.

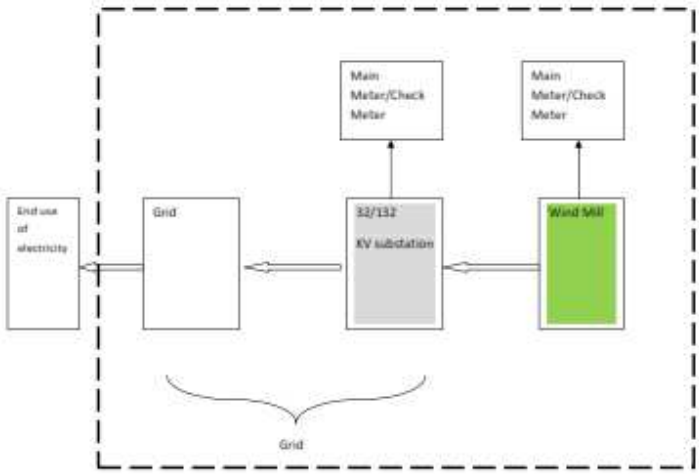
Criteria	Applicability Conditions	Justification
	be used in the project plant.	
05	If the new unit has both renewable and non-renewable components (e.g., a wind/diesel unit), the eligibility limit of 15 MW for a small-scale CDM project activity applies only to the renewable component. If the new unit co-fires fossil fuel, the capacity of the entire unit shall not exceed the limit of 15 MW.	There is neither a non-renewable component added, nor co-firing is required for the project activity. At any given point of time, the capacity of the said project activity shall not exceed 15 MW. Foot note is also not applicable. No system is present in the project activity which may utilize fossil fuels.
06	Combined heat and power (co-generation) systems are not eligible under this category.	No such system is present in the project activity. The project activity does not involve any addition to existing renewable energy generation unit and total installed capacity will remain same throughout the entire crediting period. Foot note also is not applicable.
07	In the case of project activities that involve the addition of renewable energy generation units at an existing renewable power generation facility, the added capacity of the units added by the project should be lower than 15 MW and should be physically distinct from the existing units.	The project activity does not involve any addition to existing renewable energy generation unit and total installed capacity of the project activity will remain 1.65 MW throughout the entire crediting period. Foot note is also not applicable as this project activity is not a retrofit or modification of an existing facility.
08	In the case of retrofit or replacement, to qualify as a small-scale project, the total output of the retrofitted or replacement unit shall not exceed the limit of 15 MW.	Not Applicable as project activity is not a retrofit or modification of an existing facility.

The project activity is a renewable power generation unit which uses wind power as the source of energy supplying the power to the regional grid. Thus, the project produces electricity by renewable means (through wind power) that would otherwise have been generated through fossil fuel sources connected to NEWNE grid. Hence, AMS I D (Version 17) is applicable for the project activity.

B.3. Project boundary

As per the methodology, the project boundary is defined as "*The spatial extent of the project boundary includes the project power plant and all power plants connected physically to the electricity system*[6] *that the CDM project power plant is connected to.*" Thus, it includes the installations of WEGs, metering system for each generator and corresponding sub-station which is a node in connecting Wind mills to local grid and all the power plants connected to the grid itself. The diagram below provides a pictorial representation of the project activity:

[6] Refer to the latest approved version of the "Tool to calculate the emission factor for an electricity system" for definition of an electricity system.



	Source	Gases	Included	Justification/Explanation
Baseline	CO2 emissions from electricity generation in fossil fuel fired power plants that is displaced due to the project activity.	CO_2	Yes	Main Emission Source
		CH_4	No	Minor Emission Source-Excluded for simplification. This is conservative
		N_2O	No	Minor Emission Source-Excluded for simplification. This is conservative
Project Activity	On site fossil fuel consumption due to the implementation of the project	CO_2	No	This source is not required to be estimated for wind energy projects.
		CH_4	No	Expected not to be emitted.
		N_2O	No	Expected not to be emitted.

B.4. Establishment and description of baseline scenario

Project activity is grid connected renewable power plant and as per paragraph 10 of the approved methodology AMS I-D version 17 - "The baseline scenario is that the electricity delivered to the grid by the project activity that otherwise would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources into the grid."

"The baseline emissions are the product of electrical energy baseline $EG_{BL, y}$ expressed in kWh of electricity produced by the renewable generating unit multiplied by the grid emission factor.

$BEy = EG_{BL, y} * EF_{CO2,grid,y}$ (1)

Where:

BEy	Baseline Emissions in year y; t CO_2
$EG_{BL, y}$	Quantity of net electricity supplied to the grid as a result of the implementation of the CDM project activity in year y (MWh)
$EF_{CO2, grid, y}$	CO_2 Emission Factor of the grid in year y; t CO_2/MWh"

According to Para 12 of AMS I D Version 17, the Emission Factor can be calculated in a transparent and conservative manner as follows:

a) A combined margin (CM), consisting of the combination of Operating Margin (OM) and Build Margin (BM) according to the procedures prescribed in the "Tool to calculate the emission factor for an electricity system". Any of the four procedures to calculate the operating margin can be chosen, but the restrictions to use the Simple OM and the Average OM calculations must be considered.

OR

b) The weighted average emissions (in kg CO2eq. / kWh) of the current generation mix. The data of the year in which project generation occurs must be used. Calculations must be based on data from an official source (where available) and made publicly available.

The PP has calculated the ex-ante emission factor with approach (a) that is as the combined margin (CM) consisting of weighted average of the operating margin (OM) and build margin (BM).

The calculation of the baseline emission factor using the Combined Margin methodology has been detailed under Section B.6.1 and Annex 3 of the PDD.

