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

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SECTION A. General description of project activity

A.1. Title of the project activity:

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Title : Wind power project in Maharashtra, India – Andhra Lake Phase - I
Version : 6
Date : 05/07/2012

A.2. Description of the project activity:

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Description of project

CLP Wind Farms (India) Private Limited (CLPWF), now onwards referred as the Project Proponent (PP) in this PDD, has developed a green-field wind based electricity generation project at Andhra Lake, Pune District, in the State of Maharashtra.

Project Proponent plans to eventually establish 113.6 MW wind farm in three phases. Currently Phase –I of 56.0 MW capacity and Phase-II of 50.4 MW capacity has been commissioned. Phase-III of 7.2 MW is under development. Project activity under this PDD refers to development of 56.0 MW (Andhra Lake Phase - I) and will be referred as the Project in this PDD.

The Project would install 70 number of Enercon (India) Limited (EIL) make E-53 Wind Turbine Generators (WTGs) to generate electrical power for export to the distribution licensee. In the baseline scenario, the similar quantum of electricity would have been generated by the operation of grid-connected power plants and by the addition of new generation sources that would have led to emission of Green House Gases (GHGs).

Emission Reductions from anthropogenic sources

The electricity generated from the Project activity would displace the electricity generated from thermal power stations feeding into the regional grid. Since the electricity generation using wind power is GHG emissions free, the power generated from the Project will reduce the anthropogenic GHG emissions generated by fossil fuel based thermal power stations comprising coal, diesel, furnace oil and gas. Thus the proposed Project activity leads to an emission reduction of greenhouse gases over the chosen crediting period.

View of the Project Participants on the contribution of the Project activity to sustainable development

Ministry of Environment and Forests, Govt. of India has stipulated the following indicators for sustainable development in the interim approval guidelines for CDM projects[1]:

- ***Social well being***

→ The Project activity shall contribute towards generating employment opportunities for the local inhabitants during the installation and operation of the project activity.

→ The Project will lead to development of the road and telecommunication network and improvement in the local infrastructure that would boost the development and social upliftment of the region.

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

- ***Economic well-being***

→ The Project activity will bring in a substantial investment into the region that will contribute to the local economy as well as set an example to other industries over the suitability of the region for investment.

→ The Project activity would improve the grid frequency and availability of electricity to the local consumers which would further provide opportunities for industries and economic activities to be setup in the area resulting in greater local employment and overall development of the region.

→ The Project activity would contribute to resource conservation by reducing the pressure on dwindling reserves of fossil fuels. By reducing the demand for these expensive fossil fuels, the project would minimize the fiscal load on the national economy from these imports.

- ***Environmental well being***

→ The Project would utilize wind energy for generating electricity that would otherwise have been generated through alternate fossil fuel based power plants, contributing to reduction in GHG emissions and thereby contributing to the mitigation of climate change resulting from increased anthropogenic emissions of GHG.

→ As wind power projects produce no end products in the form of solid waste (ash etc.), they address the problem of solid waste disposal encountered by most other sources of power.

- ***Technological well being***

→ The Project activity would utilize gearless synchronous generator based EIL make E-53 WTGs for generation, which are designed for conditions specific to India. Thus the project activity is propagating the latest technology, which is comparable with best practices in the renewable wind based energy sector anywhere in the world. Hence the project leads to technological well-being.

→ The project activity would generate electricity through a technology that is environmentally safe and sound.

The National CDM Authority – India requires CLPWF to commit 2% of the revenue from the sale of CERs every year for activities related to Sustainable Development including society/community development and has accordingly made an action plan for the same, which is included in Appendix 1.

A.3. Project participants:

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Name of Party involved (*) ((host) indicates a host party)	Private and/or public entity (ies) Project participants (*) (as applicable)	Kindly indicate if the party involved wishes to be considered as project participant (Yes/No)
Government of India (Host Country)	CLP Wind Farms India Private Limited (Private entity)	No

A.4. Technical description of the project activity:

A.4.1. Location of the project activity:

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A.4.1.1.	Host Party(ies):

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Country: India

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

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State: Maharashtra

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

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District: Pune
Taluka: Khed & Maval
Site: Andhra Lake

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

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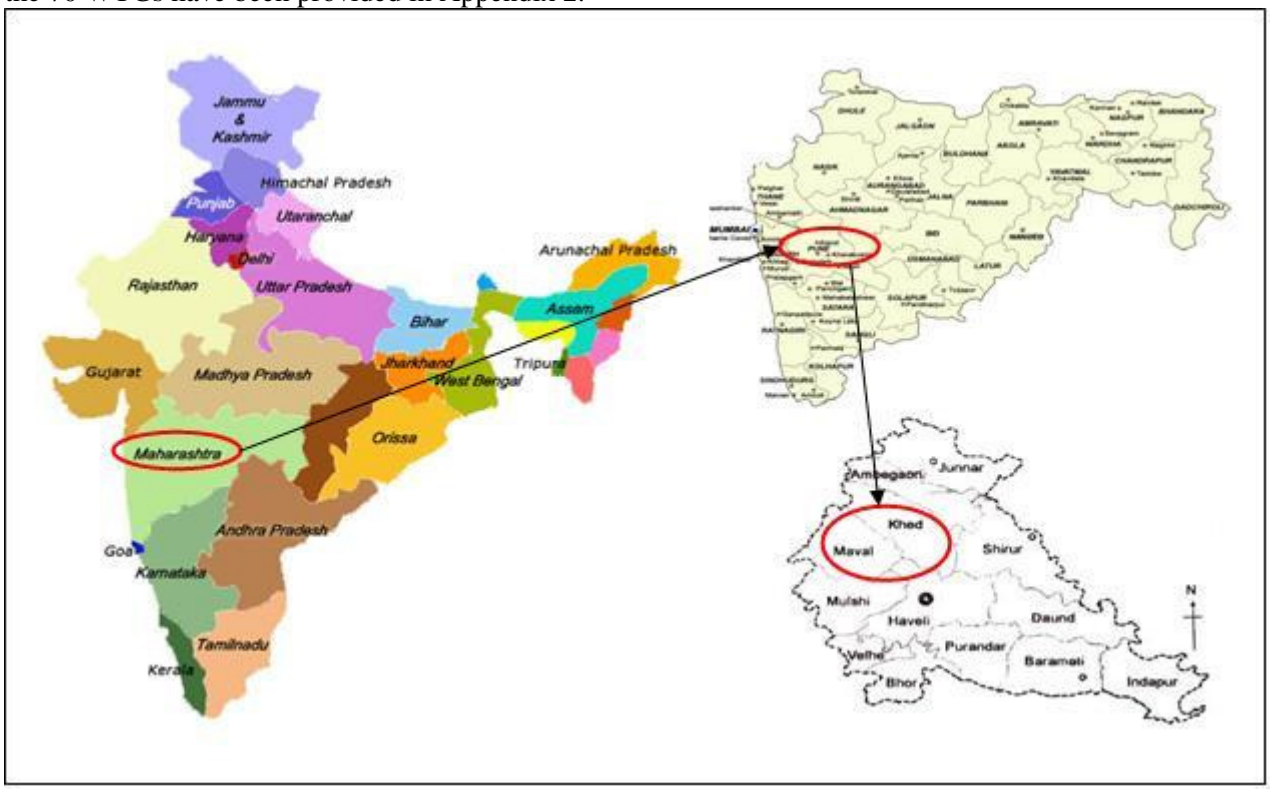
The Project activity is located in the Khed and Maval taluk of Pune district in Maharashtra. The nearest airport and railway station is in Pune city. The geographical coordinates (Latitudes and Longitudes) of the 70 WTGs have been provided in Appendix 2.



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

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The Project activity is considered under "*Grid-connected electricity generation from renewable sources*", with a capacity more than 15 MW. Therefore as per the scope of the project activity enlisted in the 'list of sectoral scopes and related approved baseline and monitoring methodologies', the Project activity may principally be categorized in:

Scope Number: 1
Sectoral Scope: Energy Industries (renewable/non-renewable sources).
Methodology: ACM0002 - "Consolidated baseline methodology for grid-connected electricity generation from renewable sources" *(Version 12.3.0)*

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

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The project activity involves the installation of 70 numbers of EIL make E-53 WTGs to utilize the kinetic energy present in wind to generate electrical power for export to the grid. Each individual WTG has a rating of 800 kW and the technical specifications of the same are provided below:

Technical Data for Enercon E-53 WTG[2]

Rated output	: 800 kW
Rotor diameter	: 52.9 m
Hub height	: 72-74 m
Lifetime of WTGs	: 20 years
Number of blades	: 3
Swept area	: 2198 m²
Blade material	: Fibre glass (reinforced epoxy)
Rotor speed	: 12- 29 RPM
Tip speed	: 81.9 m/s (maximum)
Pitch system type	: Continuous variable pitching mechanism
Generator type	: Synchronous
Main Bearing Type	: Tapered roller alloy steel
Braking System	: 3 independent brakes with power back up supply
Yawning system type	: Active yawing with 4 electric yaw drives
Cut-in Wind Speed	: 3 m/s
Cut-out wind speed	: 28-34 m/s
Rated Wind Speed	: 12.6 m/s
Tower	: Concrete Tubular, 74 m height

These turbines are supplied by EIL and are designed for particular wind conditions. The technology for the same is environmentally safe and sound and there is no technology transfer involved in the same.

The WTGs are connected to the main meter at the substation. Data monitoring takes place at the WTG end and also using main meter at the substation. The electricity metered at the substation main meter is

[2] E-53 Product Brochure available on http://www.enerconindia.net/our-product.jsp#

proportionally divided among all the customers connected to the meter on the basis of the prorate readings taken at the WTG end.

