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

CONTENTS

Annexes

SECTION A. General description of project activity

A.1. Title of the project activity:

Title: Wind Power Project in Jaisalmer District of Rajasthan

Version: 01

Date: 28/03/2012

A.2. Description of the project activity:

Surya Vidyut Limited (SVL) was incorporated in the year 2010. It is a subsidiary of CESC Ltd., which is one of largest distributors of power in the Eastern region of India, and is based out of Kolkata. The Company, set up with an overall objective of renewable power generation, is now planning to foray into the business of wind power generation. The Company is planning to set up a 50 MW wind farm in and around the Dangri village, in Jaisalmer district of Rajasthan state, a region located in the North-Western part of India which would be the 1st project undertaken by the company. The proposed project activity is a Greenfield initiative and the power generated in the wind farm will be exported to the NEWNE[1] grid of India. This will replace an equivalent amount of power generation in the NEWNE grid and hence reduce equivalent amount of greenhouse gas emissions as per the carbon intensity of the grid.

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The project activity involves installation of twenty-five Wind Turbine Generators (WTGs) of 2 MW capacity each. Considering the site specific conditions, the project activity is expected to generate a net exportable electricity of around 92199 MWh per annum. The same will be exported to the Rajasthan state grid which is a part of the NEWNE grid. In absence of the project activity, equivalent power would have been generated in power plants connected to the NEWNE grid and the same would have led to overall emissions of 87850 tCO_2 per annum as per the carbon intensity of the NEWNE grid. Since the project activity represents a cleaner mode of power generation, hence it will not result in any additional greenhouse gas emissions and therefore it will lead to an overall emission reduction of 87850 tCO_2 per annum. Thus over the entire crediting period of 10years, the project activity will result in a reduction of 878500 tCO_2.

[1] As per the CEA database version 5, Northern, Eastern, Western and North-Eastern regional grids have been combined as NEWNE grid.

Project's contribution to sustainable development

The project activity's contribution towards sustainable development of the host country-India is elaborated below:

Table T1 - Project's Contribution to Sustainable Development	
Indicator	Description
Social well-being	Contribution towards Indian power sector through reduction in electricity demand-supply gap Enhancing local employment and capacity building thereby improving the quality of life of the rural people in near vicinity of the project site In addition to this, Surya Vidyut Limited (SVL) will also contribute 2% of the revenue realised from the sale of CERs towards different society/community development programmes as per the scheme developed (please refer to Annexure-A for the same). Such expenditure will be made within one year post realization of revenues from the sale of CERs. The details of such expenditure made will be included in the monitoring report for the period following the transaction.
Technological well-being	The project activity involves power generation from clean technology and therefore will have minimal associated GHG emissions. This will assist in accelerating the commercialization of renewable energy technologies in the host country-India.
Economic well-being	The implementation of the project activity has also brought about an increase in the business opportunities for contractors, suppliers and erectors at different phases of its implementation
Environmental well-being	▪ Usage of clean source (wind energy) for generation of electricity ▪ Reduction in GHG emissions ▪ Conservation of non-renewable fuel resources (like coal) ▪ Reduction in air borne SPM and pollutants (SO_x and NO_x) in ambient air

A.3. Project participants:

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

A.4. Technical description of the project activity:

A.4.1. Location of the project activity:

A.4.1.1. Host Party(ies):

India

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

Western Region / Rajasthan / Jaisalmer District

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

Dangri and nearby villages[2]

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

The project land is located in Dangri village, in Jaisalmer district, of the state of Rajasthan. The project land is about 70 km distance from Jaisalmer city and is well connected to NH-15 via district road towards Devikot. Approach Road to site is good : 48 km on NH-15 from Jaisalmer City and then 22 km of District Road. Nearest railway station is Jaisalmer. The nearest 220/400 kV RVPN Grid Substation is Akal substation and is located at around 47km from Wind farm pooling substation. Nearest Airport is at Jodhpur which is about 230 km from project site. The land is almost plain with very low vegetation in the area.

[2] The detailed list of all WTG locations and villages has been provided in Annexure B to the PDD

The geographic location of the corresponding wind turbines in different areas are listed below in Annexure-B.

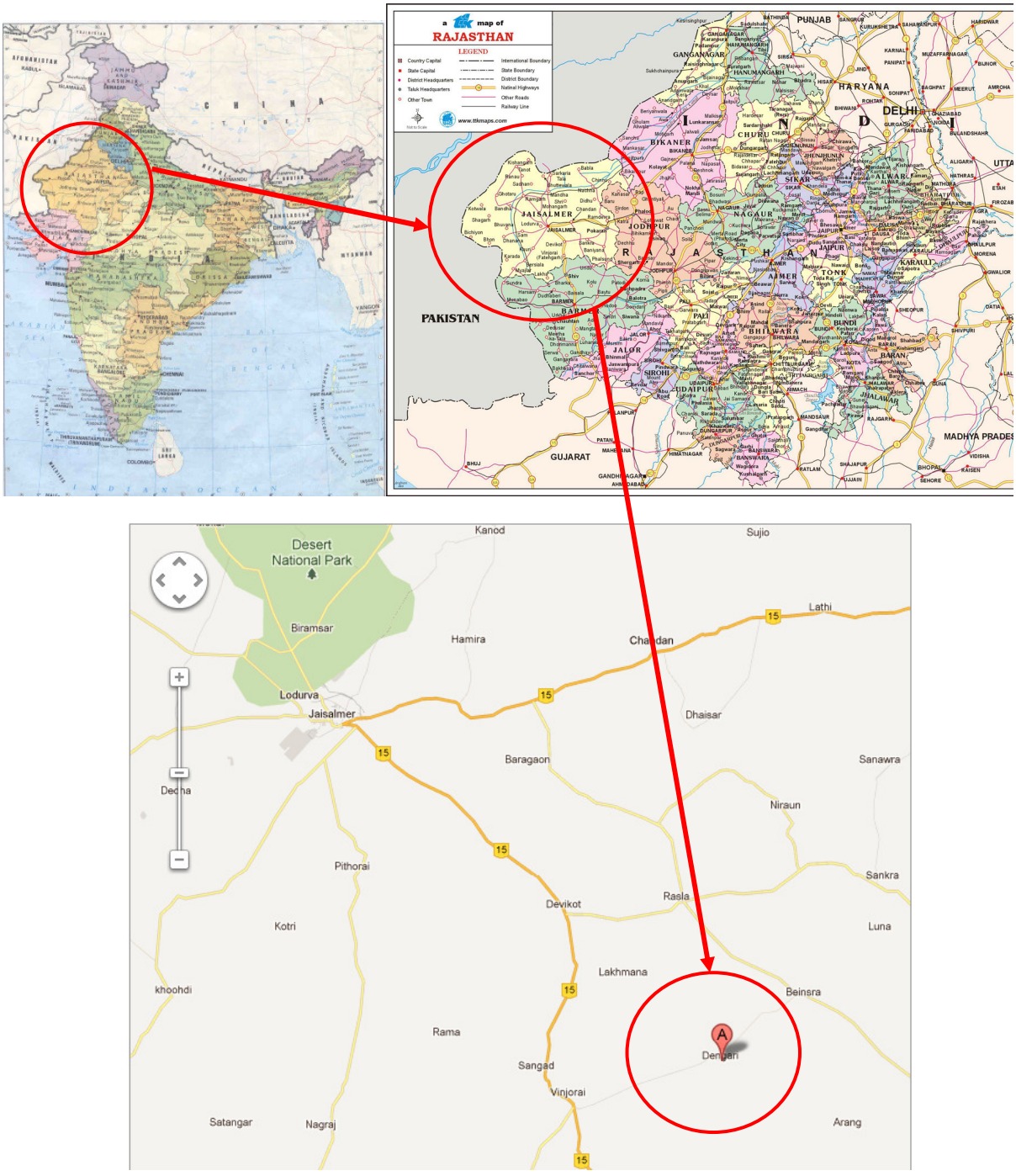

Exhibit E1 – Geographic Location of Project Activity

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

The project activity is a grid connected renewable energy based power generation project. The electrical energy generated by the project activity will replace equivalent energy generation in power plants connected to the NEWNE grid of India. With this background, the project activity falls under:

Sectoral Scope: 01

Category: Energy industries (renewable /non - renewable energy sources)

The project activity will be developed in accordance with the guidance of the Approved Consolidated Methodology-ACM0002/ Version 12.3.0.

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

The project activity is a Greenfield project which involves installation of twenty-five Wind Turbine Generators (WTGs) of 2 MW capacity each, aggregating to a gross power generation capacity of 50 MW.

Wind power generation technology entails conversion of the kinetic energy of the blowing wind to mechanical energy by rotation of the blades of the wind mills. The mechanical energy, thus generated, is subsequently utilized to rotate the turbines for generation of electricity. The electricity is generated at 690V and subsequently stepped up to 33kV. The same is then wheeled through a pooling sub-station at Dangri to the grid substation at Akal, The pooling station at Dangri will have a 220 KV evacuation system, which would save considerable line losses in comparison to one, with a lower KV level. The 220 KV system will be having modern technology by using Zebra insulators.

At Akal wherein this is further stepped up to 400kV and fed to the Rajasthan state grid which is a part of the NEWNE grid of India.

The WTGs are also equipped with a closed loop liquid cooling system on the nacelle to cool the windings of the alternator and the gearbox. This additional feature, reduces the possibility of permanent derating of the machine, even though it would be operating at high temperatures.