B.5. Demonstration of additionality

Additionality:

According to "Guidelines for Demonstrating Additionality of Micro scale Project Activities" EB 63, Annex 23, Project activities up to five megawatts that employ renewable energy technology are additional if any one of the conditions below is satisfied:

(a) The geographic location of the project activity is in one of the least developed countries or the small island developing States (LDCs/SIDS) or in a special underdeveloped zone of the host country identified by the government before 28 May 2010: This is not applicable for the project acitivity.

(b) The project activity is an off-grid activity supplying energy to households/communities (less than 12 hours grid availability per 24 hrs day is also considered ìoff-gridî for this assessment): This is not applicable as project activity is supplying electricity to grid.

(c) The project activity is designed for distributed energy generation (not connected to a national or regional grid) with both conditions (i) and (ii) satisfied; (i) Each of the independent subsystems/measures in the project activity is smaller than or equal to 1500kW electrical installed capacity; (ii) End users of the subsystems or measures are households/communities/small and medium enterprises (SMEs): This is not applicable as project activity is supplying electricity to grid.

(d) The project activity employs specific renewable energy technologies/measures recommended by the host country designated national authority (DNA) and approved by the Board to be additional in the host country.: This is not applicable

Hence, "Guidelines for Demonstrating Additionality of Microscal Project Activities" EB 63, Annex 23 is not applicable for the project activity.

Additionality of the project activity is demonstrated according to EB 68, Annex 27 – "Guidelines on the Demonstration of Additionality of small -scale project activities"[7].

Para 1(EB 68, Annex 27): Project participants shall provide an explanation to show that the project activity would not have occurred anyway due to at least one of the following barriers:

(a) Investment barrier

(b) Technological barrier

(c) Barrier due to prevailing practice

(d) Other barriers

The barrier that is considered for the project activity is listed below:

a) Investment barrier

National Policies relevant to the baseline of project activity are as below:

1) Baseline CO2 database Version 06
2) Gujarat Electricity Regulatory Commission (GERC Tariff Order - 2010)
3) Electricity Act 2003

The Electricity Act, 2003 provides an enabling framework for accelerated and more efficient development of the power sector. The Act seeks to encourage competition with appropriate regulatory intervention. Competition is expected to yield efficiency gains and in turn result in availability of quality supply of electricity to consumers at competitive rates.

The Section 3 (1) of the Electricity Act 2003 requires the Central Government to formulate, inter alia, the National Electricity Policy in consultation with Central Electricity Authority (CEA) and State Governments. The provision is quoted below:

"The Central Government shall, from time to time, prepare the National Electricity Policy and tariff policy, in consultation with the State Governments and the Authority for development of the power system based on optimal utilization of resources such as coal, natural gas, nuclear substances or materials, hydro and renewable sources of energy".

Further, as per section 5.2.12 of the National Electricity Plan:

Even with full development of the feasible hydro potential in the country, coal would necessarily continue to remain the primary fuel for meeting future electricity demand. The National Electricity Plan also

[7] https://cdm.unfccc.int/Reference/Guidclarif/meth/methSSC_guid05.pdf

emphasizes the use of other fossil fuel like gas, LNG, Lignite, other imported fossil fuels in meeting the future electricity need.
It further emphasize on the Renovation and Modernization (R&M) of the low performing thermal power stations in the country. This will enable to achieve improved PLF of the thermal power plant. The implementation of the National Electricity Plan is clearly evident from the installed capacity in the project boundary i.e. the NEWNE Grid:

Below section further discusses financial analysis of the project.

The simple cost analysis is not applicable for the proposed project activity because the project activity will produce economic benefit other than the CDM related income, notably from electricity sale. Hence the bench mark approach is used.

Benchmark Analysis

According to para 12, "Guidelines on the Assessment of Investment Analysis" EB 62, Annex 5 : In cases where a benchmark approach is used the applied benchmark shall be appropriate to the type of IRR calculated. Local commercial lending rates or weighted average costs of capital (WACC) are appropriate benchmarks for a project IRR.

Since it is a predominant investment decision in non core business (wind energy), the management of the individual project proponents was particularly interested in the return of the investment. Hence Project IRR was selected as the financial indicator to assess the attractiveness of the project proponents since there is a debt component involved in these projects.

Prime Lending Rate of RBI[8] at the time of investment decision has been taken as Benchmark.

Benchmark = Prime Lending Rate = 11.00**%**

Calculation and comparison of financial indicators:

Particulars	**GR Engineering Pvt. Ltd.**
Capacity	1.65 MW
Machines	1 No.
Total Capacity	1.65 MW
PLF	20 %
Tariff Rate	3.56 INR/kWH
O & M	0.20 Million INR/annum
Escalation in O & M	6% every year
Insurance	0.15 Million INR
Interest Rate	11.00%
Cost of WEG	102.50 Million INR
Term Loan	71.75 Million INR
Promoters Contribution	30.75 Million INR
Repayment Period	10 Years
Income Tax-MAT	19.93%
Income Tax	33.22%
Project IRR (without CDM)	07.21%

Name of Project Proponent	**IRR Without CDM revenues**	**Benchmark**
G.R. Engineering Pvt. Ltd.	**7.21 %**	**11.00%**

[8] http://www.rbi.org.in/scripts/WSSView.aspx?Id=14965

Thus, it is clear from the table above that the PP would have not invested in the project activity without the CDM benefits .

Sensitivity analysis:

The sensitivity analysis shall show whether the conclusion regarding the financial attractiveness is robust to reasonable variations in the critical assumptions. In case of wind energy projects, the most critical parameters are PLF, project cost & Tariff. The Project Participants has carried out the detail financial analysis of the project with (+/ -) 10 % variation in Project Cost, PLF , Tariff & O & M cost. The detailed sensitivity analysis is shown in the financial excel sheet and which will be submitted to the DOE.