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

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Years	Annual estimation of emission reductions in tonnes of CO_2 e
Year 1	84,461
Year 2	84,461
Year 3	84,461
Year 4	84,461
Year 5	84,461
Year 6	84,461
Year 7	84,461
Total estimated reductions (tonnes of CO_2e)	**591,227**
Total number of crediting years	**7**
Annual average over the crediting period of estimated reductions (tonnes of CO_2 e)	84,461

A.4.5. Public funding of the project activity:

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There is no recourse to any public funding by CLPWF in the proposed Project activity. The Project Proponent hereby confirms that there is no diversion of Official Development Assistance (ODA) to the proposed 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:

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Title of the baseline methodology: "Consolidated Baseline Methodology for grid-connected electricity generation from renewable sources".

Reference: ACM0002, Version 12.3.0 (Sectoral Scope: 01)

It has been referred from the list of approved methodologies for CDM project activities in the UNFCCC CDM website (http://cdm.unfccc.int/methodologies/PAmethodologies/approved.html).

The approved methodology also draws upon Version 6.0.0 of the "Tool for demonstration and assessment of additionality" . The baseline for the said Project activity is determined using the "Tool to calculate the Emission Factor of an electricity system" (Version 02.2.1).

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

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Sr. No	Applicability criterion	Justification
1	This methodology is applicable to grid-connected renewable power generation project activities that (a) install a new power plant at a site where no renewable power plant was operated prior to the implementation of the project activity (greenfield plant); (b) involve a capacity addition; (c) involve a retrofit of (an) existing plant(s); or (d) involve a replacement of (an) existing plant(s).	The Project activity involves installation of a new wind power project at a site where no renewable power plant was operated prior to the implementation of the project activity (Greenfield plant). Hence, it meets the requirement.
2	The project activity is the installation, capacity addition, retrofit or replacement of a power plant/unit of one of the following types: hydro power plant/unit (either with a run-of-river reservoir or an accumulation reservoir), wind power plant/unit, geothermal power plant/unit, solar power plant/unit, wave power plant/unit or tidal power plant/unit;	The Project activity involves the installation of a wind power plant. Hence, it meets the requirement.
3	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	Not applicable to the Project activity as the project is a Greenfield setup and does not involve capacity additions, retrofits or replacements.

	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;	
4	In case of hydro power plants: • At least one of the following conditions must apply: o The project activity is implemented in an existing single or multiple reservoirs, with no change in the volume of any of the reservoirs; or o The project activity is implemented in an existing single or multiple reservoirs, where the volume of any of reservoirs is increased and the power density of each reservoir, as per the definitions given in the Project Emissions section, is greater than 4 W/m^2 after the implementation of the project activity; or o The project activity results in new single or multiple reservoirs and the power density of each reservoir, as per the definitions given in the Project Emissions section, is greater than 4 W/m^2 after the implementation of the project activity.	Not applicable to the Project activity. The Project activity involves installation of a wind power plant.
5	In case of hydro power plants using multiple reservoirs where the power density of any of the reservoirs is lower than 4 W/m^2 after the implementation of the project activity all of the following conditions must apply: • The power density calculated for the entire project activity using equation 5 is greater than 4 W/m^2; • All reservoirs and hydro power plants are located at the same river and were designed together to function as an integrated project that collectively constitutes the generation capacity of the combined power plant; • The water flow between the multiple reservoirs is not used by any other hydropower unit which is not a part of the project activity;	Not applicable to the Project activity as the project is a Greenfield setup and does not involve capacity additions, retrofits or replacements.

	• The total installed capacity of the power units, which are driven using water from the reservoirs with a power density lower than 4 W/m^2, is lower than 15 MW; • The total installed capacity of the power units, which are driven using water from reservoirs with a power density lower than 4 W/m^2, is less than 10% of the total installed capacity of the project activity from multiple reservoirs.	
6	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; • A hydro power plant that results in the creation of a new single reservoir or in the increase in an existing single reservoir where the power density of the power plant is less than 4 W/m2.	Not applicable to the Project activity. The Project activity involves installation of a wind power plant.
7	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 retrofits, replacements, or capacity additions and hence this criteria is not applicable.
8	In addition, the applicability conditions included in the tools referred to above apply.	All the applicability conditions included in the tools referred to above have been applied to and complied with.

Thus, as evident from the justifications presented in the table above, the application of the aforementioned methodology for this CDM Project activity is justified.

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

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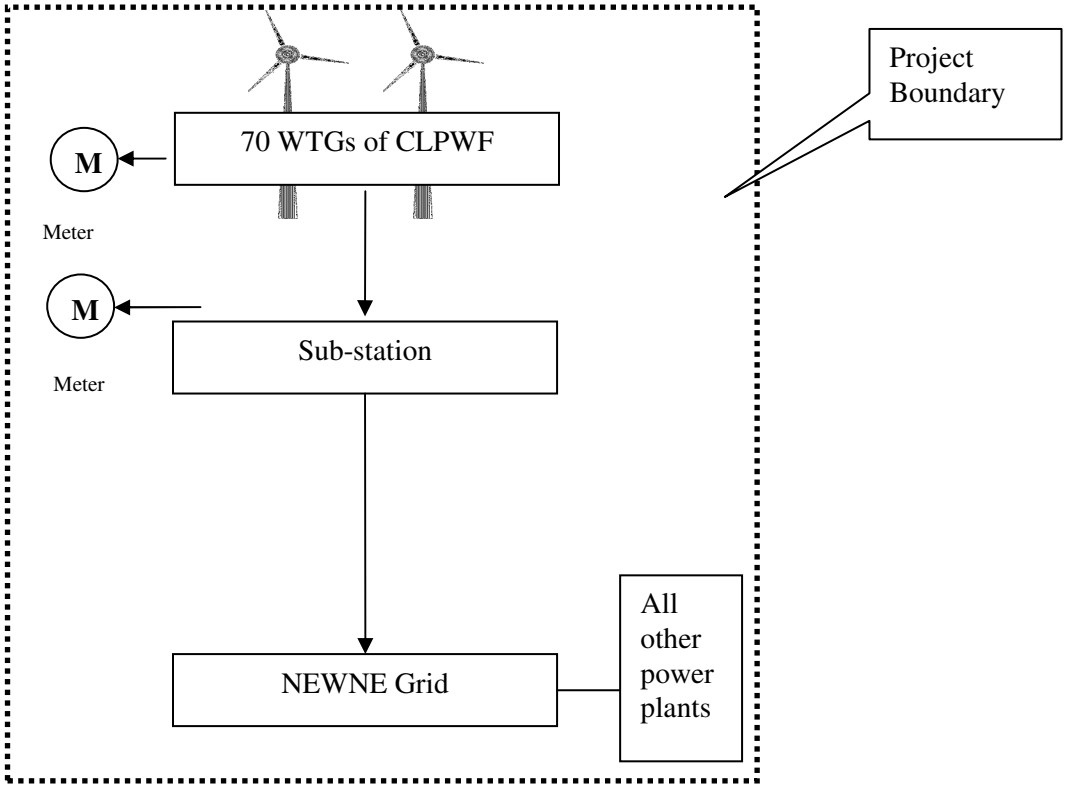
The project boundary for the Project activity is selected in accordance with the guidance provided in the applied methodology ACM0002 Version 12.3.0. The determination of the spatial extent of the project boundary includes the Project site and all power plants connected physically to the electricity system that the Project is connected to.



The Project activity has a distinctive physical demarcated boundary. According to the methodology ACM0002 the following gases are to be considered for the boundary:

	Source	Gas	Included?	Justification / Explanation
Baseline	CO_2 emissions from electricity generation in fossil fired power plants that are displaced due to the project activity.	CO_2	Yes	The Project activity is aimed at displacing the grid power, and thus reducing the CO_2 emissions resulting from the power generation.
		CH_4	No	Minor mission source
		N_2O	No	Minor mission 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 for wind projects
		CH_4	No	Not applicable for wind projects
		N_2O	No	Not applicable for wind projects

	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 for wind projects
		CH_4	No	Not applicable for wind projects
		N_2O	No	Not applicable for wind projects
	For hydro power plants emissions of CH_4 from the reservoir	CO_2	No	Not applicable for wind projects
		CH_4	No	Not applicable for wind projects
		N_2O	No	Not applicable for wind projects

As the Project activity is a wind power project, the baseline emissions are only the CO_2 emissions from the power plants displaced by the Project activity and there are no project emissions to be considered.

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

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

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

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

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

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

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In accordance with the "Guidelines on the demonstration and assessment of prior consideration of the CDM" Version 04, CLPWF notified the National Clean Development Mechanism (CDM) Authority - India, the Host Party DNA and the UNFCCC Secretariat on 25th August 2009 in writing of the commencement of the Project activity and of their intention to seek CDM status for it. T he PP has sent the revised prior consideration forms on 13 February 2012 after splitting the project activity in three phases.

The start date for the Project is 16th of September 2009, the date on which Notice to Proceed (NTP) was issued by Project Participant to EIL and thus made Project Participant financially committed towards the implementation of project. The Notice to proceed was issued post intimation to UNFCCC. Hence, prior consideration of CDM is demonstrated by Project Participant for this Project activity.

Further, the PP had also appointed a CDM consultant for the Project activity on 14th May 2009. Subsequently, the PDD development was initiated for the entire project of 113.6 MW. However, due to various delays in obtaining regulatory clearances, the PP decided to split the Project into various phases for the purpose of implementation and CDM registration. Later, on 5 April 2011, the DOE was appointed to conduct the validation of the first phase under CDM.