The technical specifications of the Wind Turbine Generators (WTGs) installed under the project activity are as follows:

Table T2 - Technical Specifications	
Operating Data	Details
Rated power	2 MW

Cut-in wind speed	3 m/s
Rated wind speed	11m/s
Cut-out wind speed	20 m/s
Survival Wind Speed	52.5 m/sec
Hub height	80 Meters
Type Class	TC IIIB
Rotor Speed	15.9 RPM
Operational mode	Variable speed
Design Standards	Germanischer Lloyd
Rotor	
Pitch system	Pitch Control- Electrical; Variable Speed Inverters; Power back up with Ultra Capacitor
Diameter	93 Meters
Swept area	6785 Sq Meters
Blade material type	Epoxy Glass Fibre
Generator	
Type	Double fed Induction Generator
Rated Power	2 MW
Rated Voltage	690 V AC, 3 Phase
Frequency	50 Hz
Cooling System	Forced Liquid Cooling System
Insulation	Class H
Braking System	
Aerodynamic Brake	Full span independent blade pitching
Mechanical Brake	Disc Brakes
Drive Train	
Drive Train	Patented integral drive train with rotor shaft and drive train as single unit
Rated Drive Torque	1280 kNm

Maximum Static Torque	2235 kNm
Type of Gearing	Two Planetary and One Parallel shaft gear
Transmission Ratio	1:114.7
Gear Lubrication	Forced Lubrication
Conncection Gear / Generator	Flexible Coupling
Yaw System	
Type	Driven by 4 Gear Meters
Bearings	Slide Bearings
Tower	
Type	Conical Tubular Steel Tower
Tower Height	78 Meters
Corrosion Protection	Protective Paint

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

Table T3 – Estimated Emission Reduction during the crediting period

Years[3]	Annual estimation of emission reductions in tonnes CO_2e
January 2013 – December 2013	87850
January 2014 – December 2014	87850
January 2015 – December 2015	87850
January 2016 – December 2016	87850
January 2017 – December 2017	87850
January 2018 – December 2018	87850
January 2019 – December 2019	87850

[3] 1st year begins from the date of registration or date of commissioning, whichever is later and each year extends for 12 months

January 2020 – December 2020	87850
January 2021 – December 2021	87850
January 2022 – December 2022	87850
Total estimated reductions (tonnes of CO_2 e)	**878500**
Total number of crediting years	**10**
Annual average over the crediting period of estimated reductions (tonnes of CO_2 e)	**87850**

A.4.5. Public funding of the project activity:

No public funding from Annex-1 countries is available for this project activity.

SECTION B. Application of a baseline and monitoring methodology

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

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

Reference: Approved Consolidated Baseline Methodology ACM0002/Version 12.3.0 (Sectoral Scope: 01)

The methodology also refers to the following Tools:

- Tool to calculate the emission factor for an electricity system (Version 2.2.1)
- Tool for the demonstration and assessment of additionality (Version 6.0.0)

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

As per the applicability condition of the Approved Consolidated Methodology-ACM0002/Version 12.3.0:

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 (green field 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 project which entails installation of a new grid connected wind power plant at a site where no renewable energy based power plant was operated prior to the implementation of the project activity. Hence the project activity meets this applicability criterion of the Approved Consolidated Methodology.

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;*

The project activity involves installation of a new grid connected wind power plant and does not involve capacity additions, retrofits or replacements. Hence the project activity meets this applicability criterion of the Approved Consolidated Methodology.

- *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 does not involve capacity addition, retrofits or replacements of an existing power plant. Therefore this applicability criterion of the Approved Consolidated Methodology is not relevant for the project activity under consideration.

- *In case of hydro power plants, one of the following conditions must apply:*
  - *The project activity is implemented in an existing single or multiple reservoirs, with no change in the volume of any of the reservoirs; or*
  - *The project activity is implemented in an existing single or multiple reservoirs, where the volume of any of reservoirs is increased and the power density of each reservoir, as per the definitions given in the Project Emissions section, is greater than 4 W/m2 after the implementation of the project activity; or*
  - *The project activity results in new single or multiple reservoirs and the power density of each reservoir, as per the definitions given in the Project Emissions section, is greater than 4 W/m2 after the implementation of the project activity.*

Since this is a wind power generation project, hence this applicability criterion of the Approved Consolidated Methodology is not relevant for the project activity under consideration.

The methodology is not applicable to the following:

- *Project activities that involve switching from fossil fuels to renewable energy sources at the site of the project activity, since in this case the baseline may be the continued use of fossil fuels at the site;*

- *Biomass fired power plants*
- *Hydro power plants that result in new reservoirs or in the increase in existing reservoirs where the power density of the reservoir is less than 4 W/m^2.*

Neither the project activity entails fossil fuel switch nor it is a biomass or hydro power plant, hence this applicability criterion of the Approved Consolidated Methodology is not relevant for the project activity under consideration.

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 does not involve capacity addition, retrofits or replacements of an existing power plant. Therefore this applicability criterion of the Approved Consolidated Methodology is not relevant for the project activity under consideration.

The above justifications clearly demonstrate that the project activity is in compliance with all the applicability criterion of the Approved Consolidated Methodology-ACM0002/ Version 12.3.0.

B.3. Description of the sources and gases included in the project boundary:

As per the guidance of the Approved Consolidated Methodology-ACM0002/Version 12.3.0,

"*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..*"

In accordance with this guideline, the project boundary for the project activity will include:

- The project site, as presented in Section A.4.1.4 along with the Wind Turbine Generators (WTGs) and the associated facilities;
- The NEWNE grid of India where the power generated from the project activity is finally evacuated-The power plants supplying electricity to the NEWNE grid (both existing and new) are therefore considered as power generation stations connected physically to the electricity system (*i.e.* NEWNE grid) where the project activity wind power plant is connected to.

A diagrammatic representation of the project boundary is provided below:

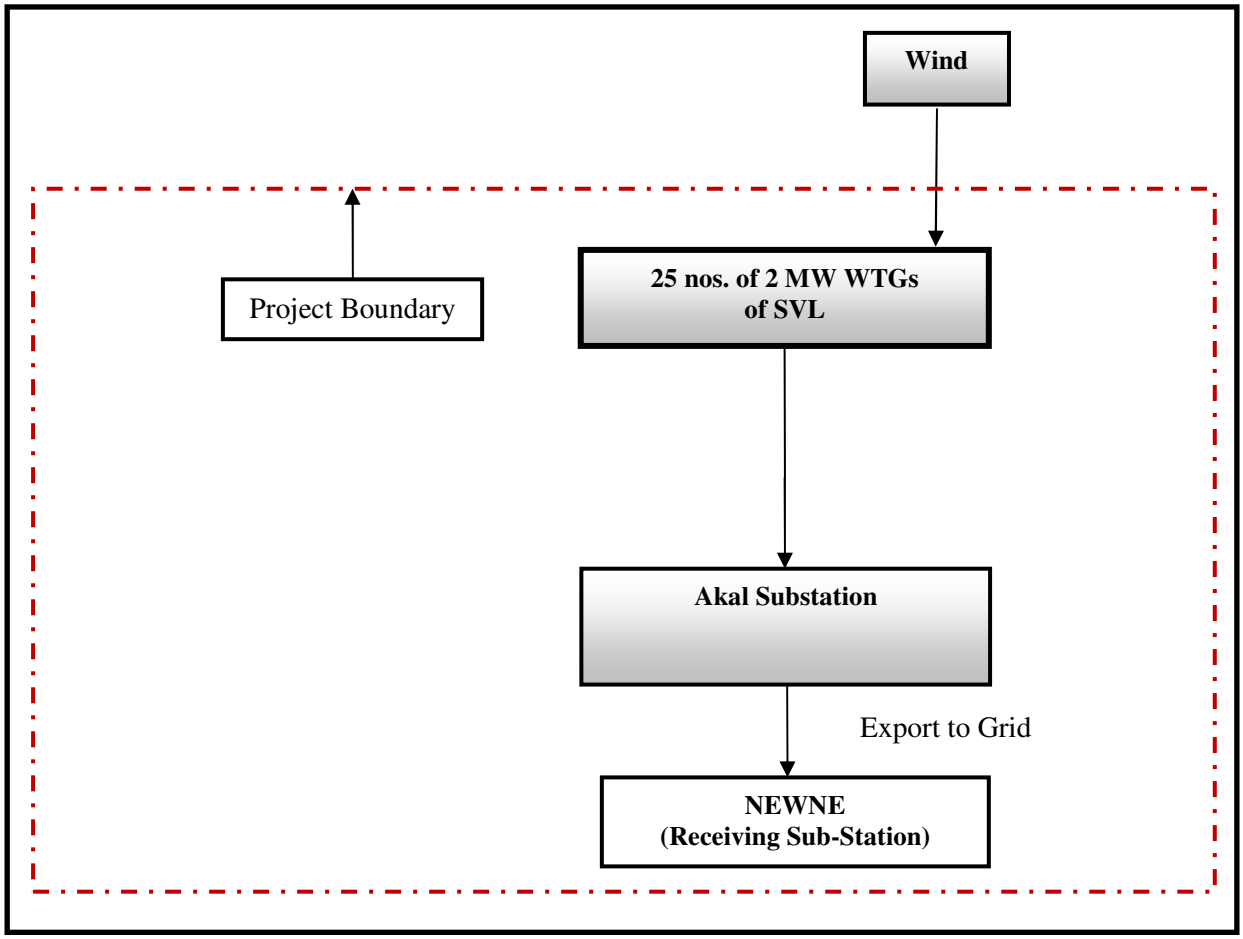

Exhibit E2 – Project Boundary

In accordance with the methodology, the following emission sources are considered for determination of baseline and project emissions:

TableT4: Emission sources included in or excluded from the project boundary				
Source		Gas	Included?	Justification/Explanation
Baseline	CO_2 emissions from electricity generation in fossil fuel fired power plants that are displaced due to the project activity	CO_2	Yes	Main emission source
		CH_4	No	Minor emission source
		N_2O	No	Minor emission source

Project Activity	For geothermal power plants, fugitive emissions of CH_4 and CO_2 from non-condensable gases contained in geothermal steam	CO_2	No	Not applicable since the project activity does not entail installation of a geothermal power plant *(please refer to Section A.2 of this PDD).*
		CH_4	No	
		N_2O	No	
	CO_2 emissions from combustion of fossil fuels for electricity generation in solar thermal power plants and geothermal power plants	CO_2	No	Not applicable since the project activity does not entail installation of a solar thermal plant or geothermal power plant *(please refer to Section A.2 of this PDD).*
		CH_4	No	
		N_2O	No	
	For hydro power plants, emissions of CH_4 from the reservoir	CO_2	No	Not applicable since the project activity does not entail installation of a hydro power plant *(please refer to Section A.2 of this PDD).*
		CH_4	No	
		N_2O	No	

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

As per the guidance of the Approved Consolidated Methodology-ACM0002/Version 12.3.0,

"If the project activity is the installation of a new grid-connected renewable power plant/unit, the baseline scenario is the following:

Electricity delivered to the grid by the project 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".

Since the project activity under consideration is a new grid connected wind power plant (*i.e.* renewable energy based power plant) which will supply electricity to the NEWNE grid of India, hence in accordance with the above methodological guidance, the baseline scenario for the project activity is considered as continued generation of electricity in the NEWNE grid. This will include power generation both by the existing power plants connected to the NEWNE grid as well as by the power plant capacity additions in the aforesaid grid in the baseline scenario *i.e.* in absence of the project activity under consideration.

Since the displaced electricity generation is the element that is likely to affect both the 'Operating Margin' in the short run and the 'Build Margin' in the long run, electricity baselines should reflect a combination of these effects. Therefore an ideal baseline approach is envisaged as the one that combines both 'Operating Margin' and 'Build Margin' and determines the carbon intensity of power generation of the NEWNE grid as the 'Combine Margin (CM)' Emission Factor of the NEWNE grid following the guidance of the *"Tool to calculate the emission factor for an electricity system (Version 2.2.1)"*.

For details on the computation of Combine Margin Emission Factor of the NEWNE grid, please refer to 'Annex-3: Baseline Information' for details.

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

As per the decision 17/cp.7 para 43, a CDM project activity is additional if anthropogenic emissions of greenhouse gases by sources are reduced below those that would have occurred in the absence of the registered CDM project activity. As per the guidance of the Approved Consolidated Methodology-ACM0002/Version 12.3.0, the project proponent is required to demonstrate the additionality of the project activity following the guidelines of the latest version of the 'Tool for the demonstration and assessment of additionality (Version 06.0.0)'. The flowchart presented below provides a step-by-step approach to establishing additionality of the project activity as per the tool:

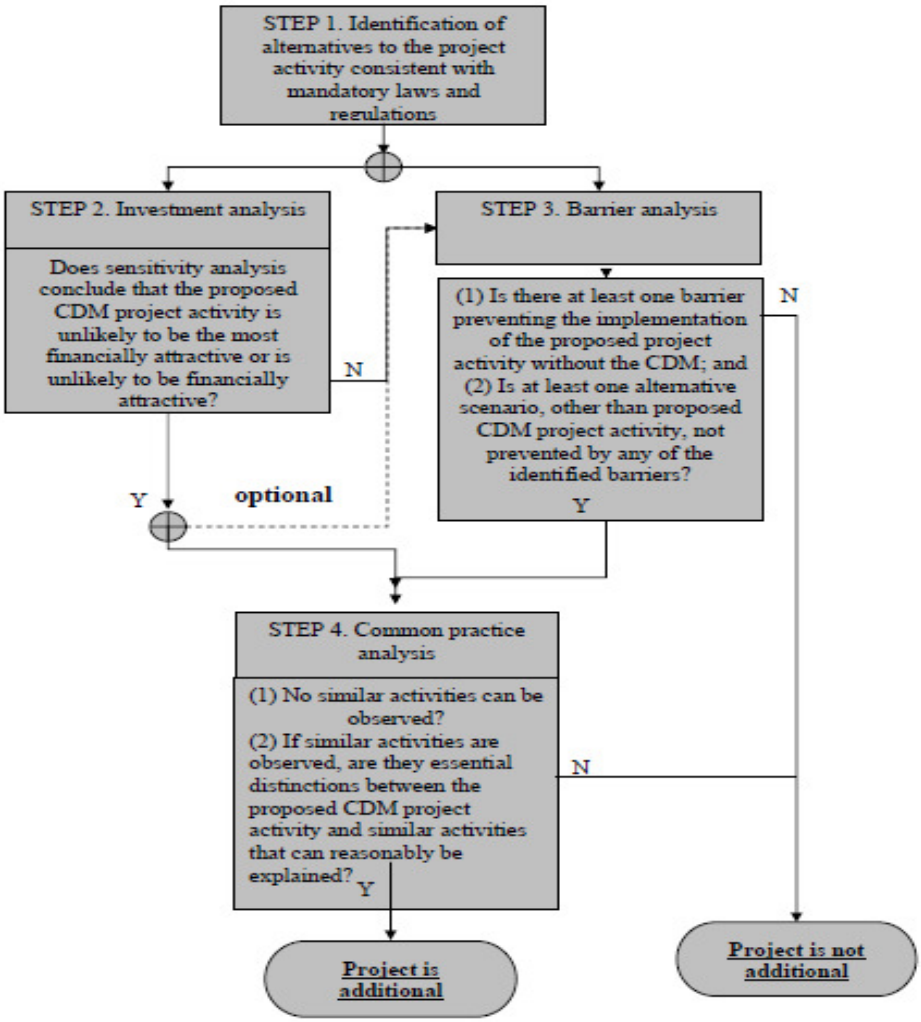

Exhibit E3 – Flowchart for Establishing Additionality

In accordance with the guidance of this tool, the additionality of the project activity has been demonstrated as below:

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

The objective of this step is to identify realistic and credible alternatives of the project activity through the following sub-steps:

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

In accordance with the guidance of the tool, the project proponent has identified the following realistic and credible alternative to the project activity which will have similar output in terms of generation of power:

Table T5: Definition of alternatives to the project activity	
Alternative	Description of Alternative
Alternative-1: The project activity undertaken without being registered as a CDM project activity	As per this alternative, the project proponent could have implemented the wind power project under consideration without the same being registered as CDM project with the United Nations Framework Convention on Climate Change (UNFCCC). Under this alternative, power would have been generated using the wind energy potential and the same would have been supplied to the NEWNE grid of India. This would have replaced an equivalent power generation from both the existing power plants connected to the NEWNE grid as well as from power plant capacity additions in the aforesaid grid.
Alternative-2: Continuation of the current situation (no project activity or other alternatives undertaken)	As per this alternative, the project proponent could have selected not to implement the project activity under consideration. Under this alternative, electricity, equivalent to that generated in the project activity, would have been continued to be generated in the NEWNE grid of India. This would include power generation both by the existing power plants connected to the NEWNE grid as well as by the power plant capacity additions in the aforesaid grid.

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

Both these alternatives, Alternative-1 and Alternative-2, are in compliance with the current laws and regulations those are enforced in the host country-India. Therefore the project proponent could have implemented either of these alternatives. However implementation of the project activity without CDM

revenue is not a feasible alternative for the project proponent. The same has been illustrated below through 'Investment Analysis'.

Step 2: Investment Analysis

As per the investment analysis, the project proponent is required to determine whether the project activity is financially attractive without the revenue from the sale of Certified Emission Reductions (CERs). To conduct the investment analysis, the project proponent is required to use the following sub-steps:

Sub-step 2a: Determine appropriate analysis method

In accordance with the guidance of the tool, the project proponent has the following three options carrying out the investment analysis for the project activity under consideration:

- Option-I: Simple cost analysis
- Option-II: Investment comparison analysis
- Option-III: Benchmark analysis

As per the guidance of the tool, simple cost analysis can be adopted only when the project activity or the identified alternatives generate no financial benefits other than the CDM revenue. However, the project activity under consideration, involves generation of electricity using wind energy potential and its subsequent supply to the NEWNE grid of India. Hence the project activity will generate revenue through sale of electrical energy over and above the revenue generated through sale of the resulting Certified Emission Reduction (CER) units under CDM. Therefore, 'Option-I: Simple cost analysis' would not be an appropriate analysis method for the project activity under consideration.

As far as investment comparison analysis is concerned, the project proponent would be required to make an investment only when Alternative-1 is implemented. However implementation of Alternative-2 does not require any investment by the project proponent. Therefore 'Option-II: Investment comparison analysis' would also not be an appropriate analysis method for the project activity under consideration.

With the above background, the project proponent has adopted 'Option-III: Benchmark analysis' to determine the financial attractiveness of the project activity wherein the equity Internal Rate of Return (IRR) of the project activity has been compared with an appropriate 'benchmark' to assess financial attractiveness of the project activity.