Project Cost:

SENSITIVITY ANALYSIS		
% variation in Project Cost	IRR %	Benchmark
+10%	6.19%	11.00%
Base	07.21%	
-10%	8.31%	

The actual investment cost of the project activity is 97.088 Million INR (as per the Purchase Order) which is 5.28 % less than the assumed investment cost. Hence, the +/- 10% variations shown in the table above cover the actual investment scenario.

Operation & Maintenance Cost:

SENSITIVITY ANALYSIS		
% variation in O & M Cost	IRR %	Benchmark
+10%	6.82%	11.00%
Base case	7.21%	
-10%	07.47%	

It is observed from the sensitivity analysis above that +/- 10% variations in the O & M cost do not have a major impact on the project IRR.

Electricity Tariff:

SENSITIVITY ANALYSIS		
% variation in O & M Cost	IRR %	Benchmark
+10%	8.54%	11.00%
Base case	7.21%	
-10%	5.66%	

As shown above, with 10 % increase in tariff, the IRR remains below the benchmark.

The tariff used in the financial analysis has been taken as per the GERC (Gujarat Electricity Regulatory Commission's) tariff order[9] dated 30th January 2010, the applicable Tariff order at the time of decision making. (Publicly Available Information). According to the same, tariff has been mentioned as INR 3.56 per kWH.

According to the tariff order dated 30th January 210- "The Commission has control period of 3 (three) years w.e.f. 11th August, 2009. The tariff decided in a particular control period shall apply to all projects which are commissioned after 11th August 2009. Further, it is proposed that the tariff determined for a project shall remain in effect for the whole project life" This project was commissioned during the year 2010 which falls within the control period of three years and hence the applicable tariff rate would be Rs 3.56 only for the complete project life.

Hence clearly the applicable tariff for the project activity is Rs 3.56 per kWH. This can be also cross checked with signed PPA . Thus, it is unlikely that the project IRR would cross the benchmark for an increase in tariff rate.

Plant Load Factor:

SENSITIVITY ANALYSIS		
% variation in PLF	IRR %	Benchmark
+15%	9.21%	**11.00%**
Base	07.21%	
-15%	4.82%	

It is to be noted that the PLF indicated in the GERC tariff order of 2010[10] is 23 %. Therefore, the PP has subjected this parameter to a sensitivity of 15% which covers the possibility of achieving a PLF of 23 % as is mentioned in the tariff order.

All the above points clearly suggest that IRR remains less than the Benchmark of 11.00%, even with variations in certain critical input parameters.

This clearly indicates the importance of CERs revenues for the project and hence, the project is additional.

DEMONSTRATION AND ASSESSMENT OF PRIOR CONSIDERATION OF THE CDM

As per Annex 13 of EB 62,

B. New project activities

- Since the starting date of the project activity is after 2nd August 2008 (25th June 2010 – the date on which Purchase Orders were placed for the project activity), the PPs have notified the UNFCCC & DNA of their intention to undertake CDM for these projects. The timeline is shown below:

[9] http://www.gercin.org/renewablepdf/en_1303211765.pdf
[10] http://www.gercin.org/docs/Orders/Nonconv%20orders/Year%202006/wind%20enrrgy%20tariff.pdf

PP Name	Date of Purchase Order/Start Date	Date of UNFCCC & DNA Intimation/
G.R. Engineering Pvt. Ltd.	**25/06/2010**	**19/10/2010**

Thus, it is clear that the PP has intimated the UNFCCC and DNA within 6 months of project activity start date and evidence for the same will be provided to the DOE responsible for validation. Thus, the project activity demonstrates prior CDM consideration.

B.6. Emission reductions

B.6.1. Explanation of methodological choices

The project activity meets the eligibility criteria to use simplified modalities and procedure for small scale CDM project activities as set out in paragraph 6 (c) of decision 17/CP.7. The total installed capacity of the project is 1.65 MW, which is less than the limit of 15 MW prescribed for small scale project. Moreover, being a renewable energy project, the project emissions are zero. The baseline and monitoring methodology being used for the project is AMS-I.D Version 17. Accordingly the emission reductions for the project will be determined. The monitoring is the part of the baseline methodology. Accordingly, the emissions in the baseline scenario would be determined using the following formula

$BEy = EG_{BL, y} * EF_{CO2, grid, y}$

Where:

BEy	Baseline Emissions in year y; t CO_2
$EG_{BL, y}$	Quantity of net electricity supplied to the grid as a result of the implementation of the CDM project activity in year y (MWh)
$EF_{CO2, \text{grid}, y}$	CO_2 Emission Factor of the grid in year y; t CO_2/MWh

. During lean phases (when the WEGs are not generating electricity) some electricity gets drawn/ imported from the grid for maintenance of the common facilities. This aspect is taken care of as baseline emissions are computed on the net electricity supplied to the grid. For the purpose of determining the net electricity exported by the project activity wind turbines, tri vector meters are installed at the point of power transmission from each WEG to the grid, the readings of which shall be regularly monitored and recorded by plant personnel as well as personnel of the state electricity utility. The CO_2 emission factor is fixed ex-ante and thus, remains constant during the entire crediting period. This is as explained in Section B.4 above.

Project Emissions (PEy)

Being a renewable and clean energy project, the project emissions (PEy) during operation are considered zero.
PEy = 0

Leakage (LEy)

Since there is no equipment transferred from another project activity or that any existing equipment is transferred to another activity, leakage as per AMS-I.D. is taken as zero.

LEy = 0

Emission reductions are calculated as:

ERy = BEy – PEy-LEy

The Emission Factor can be calculated in a transparent and conservative manner as follows:

(a) A combined margin (CM), consisting of the combination of operating margin (OM) and build margin (BM) according to the procedures prescribed in the 'Tool to calculate the Emission Factor for an electricity system'.