The additionality of the Project is ascertained in line with the applicable guidance from the UNFCCC. Accordingly the decision 17/cp.7, paragraph 43 is consulted; which states a CDM project activity is additional if anthropogenic emissions of greenhouse gases by sources are reduced below those that would have occurred in absence of registered CDM project activity.

The demonstration of the additionality of the said Project activity is being carried out in accordance with the additionality tool provided by the UNFCCC i.e. "*Tool for demonstration and assessment of Additionality"* Version 6.0.0 , EB 65.

This tool provides a step-wise approach to demonstrate additionality, which is dealt with below:

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

Sub-step 1a: Define alternatives to the project activity:
Identify realistic and credible alternative(s) available to the project participants or similar project developers that provide outputs or services comparable with the proposed CDM project activity.

The proposed Project activity envisages the installation of 70 WTGs of Enercon make supplied and each WTG has a capacity of 800 kW. The total installed generation capacity of the Project activity is 56 MW. As the purpose of the Project activity is to generate electrical power to be fed to the grid, the following alternatives are considered:

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

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

Alternative 2: No proposed project activity and equivalent amount of energy would have been produced by the grid electricity system through its currently running power plants and by new capacity addition to the grid i.e. Continuation of the present situation.
The PP would have continued without investment in Project activity with usual business activities. The grid would continue with the fossil fuel based power projects and this would result in GHG emissions. Hence, the new capacity add-on from a fossil fuel based power plant is appropriate, realistic & credible baseline alternative for the project activity.

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

Sub-step 1b: Consistency with mandatory laws and regulations:
The alternative(s) shall be in compliance with all applicable legal and regulatory requirements, even if these laws and regulations have objectives other than GHG reductions, e.g. to mitigate local air pollution. (This sub-step does not consider national and local policies that do not have legally-binding status.).

The relevant national laws and regulations pertaining to generation of energy in India are:
- Electricity Act 2003
- National Electricity Policy 2005
- Tariff Policy 2006

The Project activity conforms to all the applicable laws and regulations in India:
- Power generation using wind energy is not a legal requirement or a mandatory option. There are state and sectoral policies, framed primarily to encourage wind power projects. These policies have also been drafted realizing the extent of risks involved in the projects and to attract private investments.
- The Indian Electricity Act, 2003 (May 2007 Amendment) does not influence the choice of fuel used for power generation.
- There is no legal requirement on the choice of a particular technology for power generation.

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

Step 2. Investment analysis
Determine whether the proposed project activity is economically or financially less attractive than at least one other alternative, identified in step 1, without the revenue from the sale of certified emission reductions (CERs). To conduct the investment analysis, use the following sub-steps:

Sub-step 2a: Determine appropriate analysis method

The Project activity envisages to export the power to NEWNE grid and the revenues from the sale would be generated in accordance with the terms and tariffs established in the Power Purchase Agreement (PPA). Thus, simple cost analysis cannot be used as the analysis method as the sale of the units of generated electricity shall result in a revenue stream during the operations of the Project activity.

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

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

The investment analysis using Benchmark analysis (Option III) is determined to be the most accurate indicator of the financial attractiveness of the Project. Further, this method illustrates the evaluation of the Project by the Project Proponent before the decision to undertake the project was taken and management approval granted.

Internal Rate of Return (IRR) is one of the known financial indicators used by banks, financial institutions and project developers for making investment decisions. PP has hence identified Equity IRR as the financial indicator for the Project and carried out an investment analysis of the Project activity.

The benchmark has been determined in accordance with para 6(a) sub step 2b of the "Tool for demonstration and assessment of additionality" Version 6.0.0 i.e. *Government bond rates increased by a suitable risk premium to reflect private investment and / or project type*.

The cost of equity for the Project has been calculated using the Capital Asset Pricing Model (CAPM). As per CAPM, the cost of equity investment is the return of a risk-free security plus beta times the difference between the market return and the risk-free return.

While considering a new project, CAPM can provide the required rate of return that the project needs to yield, taking into account the volatility (risk) of the stock relative to the market (Beta). This required return on equity represents the cost of equity benchmark for the project.

The formula of CAPM is as follows:

$$\mathbf{R_i = R_f + \beta\ (R_m - R_f)}$$

where:

R_i	=	Rate of return on equity;
R_f	=	Risk-free rate of return;
β	=	Beta or systematic risk for this type of equity investment coefficient reflecting the volatility (risk) of the stock relative to the market;
R_m	=	Expected market returns
$R_m - R_f$	=	Market risk premium;

"Guidelines on the Assessment of Investment Analysis" (EB 62, Annex 5), paragraph 13, states that "*In the cases of projects which could be developed by an entity other than the project participant, the*

benchmark should be based on parameters that are standard in the market." Since the project activity could have been implemented by an entity other than the PP, the benchmark return on equity has been calculated taking values from publically available and reliable data sources that are frequently used in investment analysis, namely the websites of Reserve Bank of India, Bombay Stock Exchange, Interest Rates on Central and State Government Dated Securities have been referred from Reserve bank of India records. Thus, all the data sources utilized for benchmark computation are publically available and are values that are standard in the market.

Further, the "Guidelines on the Assessment of Investment Analysis" (EB 62, Annex 5, paragraph 15, states, "*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*". In line with this guidance, the cost of equity has been determined through option (b) by using the best financial practices in the country based on publically available and reliable data sources which can be clearly validated by the DOE.

Risk free rate:
Risk free rate = 8.3698%
Note: The above value considered is average for a period of 12 months from August 2007 to July 2008 based on latest data available at the time of decision making i.e. Sep 2008 (Web Link: http://rbidocs.rbi.org.in/rdocs/Bulletin/PDFs/86853.pdf)

Beta (β) Value:
The β in the CAPM equation helps to account for the systematic risk by quantifying the sensitivity of the stocks of the companies representing a particular project type/sector with the market returns. Thus, it incorporates the risk of a specific sector in the calculation of the cost of equity. The Beta value taken for this analysis is based on the beta values of the listed power companies engaged in similar business at the time of investment decision (16/09/2008) estimated by regressing monthly returns (from Sep 2003 to August 2008) on stock against local index BSE Sensex for a period of 5 years or from the date of listing if the listing happened at a later date.

Company Name	Equity Beta (Levered)	Debt to Equity Ratio	Tax Rate (%)	Asset Beta (Unlevered)
CESC	1.0884	0.36	11.29%	0.83
GIPC	1.2261	0.60	19.36%	0.827
JHPL	1.4988	0.81	11.33%	0.875
Neyveli Lignite	1.4778	0.31	34.48%	1.229
BF Utilities	2.9988	0.71	12.29%	1.849
NTPC	0.8357	0.52	24.02%	0.600
Tata Power	1.3490	0.41	12.67%	0.995
Reliance Infrastructure	1.4524	0.46	11.90%	1.035
Average Beta				**1.030**

In order to understand the standard market returns, it is essential to consider a wide range of companies. Hence an attempt to study the beta values of companies with relatively significant investment in power sector including renewable and non-renewable energy has been done.

Conventional (Thermal and Large Hydro) power projects are a more attractive investment option as compared to non-conventional (renewable energy power projects) projects, primarily because of the lower risks that such project activities face as compared to renewable energy projects and in particular wind power projects. Conventional power plants supply firm power, operate on higher Plant Load Factor (PLF) and are not subject to the vagaries of nature as wind power plants. Wind power projects on the other hand operate at much lower PLF and have much higher capital costs. Thus, from the perspective of a private investor, investments in thermal power plants are a safer option.

Hence it is assumed that such companies with significant investments in non-renewable energy projects face lower risk as compared to the wind power developers. Thus, as the use of the beta value for companies with significant investment in non-renewable power projects is representative of the returns generated in the baseline scenario and is also conservative, the same has been considered appropriate for the analysis. The average beta value of companies after unlevering has been estimated as **1.03** and the same has been used for further analysis.

$R_m - R_f$ (Market Risk Premium)

The market risk premium is the return that an investor expects over and above the risk free return available in the market. The market risk premium has been estimated using historical approach. This can be defined as the historical differential return of the market and the risk-free rate. The most common method of calculating this is the difference between historical return of the stock market index and the historical return of the risk free rate. Accordingly we have calculated market risk premium as the historical return on the stocks (using the BSE Sensex[3] Index) minus the return on government securities. This would give the incremental returns over and above the risk free rate.

Market Rate of Return (R_m)

= (14564.53/100)^(1/29.42) -1

= 18.45%

(Calculations provided in the excel sheet)

Market Risk Premium

18.45% - 8.3698%

= 10.08%

Rate of return on equity or cost of equity benchmark is

$R_i = R_f + \beta (R_m - R_f)$

= 8.3698% + 1.03 x 10.08%

= 18.75%

Hence the benchmark for equity IRR of the Project is the Cost of equity of companies engaged in similar business as that of the Project which is calculated as 18.75%

The equity internal rate of return for the proposed Project activity without CDM revenues was computed for a period of 20 years, corresponding to the lifetime of the wind farm based on the following assumptions[4] including various benefits available to the Project activity from the National and Sectoral policies for promoting renewable energy generation in India.