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

The project proponent has conducted benchmark analysis by calculating equity Internal Rate of Return (IRR). The equity IRR for the project activity has been calculated without the CDM benefits and it has been manifested that *sans* the benefits, implementation of the project activity would not have been financially attractive when compared with an appropriate benchmark. All relevant assumptions and the necessary details for computation of the IRR have been presented below in subsequent sub-steps.

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

Calculation of Benchmark

As per the guidance provided under Paragraph-12 of 'Selection and Validation of Appropriate Benchmarks' in the 'Guidelines on the assessment of investment analysis' Version 05.0.0

"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. Required/expected returns on equity are appropriate benchmarks for equity IRR. Benchmarks supplied by relevant national authorities are also appropriate if the DOE can validate that they are applicable to the project activity and the type of IRR calculation presented".

The financial viability of the project activity has been assessed by the project proponent based on the project activity's Equity IRR (Internal Rate of Return) as the financial indicator. Therefore, in accordance with the above mentioned guidelines, the project proponent has selected the Expected Return on Equity as the benchmark for the equity IRR.

Further, as per the guidance provided under Paragraph-13 of 'Selection and Validation of Appropriate Benchmarks' in the 'Guidelines on the assessment of investment analysis' Version 05.0.0

"In the cases of projects which could be developed by an entity other than the project participant the benchmark should be based on publicly available data sources which can be clearly validated by the DOE. Such data sources may include local lending and borrowing rates, equity indices, or benchmarks determined by relevant national authorities. The DOE's validation of such benchmarks shall also

include its opinion of the suitability of the benchmark applied in the context of the underlying project activity."

It is also worthwhile to note that the project activity under consideration is a Greenfield wind power generation project that generates and exports electricity to the NEWNE Grid. Therefore the project cannot have only one possible project developer. In such cases (where the project has more than one potential developer) the benchmark cannot be based on internal cost of equity and shall be based on parameters that are standard in the market, considering the specific characteristics of the project type. Hence, the project developer has not used company or project specific parameters for the calculation of the benchmark.

Further, as per the guidance provided under Paragraph-15 of 'Selection and Validation of Appropriate Benchmarks' in the 'Guidelines on the assessment of investment analysis' Version 05.0.0

If the benchmark is based on parameters that are standard in the market, the cost of equity should be determined either by: (a) selecting the values provided in Appendix A; or by (b) calculating the cost of equity using best financial practices, based on data sources which can be clearly validated by the DOE, while properly justifying all underlying factors. The values in the table in Appendix A may also be used, as a simple default option, if a company internal benchmark is used.

As mentioned above, the project proponent chose to select the benchmark, based on parameters standard in the market. Hence, the cost of equity has been selected based on default values in the Appendix of 'Guidelines on the assessment of investment analysis' Version 05.0.0. The expected nominal return on equity, calculated based on the default real value provided in the table in the Appendix of 'Guidelines on the assessment of investment analysis' Version 05.0.0, and the inflation forecast by the Reserve Bank of India for the next ten years, is 17.90%.

Calculation of Financial indicator

As stated earlier, the financial indicator used for benchmark analysis is the equity IRR. The various assumptions in calculation of the equity IRR are mentioned below:

Table-T6: Key Assumptions for IRR Computation		
Parameter	Unit	Value
Total number of WTGs	No.	25
Net Power Generation	MWh/annum	92199
Proportion of Debt	%	70%
Tenure of debt	Years	12
Interest Rate	%	13.00%
Cost of each WTG	INR Lacs	1204
Contingency	%	3%
Financing Expenses	%	1.6%
O&M Expenses (Year-3 onwards)	INR Lacs/WTG	14
Annual Escalation on O&M Expenses from Year 3 till remaining lifetime	%	5%
Administrative Expense	INR Lacs/annum	82
Insurance Cost (% of Project Cost)	%	0.20%
APPC	INR/kWh	2.57
Annual Escalation in APPC	%	2%
REC price	INR/kWh	1.50
GBI (upto a cumulative maximum of INR 62 lacs/MW)	INR/kWh	0.50
Net Salvage Value (as a % of Project Cost)	%	10%
Book Depreciation (SLM)	%	5.28%
Tax Depreciation (SLM)	%	7.69%
Regular Tax	%	32.45%
MAT	%	20.01%

Based on the above assumptions, the equity IRR of the project activity was found out to be 6.88% which is much below the investment benchmark of 17.90%, calculated at the time approval of the project

activity by their Management. The analysis thus demonstrates that the project activity is financially not attractive when compared to the selected benchmark.

Sub-step 2d: Sensitivity analysis

In line with guidance of the tool, the project proponent is required to carry out a sensitivity analysis to assess the robustness of the conclusion of the financial unattractiveness of the project activity with regards to reasonable variations in the critical assumptions. The project activity under consideration is found to be sensitive to the following parameters:

- Total Project Cost
- Plant Load Factor
- Power Sale Tariff

The sensitivity analysis has been conducted for scenarios with variations in each one of the above - mentioned parameters in order to assess the financial attractiveness of the project activity under such circumstances. The results of the sensitivity analysis are presented below:

Table T7: Results of Sensitivity Analysis on Key Parameters

Sl. No.	Parameter	Change	IRR
1.	Project Cost	+10%	4.76%
		-10%	9.57%
2.	Plant Load Factor	+10%	9.55%
		-10%	4.27%
3.	Power Sale Tariff	+10%	9.49%
		-10%	4.31%

The results of the sensitivity analysis conducted confirm that the IRR of the project activity without CDM revenues is lower than the benchmark and the project activity is not a financially attractive option for the project proponent to implement.

Outcome of Step 2:

From the Investment analysis, it is evident that the proposed project is not financially attractive, even under the favourable conditions as discussed in the sensitivity analysis presented in table B3.

Step 3: Barrier analysis

- As per the "Tool for the demonstration and assessment of additionality", the project participants may choose to apply Step 2 (Investment analysis) or Step 3 (Barrier analysis) to demonstrate the additionality of the project. So the project proponent does not use Step 3 to demonstrate the additionality of the proposed project activity.

Step 4: Common practice analysis

As per "Tool for the demonstration and assessment of additionality", for the measures that are listed in paragraph 64, the common practice analysis[5] has to be performed as per the following step by step approach illustrated below:

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

The proposed project activity has a capacity of 50 MW. Therefore the applicable output range for analysis of +/-50% for the proposed project activity is from 25 MW to 75 MW.

Step 2: In the applicable geographical area, identify all plants that deliver the same output or capacity, within the applicable output range calculated in Step 1, as the proposed project activity and have started commercial operation before the start date of the project. Note their number N_{all}. Registered CDM project activities and projects activities undergoing validation shall not be included in this step13;

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[4] Measure (for emission reduction activities) is a broad class of greenhouse gas emission reduction activities possessing common features. Four types of measures are currently covered in the framework:

(a) Fuel and feedstock switch;

(b) Switch of technology with or without change of energy source (including energy efficiency improvement as well as use of renewable energies);

(c) Methane destruction;

(d) Methane formation avoidance.

[5] Detailed spreadsheet of all plants considered will be submitted to DOE

Within the applicable geographical area, which is the host country by default, i.e. India and within the applicable output range as calculated in step 1, of 25 MW to 75 MW, and before the submission of the PDD for validation, the number of plants that have started commercial operation are 59.

Therefore $N_{all} = 488$

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

As per paragraph 9 of the "Tool for the demonstration and assessment of additionality", different technologies are technologies that deliver the same output and differ by at least one of the following:

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

Therefore as per the above conditions the following are considered different:

(a)Thermal, hydro, OTEC, Solar, Geothermal and biomass power plant are considered different as their energy source/fuel is different from project activity which is a wind power plant.

(c) Micro and small installations, i.e. where the project size is less than 15 MW are considered different, as the project activity is a large scale CDM project activity, of overall installed capacity of 50 MW, which is greater than 15 MW.

(d)

(ii) Public projects are considered different, as the subsidies forwarded to them by governments, and financial flows applicable to them, in the form of public funding, capital sourcing, debt obligations, return expectations, etc. are different from the proposed project activity which has been set up by private investors.

(iv) The proposed project activity is governed by the RERC Tariff Regulations 2009, which is under the jurisdiction of the Government of Rajasthan. Different states in India have different wind purchase obligations, wind availability, and thus different tariff determination policies. Also, owing to the federal structure of the government, each state government has the responsibility and independent jurisdiction over fixing tariff within its boundaries. Therefore, projects outside the state of Rajasthan, are considered different.

Therefore $N_{diff} = 488$

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.

The proposed project activity is a "common practice" within a sector in the applicable geographical area if both the following conditions are fulfilled:
(a) the factor F is greater than 0.2, and
(b) Nall-Ndiff is greater than 3.

The factor F = 1 – (488/488)
= 0

Therefore, the proposed project activity is not a "common practice" within the sector in the applicable geographical area as:

- F which is equal to 0, is less than 0.2

The analysis clearly demonstrates that project activity is not a common practice within a sector in the applicable geographical area. Lack of investment in wind projects is primarily due to the economics of the wind projects, reduced plant load factor leading to overall financial unattractiveness of the projects. This has led to the low implementation of wind power projects setup by private investors.