OR

(b) The weighted average emissions (in kg CO2e/kWh) of the current generation mix.

The emission factor has been estimated using option (a) above by using the following seven steps of "Tool to calculate the emission factor for an electricity system" (Version -02.2.1, EB- 63, Annex 19):

Step 1 Identify the relevant electricity systems

Central Electricity Authority, Ministry of Power, Government of India (Host Country) has given the delineations of the project electricity system and the connected electricity system in India. As per CEA, the Indian power system is divided into two regional grids, viz. NEWNE Grid & Southern Grid. Each grid covers several states as given in the following table. The project activity exports power to the NEWNE Grid.

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

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

Option I is applicable as the grid system in India is stable and off grid generation is not significant. Further, all the manufacturing units would purchase electricity from the grid (in the absence of the project activity) and thus, this option is not applicable.

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

The calculation of the operating margin emission factor (EFgrid, OM,y) is based on one of the following methods:

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

Out of the above options, the simple OM method (option a) is used in India. The Dispatch data analysis OM is not used as off-grid generation is not significant in India as per step 2 above. Other methods cannot currently be applied in India due to lack of necessary data.

As per emission factor tool, the simple OM method (option a) can only be used if low- cost/must-run resources constitute less than 50% of total grid generation in: 1) average of the five most recent years, or 2) based on long-term averages for hydroelectricity production. In India as per available data (average of recent five years) with CEA, the low-cost/must-run resources constitute 17.70% (NEWNE Grid) and 24.00% (Southern Grid) respectively for which is less than 50% of total grid generation.

Share of low cost / Must- run (% of net generation)					
Year	**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	18.6	17.1	18.4
Average of most recent 5 years (NEWNE Grid)	*17.70%*				
Average of most recent 5 years (Southern Grid)	*24.00%*				
Source: http://www.cea.nic.in/reports/planning/cdm_co2/cdm_co2.htm					

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

The operating margin describes the average CO_2 intensity of the existing stations in the grid which are most likely to reduce their output if a CDM project supplies electricity to the grid (or reduces consumption of grid electricity). The simple operating margin is the weighted average emissions rate of all generation sources in the region except so-called low-cost or must-run sources. In India, hydro and nuclear stations qualify as low-cost / must run sources and are excluded. The operating margin, therefore, can be calculated by dividing the region's total CO2 emissions by the net generation of all thermal stations. In other words, it represents the weighted average emissions rate of all thermal stations in the regional grid.

The simple OM emission factor is calculated as the generation-weighted average CO2 emissions per unit net electricity generation (tCO2/MWh) of all generating power plants serving the system, not including low-cost/must-run power plants/units. The value of OM has been taken from CEA Database which has been calculated by Tool to calculate the emission factor for an electricity system.

Simple Operating Margin (tCO2/MWh)				
	2008-09	2009-10	2010-11	Average
NEWNE	1.0066	0.9777	0.9707	0.9850
South	0.9729	0.9415	0.9419	0.9521
Table reference: CEA Baseline Database, Version 7				

Step 5 Calculate the build margin emission factor

The build margin reflects the average CO_2 intensity of newly built power stations that will be (partially) replaced by a CDM project. The value of BM has been taken from CEA Database which has been calculated by Tool to calculate the emission factor for an electricity system.

Build Margin (tCO2/MWh)			
	2008-09	2009-10	2010-11
NEWNE	0.6755	0.8123	0.8588
South	0.8179	0.7634	0.7339
Table reference CEA Baseline Database Version 7			

Step 6 Calculate the combined margin emissions factor

The combined margin is calculated as a weighted average of the simple operating margin and the build margin. By default, both margins have equal weights (50%). In particular, for intermittent and non-dispatchable generation types such as wind and solar photovoltaic, the Grid Tool allows to weigh the operating margin and build margin at 75% and 25%, respectively.

Thus,
$W_{OM} = 0.75$ & $W_{BM} = 0.25$.

$EF_{grid, CM,y}$ = EFgrid,OM,y * W_{OM} + EFgrid,BM,* W_{BM}
= 0.9850 *O.75+0. 8588 *0.25
= **0.9534** tCO_2/MWh (NWENE Grid)

Where:
$EF_{grid, CM,y}$ =Combined margin CO2 emission factor in year *y* (tCO2/MWh)
$EF_{grid,BM,y}$ = Build margin CO2 emission factor in year *y* (tCO2/MWh)
$EF_{grid,OM,y}$ = Operating margin CO2 emission factor in year *y* (tCO2/MWh)
W_{OM} = Weighting of operating margin emissions factor (%)
W_{BM} = Weighting of build margin emissions factor (%)

For year y:
Further multiplication of Energy baseline ($EG_{BL,y}$) in MWh with CO_2 Emission Factor (EF_{CO2}) in tCO_2e/MWh will give the estimated value of Baseline Emissions tCO_2 (BE_y)
Baseline Emissions (BE_y) = Emission Factor (EF_{CO2}) × Energy baseline ($EG_{BL,y}$)
(tCO_2) (tCO_{2e}/ MWh) (MWh)

The CO_2 emission factor is fixed ex-ante and thus, remains constant during the entire crediting period. This is as explained in Section B.4 above.