The key assumptions used to calculate the equity IRR are listed below:

Particulars	Value	Unit	Source
Project details			
No. of wind turbines	70	Nos	Internal Assumption based on presentation submitted to Investment committee meeting dated 16/09/2008.
Capacity of each wind turbine	0.8	MW	Enercon offer letter
Capacity of the project	56	MW	Calculated
Energy generation			
Net Generation	890.28[5]	Lakh units[6]	Apportioned value from Long Term Annual Energy Output Estimate (LTAEOE) by Hydro Tasmania Consulting April 2010 for E-53 machines. Total no. of machines in wind farm = 142
CUF	18.15	%	Apportioned value from Wind assessment study by Hydro Tasmania Consulting April 2010 for E-53 machines. Total no. of machines in wind farm = 142
Capital expenditure			
Project cost	30,800	INR Lakhs	Calculated on the basis of offer
WTG cost	440	INR Lakh/WTG	Enercon offer letter [7]
Debt	70	%	MERC tariff order dated 24 Nov 2003 - Group III - (New) Projects
Equity	30	%	MERC tariff order dated 24 Nov

[4] The Investment analysis includes various benefits available to the project activity from the national and sectoral policies for promoting renewable energy generation in India such as accelerated depreciation, tax holidays etc.

[5] Total Capacity assessed as a part of LTAEOE study was 113.6 MW comprising of 142 WTGs of capacity 0.8 MW each . The Net generation for this project activity (consisting of 56 MW/70 WTGs) has been derived by apportioning the estimated net generation value as [180.6GWh * (56MW/113.6MW)] = 89.028 GWh *i.e* 890.28 Lakh units

[6] 1 unit = 1 kWh

[7] Offer letter mentions the cost Rs 460 Lacs /WEC with Rs 20 Lacs/WEC as infrastructure development cost (Refundable)

			2003 - Group III - (New) Projects
Debt	21,560	INR Lakhs	Calculated Value
Equity	9,240	INR Lakhs	Calculated Value
Loan			
Interest rate	12.50	%	MERC tariff order dated 24 Nov 2003 - Group III - (New) Projects
Debt tenure	10	Years	MERC tariff order dated 24 Nov 2003 - Group III - (New) Projects
Moratorium	1	Year	MERC tariff order dated 24 Nov 2003 - Group III - (New) Projects
Operation and maintenance costs			
Operation and Maintenance (first year) per WTG	0	INR Lakhs	Enercon offer letter
Operation and Maintenance (2nd year) per WTG	5	INR Lakhs/WTG /annum	Enercon offer letter
Escalation in O & M (3 to 20)	5	%	Enercon offer letter
Service tax on O & M fees	12.36	%	Enercon offer letter
Insurance cost			
Insurance cost per turbine	0.22	INR Lakhs	Insurance premium payments for similar project
Insurance cost for the project	15.43	INR Lakhs	Insurance premium payments for similar project
Tariff	3.50	INR/kWh	MERC tariff order dated 24 November 2003, Group III project
Escalation in Tariff YoY till 13th Year	0.15	INR/kWh	MERC tariff order dated 24 November 2003, Group III project
Depreciation			
Depreciation Rate (Book)	5.28	%	Rate specified in Indian Companies Act, Schedule XIV, II Plant & Machinery (b) for continuous process plant. Wind power project is considered to be continuous process plant.
IT Depreciation Rate	7.69	%	Indian IT Act - Rule 5(1A)
Generation based incentive			
GBI	0.50	INR/kWh	MNRE GBI Guidelines
GBI cumulative cap	62.00	INR Lakhs per MW	MNRE GBI Guidelines
Max. GBI allowed in a year	15.50	INR Lakhs per MW	MNRE GBI Guidelines
Max. GBI allowed in a year	868.00	INR Lakhs	Calculated
GBI cumulative cap	3472.00	INR Lakhs	Calculated

Max duration for GBI	10	years	MNRE GBI Guidelines
Income tax			
Income tax rate	33.99	%	IT Act
MAT rate	11.33	%	IT Act
Service Tax	12.36	%	Finance Act
Terminal Value	10	%	Industry best practice

S.I units Conversion:
1 Lakh INR= 100,000 INR
1 Lakh units= 100,000 kWh

The base case equity IRR has been calculated as 7. 89%.

The equity IRR for the Project activity was calculated in accordance with the "Guidelines on the Assessment of Investment Analysis" Version 6.0.0 as demonstrated below:

General issues in calculation and presentation:

Guidance: *The period of assessment should not be limited to the proposed crediting period of the CDM project activity. Both project IRR and equity IRR calculations shall as a preference reflect the period of expected operation of the underlying project activity (technical lifetime), or - if a shorter period is chosen - include the fair value of the project activity assets at the end of the assessment period. In general a minimum period of 10 years and a maximum of 20 years will be appropriate. The IRR calculation may include the cost of major maintenance and/or rehabilitation if these are expected to be incurred during the period of assessment. Project participants are requested to justify and DOEs are requested to validate the appropriateness of the period of assessment in the context of the underlying project activity, without reference to the proposed CDM crediting period.*

→ The period of assessment has been chosen as the operational life of the Project activity i.e. 20 years which also satisfies the criteria of the maximum period of 20 years in accordance with the above guidance. The IRR calculation has been done to include the cost of operation and maintenance that would be incurred during the period of assessment in accordance with the Warranty Operations & Maintenance Agreement that has been signed with Enercon (India) Limited.

Guidance: *The fair value of any project activity assets at the end of the assessment period should be included as a cash inflow in the final year. The fair value should be calculated in accordance with local accounting regulations where available, or international best practice. It is expected that such fair value calculations will include both the book value of the asset and the reasonable expectation of the potential profit or loss on the realization of the assets.*

→ The assessment period has been considered for the same duration as the operational life of the Project activity i.e. 20 years. The book value of the Project activity assets calculated in accordance with the accounting procedures and rates mentioned in the Companies Act at the end of this period

is also zero. Hence, no cash inflow on account of the salvage value at the end of assessment period has been considered in the financial analysis.

Guidance: *Depreciation, and other non-cash items related to the project activity, which have been deducted in estimating gross profits on which tax is calculated, should be added back to net profits for the purpose of calculating the financial indicator (e.g. IRR, NPV). Taxation should only be included as an expense in the IRR/NPV calculation in cases where the benchmark or other financial indicator is intended for post-tax comparisons.*

→ Depreciation and all other non-cash items related to the Project activity were added back to net profit for the purpose of calculating the equity IRR. Tax has been included as an expense in the equity IRR calculation since the benchmark i.e. cost of equity calculated using the CAPM model is intended only for post-tax comparisons.

Guidance: *Input values used in all investment analysis should be valid and applicable at the time of the investment decision taken by the project participant. The DOE is therefore expected to validate the timing of the investment decision and the consistency and appropriateness of the input values with this timing. The DOE should also validate that the listed input values have been consistently applied in all calculations.*

The input values such as project cost and O&M expenses used in the investment analysis are as per the actual agreements signed with EIL on 29th September 2008.

Guidance: *In the case of project activities for which implementation ceases after the commencement and where implementation is recommenced d*^{ue} *to consideration of the CDM the investment analysis should reflect the economic decision making context at point of the decision to recommence the project. Therefore capital costs incurred prior to the revised project activity start date can be reflected as the recoverable value of the assets, which are limited to the potential reuse/resale of tangible assets.*

→ The implementation of the Project activity did not cease at any point of time after the initial decision for investment in the project after consideration of revenues from CDM was made on 26th September 2008.

Guidance: *Project participants should supply spreadsheet versions of all investment analysis. All formulas used in this analysis be readable and all relevant cells be viewable and unprotected. The spreadsheet will be made available to the Executive Board, UNFCCC secretariat and others contracted to assess the request for registration on behalf of the Board including assigned members of the Registration and Issuance Team. In cases where the project participant does not wish to make such a spreadsheet available to the public an exact read-only or PDF copy shall be provided for general publication. In case the PP wishes to black-out certain elements of the publicly available version, a clear justification for this shall be provided to the UNFCCC secretariat by the DOE when requesting registration.*

→ The spreadsheets for calculation of equity IRR as well as the benchmark (cost of equity) are being made available to the DOE as well as the Executive Board, UNFCCC secretariat and others contracted to assess the request for registration on behalf of the Board including assigned members

of the Registration and Issuance Team with all formulae used in a readable, viewable and unprotected format.

Specific Guidance on the Calculation of Project IRR and Equity IRR:

Guidance: *The cost of financing expenditures (i.e. loan repayments and interest) should not be included in the calculation of project IRR.*

→ Project IRR has not been selected as the financial indicator for the Project activity. The equity IRR has been calculated for the Project activity and assessed with the benchmark for the Project activity i.e. cost of equity. Hence, the financing expenditures i.e. loan repayments and interest on debts were considered in the calculations.

Guidance: *In the calculation of equity IRR only the portion of investment costs which is financed by equity should be considered as the net cash outflow, the portion of the investment costs which is financed by debt should not be considered a cash outflow.*

→ In the calculation of equity IRR, only the part of the project cost that was financed by equity was considered as a cash outflow.

Using the assumptions in the tables above and referring to the guidance by the EB as demonstrated above, the equity IRR for the Project activity is found to be 7.89%, which clearly depicts the fact that the Project activity is not very attractive as an investment option since the returns are much below the selected benchmark. From the analysis above, it is also clear that the Project activity does not meet the stipulated benchmark without the CDM revenues and is hence additional.

Sub-step 2c: **Sensitivity Analysis:**

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

S.No.	Parameters	Variation	Equity IRR	Breakeven point
Project scenario			**7. 89%**	
1.	PLF/Net Generation	+10 %	10.30%	43.8%
		-10 %	5.50%	

2.	Project Cost	+10 %	5.91%	-31.8%
		-10 %	10.37%	
3.	Tariff	+10 %	9.78%	53.9%
		-10 %	6.05%	
4.	O&M cost	+10 %	7.59%	-403. 0%
		-10 %	8.19%	

The above sensitivity analysis shows the IRR for the Project does not exceed the benchmark even after variation of generation, O&M costs and Project cost hence establishing that the financial analysis presented above is robust to variations in critical parameters.