Prior consideration - CDM

In accordance with EB 49, Annex 22, paragraph 2 (i.e. 'Guidelines on the demonstration and assessment of prior consideration of the CDM') "*for project activities with a starting date on or after 02 August 2008, the project participant must inform a Host Party DNA and the UNFCCC secretariat in writing of the commencement of the project activity and of their intention to seek CDM status. Such notification must be made within six months of the project activity start date and shall contain the precise geographical location and a brief description of the proposed project activity, using the standardized form F-CDM- Prior Consideration*"

The project proponent had already informed both the Host Party DNA and the UNFCCC secretariat in writing of the commencement of the project activity and of their intention to seek CDM status using the standardized form F-CDM-Prior Consideration even prior to the placement of purchase order *i.e.* the start date of the project activity. The above mentioned notification was made by the project proponent dated 05/01/2012. Evidences substantiating the above will be submitted to the DOE. The same may be verified against the following Link to the UNFCCC website:
http://cdm.unfccc.int/Projects/PriorCDM/notifications/index_html

B.6. Emission Reduction:

B.6.1. Explanation of methodological choices:

The emission reductions resulting from the project activity will be computed as detailed below:

Computation of Baseline Emissions

As per the guidance of the methodology, the baseline emissions will include CO_2 emissions from electricity generation in fossil fuel fired power plants that are displaced due to the project activity. The

methodology assumes that all electricity generated in the project activity above the baseline levels would have been generated by existing grid-connected power plants and the addition of new grid-connected power plants. In line with this, the baseline emissions will be computed as:

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

Where:

BE_y : Baseline Emissions in the year y (tCO_2e)

$EG_{PJ,y}$: 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 the year y (MWh)

$EF_{grid,CM,y}$: Combined Margin CO_2 Emission Factor for grid connected power generation in the year y (tCO_2/MWh)

y : Any year within the crediting period of the project activity under consideration

Further in accordance with the guidance for "Greenfield renewable energy power plants" as provided in the methodology-*"If the project activity is the installation of a new grid-connected renewable power plant/unit as a site where no renewable power plant was operated prior to the implementation of the project activity, then"*

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

Where:

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

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

y : Any year within the crediting period of the project activity under consideration

Since the project activity entails installation of a new grid-connected wind power project at a site where no renewable power plant was operated prior to the implementation of the project activity, hence the baseline emissions from the project activity will be determined as:

$$BE_y = EG_{facility,y} \times EF_{grid,CM,y}$$

Where:

BE_y : Baseline Emissions in the year y (tCO_2)

$EG_{facility,y}$: Quantity of net electricity generation supplied by the project activity plant to the grid in

the year y (MWh)

$EF_{grid,CM,y}$: Combined Margin CO_2 Emission Factor for grid connected power generation in the year y (tCO_2/MWh)

y : Any year within the crediting period of the project activity under consideration

Since the project activity will replace equivalent power generation from power plants connected to the NEWNE grid (both existing and new power plants), the *"Combined Margin CO_2 Emission Factor for grid connected power generation in the year y ($EF_{grid,CM,y}$)"* will be determined for the NEWNE grid of India following the guidance of the "Tool to calculate the emission factor for an electricity system (Version 2.2.1)". The details of the same have been provided in 'Annex-3: Baseline Information'.

Computation of Project Emissions

As per the guidance of the methodology, the project emissions will be computed as:

$$PE_y = PE_{FF,y} + PE_{GP,y} + PE_{HP,y}$$

Where:

PE_y : Project Emissions in the year y (tCO_2e)

$PE_{FF,y}$: Project Emissions from fossil fuel consumption in the year *y* (tCO_2e)

$PE_{GP,y}$: Project Emissions from the operation of geothermal power plants due to the release of non-condensable gases in the year *y* (tCO_2e)

$PE_{HP,y}$: Project Emissions from water reservoirs of hydro power plants in the year *y* (tCO_2e)

y : Any year within the crediting period of the project activity under consideration

However there will be no fossil fuel consumption in the project activity and hence,

$$PE_{FF,y} = 0$$

Furthermore the project activity entails installation of a wind power project (*i.e.* neither a geothermal nor a hydro power project) and hence both the emission sources $PE_{GP,y}$ and $PE_{HP,y}$ are not applicable for the project activity under consideration. Therefore,

$$PE_y = 0$$

Computation of Leakage Emissions

The methodology does not require the project proponent to consider any leakage emissions.

Computation of Emission Reductions

In accordance with the guidance of the methodology, the emission reductions resulting from the project activity will be computed as:

$$ER_y = BE_y - PE_y$$

Where:

ER_y : Emission Reductions in the year y (tCO_2e)

BE_y : Baseline Emissions in the year y (tCO_2e)

PE_y : Project Emissions in the year y (tCO_2e)

y : Any year within the crediting period of the project activity under consideration

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

Data / Parameter:	$EF_{grid,CM,y}$
Data unit:	tCO_2/ MWh
Description:	Combined Margin CO_2 Emission Factor for grid connected power generation in the year y-The same is determined for the NEWNE grid of India following the guidance of the "Tool to calculate the emission factor for an electricity system (Version 2.2.1)". Please refer to 'Annex-3: Baseline Information' for details.
Source of data used:	'Baseline Carbon Dioxide Emission Database/Version 07', published by Central Electricity Authority (CEA), Government of India
Value applied:	0.95284
Justification of the choice of data or description of measurement methods and procedures actually applied :	The parameter is calculated by the Central Electricity Authority (CEA), Government of India following the "Tool to calculate the emission factor for an electricity system".
Any comment:	The parameter is calculated following the tool approved by UNFCCC by the Central Electricity Authority (CEA), Government of India. Consideration of the data from a government database will ensure the reliability of the parameter.

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

The *ex-ante* computation of emission reductions from the project activity is detailed below:

Computation of Baseline Emissions

The *ex-ante* computation baseline emissions will be as below:

$$BE_y = EG_{facility,y} \times EF_{grid,CM,y}$$

Where:

BE_y : Baseline Emissions in the year y (tCO_2e)

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

$EF_{grid,CM,y}$: Combined Margin CO_2 Emission Factor for grid connected power generation in the year y (tCO_2/MWh)

y : Any year within the crediting period of the project activity under consideration

As per the technical details of the project activity, the same is expected to supply a net electricity of around 92199MWh/annum to the NEWNE grid of India. Therefore,

$$EG_{facility,y} = 92199$$

The Combined Margin CO2 Emission Factor of the NEWNE grid has been determined *ex-ante* following the guidance of the "Tool to calculate the emission factor for an electricity system (Version 2.2.1)" and the same is found to be 0.95284 tCO_2/MWh (please refer to 'Annex-3: Baseline Information' for details). Therefore,

$$EF_{grid,CM,y} = 0.95284$$

Therefore, the *ex-ante* computation of baseline emissions will be:

$$BE_y = EG_{facility,y} \times EF_{grid,CM,y}$$
$$= 92199 \times 0.95284$$
$$= 87850$$

Computation of Project Emissions

As explained in Section B.6.1 of the PDD,

$$PE_y = 0$$

Computation of Emission Reductions

The *ex-ante* computation emission reductions will be as below:

$$ER_y = BE_y - PE_y$$

Where:

ER_y : Emission Reductions in the year y (tCO_2e)

BE_y : Baseline Emissions in the year y (tCO_2e)

PE_y : Project Emissions in the year y (tCO_2e)

y : Any year within the crediting period of the project activity under consideration

Therefore, the *ex-ante* computation of emission reductions will be:

$$ER_y = BE_y - PE_y$$
$$= 87850 - 0$$
$$= 87850$$

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

Table T8 – Summary of ex-ante estimation of emission reductions

Years	Estimation of project activity emissions (tonnes of CO_2e)	Estimation of baseline emissions (tonnes of CO_2e)	Estimation of leakage (tonnes of CO_2e)	Estimation of overall emission reductions (tonnes of CO_2e)
January 2013 – December 2013	0	87850	0	87850
January 2014 – December 2014	0	87850	0	87850
January 2015 – December 2015	0	87850	0	87850
January 2016 – December 2016	0	87850	0	87850
January 2017 – December 2017	0	87850	0	87850
January 2018 – December 2018	0	87850	0	87850
January 2019 – December 2019	0	87850	0	87850
January 2020 – December 2020	0	87850	0	87850
January 2021 – December 2021	0	87850	0	87850

January 2022 – December 2022	0	87850	0	87850
Total (tonnes of CO_2e)	**0**	**87850**	**0**	**87850**

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

Title: Consolidated monitoring methodology for grid-connected electricity generation from renewable sources

Reference: Approved Consolidated Monitoring Methodology ACM0002/Version 12.3.0 (Sectoral Scope: 01)

B.7.1 Data and parameters monitored:

Data / Parameter:	$EG_{facility,y}$
Data unit:	MWh
Description:	Quantity of net electricity generation supplied by the project activity plant to the grid in the year y
Source of data to be used:	Joint Meter Reading
Value of data applied for the purpose of calculating expected emission reductions in section B.5	92199
Description of measurement methods and procedures to be applied:	An ABT (Availability Based tariff) class meter as mandated by CERC will be installed at the Akal grid Sub Station , 220 KV incoming bus. Additionally, an ABT Class meter will be installed at the individual switchyard of each WTG to measure individual energy sent out by each WTG as they are a part of the larger wind farm at Dangri. For the purpose of billing, a joint meter reading will be done monthly, at the discretion of the Discom.. At the end of each billing cycle, the DISCOM will furnish an SLDC (State Load Despatch Centre) report based on the joint meter reading, which would be further used for invoicing.
QA/QC procedures to be applied:	The energy meters at Akal GSS and at individual WTG location will be calibrated regularly, at a frequency of atleast once every two years, . The said meters will be sealed by DISCOM in all the cases.
Any comment:	This data will be used for determining the power fed to the grid and hence

	the emission reductions. The data will be kept for two years after the end of the crediting period. The uncertainty level of the parameter will be low since the same will be monitored with energy meters having specifications as directed by the State Electricity Board.