Project Emissions (PE_y)
Being a renewable and clean energy project, the project emissions (PEy) during operation are considered zero.
$PE_y = 0$

Leakage (LE_y)
Since there is no equipment transferred from another project activity or that any existing equipment is transferred to another activity, leakage as per AMS-I.D. is taken as zero.
$LE_y = 0$
Emission reductions are calculated as: ***ERy = BEy – PEy – LEy***

B.6.2. Data and parameters fixed ex ante

Data / Parameter:	**$EF_{grid,OM,y}$**
Unit:	tCO2/MWh
Description:	**Operating margin CO2 emission factor in year y –(** NEWNE grid)
Source of data	CO2 Baseline Database for the Indian Power Sector, User Guide, Version 7.0 dated January 2012 – from Central Electricity Authority (CEA)
Value(s) applied	0.9850 for NEWNE Grid
Choice of data or measurement methods and procedures	As mentioned CEA has developed a database to help the CDM project developers in India and is being revised based on the latest data that is available. Hence the latest version of CM EF has been considered into account on ex-ante basis.
Purpose of data	Calculation of baseline emissions
Additional comment	http://www.cea.nic.in/reports/planning/cdm_co2/cdm_co2.htm

Data / Parameter:	**$EF_{grid,BM,y}$**
Unit:	tCO_2/MWh
Description:	**Build margin CO_2 emission factor in year y – (**NEWNE grid)
Source of data	CO_2 Baseline Database for the Indian Power Sector, User Guide, Version 7.0 dated January 2012 – from Central Electricity Authority (CEA)
Value(s) applied	0.8588 for NEWNE Grid
Choice of data or measurement methods and procedures	As mentioned CEA has developed a database to help the CDM project developers in India and is being revised based on the latest data that is available. Hence the latest version of CM EF has been considered into account on *ex-ante* basis.
Purpose of data	Calculation of baseline emissions
Additional comment	http://www.cea.nic.in/reports/planning/cdm_co2/cdm_co2.htm

Data / Parameter:	$EF_{CO2\,y}$
Unit:	tCO_2/MWh
Description:	**Combined margin CO_2 emission factor in year** (NEWNE grid)
Source of data	Calculated
Value(s) applied	0.9534 (calculated)
Choice of data or measurement methods and procedures	Calculated as the weighted average of the build margin emission factor (25%) and operating margin emission factor (75%)
Purpose of data	Calculation of baseline emissions;
Additional comment	-

B.6.3. Ex-ante calculation of emission reductions

The project activity involves one component that is grid connected electricity generation. By applying approved methodology AMS I .D. Version 17, emission reduction calculations due to the implementation of the project activity are as follows:

$ER_y = BE_y – PE_y$ -LEy

Where,
ER_y - Net Emission Reduction in tCO_2 in year y

BE_y- Baseline emissions in tCO_2 in year y
PE_y - Project emissions in tCO_2 in year y

LEy- Lekage emissions in tCO_2 in year y

This project activity is grid connected wind power generation. Hence there is no project emission from the project activity. There are no GHG emissions or leakage within the project boundary.

Therefore the above equation is simplified to
$ER_y = BE_y$

Baseline emissions (BE_y)

BE_y is calculated by multiplying the net quantity of electricity supplied to the grid by this project activity ($EG_{BL,y}$) with the CO_2 emission factor for the grid ($EF_{CO2, grid, y}$) as follows:

$BE_y = EG_{BL, y} * EF_{CO2, grid, y}$

Where:

$EF_{CO2, grid, y}$ = Baseline emission factor in tCO_2/MWh = 0.9535 tCO2/MWh[11]
$EG_{BL, y}$ = Net electricity supplied to the regional grid in year y
= Rated capacity (MW) * Plant Load Factor (%) * Operational hours per year (hours)
= 1.65 MW (Capacity) * 20 % (PLF) * 8760 (hours) MWh
= **2890.80 MWh**
~ **2891 MWh**

EGy [Net electricity supplied to the regional grid in year y (MWh/y)] = 2890.80 MWh
Inserting $EF_{CO2, grid, y}$ in formula, we get:
BEy = 2891MWh/year X 0.9534 tCO_2/MWh
= 2756 tonnes of CO_2/yr
And $ER_y = BE_y$

Where:
ER_y = Emissions reductions generated in year y, tCO_2e
BE_y = Baseline Emissions in year y, tCO_2e

Based on the values above, the total annual emission reductions amount to **2,756 tCO_2e.**

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

Year	Baseline emissions (tCO_2 e)	Project emissions (tCO_2 e)	Leakage (tCO_2 e)	Emission reductions (tCO_2 e)
2012	2756	0	0	2756
2013	2756	0	0	2756
2014	2756	0	0	2756
2015	2756	0	0	2756
2016	2756	0	0	2756

[11] Emission Factor calculation is provided in Annex 3 and section B.4.1

2017	2756	0	0	2756
2018	2756	0	0	2756
2019	2756	0	0	2756
2020	2756	0	0	2756
2021	2756	0	0	2756
Total	27560			27560
Total number of crediting years	10			
Annual average over the crediting period	2756	0	0	2756

B.7. Monitoring plan

B.7.1. Data and parameters to be monitored

Data / Parameter	$EG_{BL, y}$
Unit	MWh
Description	Quantity of net electricity supplied to the grid as a result of the implementation of the CDM project activity in year *y*
Source of data	'Certificate for Share of Electricity' issued by GETCO i.e. Gujarat Energy Transmission Corporation Limited- State Load Dispatch Centre
Value(s) applied	2891
Measurement methods and procedures	• There are main and check meter located adjutants to the project activity at the site. • These meter are trivector energy meters and are capable of recording both, export and import of electricity from the project WEG and have an accuracy class of 0.5%. • They electricity exported and imported at the project site are monitoring continuously and recorded on monthly basis by the PP representative. • Apart from the above mentioned energy meters there is a main meter (ABT) and a check meter of accuracy class 0.5%,located at substation(Shikarpur), to which project as well as non project WEGs are connected. These meters are also capable of continuous monitoring and measurement. • The representatives of GETCO/GEDA and the PP record the monthly reading of electricity supplied by the connected WEGs at the substation. • Based on the above monthly recordings i.e one at the energy meter at the project site and the other at the energy meter at the substation (Shikarpur) an apportioning procedure is conducted by GEDA/GETCO representatives to calculate the net electricity supplied by the individual WTGs connected to the feeder. PP would like to clarify that this procedure of apportioning is carried out and controlled by the GETCO/GEDA representatives and PP has no role to play in to the same. • Finally, SLDC/GETCO provides "Certificate for Share of Electricity" which indicates the net electricity supplied by project WEGs. Value indicated in the share certificate will be used for emission reduction on calculation. • Based on the share certificates, PP raises an invoice on GETCO/GEDA for payments
Monitoring frequency	Monthly