Step 4: Common practice analysis

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

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

Output: As per paragraph 7, "power generation" may be considered to be the output in the context of the project activity. Further as per Step 1 of paragraph 47 of the same tool, the applicable output range will be 28 MW to 84 MW, i.e. ±50% of installed capacity of the project activity (56 MW)

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

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

The capacity of the project activity is 56 MW. The project capacity has been subject to the variation in the range of +/- 50%, the following table depicts the outcome of the variation applied. Hence, the applicable output range will be 28 MW to 84 MW, i.e. ±50% of installed capacity of the project activity

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

India has been considered applicable geographical area as a default, for the common practice analysis of project activity. All power plants generating electricity within the capacity range of 28 MW to 84 MW and having commercial operations date before project activity start date (16/09/2009) have been considered in this analysis. The power generation plants identified in this step are hydro, thermal, nuclear, biomass based, solar and wind power projects. The total number of power plants in the applicable output range = 411.

Category of Power plants	No. of Projects
Thermal	155
Hydro	233
Wind	6
Nuclear	0
Solar	0
Biomass	17
Total (N_{all})	**411**

Therefore N_{all} =411.

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

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

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

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

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

Category of Power plants	No. of Projects
Thermal	155
Hydro	233

Wind	0
Nuclear	0
Solar	0
Biomass	17
Total (N_{diff})	**405**

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*

N_{all}	411
N_{diff}	405
$N_{all} - N_{diff}$	6
$F = 1-N_{diff}/N_{all}$	0.0146

The factor F and N_{all}-N_{diff} is calculated and following values are arrived at;
F = 0.0146;
N_{all}-N_{diff} = 6;

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

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

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

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

Sr. No.	Event	Reference	Date
1.	Offer Letter received from Technology Supplier	Enercon offer letter	15/07/2008
2.	Receipt of Long Term Annual Energy Output Estimate from Hydro Tasmania Consulting (HTC)	Hydro Tasmania Consulting (HTC) report	12/09/2008
3.	Board Decision to implement the 113.6 MW project	Board resolution by CLP	26/09/2008
4.	Signing of Facilitation Agreement with technology Supplier #	Facilitation Agreement	29/09/2008
5.	Appointment of CDM Consultant by the PP	Engagement letter	14/05/2009

6.	UNFCCC & DNA intimation for the 113.6 MW project (Initial)	Prior Consideration forms sent to UNFCCC and DNA	25/08/2009
7.	Notice to proceed to technology supplier for the project (Start Date)#	NTP from CLP to Enercon	16/09/2009
8.	Local stakeholders consultation meeting	Minutes of the Meeting and Attendance sheet	19/02/2010
9.	Appointment of DoE	DOE engagement letter	01/04/2011
10.	Global stakeholder process initiation (web hosting of PDD)	UNFCCC	31/08/2011
11.	Commissioning of the Project	Commissioning certificates	28/12/2011
12.	Revised UNFCCC & DNA Intimation for the project *	Prior Consideration Forms	13/02/2012

* - Initially, the project was conceptualized as a single 113.6 MW CDM project. However, due to various delays in obtaining regulatory clearances, the PP decided to split the project into three phases of 56.0 MW, 50.4 MW and 7.2 MW viz. Andhra Lake-I, Andhra Lake-II and Andhra Lake-III projects respectively. The UNFCCC and DNA (MoEF, Government of India) were informed about the same.

The PP had taken an investment decision on 26/09/2008 and signed a Facilitation Agreement with the technology supplier on 29/09/2008. As per the one of the conditions precedent (Clause 2.3 (c)) of the facilitation agreement, the technology supplier shall not commence the works for the project until the Company (i.e. PP) has issued a Notice To Proceed (NTP). On failing to issue a NTP, the Facilitation Agreement shall terminate automatically and the technology supplier. In such cases, Facilitation Agreement is a non-binding to supplier as well as to the project proponent and it does not create any financial or any other type of commitment or obligation to PP. PP's commitment for the Project Activity starts after issuance of NTP also their expenditure related to construction of project activity starts after issuance of NTP. The PP had issued a Notice to Proceed to the technology supplier on 16/09/2009. As per the "Glossary of CDM terms", the start date of a CDM project activity is the earliest date at which either the implementation or construction or real action of a project activity begins. Thus, the date of issue of NTP has been considered as start date for the project activity and not the date of signing of facilitation agreement with the technology supplier.

B.6. Emission reductions:

B.6.1. Explanation of methodological choices:

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Project emissions (PE_y)

According to the chosen baseline methodology ACM0002 Version 12.3.0, For most renewable power generation project activities, $PEy = 0.$, $PE_y = 0$.

Baseline Emissions (BE_y)

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

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

Where:

BE_y	Baseline emissions in year y (tCO_2e/yr)
$EG_{PJ,\ y}$	Quantity of net electricity generation that is produced and fed into the grid as a result of the implementation of the CDM project activity in year y (MWh/yr)
$EF_{grid,\ CM,\ y}$	Combined margin CO_2 emission factor for grid connected power generation in year y calculated using the latest version of the "Tool to calculate the emission factor for an electricity system" (tCO_2e/MWh)

Calculation of $EG_{PJ,\ y}$

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

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

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

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

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

Where:

$EG_{PJ,\ y}$	*Quantity of net electricity generation that is produced and fed into the grid as a result of the implementation of the CDM project activity in year y (MWh/yr)*
$EG_{facility,\ y}$	*Quantity of net electricity generation supplied by the project plant/unit to the grid in year y (MWh/yr)"*

$$EG_{facility,\ y} = EG_{export,y} - EG_{import,y}$$

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

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

As per version 2.2.1 of Tool to calculate emission factor for an electricity system, following steps are included in the calculation of the emission factor for the baseline scenario:

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

STEP 6: Calculate the combined margin (CM) emissions factor.

The Central Electricity Authority (CEA) has published CO_2 baseline database in its version 6.0 (March, 2011). The values for OM, BM, CM are given excluding and including imports. For the present project activity, including imports are considered.

Step 1: Identifying the relevant electricity system

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

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

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

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

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

Step 3: Selection of an Operating Margin method

The project proponent wishes to use the Simple Operating Margin (OM) method for the estimation of the baseline. The use of the Simple OM method is justified as the share of the low cost/ run resources constitute less than 50% of the total grid generation. The data pertaining to the total grid generation and the low/cost must run resources have been included in Annex 3 of this PDD.

	2005-06	2006-07	2007-08	2008-09	2009-10
NEWNE	18.0%	18.5%	19.0%	17.4%	15.9%
South	27.0%	28.3%	27.1%	22.8%	20.6%
India	20.1%	20.9%	21.0%	18.7%	17.1%

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

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

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

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

The data provided by the Central Electricity Authority (CEA), an official data source has been relied upon for the calculation of the OM. The same has been detailed in Annex 3. The latest version of the database, Version 6 (March, 2011) has been used. The OM calculations have been based upon generation data, fuel consumption and the Gross Calorific value (GCV) of the fuel.

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

Assumptions

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

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

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

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

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

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

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

Calculation Approach

The Simple OM has been calculated using the following formula:

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

Where:

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

As per Annex 3, the last 3 year generation values are 0.9993, 1.0066 and 0.9777.

The 3-year generation-weighted average was taken and the same has been derived as $EF_{grid,OM,y} = 0.9942$

Step 5: Calculate the build margin emission factor

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

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

Where:

$EF_{grid, BM, y}$	Build margin CO_2 emission factor in year y (tCO_2e/MWh)
$EG_{m, y}$	Net quantity of electricity generated and delivered to the grid by power unit m in year y (MWh)
$EF_{EL, m, y}$	CO_2 emission factor of power unit m in year y (tCO_2e/MWh)
m	Power units included in the build margin
y	Most recent historical year for which power generation data is available

As described above, the Build Margin would be calculated annually during the entire crediting period. For the purpose of ex-ante emission reduction calculations the most recent data available (from CEA for 2009-10) has been used and the build margin thus calculated is 0.8123

Therefore, $EF_{grid,BM,y} = 0.8123$

Step 6: Calculation of the combined Build Margin emission factor

The combined margin emission factor will be calculated as follows:

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

Where,

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

As per the 'Tool to calculate the Emission Factor for an electricity system' version 2.2.1, the default values for w_{OM} and w_{BM} are taken as 0.75 and 0.25 respectively as per the guidance provided for wind project activities for the first crediting period and subsequent crediting periods.

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

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

Project Emissions

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

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

Where:

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

Leakage Emissions

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

Emission reductions

Emission reductions are calculated as follows:

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

Where:

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

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

Data / Parameter:	**$EF_{OM,y}$**
Data unit:	tCO_2/MWh
Description:	Operating Margin emission factor for NEWNE grid
Source of data used:	Referred from CO_2 Baseline Database for the Indian Power Sector prepared by Central Electricity Authority, Version 6.0.
Value applied:	0.9942
Justification of the choice of data or description of measurement methods and procedures actually applied :	Calculated it as CEA sourced data 3 years vintage data (2007-08, 2008-09 and 2009-10) and option of ex ante calculation based on Simple Operating Margin Method. Computed once during PDD finalization.
Any comment:	The value has been fixed ex-ante.