B.7.2. Description of the monitoring plan:

The monitoring plan is being devised as per approved consolidated monitoring methodology ACM0002 Version 12.3.0

"Consolidated monitoring methodology for grid-connected electricity generation from renewable sources".

The methodology requires monitoring of the following parameters:

- Electricity generation from the proposed project activity; Data needed to recalculate the operating margin emission factor, if needed, based on the choice of the method to determine the operating margin (OM), consistent with "Consolidated baseline methodology for grid-connected electricity generation from renewable sources" (ACM0002);
- Data needed to recalculate the build margin emission factor, if needed, consistent with "Consolidated baseline methodology for grid-connected electricity generation from renewable sources" (ACM0002);

The details of the monitoring and metering arrangements for the project activity are as follows:

Metering

The SVL wind power Project at Rajasthan has four metering points:

a. LCS (Local Control System) meter installed by the WTG supplier known as WTG controller.

b. ABT class meters will be installed at every WTG switchyard

c. ABT class meters at the Pooling station

d. ABT class meters at the Grid substation

• The electricity supplied to the grid will be metered at the substation of the utility which will indicate both the energy sent out and energy imported. The joint meter reading (JMR) would be taken at the Akal Grid Substation in the presence of the PP and the Discom, and would be mutually signed. Simultaneously, the joint meter reading at backup metering system will also be taken by representatives of Discom and the PP. In case of any disputes, the reading on the backup meter will be taken for resolution.

• The WTG switchyard meter and the Pooling station meter will be used to validate the apportioning of electricity.

• The main and backup meters at the WTG switchyard, the pooling station and the grid substation will be two-way ABT class meters and measure the electricity import and export and give the net electricity. The main and backup meters are tri-vector meter of accuracy class of 0.2s. The Pooling station feeder meter, main meter and the backup meter at the substation will be calibrated at least once in every two years.

• In the event that the date of registration is in the middle of the month, while the statement showing energy generated/break up of net export units is issued on monthly basis. The apportioning will be carried out based on LCS data for CER estimation.

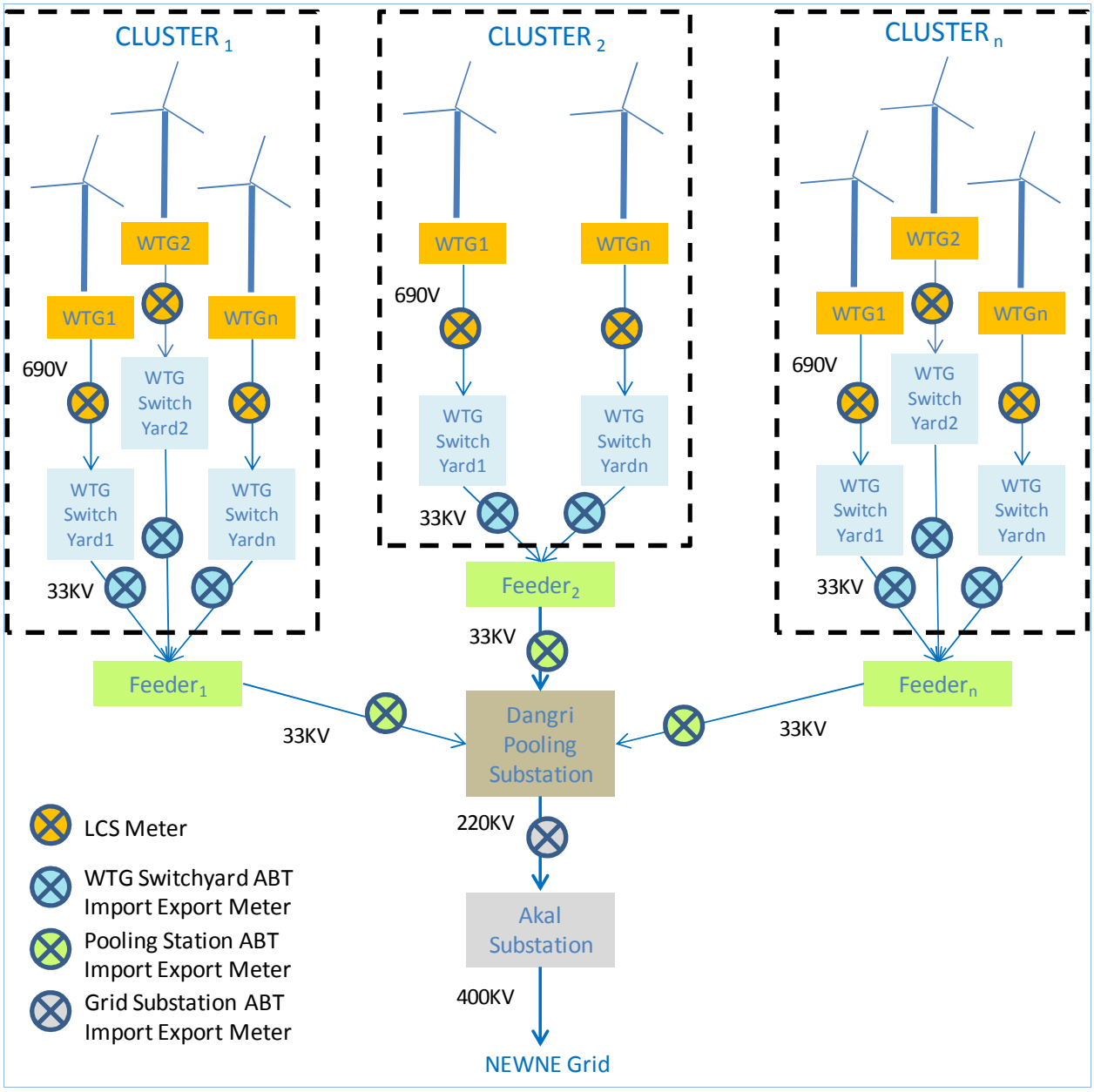

Exhibit E4 – Schematic Diagram of Metering Arrangement for Apportioning of Electricity

The description and representation of method apportioning of electricity, generated by the project proponent has been included only to bring clarity to the apportioning procedure. However, the same is not part of the monitoring plan of the of the project activity.

Calibration Procedure

Calibration of the ABT class meter attached at the pooling substation at Dangri, will be done by the Discom, at least once every two years at its discretion. The calibration of the ABT meter at the grid substation at Akal, will be governed by the terms of the contract with the Discom. Calibration will be carried out by Discom as per its own internal schedule. The LCS meters and WTG switchyard meters do not require calibration as such.

• The data will be cross checked with Joint Meter Readings.

• The meters at the grid substation will be jointly inspected / tested at least once every two years. The main and the backup metering systems are sealed in presence of representatives of the PP and the Discom. Joint inspection and testing will also be carried out as and when difference in monthly meter readings exceeds the sum of maximum error as per accuracy class of main and back up meters.

• In case the meters are found to operate outside the permissible limits, the meters will be either replaced immediately or calibrated. Whenever a main meter goes defective, the consumption recorded by the backup meter will be referred.

• If main as well as back up metering system becomes defective, the details of the malfunctioning along with date and time and snaps shot parameters along with load survey will be retrieved from the main meter. The exact nature of the malfunctioning will be determined after analyzing the data so retrieved and the consumption recorded by the main meter will be adjusted accordingly.

Accuracy of Data

• The uncertainty of the data is considered to be low as the monitoring equipment(s) are of reputed make. In case any of the meters is found faulty, then it is calibrated and correction is applied to the data.

Archiving of Data

Field data will be stored on computer electronically in the SCADA system to which all WTGs are connected, and archived at Project site. Monthly monitoring report will be made available at both the Project site and SVL's administrative office electronically. All data will be kept up to 2 years after the end of crediting period.

Monitoring roles and responsibilities.

The Project is to be commissioned by M/s GFL and managed by the PP. The operational and maintenance contract for the project would be signed with M/s Inox Wind Limited which is a group company of M/s GFL. Inox Wind Limited, is an ISO 9001:2000 certified Quality Management system. It follows the documentation practices to ensure the reliability and availability of the data for all the activities as required from the identification of the site, wind resource assessment, logistics, finance, construction, commissioning and operation of the wind power project.

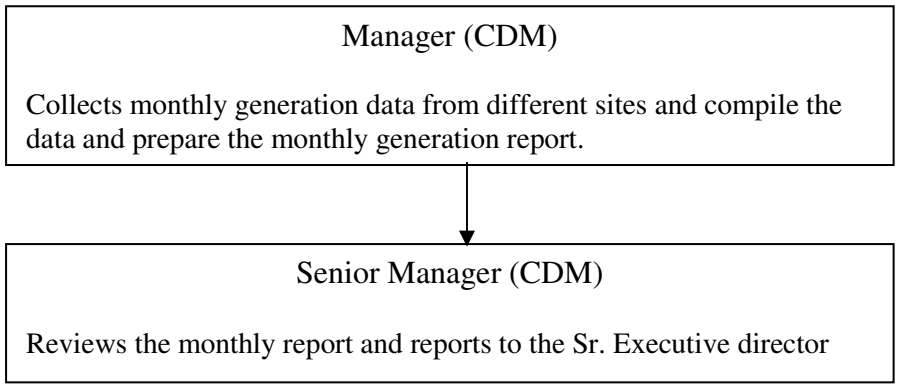

Exhibit E5- Monitoring Roles and Responsibility

Training & Implementation

Training on the machine is an essential pre-requisite, to ensure necessary safety of man and machine. Further, in order to maximize the output from the WTGs, it is extremely essential, that the engineers and technicians understand the machines and keep them in good health. In order to ensure, that Inox Wind Limited's service staffs is capable of handling technical snags on top of the turbine, the necessity of ensuring that they are capable of climbing the tower with absolute ease and comfort has been established. The training is contemporary, which results in imparting focused knowledge leading to value addition to the attitude and skills of all trainees. This ultimately leads to creativity in problem solving.