QA/QC procedures	The main and check meters installed at connected substation and at the project site respectively for monitoring of the project activity are electronic tri-vector energy meters of 0.5 accuracy class. Each meter is jointly inspected and sealed on behalf of project proponent and GETCO, in the presence of its authorised representatives. All main and check meters will be calibrated once in a three year by GETCO. Net electricity supplied value as indicated in the share certificate can be cross- checked with the invoice raised by the PP for the payment.
Purpose of data	Calculation of baseline emissions
Additional comment	The data will be kept in electronic form 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	$EG_{WEG, y}$
Unit	MWh
Description	Quantity of net electricity generated by the project activity WEG , as recorded at the energy meters at project site.
Source of data	Monthly generation records maintained by the PP/Representatives of PP
Value(s) applied	-
Measurement methods and procedures	• There are main and check meter located adjutants to the project activity at the site. • These meter are trivector energy meters and are capable of recording both, export and import of electricity from the project WEG and have an accuracy class of 0.5 • They electricity exported and imported at the project site are monitoring continuously and recorded on monthly basis by the PP representative..
Monitoring frequency	Monthly
QA/QC procedures	The main and check meters installed at connected substation and at the project site respectively for monitoring of the project activity are electronic tri-vector energy meters of 0.5 accuracy class. Each meter is jointly inspected and sealed on behalf of project proponent and GETCO, in the presence of its authorised representatives. All main and check meters will be calibrated once in a three year by GETCO. This parameter will be used to cross check the electricity supplied values as indicated in the monthly share certificates ($EG_{BL,y}$) and a conservative approach would be taken to deduce the electricity supplied values in the calculation of emission reductions.
Purpose of data	Calculation of baseline emissions
Additional comment	The data will be kept in electronic form 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

Not applicable

B.7.3. Other elements of monitoring plan

Monitoring of emission reductions will be carried out following the guidance provided in the applicable methodology for the project activity i.e. AMS-ID version 17, which requires monitoring of the following:

• Quantity of net electricity supplied to the grid from the project activity; and

• CO_2 emission factor of the grid electricity (Ex ante determination of grid emission factor has been chosen).

The general conditions set out for metering, recording, meter readings, meter inspections, Test & Checking and communication shall be as per the PPA (power purchase agreement) with GUVNL.

Description of measurement methods and procedures to be applied:

- The electricity is generated at 690 Volts at the WEG site and is then step up to 33 kV at the step up transformer at the project site and subsequently stepped up to 132 kV at the grid feeder site at the substation.
- Currently, the project activity WTG is connected to feeder no 06 at the 132 kV , wherein there are 14 nos of non project activity WEGs are connected.
- There are main and check meter located adjutants to the project activity at the site.
- These meter are trivector energy meters and are capable of recording both, export and import of electricity from the project WEG and have an accuracy class of 0.5
- They electricity exported and imported at the project site are monitoring continuously and recorded on monthly basis by the PP representative.
- Apart from the above mentioned energy meters there is a main meter (ABT) and a check meter of accuracy class 0.5s,located at substation(Shikarpur), to which project as well as non project WEGs are connected. These meters are also capable of continuous monitoring and measurement.
- The representatives of GETCO/GEDA and the PP record the monthly reading of electricity supplied by the connected WEGs at the substation.
- Based on the above monthly recordings i.e one at the energy meter at the project site and the other at the energy meter at the substation (Shikarpur) an apportioning procedure is conducted by GEDA/GETCO representatives to calculate the net electricity supplied by the individual WTGs connected to the feeder. PP would like to clarify that this procedure of apportioning is carried out and controlled by the GETCO/GEDA representatives and PP has no role to play in to the same.
- Finally, SLDC/GETCO provides “Certificate for Share of Electricity” which indicates the net electricity supplied by project WEGs. Value indicated in the share certificate will be used for emission reduction on calculation.
- Based on the share certificates, PP raises an invoice on GETCO/GEDA for payments

The apportioning formula used by GETCO/GEDA representatives to calculate the net electricity supplied by the project activity WTG to the grid is as follows:

D= (A/B)*C

Where,

A= Net electricity generated by the project WTG and recorded by energy meters at the project site.

B=Sum of net electricity supplied by all the WTGs (Project as well no project WTGs) and recorded by energy meters at the project site.

C= Net electricity supplied to the grid by all the WTGs (Project as well as non project WTGs) connected to the substation and recorded by the energy meters at the substation .