Operating Margin Estimation for NEWNE Grid (tCO_2 / GWh)		
Year	**Operating Margin (tCO_2e/GWh)**	**Net Generation (GWh)**
2007-08	0.9999	401.642
2008-09	1.0006	421,8063
2009-10	0.9777	458,043
Generation Weighted Average OM	**0.9942 tCO_2e / MWh**	

Data / Parameter:	**$EF_{BM,y}$**
Data unit:	tCO_2/MWh
Description:	Build Margin emission factor for NEWNE grid
Source of data used:	Referred from CO_2 Baseline Database for the Indian Power Sector prepared by Central Electricity Authority, Version 6.0.
Value applied:	0.8123
Justification of the choice of data or description of measurement methods and procedures actually applied :	Calculated as per CEA sourced data for the year 2009-10.
Any comment:	The value has been fixed ex-ante.

Data / Parameter:	**$EF_{grid, CM, y}$**
Data unit:	tCO_2/MWh

Description:	Combined Margin CO_2 emission factor for NEWNE grid
Source of data used:	Estimated figure based on 75% of OM and 25% of BM values
Value applied:	0.9487 tCO_2/MWh
Justification of the choice of data or description of measurement methods and procedures actually applied :	Calculated as per CEA sourced data with 3 years vintage data and option of ex ante calculation based on 75% of OM and 25% of BM values approach. Computed once during PDD finalization.
Any comment:	The value has been fixed ex-ante.

Combined Margin Estimation for NEWNE Grid (tCO_2e / MWh)	
Generation Weighted Average OM ($EF_{grid, OM,y}$)	**0.9942**
BM ($EF_{grid, BM, y}$)	**0.8123**
Combined Margin (EF_{CO2})	**0.9487**

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

>>

The ex-ante calculations for the estimation of annual emission reductions

Number of WTGs	70	Nos.
Capacity of individual WTG	0.8	MW
Net PLF	18.15%	%
Net Generation from the project ($EG_{facility,y}$)	89.028	GWh
Baseline emission factor NEWNE grid (EF_y) $EF_{grid, CM, y} = w_{OM} * EF_{grid, OM, y} + w_{BM} * EF_{grid, BM, y}$ = (0.75 x 0.9942) + (0.25 x 0.8123)	0.9487	tCO_2/GWh
Baseline Emissions $BE_y = EG_{PJ,y} * EF_{grid,CM,y}$= 0.9487 x 82.23 x 1000	84,461	tCO_2
Project Emissions (PE_y)	0	tCO_2
Leakage Emissions (L_y)	0	tCO_2
Emission Reduction (ER_y) $ER_y = BE_y - PE_y - L_y$	84,461	tCO_2

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

>>

Year	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)
Year 1	0	84,461	0	84,461
Year 2	0	84,461	0	84,461
Year 3	0	84,461	0	84,461
Year 4	0	84,461	0	84,461

Year 5	0	84,461	0	84,461
Year 6	0	84,461	0	84,461
Year 7	0	84,461	0	84,461
Total (tonnes of CO_2 e)	**0**	**591,227**	0	**591,227**

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

B.7.1 Data and parameters monitored:

Data / Parameter:	$EG_{export,y}$
Data unit:	MWh/yr
Description:	Quantity of electricity exported by the Project to the grid in year *y*
Source of data to be used:	Joint Meter Reading Sheets and generation reports issued by Maharashtra State Electricity Distribution Co. Ltd. (MSEDCL) for all the feeders to which WTGs of the project activity are connected. $EG_{export, y}$ will be summation of readings of individual Joint Meter Reading Sheets.
Value of data applied for the purpose of calculating expected emission reductions in section B.5	89, 028 MWh/yr
Description of measurement methods and procedures to be applied:	The PP shall duly install the approved ABT meters with accuracy class of 0.2 s with online metering features at the metering point (Main Meter). The PP will also install Check meter with separate CT/PT of class 0.2s. Quantity of electricity exported by the Project to the grid would be calculated using the sum of readings taken at the main/check meter installed at the interconnection points. The WTGs of CLPWF would be connected to the main meter of accuracy class 0.2s at the substation. Data monitoring would take place at the substation on a continuous basis and will be recorded on at least monthly basis. On the basis of these readings taken, a generation report would also be issued by MSEDCL.
QA/QC procedures to be applied:	The readings from main and check meters installed at the interconnection point will be checked every month at the time of metering of electricity generation. In case the meters are found to be operating beyond the permissible limits, it shall be immediately sent for calibration. The frequency of meter testing will be annual. It would be prudent to note that the meter testing and calibration is not within the control of the Project Proponent.
Any comment:	The data will be kept for two years after the end of the crediting period or the last issuance of CERs for this Project activity, whichever occurs later.

Data / Parameter:	$EG_{import,y}$
Data unit:	MWh/yr
Description:	Quantity of electricity imported by the Project from the grid in year *y*
Source of data to be used:	Joint Meter Reading Sheets and generation reports issued by Maharashtra State Electricity Distribution Co. Ltd. (MSEDCL) for all the feeders to which WTGs of the project activity are connected. $EG_{import, y}$ will be summation of readings of individual Joint Meter Reading Sheets.
Value of data applied for the purpose of	0 MWh/yr

calculating expected emission reductions in section B.5	
Description of measurement methods and procedures to be applied:	The PP shall duly install the approved ABT meters with accuracy class of 0.2 s with online metering features at the metering point (Main Meter). The PP will also install Check meter with separate CT/PT of class 0.2s. Quantity of electricity exported by the Project to the grid would be calculated using the sum of readings taken at the main/check meter installed at the interconnection points. The WTGs of CLPWF would be connected to the main meter of accuracy class 0.2s at the substation. Data monitoring would take place at the substation on continuous basis and will be recorded on at least a monthly basis. On the basis of these readings taken, a generation report would also be issued by MSEDCL.
QA/QC procedures to be applied:	The readings from main and check meters installed at the interconnection point will be checked every month at the time of metering of electricity generation. In case the meters are found to be operating beyond the permissible limits, it shall be immediately sent for calibration. The frequency of meter testing will be annual. It would be prudent to note that the meter testing and calibration is not within the control of the Project Proponent.
Any comment:	The data will be kept for two years after the end of the crediting period or the last issuance of CERs for this Project activity, whichever occurs later.

Data / Parameter:	$EG_{facility,y}$
Data unit:	MWh/yr
Description:	Quantity of net electricity generation supplied by the project plant/unit to the grid in year *y*
Source of data to be used:	Joint Meter Reading Sheets and generation reports issued by Maharashtra State Electricity Distribution Co. Ltd. (MSEDCL) for all the feeders to which WTGs of the project activity are connected.
Value of data applied for the purpose of calculating expected emission reductions in section B.5	89, 028 MWh/yr
Description of measurement methods and procedures to be applied:	Net electricity supplied will be calculated as the difference of electricity exported to and imported from the grid measure using the readings taken at the main/check meter installed at the interconnection point. $EG_{facility,y} = EG_{export,y} - EG_{import,y}$ Joint Meter Reading Sheets and generation report issued by Maharashtra State Electricity Distribution Co. Ltd. (MSEDCL) on a monthly basis shall be used for this purpose.
QA/QC procedures to be applied:	The value of this parameter can be cross checked with all the invoices generated for the sold electricity during the year y.
Any comment:	The data will be kept for two years after the end of the crediting period or the last issuance of CERs for this Project activity, whichever occurs later.

B.7.2. Description of the monitoring plan:

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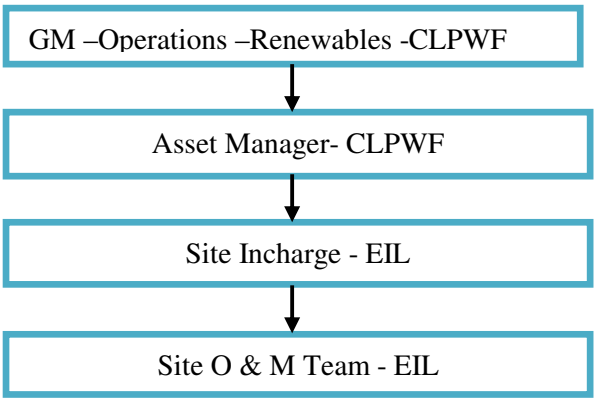
The monitoring plan has been formulated according to the approved consolidated monitoring methodology in ACM0002 Version 12.3.0.

CLPWF has entered into a comprehensive Operation and Maintenance agreement with the manufactures of the WTGs for a period of 10 years, which is extendable at renegotiated terms. The contractor EIL, under the O&M contract with CLPWF would be responsible for the operation and maintenance of the Project activity for the entire crediting period. The O&M personnel will be qualified engineers and will be trained at the WTG manufacturing facility of EIL for operating and ensuring best performance of the WTGs.

The authority and responsibility of project management as well as registration, monitoring, measurement and reporting lies with the PP. CLPWF has formulated a Project Team to ensure proper and continuous monitoring of the performance of turbines and generation of power. The operation and management structure implemented by the PP for the purpose of the Project activity is illustrated below:



The Project activity essentially involves generation of electricity from wind, the employed WTG can only convert wind energy into electrical energy and cannot use any other input fuel for electricity generation.

Frequency of meter reading: The meters installed at the metering point will have 15 minutes block online reading. However, the main/check meter reading at the metering point will be undertaken jointly by the representative of the MSEDCL and authorized officials of the PP on 1st day of every month for the preceding month.

Data archiving

Data will be archived electronically. The data would be archived two years after crediting period or last issuance whichever is later.

Calibration of Meters

The readings from main and check meters installed at the interconnection point will be checked every month at the time of metering of electricity generation. In case the meters are found to be operating beyond the permissible limits, it shall be immediately sent for calibration. The frequency of meter testing will be annual.