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

Parameter	Details
Date of completing the final draft of this baseline selection and monitoring plan	28/03/2012
Name of person/ entity determining the baseline and establishing the monitoring plan	Surya Vidyut Limited
Note: The contact information for the project proponent, Surya Vidyut Limited, is provided in Annex-1 of this Project Design Document (PDD).	

SECTION C. Duration of the project activity / crediting period

C.1. Duration of the project activity:

C.1.1. Starting date of the project activity:

The project has a future start date. The purchase orders are expected to be placed by 01/05/2012.

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

20 years 00 months

C.2. Choice of the crediting period and related information:

C.2.1. Renewable crediting period:

C.2.1.1. Starting date of the first crediting period:

Not Applicable.

C.2.1.2. Length of the first crediting period:

Not Applicable.

C.2.2. Fixed crediting period:

C.2.2.1. Starting date:

01/01/2013 or the date of registration of the project activity with UNFCCC or date of commissioning of the wind power project, whichever is later.

C.2.2.2. Length:

10 years 00 months

SECTION D. Environmental impacts

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

The host country - India and the Ministry of Environment & Forests (MoEF), Government of India do not require to carry out the 'Environmental Impact Assessment' for a wind power project as a statutory requirement as per its 'Environmental Impact Assessment (EIA) Notification dated 27th January, 1994 (and incorporating further amendments)[6]'. The project activity implementation is also expected to result in positive environmental impacts. The same has been detailed below:

Impact on air: The project activity entails installation of a wind power project and export of the electricity generated to the NEWNE grid of India. This will replace an equivalent electricity generation in the grid connected power plants. Since NEWNE grid of India is primarily dominated by thermal power generation, the project activity will reduce the emissions of CO_2-a potential greenhouse gas thereby reducing the negative impact of global warming. Further this will also improve the local air quality through reduction in emissions of SO_x, NO_x and Suspended Particulate Matter (SPM) associated with thermal power generation at the grid connected power plants.

Impact on water: Since wind power generation under the project activity would not require water for its operation, hence the project activity implementation will not have any impact on water quality.

Impact on soil: During the construction phase of the project activity, some soil movement is expected to facilitate erection of the Wind Turbine Generators (WTGs). However the impact is temporary and will be stabilized once the construction phase is over.

Impact on noise: The project activity is expected to generate some noise due to rotation of the turbine blades. However the noise level is not expected to exceed beyond the standards as specified by the host country-India for similar wind power projects.

[6] http://envfor.nic.in/divisions/iass/notif/eia.htm

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

As explained above, a detailed environmental impact assessment is not required to be undertaken for the project activity under consideration as per the host country regulations. Moreover, the comprehensive impact assessment, as explained above, clearly establishes that the project activity will have no major negative impact on the baseline environment. The project proponent, as a statutory requirement, will also comply with all the environmental standards prescribed by the Rajasthan State Pollution Control Board. The MoEF official web site does not include wind projects amongst the list of projects which is mandated to take environmental clearance from MoEF.

SECTION E. Stakeholders' comments

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

Surya Vidyut Limited (SVL), as a policy matter, considers the consultation of local stakeholders as an integral component of any new project implementation. Representatives of Surya Vidyut Limited (SVL) will identify and consult with the relevant stakeholders for their comments and approvals regarding such initiatives.

The following operating protocol has been followed by Surya Vidyut Limited (SVL) for stakeholder consultation for the project activity under consideration:

Identification of Stakeholders: Stakeholders have been broadly identified as entities who will be directly/indirectly involved at any stage of implementation and operation of the project activity and impacted there from. In line with this principle, Surya Vidyut Limited (SVL) has identified the following stakeholders:

- Local people
- Equipment Supplier and O&M Contractor - M/s GFL
- Employees of Surya Vidyut Limited (SVL)

The stakeholders were invited to participate in a meeting which was held on 17th February, 2012 in Jaisalmer district of Rajasthan through notice in a local newspaper, notices at various places in the nearby villages , and through letters of invitation.

Information Sharing: Salient information about the project activity are shared and explained to the identified stakeholders by the representatives of Surya Vidyut Limited (SVL) in a way that they clearly understand all the aspects of the project activity implementation. The stakeholders were requested to provide their feedbacks/opinions and suggestions to Surya Vidyut Limited (SVL) regarding the project activity.

Compilation of the comments received: The comments received from all the stakeholders are compiled by the representatives of Surya Vidyut Limited (SVL).

Follow up actions: After compilation of the comments received from various stakeholders, the same have been considered by the management of Surya Vidyut Limited (SVL) and necessary actions have been undertaken.

The following section will provide a detailed analysis of all the comments received from the identified stakeholders.

E.2. Summary of the comments received:

The feedback of the stakeholders has been very positive and encouraging. The local people are pleased with the employment opportunities being created in the region because of the project activity. All stakeholders appreciated the fact that the project activity would lead to abatement of greenhouse gas (GHG) emissions, and improve the energy security of India. The stakeholders believe that the project activity will lead to improvement in living standards, bring investment in the region, and lead to more stable proper supply.

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

The project activity has received only positive feedback from all the stakeholders as explained above. All of them supported the initiative and appreciated the project proponent for carrying out such an activity in the region. Hence no comments warranting any action from the project proponent were received.

Furthermore, as per the requirement of UNFCCC, the Project Design Document (PDD) will be web-hosted on the DOE's (Designated Operational Entity) website for a period of one month for global stakeholder consultation. The comments received by the Validator during the period of global stakeholder consultation will be properly addressed as a part of the CDM process.

Annex 1

CONTACT INFORMATION ON PARTICIPANTS IN THE PROJECT ACTIVITY

Organization:	Surya Vidyut Limited
Street/P.O.Box:	1, Chowringhee Square
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State/Region:	West Bengal
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Country:	India
Telephone:	+ 91-33-2225-6037
FAX:	+ 91-33-2225-5541
E-Mail:	-
URL:	-
Represented by:	
Title:	Executive Director
Salutation:	Mr.
Last name:	Chandak
Middle name:	-
First name:	B.L.
Department:	-
Mobile:	+91-98744-27000
Direct FAX:	+ 91-33-2225-5541
Direct tel:	+ 91-33-2204-0418
Personal e-mail:	blc@rp-sg.in

Annex 2

INFORMATION REGARDING PUBLIC FUNDING

No public funding from any of the Annex-1 countries is available for the project activity.Further it is clarified the project proponent has not availed any financial assistance from central government.

Annex 3

BASELINE INFORMATION

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

As per the methodology, in case of displacement of electricity from the grid, the 'Combined Margin CO_2 Emission Factor for grid connected power generation in the year y ($EF_{grid,CM,y}$)' shall be determined following the guidance provided in the "Tool to calculate the emission factor for an electricity system (Version 2.2.1)". In accordance with this guidance, the Central Electricity Authority (CEA) of Government of India has calculated the CO_2 emission factor for the NEWNE grid of India and the same is made available in the 'Baseline Carbon Dioxide Emission Database/Version 07. The emission factor of NEWNE grid, as published by CEA, will be followed for the computation of baseline emissions resulting from the project activity and the same will remain fixed for the entire crediting period. The step-wise approach followed for computation of the CO_2 emission factor of the NEWNE grid is presented below:

NEWNE grid consists of independent state level electricity systems including public sector undertakings that exchange significant power within the region depending on the demand. The overall power flows are managed by the Regional Load Despatch Centres (RLDC). According to the 'Tool to calculate the emission factor for an electricity system (Version 2.2.1)', the CO_2 emission factor for the NEWNE grid is calculated by the Central Electricity Authority (CEA) of Government of India as a Combined Margin (CM), comprising the Operating Margin (OM) emission factor and the Build Margin (BM) emission factor. The following procedure is adopted for estimating the CO_2 emission factor for the NEWNE grid:

Step-1: Calculation of the Operating Margin

Step-2: Calculation of the Build Margin

Step-3: Calculation of the CO_2 emission factor for the NEWNE grid (Combined Margin)

Step-1: Calculation of the Operating Margin

The 'Tool to calculate the emission factor for an electricity system (Version 2.2.1)' recommends the use of dispatch data analysis as the first methodological choice. However, in India availability of accurate data on grid system dispatch order for each power plant in the system and the amount of power dispatched from all plants in the system during each hour is practically not possible. Also, still the merit order dispatch system has not become applicable and is not likely to be so during the crediting period. In view of this, it is proposed to apply other choices as suggested in the 'Tool to calculate the emission factor for an electricity system (Version 2.2.1)'. Since the average power supplied by low cost - must

run power plants to the NEWNE grid during the five most recent years before the implementation of the project activity is 17.7% which is clearly below 50%, it is decided to apply the Simple OM method following the guidelines of the tool. The same can be validated with published records of the Central Electricity Authority of Government of India (available at: http://www.cea.nic.in/reports/planning/cdm_co2/user_guide_ver6.pdf) and is presented below:

Share of Must-Run (Hydro/Nuclear) (% of Net Generation)						
Grid	2006-2007	2007 - 2008	2008 - 2009	2009 - 2010	2010 - 2011	Average
NEWNE	18.5%	19.0%	17.4%	15.9%	15.64%	17.7%