Sealing and maintenance of meters:

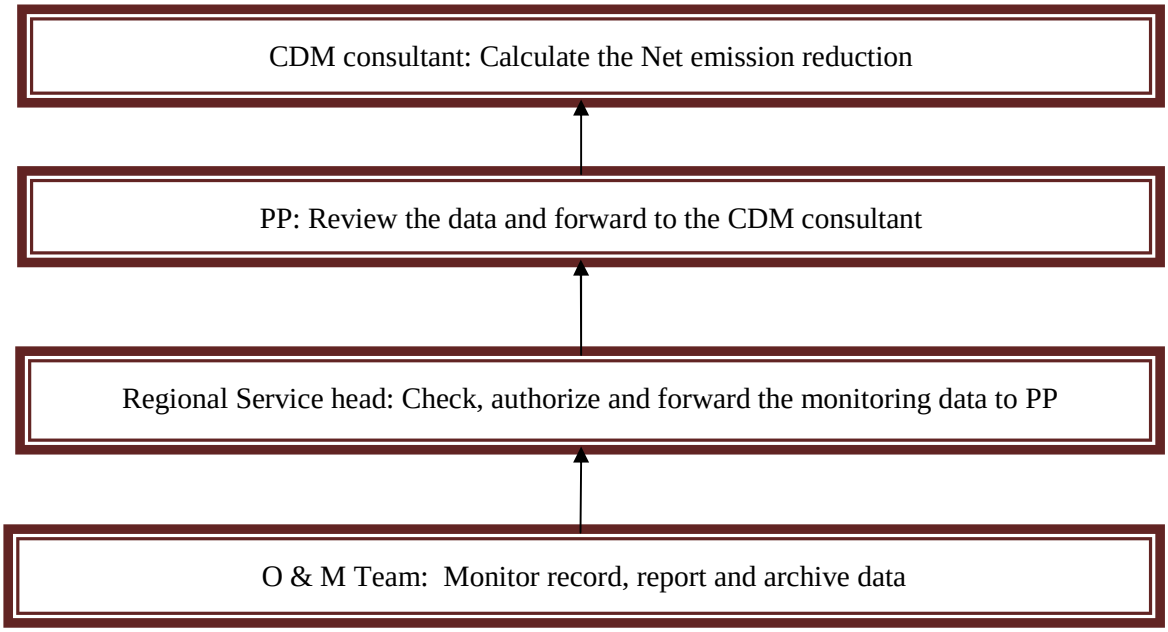
- The main meter and back up meter shall be sealed in the presence of representatives of project developer and GETCO.
- Any meter seal(s) shall be broken only by GETCO's representative in the presence of project developer representative whenever the main metering system is to be inspected, tested, adjusted, repaired or replaced.
- Al l the main meter and Check meter will be calibrated once in three years (as mentioned in PPA) by GETCO.

Procedure to deal with data uncertainity is as follows:

- During the calibration of energy meters at the connected substation, if the energy meters is found to be outside the permissible limit of accuracy and the reading from the same energy meter have been used to prepare the montly share certificates, then the identified errors would be applied to all major values since the date of last calibrations. Further the defective energy meter would be replaced immediately
- If the date of registration is after the date of JMR (Verification period dates are not matching the billing cycle) then no CERs will be claimed until the next JMR is undertaken. Similarly, no CERs will be claimed for the last month if end date of the crediting period and JMR reading day do not coincide.

Roles and Responsibility

Operation and maintenance is carried out by Vestas (Technology supplier) which are highly experienced and trained in carrying out the same. The monitoring recording and reporting is carried out by Vestas. Generation report from controller is sent by Vestas to project participant. The PP reviews the data & submit to CDM consultant to prepare the monitoring report.



SECTION C. Duration and crediting period
C.1. Duration of project activity

C.1.1. Start date of project activity

25/06/2010 (Date of Purchase order placed by G.R. Engineering Pvt. Ltd to Vestas Wind Technology India Pvt Ltd.)

C.1.2. Expected operational lifetime of project activity

20 years 00 months

C.2. Crediting period of project activity
C.2.1. Type of crediting period

Fixed Crediting Period

C.2.2. Start date of crediting period

27/12/2012 or the project registration date, whichever is earlier.

C.2.3. Length of crediting period

Ten (10) years 00 months

SECTION D. Environmental impacts

D.1. Analysis of environmental impacts

As per the Ministry of Environment and Forest (MoEF) India, Environment Impact Notification S.O. 1533[12], dated 14th September 2006 and Environment Impact Notification S. O. 60 (E)[13], dated 27th January 1994, wind power projects are not covered under this schedule and thus EIA is not required.

There are no additional requirements by the host party on the analysis of environmental impacts of the present project activity. Although it is not directly related to the environmental impacts, Project activity has got clearance from the local electricity authority.

The Environmental Impacts are not considered significant both by the investors and also the host party. However, the renewable energy projects are not doing any kind of harmful emissions, they would have only positive environmental impacts.

SECTION E. Local stakeholder consultation

E.1. Solicitation of comments from local stakeholders

The local population and farmers are considered the major stakeholders with respect to the project activity. The consent from the local stakeholders has been taken by the following ways:

1. Publishing a stakeholders' notification of the project activity in a local news paper on 23 June, 2011. The notice for invitation of comments for the project activity was published in local news paper
2. Public Notice was circulated to the nearby region.
3. Organising a stakeholder meeting at the project site – On 2nd July, 2011 The Stakeholders Meeting was organised by Vestas, G.R. Engineering & Ecolutions Carbon India Pvt.

   The meeting was attended by around 10 people. The attendance sheet was prepared to get the signatures of all the stakeholders attended the meeting. This included village Sarpanch, leaders/members of local bodies, site officials and local residents.

   During the meeting, the welcome note was given by Mr. Pravir Kale – Ecolutions Carbon India Pvt. Presentation about the project activity and its contribution to sustainable development was given by Ms. Pravir Kale, Asst. Manager – CDM – Ecolutions Carbon India Pvt. Ltd.

   The stakeholder meeting was made interactive by distributing questionnaire about the project activity and its effect on sustainable development.

   A detailed Minutes of Meeting (MoM) will be provided to DOE during validation.