Apportioning of electricity: In case dates of monitoring period do not match with the dates of Joint Meter Reading Sheets / Generation reports issued by Maharashtra State Electricity Distribution Co. Ltd. (MSEDCL)
Apportioning will be carried out based on ratio of generation data recorded using LCS meters installed at the WTG. The LCS meters do not require calibration as the energy readings of electricity generated at the LCS meter is cross verified by the energy calculated by inverting system installed in the WTGs.

The emission reductions of that particular period (from the date of registration of the project till the end of the month) will be calculated based on percentage generation of that particular period at WTG using LCS data multiplied with the total units generated in the month as per the Joint Meter Reading Sheets / Generation report issued by Maharashtra State Electricity Distribution Co. Ltd. (MSEDCL).

The sample calculation is furnished below:
Generation from CLPWF WTGs for the monitoring period = A (From LCS data)
Generation from CLPWF WTGs for the billing period = B (From LCS data)
Net energy exported from CLPWF WTGs for the billing period = C (JMR/Generation share report by MSEDCL)
Net energy export used for calculation of emission reduction for the monitoring period = (C * A / B)

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

>>

Date of completion of the application of the baseline study *(DD/MM/YYYY)*: 26/08/2011

Name of person/entity determining the baseline: CLP Wind Farms (India) Private Limited

CLPWF has determined the baseline for the Project activity. The entity is also the project participant listed in Annex-I where the contact information has also been provided.

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:

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16/09/2009
The start date of the Project activity has been considered as the date when the WTG supplier Enercon (India) Limited was granted the authorization by CLP Wind Farms (India) Private Limited to proceed with works for the project. Since this notice to proceed represents the commitment to expenditures by the PP, it is in accordance with the definition of start date by the CDM EB in its 41st meeting which states that '*the start date shall be considered to be the date on which the project participant has committed to expenditures related to the implementation or related to the construction of the project activity*'.

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

>>
20 years 0 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:

>>
01/08/2012

CLPWF confirms that the crediting period will not start before the registration of the Project activity.

C.2.1.2. Length of the first crediting period:

>>
7 years 0 months

C.2.2. Fixed crediting period:

C.2.2.1. Starting date:

>>
Not Applicable

C.2.2.2. Length:

>>
Not Applicable

SECTION D. Environmental impacts

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

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The Ministry of Environment and Forests (MoEF), Government of India notification[8] S.O. 3067 (E) dated December 01, 2009 regarding the requirement of Environment Impact Assessment (EIA) studies as per the Environment Protection Rule, 1986 (Published in the Gazette of India, Extraordinary, Part-II, and Section 3, Sub-section (ii) MINISTRY OF ENVIRONMENT AND FORESTS) states that any project developer in India needs to file an application to the Ministry of Environment and Forests (including a public hearing and an EIA) in case the proposed industry or project is listed in a predefined list.

Wind parks are not included in this notification and thus an Environment Impact Assessment is not required for the Project activity. Further, the Project activity does not have any significant impact on the environment.

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

>>

As discussed above, the Project activity would not have any adverse environmental impacts. The Project activity does not fall under the purview of the Environmental Impact Assessment (EIA) notification of the Ministry of Environment and Forest, Government of India. Hence EIA is not required to be undertaken by the host party.

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

SECTION E. Stakeholders' comments

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

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The Project activity is the installation of a greenfield wind farm in Maharashtra to supply electricity to the grid. The local stakeholders identified in the Project activity include the local villagers and representatives of village governing body, the suppliers of the WTGs i.e. Enercon (India) Limited, the state electricity distribution company i.e. Maharashtra State Electricity Distribution Co. Ltd and the employees of CLPWF.

The stakeholders who would be affected directly/indirectly by the project implementation were identified and invited to a meeting though invitation letters for discussing the impacts of the entire 113.6 MW Project activity. The meeting was conducted on 19th February 2010 at Mouli Bunglow, Hotel Sheetal, Vadgaon-Urse Phata, Vadgaon, Pune for which invitation were sent out in advance on 1st February 2010. A record of the people attending the meeting was maintained and all comments from the stakeholders received during the meeting were recorded.

E.2. Summary of the comments received:

>>

The stakeholders for the Project activity were invited through a meeting conducted on 19th February 2010 to discuss the benefits of the Project activity and address any concerns they might have regarding its impacts on them.

Mr. Kishor Ahire of Enercon (India) Limited welcomed the gathering and explained the purpose of the meeting. He explained in the vernacular language about global warming and its effects through audio and video presentations. Mr. Ahire went on to explain the need for wind power projects which operate from a renewable source like wind to produce green, pollution free energy and their valuable contribution towards reducing global warming and minimizing power scarcity of the power deficient state like Maharashtra.

Mr. Peyush Tandon welcomed all the stakeholders and gave an overview of the operations of CLPWF. He also explained how CLPWF was into the business of setting up of wind power projects in India and as a part of their ongoing programme they plan to establish the Andhra Lake Wind Power Project in Khed / Maval taluka in Pune District. Mr. Tandon assured the gathering that all efforts would be made to take into confidence the Villagers / stake holders during the process of the moving ahead with the project.

Mr. Manpreet Singh then highlighted purpose of conducting the CDM stakeholder meeting. During his address he explained the effects of emission of CO_2 gases due to industrialisation, generation of power from conventional power plants like thermal & diesel power plants which have an adverse effect on the climate. He also emphasized on how the rise in temperature is causing the ice at the poles to melt, leading to increase in sea water level and submergence of terrestrial region along the sea coast.

A summary of the comments received and how they were addressed is provided below:

Comment	Response
Mr. Jagjeevan Mouduiya (Village Name Somatane): There are so many forest ridges in our area. Are you installing WTGs on all ridges?	No. Because before installing any wind Power project, there are wind flow analysis & studies which are carried out and based on Wind Flow assessment, we select the area/ridges. The nearby MSETCL infrastructure (transmission line) is taken in to consideration as the same is required for evacuation of Power generated from the Wind Power Project.
Mr. Sambhaji Kadu (Village Name Kondiwade): Do Wind Energy machines affect the rainfall?	There is lot of difference between the altitude of installed machine and clouds. The Proposed WTGs are on 50/75 mtr height and clouds are above 2000 mtr height. Rain is natural phenomenon and is not affected or stopped by WTGs. It has been established that there is no relation between the function of the wind Mills and the Rains.
Mr. Bhausheb Khomme (Village name Sai): How do you compensate the deforestation caused due to your project?	There is no appreciable de-forestation as the construction of the wind Power project is not done on continuous expanse of the land. The construction is done only for the Approach roads and the Area where the WTG has to be installed. However as a statutory requirement, an equivalent extent of the land has been handed over to the forest department for the purpose of Afforestation Plantation. Statutory payment has also been paid for the same.
Mr. S.R. Sarpate (Village name Pimpali): How are the villages benefited by the Electricity generated by WPP?	Power is generated from different source in the state is supplied through distribution lines to the villages MSEDCL. By feeding Electricity from the project to the State Grid, it will increase the quantum of power available for distribution thus it would contribute in reducing the scarcity of the power and thereby reducing the Load shedding.
Mr. Suresh Gaikwad (Village name Kashal): Can any by-product of WTG affect human life?	WTGs rotate due to wind speed and generate Electricity only. It does not use any fossil fuels like Coal or any Oil or Gas thereby there is NO by-product. Hence will not cause any harm to human beings, animals and nature.
Mr. Arun Hugle (Village name Kondhiwade):	The Wind Power Project is developed with the

Are you going to transfer this project to Government?	support and interest of Government, under its rules and regulations to harness the green power. The project will be installed and maintained by the company for prescribed period of 20-30 years and it would not be transferred to Government. Fresh application would be made later, for the further extension of the Project.
Mr. Papu Gaikwad (Village name Kashal): How does the common man be benefited?	During the project execution, local villagers can get direct / indirect temporary employment. Unskilled labors can also get temporary jobs. Local villager's vehicles can be hired by company for transport. Project will develop infrastructure like road which will be helpful for local villagers for transportation.
Mr. B.K. Mormare (Village name Mormarwadi): Will the unit rates of Electricity go down?	The rate which you pay is determined by the Maharashtra Electricity Regulatory commission. The company has no say in fixing of the rates. In fact the rates at which the electricity is sold to the State Utility, MSEDCL is also determined by the Maharashtra Electricity Regulatory Commission.
Mr. S.K. Budhe (Village name Supe) How it will benefit the farmers?	The roads developed for the wind farm will provide easy access to the adjacent farm of local farmers, leading to use of machinery for cultivation of crops.
Mr. Balu Shinde (Village name: Pursal): Our life totally depends on Forest. Will your project stop our entry in forest area?	No. You can continue your life style as before. There will only be restriction for your entry near to machines as these are electricity generation equipments.

This was followed by a speech from the President, Gramsevak Association, Maval who said that the government is promoting such wind power projects under its rules and regulations. He also said that the project does not cause any harm/adverse effect to the surrounding area and such projects are beneficial for their remote places as these places would be identified as important region, thereby promoting further development of the area. He ended his speech by saying that the people should support and welcome such projects.

Mr. Kishor Ahire concluded the meeting with the vote of thanks to all the stakeholders for their valuable time and suggestions.

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

>>

There were no adverse comments received from the stakeholders and the beneficial effects of the Project activity were acknowledged by the stakeholders present.