Determination Simple OM

In the Simple OM method, the emission factor is calculated as generation weighted average emissions per electricity unit (tCO_2/MWh) of all generating sources serving the system, not including low-operating cost and must-run power plants. The data vintage option selected is the *ex-ante* approach, where a 3 year weighted average OM is calculated. The most recent three years data for the NEWNE grid, available at the time of submission of the CDM PDD to the DOE (*i.e.* data for 2007-2008, 2008-2009 and 2009-2010), has been considered for the computation of Simple OM. The same has been calculated as per the following guideline of the tool:

$$EF_{grid,OMsimple,y} = \frac{\sum_{i,m} FC_{i,m,y} \cdot NCV_{i,y} \cdot EF_{CO2,i,y}}{\sum_{m} EG_{m,y}}$$

Where:

$EF_{grid.OM\ simple,\ y}$ = Simple Operating Margin CO_2 emission factor in year y (tCO_2/MWh)

$FC_{i,\ m,y.}$ = Amount of fossil fuel type i consumed by power plant/unit m in the year y (mass or unit 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 the year y ($t\ CO_2/GJ$)

$EG_{m,\ y}$ = Net electricity generated and delivered to the grid by power plant/unit m in the year y (MWh)

m = All power plants / units serving the grid in year y excepts low-cost/ must-run power plants/ units

i = All fossil fuel types combusted in power plant/ unit m in year y.

y = Three most recent years for which data is available at the time of submission of the CDM- PDD to the DOE for validation (*ex-ante* option)

In accordance with this guidance, the Central Electricity Authority (CEA) of Government of India has calculated the Simple OM for the NEWNE grid and the same is made available in the 'Baseline Carbon Dioxide Emission Database/Version 06[7]'. The same is presented as below:

Determination of Simple Operating Margin Emission Factor ($EF_{grid, OM simple,y}$)					
Parameter	Unit	2008-09	2009-10	2010-11	Source/ Remarks
Simple Operating Margin Emission Factor - $EF_{grid.OM simple, y}$	tCO_2/MWh	1.00655	0.97774	0.97066	'Baseline Carbon Dioxide Emission Database/Version 06' published by Central Electricity Authority (CEA), Government of India
Net Generation in Operating Margin Including Imports	GWh	421,803	462,327	476,987	
Simple Operating Margin Emission Factor - $EF_{grid.OM simple, y}$	tCO_2/MWh	0.98419			

Step-2: Calculation of the Build Margin

The 'Tool to calculate the emission factor for an electricity system (Version 2.2.1)' provides two options for determination of build margin emission factor- *ex-ante* and *ex-post* determination of the

[7] Source: http://www.cea.nic.in/reports/planning/cdm_co2/user_guide_ver6.pdf

Build Margin (BM). For the project activity under consideration, the project proponent has selected Option-1 wherein the build margin emission factor is calculated *ex- ante* based on most recent information available on plants already built for sample group m in NEWNE grid at the time of submission of the CDM- PDD to the DOE for validation. The sample group m shall be the one having higher power generation between

(a) five power plants that have been built most recently and

(b) the capacity additions in the electricity system that comprises 20% of the system generation built most recently.

It is found that the option (b) has higher generation compared to option (a). Hence option (b) is selected. As per this guideline the Build Margin has been calculated for the most recent year (*i.e.* 2009-2010) at the time of submission of the CDM- PDD to the DOE for validation in accordance with the following formula:

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

Where:

$EF_{grid.BM,\,y}$ = Build Margin CO_2 emission factor in year y (tCO_2/MWh)

$EG_{m,\,y}$ = Net quantity of electricity generated and delivered to the grid by power unit m in year y (MWh)

$EF_{EL,m,\,y}$ = CO_2 emission factor of power unit m in year y (tCO_2/MWh)

m = Power units included in the build margin

i = All fossil fuel types combusted in power plant/ unit m in year y.

y = Most recent historical year for which power generation data is available at the time of submission of the CDM- PDD to the DOE for validation (*ex-ante* option)

In accordance with this guidance, the Central Electricity Authority (CEA) of Government of India has calculated the Build Margin for the NEWNE grid and the same is made available in the 'Baseline Carbon Dioxide Emission Database/Version 06[8]'. The same is presented as below:

Determination of Build Margin Emission Factor ($EF_{grid,BM,\,y}$)			
Parameter	Unit	2010-2011	Source/ Remarks
Build Margin Emission Factor - $EF_{grid,BM,\,y}$	tCO_2/MWh	0.85878	'Baseline Carbon Dioxide Emission Database/Version

[8] Source: http://www.cea.nic.in/reports/planning/cdm_co2/user_guide_ver6.pdf

			07' published by Central Electricity Authority (CEA), Government of India

Step-3: Calculation of Combined Margin Emission Factor

In accordance with the guidelines of the 'Tool to calculate the emission factor for an electricity system (Version 2.2.1)' for a wind power project replacing power generation from the grid, the 'Combined Margin CO_2 Emission Factor for grid connected power generation in the year y ($EF_{grid,CM,y}$)' is calculated as the weighted average of the OM and BM emission factors with 75% weightage for OM and 25% weightage for BM. As noted above, the resulting Combined Margin is calculated *ex-ante* as below and would remain fixed for the entire crediting period for the project activity under consideration.

$$EF_{grid,CM,y} = EF_{elec,gr,j,y} = (w_{OM} \times EF_{grid,OM\ simple,\ y} + w_{BM} \times EF_{grid,BM,\ y})$$

Where:

$EF_{grid,CM,y}$ = Combined Margin CO_2 Emission Factor for grid connected power generation in the year y (in tCO_2/MWh)

$EF_{grid,OM\ simple,\ y}$ = Simple Operating Margin CO_2 emission factor in year y (tCO_2/MWh)

$EF_{grid,BM,\ y}$ = Build Margin Emission Factor (in tCO_2/MWh)

w_{OM} = Weighing of Operating Margin Emission Factor (75%)

w_{BM} = Weighing of Build Margin Emission Factor (25%)

In accordance with this guidance, the Combined Margin Emission Factor for the NEWNE grid of India is calculated as below:

Determination of Combined Margin Emission Factor ($EF_{elec,i,j,\ y}$)			
Parameter	Unit	2009-2010	Source/ Remarks
CO_2 emission factor for the electricity source *i* (*i.e.* the NEWNE grid), displaced due to the project activity during the year y- $EF_{elec,gr,j,y}$	tCO_2/MWh	0.95284	Calculated

Computation of Emission Reductions (*ex-ante*)

CER Calculation		
Total number of WTGs	MW	25
Capacity of each WTG	MW	2
Project Capacity	no.	50
Plant Load Factor (PLF)	%	21.05%
Net Power Generation	MWh/annum	92199.00
Combined Margin Emission Factor	tCO2/MWh	0.95284
Baseline Emissions	**tCO2/annum**	**87850.54**
Project Emissions	**tCO2/annum**	**0**
Leakege Emissions	**tCO2/annum**	**0**
Ex-ante Emission Reduction	**tCO2/annum**	**87850**

Annex 4

MONITORING INFORMATION

The same has been mentioned in Section B.7 of the PDD

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Annexure-A: Action Plan for expenditure incurred through 2% of CER Revenues

Financial Year (A)	Activity (B)	Issued CERs (C)	CER Price (D)	Total CDM Revenue (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)
Year-'y'	(1)Infrastructural up- gradation of local primary schools and secondary schools. Say, 2 schools per year in converting the kutcha roof to RCC roof. (2) Other activities in consultation with village panchayats and the community. Say, construction of roads, toilets & wells *etc.* Adequate roads, 2 wells/ toilets per year.	87850 (approx.)	Say 'X'	87850 × 'X'	(1) 878.5 × 'X' (2) 878.5 × 'X'	0 0	(1) 878.5 × 'X' (2) 878.5 × 'X'	(1) 1% (2) 1%	Such expenditure will be made within one year after the realization of revenues from the sale of CERs. The details of such expenditure made will be included in the Monitoring Report for the period following the transaction. The same can be verified by the DOE at the time of verification through the Annual Report of the Company/a certificate from the statutory auditor/a certificate from a Chartered Accountant.
'y' is any year within the crediting period of the project activity under consideration (y=1 to 10).									

Annexure-B: Geographic Location of the Wind Turbine Generators (WTGs)

Turbine Number	Easting (m)	Northing (m)	Village
	UTM WGS84Z42R		
DANT6	732114	2940460	Chodiya
DANT7	731489	2940185	Chodiya
DANT8	731639	2939913	Chodiya
DANT13	732825	2940594	Chodiya
DANT14	732639	2940122	Chodiya
DANT15	733064	2939809	Chodiya
DANT17	734600	2940280	Dangri
DANT18	735116	2940217	Dangri
DANT19	736497	2940498	Dangri
DANT20	735181	2939201	Laxmansar
DANT21	735450	2938994	Laxmansar
DANT23	736343	2938961	Dangri
DANT77	745314	2932646	Dangri
DANT78	745259	2932962	Dangri
DANT79	746396	2933156	Dangri
DANT80	746315	2933767	Dangri
DANT130	746662	2939849	Dangri
DANT131	746614	2940529	Dangri
DANT135	748141	2940986	Dangri
DANT136	748196	2940624	Dangri
DANT142	750626	2940332	Dangri
DANT143	750190	2940349	Dangri
DANT144	749544	2941031	Dangri
DANT145	749503	2941410	Dangri
DANT146	749986	2941792	Dangri