[12] Available at http://envfor.nic.in/legis/eia/so1533.pdf (accessed in February 2010)
[13] Available at http://envfor.nic.in/divisions/iass/eia/Annex1.htm

E.2. Summary of comments received

The survey of the proposed project involved 8-10 representatives, mainly from the nearby village. All of the respondents have some knowledge and understandings about wind farm projects.

All of the respondents support the development of the Project. All of them believe that the Project will have positive impacts on local economic development. Common consensus on the establishment of wind mills; will have positive impacts on their environment and social development.

In conclusion, all stakeholders have issued their approvals and consents for setting up the project and no negative comments received.

All the comments received on the project activity were positive. None of the stakeholders have opposed or questioned the implementation of the project activity

The PP distributed a questionnaire relating to the implementation of the project activity and the views of the locals on the same (if positive or negative). The table below summarizes the questions asked to the local stakeholders and their responses:

Sr.No	Question	Answer
1	What do you think about economic and social benefits for the society due to this wind energy project -by Mr. Paresh Kumar Patel	Wind power projects are economically and socially beneficial and it is good that such projects are being implemented, as they benefit the locals indirectly
2	Whether the setting up of the project has improved the socio-economic conditions of the local communities? -by Mr. Alpesh Patel	Yes. Socio-economic wise villagers feel that increased energy production will be helpful for their village/s by reducing power cuts
3	How does the develop of the project affect you (positively or negatively or on your environment-by Mr. Ninama	Wind projects are eco friendly and it is good that such projects are being implemented in our region.)
4	Would you recommend private companies or authorities to develop projects of this nature - by Mr. Ninama	Yes, of course we will as this will help us locals gain steady power & employment. By Mr. Imran
5	Do you think “the project activity” will contribute to local employment generation in lower economic sector of the region-By Mr. Jyotidera Patel	Yes, as the project activity will indirectly contribute to local employment generation in lower economic sector of the region.
6.	Do you think the project activity” will contribute to sustainable development in the region-by Mr. K Upadhyay	Yes, the project has positive environment benefits & thus, contributes to sustainable development
7.	Would the running of the turbines alter the wind speed, pressure and change the direction of the clouds thus causing draught in these villages? By Mr. Nalin Patel	The Project Proponent explained that the WEGs reach a maximum height of 65 m and cloud formation takes place at about 1000m. The WEGs will thus not affect cloud formation and rainfall patterns in the region.

E.3. Report on consideration of comments received

No negative comment was received by any of the stakeholders during the meeting. The minutes of stakeholder meeting will be provided to DOE during validation.

SECTION F. Approval and authorization

PP has got the necessary approvals from local government body for the implementation for the project activity. PP has received Host Country Approval letter Ref. No.04/13/2012-CCC dated 11 October 2012.

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Appendix 1: Contact information of project participants

Organization	GR Engineering Pvt. Ltd.
Street/P.O. Box	Dr Anibesant Road,Worli
Building	201,Poonam Chambers
City	Mumbai
State/Region	Maharastra
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Telephone	+91 22 24960551-55
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E-mail	info@grengg.com
Website	www.grengg.com
Contact person	
Title	Managing Director
Salutation	Mr.
Last name	Hariani
Middle name	
First name	Ramesh
Department	
Mobile	
Direct fax	+91 22- 24964532
Direct tel.	+91 22-24960551
Personal e-mail	rdh@grengg.com/snitin@grengg.com

Appendix 2: Affirmation regarding public funding

Project activity has received no public funding.

Appendix 3: Applicability of selected methodology

As defined under Appendix B[14] of the simplified modalities and procedures for small-scale CDM project activities, the project activity proposes to apply following project types and categories:

Sectoral Scope: 01– Energy industries (renewable - / non-renewable sources)

Category: Type I D - Grid connected renewable electricity generation. Version 17, EB61, Annex 17

According to Table 2: Applicability of AMS-I.D, AMS-I.F and AMS-I.A based on project types:

	Project type	AMS-I.A	AMS-I.D	AMS-I.F
1	Project supplies electricity to a national/regional grid		√	
2	Project displaces grid electricity consumption (e.g. grid import) and/or captive fossil fuel electricity generation at the user end (excess electricity may be supplied to a grid)			
3	Project supplies electricity to an identified consumer facility via national/regional grid (through a contractual arrangement such as wheeling)			
4	Project supplies electricity to a mini grid[15] system where in the baseline all generators use exclusively fuel oil and/or diesel fuel			
5	Project supplies electricity to household users (included in the project boundary) located in off grid areas			

The project conforms to the project category since the nominal installed capacity is below the 15 MW thresholds and the generated electricity will be supplied and/or sold to the national/regional grid .

[14] http://cdm.unfccc.int/Projects/pac/ssclistmeth.pdf
[15] The sum of installed capacities of all generators connected to the mini-grid is equal to or less than 15 MW.

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

This has been described in Section B.6.1 of the PDD above

Appendix 5: Further background information on monitoring plan

Refer section B.7.3

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 history box by adding EB meeting and annex numbers in the Date column.
04.0	EB 66 13 March 2012	Revision required to ensure consistency with the "Guidelines for completing the project design document form for small-scale CDM project activities" (EB 66, Annex 9).
03	EB 28, Annex 34 15 December 2006	• The Board agreed to revise the CDM project design document for small-scale activities (CDM-SSC-PDD), taking into account CDM-PDD and CDM-NM.
02	EB 20, Annex 14 08 July 2005	• The Board agreed to revise the CDM SSC PDD to reflect guidance and clarifications provided by the Board since version 01 of this document. • As a consequence, the guidelines for completing CDM SSC PDD have been revised accordingly to version 2. The latest version can be found at <http://cdm.unfccc.int/Reference/Documents>.
01	EB 07, Annex 05 21 January 2003	Initial adoption.
Decision Class: Regulatory **Document Type:** Form **Business Function:** Registration		