Annex 1

CONTACT INFORMATION ON PARTICIPANTS IN THE PROJECT ACTIVITY

Organization:	CLP Wind Farms India Private Limited
Street/P.O.Box:	15th Floor,
Building:	Oberoi Commerz, Off. Western Express Highway, Goregaon (E)
City:	Mumbai
State/Region:	Maharashtra
Postcode/ZIP:	400 063
Country:	India
Telephone:	+ 91 22 6758 8888
FAX:	+ 91 22 6758 8811
E-Mail:	carbon@clpindia.in
URL:	www.clpindia.in
Represented by:	
Title:	Head – CDM
Salutation:	Mr.
Last name:	Sanchania
Middle name:	
First name:	Dipjay
Department:	Business Development
Mobile:	
Direct FAX:	+ 91 22 6758 8888
Direct tel:	+ 91 22 6758 8811
Personal e-mail:	carbon@clpindia.in

Annex 2

INFORMATION REGARDING PUBLIC FUNDING

There is no public funding involved in the proposed Project activity.

Annex 3

BASELINE INFORMATION

The Central Electricity Authority (CEA) under the Ministry of Power, Government of India, has estimated the Combined Margin emission factor for the NEWNE grid, the details of which are available on the following website.

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

The procedures and formulas used for estimation of the baseline factor and the assumptions made have also been detailed in there.

Annex 4

MONITORING INFORMATION

As discussed in detail in Section B.7.2.

Appendix 1:

Proposed Action Plan for Earmarking 2% of Annual CER Revenue for Sustainable Development Activities

CLP Wind Farms (India) Private Limited (CLPWF) is developing a 113.6 MW green-field wind farm in Khed and Maval taluk of Pune district in Maharashtra. Currently Phase –I of 56.0 MW capacity and Phase-II of 50.4 MW capacities has been commissioned. Project activity under this PDD refers to development of 56.0 MW (Andhra Lake Phase - I) and will be referred as the Project in this PDD.

As per the guidance of the National CDM Authority – India, CLPWF is proposing to undertake relevant Sustainable Development Activities in the project area/ region. CLPWF will allocate 2% of the net CER sale revenues from the above mentioned CDM project activity. The net CER sale revenue will be calculated by deducting cost related to CDM validation, verification, transaction costs, statutory tax, other mandatory contribution and CER revenue sharing requirements with the utility, if any from the Gross CER revenue realised.

CLPWF and its ultimate parent CLP Holding Ltd, lays extensive emphasis on matters pertaining to climate change, safety, air quality and community development and same if reflected in our investment, actions and polices. The objective of CLPWF is to supply electricity by striking a balance between the economics of a project on one side and social and environmental needs of the communities on the other.

The project is located in a rural area and economy of the area is heavily dependent on agriculture /other farm based livelihoods. During the process of Local Stakeholder Engagement, we found gaps in access to social and physical infrastructure. This is reflected in the overall development indicators of the area. Based on the process of need assessment and prioritization, we came across the following community needs:-

- Skill development
- Education support to children
- Strengthening health infrastructure

The expenditure on identified sustainable development activities would be made within one year after the realization of revenues from the sale of the CERs. The details of such expenditure made would be included in the subsequent monitoring report. If the activities undertaken involve an expenditure exceeding the minimum requirement of 2%, the additional expenditure made would be set off against the requirements for the subsequent years and vice versa. The data would be included in the monitoring report in the tabular format presented below. The same can be verified by the DOE at the time of verification through the Annual Report of the Company/a certificate from a Chartered Accountant.

Monitoring Plan for Expenditure on Sustainable Development

Period	Activity	Net CER Sale Revenue	Budget	Actual Expenditure	Variance	Reference Documentation
(A)	**(B)**	**(C)**	**(D)**	**(E)**	**(F = D - E)**	**(G)**
Indicates the year/time period for which the assessment is being provided	*Provides details of the social/ community activities on which the expenditure has been incurred*	*Net CER sale revenue after deducting relevant costs, sharing, taxes, transaction costs etc from the amount received*	*Amount calculated based on 2% of net CER sale revenue from the last CER sale – additional expenditure made (in access of 2%) in pervious year/period + deficit of expenditure (if actual expenditure is less than required in previous year/ period.)*	*Expenditure made on the social/ community development activity in the current assessment year.*	*Difference between budget and actual spending. This additional expenditure or deficit will be carry forward in next year/ period's budget.*	*Indicates the documentation to be provided to the DOE during the verification to evidence the amount spent on social/community development activity*

APPENDIX-2

WTG wise geographical coordinates for the project activity

SR. No.	Location number	Elevation (m)	Latitude			Longitude		
			Deg.	Minutes	Seconds	Deg.	Minutes	Seconds
1	Loc. No.48	1000.00	18	53	46.1	73	35	48.3
2	Loc. No.49	990.20	18	53	49.5	73	35	45.0
3	Loc. No.50	995.20	18	53	54.4	73	35	41.9
4	Loc. No.51	981.70	18	53	59.1	73	35	37.7
5	Loc. No.52	986.10	18	54	4.0	73	35	33.7
6	Loc. No.53	989.90	18	54	10.6	73	35	25.9
7	Loc. No.54	999.90	18	54	8.3	73	35	39.2
8	Loc. No.55	1020.00	18	54	16.7	73	35	35.2
9	Loc. No.56	1019.00	18	54	20.4	73	35	31.1
10	Loc. no.57	1020.00	18	54	27.4	73	35	26.5
11	Loc. no.58	1021.00	18	54	32.6	73	35	26.5
12	Loc. no.59	1002.00	18	54	41.7	73	35	21.2
13	Loc. no.60	1021.00	18	54	45.9	73	35	17.3
14	Loc. no.61	1005.00	18	54	48.9	73	35	15.5
15	Loc. no.62	994.40	18	54	54.3	73	35	12.2
16	Loc. no.63	997.40	18	54	59.5	73	35	10.0
17	Loc. no.64	1013.00	18	55	4.9	73	35	8.1
18	Loc. no.65	1023.00	18	55	9.8	73	35	6.7
19	Loc. No.66	1025.00	18	55	14.6	73	35	5.6
20	Loc. No.67	1035.00	18	55	17.3	73	34	49.7
21	Loc. No.68	1038.00	18	55	24.5	73	34	54.5
22	Loc. No.69	1040.00	18	55	30.5	73	34	53.9
23	Loc. No.70	1009.00	18	55	36.0	73	34	26.1
24	Loc. No.71	1021.00	18	55	40.5	73	34	20.6
25	Loc. No.72	1027.00	18	55	43.0	73	34	15.0
26	Loc. No.73	1034.00	18	55	51.2	73	34	16.1
27	Loc. No.74	1046.00	18	55	57.1	73	34	13.1
28	Loc. no.75	1045.00	18	56	1.0	73	34	7.6
29	Loc. no.76	1056.00	18	56	11.7	73	34	7.7
30	Loc. no.77	1048.00	18	56	16.9	73	33	47.9
31	Loc. no.78	1056.00	18	56	19.9	73	33	46.1
32	Loc. no.79	1067.00	18	56	26.7	73	33	45.5
33	Loc. no.80	1080.00	18	56	31.7	73	33	43.7
34	Loc. no.82	1056.00	18	56	45.2	73	33	0.9
35	Loc. no.83	1086.00	18	56	51.0	73	33	0.1
36	Loc. no.84	1081.00	18	56	56.5	73	32	57.5
37	Loc. no.85	1072.00	18	56	59.6	73	32	53.6

38	Loc. no.86	1088.00	18	56	58.7	73	32	40.4
39	Loc. no.87	1069.00	18	57	6.2	73	32	40.6
40	Loc. no.88	1067.00	18	57	12.3	73	32	35.0
41	Loc. no.89	1068.00	18	57	14.8	73	32	27.1
42	Loc. no.90	1069.00	18	57	22.7	73	32	26.3
43	Loc. no.91	1071.00	18	57	29.3	73	32	27.5
44	Loc. no.92	1052.00	18	57	33.9	73	32	26.2
45	Loc. no.93	1053.00	18	57	38.4	73	32	20.1
46	Loc. No.98	1062.00	18	58	12.0	73	31	54.2
47	Loc. No.99	1060.00	18	58	17.6	73	31	51.3
48	Loc. No.100	1049.00	18	58	21.7	73	31	47.0
49	Loc. No.101	1039.00	18	58	27.0	73	31	45.0
50	Loc. No.102	1038.00	18	58	31.1	73	31	42.3
51	Loc. No.103	1029.00	18	58	36.0	73	31	42.1
52	Loc. no.104	979.40	18	58	42.1	73	31	42.1
53	Loc. no.105	970.40	18	58	45.5	73	31	41.9
54	Loc. no.106	965.30	18	58	50.3	73	31	43.8
55	Loc. No.127	938.50	18	57	56.9	73	38	15.3
56	Loc. No.128	958.90	18	57	51.6	73	38	14.9
57	Loc. No.129	993.80	18	57	46.4	73	38	15.9
58	Loc. No.130	1010.00	18	57	41.0	73	38	19.2
59	Loc. No.131	1015.00	18	57	37.0	73	38	21.6
60	Loc. No.132	1033.00	18	57	31.3	73	38	23.3
61	Loc. No.133	1048.00	18	57	26.6	73	38	26.3
62	Loc. No. 134	1077.00	18	57	21.9	73	38	28.8
63	Loc. no. 135	1100.00	18	57	16.4	73	38	32.4
64	Loc. no. 136	1106.00	18	57	9.6	73	38	33.4
65	Loc. no. 137	1082.00	18	57	8.2	73	38	42.1
66	Loc. no. 138	1092.00	18	57	3.9	73	38	54.6
67	Loc. no. 139	1098.00	18	57	1.4	73	39	2.6
68	Loc. no. 140	1118.00	18	56	57.0	73	39	10.6
69	Loc. no. 141	1152.00	18	56	54.2	73	39	18.0
70	Loc. no.506	943.20	18	58	55.5	73	31	50.4

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