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

CONTENTS

SECTION A. General description of project activity

A.1. Title of the project activity:

Bundled Wind Power project in the states of Tamil Nadu and Karnataka, India by KBD Group, India
Version: 01.3
Date of document completion: 28/03/2011

A.2. Description of the project activity:

The Karnataka Breweries and Distilleries (KBD) group of companies, a leader in manufacturing of sugar and distillery products, also has business interests in other sectors like Real estate, Healthcare and Steel in Karnataka. Under the leadership of Sapthagiri Distilleries Private Limited (SDPL), the group with a view to align itself with sustainable development policies of India has undertaken this project to produce green power using wind as an energy source. Apart from SDPL and KBD, DA Satyprabha and DA Srinivas have also invested into a total capacity of 6.75MW. DA Satyprabha and DA Srinivas are independent entities. The projects are located in the states of Tamil Nadu and Karnataka.

The project activity has been undertaken to harness the available wind power potential in the State of Tamil Nadu and Karnataka. The project activity has established 31 numbers *(Suzlon make: 18 numbers of 1500 kW, 4 numbers of 1250 kW and Vestas make: 9 number of 750 kW)* of state-of art Wind Energy Generators (WEG) aggregating to a total installed capacity of 38.75 MW. The project will generate approximately 86,913MWh of electricity per annum, which will be entirely sold to the Karnataka and Tamil Nadu State Electricity Boards. The project activity will help in greenhouse gas emission reduction by using renewable resources for generating power which otherwise would have been generated using non- renewable, carbon intensive fuel. The project activity is a green field project aimed at utilising wind to produce power.

The implementation of project activity will achieve approximately 79,709 tCO_2e emission reduction per annum by replacing grid based electricity which is predominately generated by fossil fuel based thermal power plant in southern grid.

The objective of the project activity was to construct, operate, maintain and aggregate wind power projects in the Indian states of Tamil Nadu and Karnataka to provide renewable power to the respective state electrical grid. The project has led to reduced greenhouse gas emissions because it has displaced the electricity from fossil fuel based generating systems.

The electricity generated from this wind farm is supplied using internal electrical lines to the local substation through transmission lines. Though the activity has sub-projects (individual wind farms) of smaller capacities, they all are connected to southern grid through local sub stations. Hence, the sub-projects have been bundled in the project activity, and not dealt as separate small-scale projects.

The spatial extent of project boundary is the southern grid. The project activity will supply electricity to southern grid through transmission lines connected to the sub-stations.

There are four individual project participants from various industries who have set up wind turbines and are bundled in this project. The project promoters, the number and capacity of the WEGs are listed in Table 1.

Table 1: Project promoters and WEG capacity

Project Promoter	No. of WTGs	WTG capacity (kW)	Total installed capacity in MW
Sapthagiri Distilleries Private Ltd (SDPL)	18	1500	27
Karnataka Breweries and Distilleries Ltd (KBDL)	4	1250	5
D. A Sathya Prabha	5	750	3.75
D. A Srinivas	4	750	3.0
Total	**31**		**38.75**

Pre-project scenario
In the pre project scenario, the equivalent amount of electricity would have been generated by grid connected fossil fuel based power plants.

All the project proponents have ventured into the renewable energy sector with this project activity for the first time.

Baseline scenario
This project activity is wind based renewable energy source, zero emission power project connected to the southern regional grid.The project activity will generate approximately 86,913MWh of electricity which will be supplied to southern grid. Hence, the baseline will be generation of equivalent amount of electricity as per the combined margin carbon intensity of the grid which is dominated by the fossil fuel based power plants.

The project activity reduces the greenhouse gas emissions by generation of electricity from renewable and clean energy source, the wind. The electricity generated is connected to the regional grid and supplied to the state electricity board. The main greenhouse gas that is prevented from being emitted into atmosphere is CO_2 which would have otherwise been emitted from the fossil fuel fired power plants.

Contribution of project activity to sustainable development
National CDM Authority, Ministry of Environment and Forests, Government of India has stipulated the social, economic, environmental and technological well being as the four indicators for sustainable development in the host country approval eligibility criteria for Clean Development Mechanism (CDM) projects[1]. The project participants' view on the contribution of this project activity towards sustainable development explained as below.

Social well being
The project activity has created employment opportunities to the community during construction, operation as well as during maintenance. The local workforce technical skills and knowledge will improve leading to social knowledge building. Also, the project activity has led to sustainable

[1] http://cdmindia.nic.in/host_approval_criteria.htm

development of non-conventional renewable energy technology for production of power. The infrastructure in and around the project area has been improved due to project activities. This includes development of road infrastructure and improvement of electricity availability in the region.

Economic well being
The project activity has led to an investment of about 2316.22 million INR to a developing region which otherwise wouldn't been possible. The generated electricity will be sold to southern regional grid, thereby improving availability of electricity to the local consumers. This provides new opportunities for industries and economic activities in the area which results in increased local employment, ultimately leading to overall economic development.

Environmental well being
The electricity generated by project activity will be supplied to southern grid, which otherwise would have been generated by fossil fuels. Hence the project activity will help in reduction of the greenhouse gas emission (CO_2) and other air pollutants (especially NO_x and SO_2). The project activity helps in conservation of depleting fossil fuels such as coal, oil and natural gas which at present are predominantly used for power generation.

Technological well being
The success of the project will increase the reliability on efficient technology and large capacity wind mills. Also, it will lead to investment in research and development of higher capacity and efficient machines.

Thus, the project meets the sustainable development criteria of the Host Country.

A.3. Project participants:

Name of the party(s) involved (*host* indicates host party)	Private and/or Public entity(s) project participants (as applicable)	Indicate if the party involved wishes to be considered as project participant (yes/no)
India (Host)	Sapthagiri Distilleries Private Limited, Bangalore (private entity)	No
India (Host)	SN Nirman Infra Projects Private Ltd. Hyderabad (private entity)	No

Sapthagiri Distilleries Private Limited, Bangalore acts as a facilitator for the project activity and has entered into authorization agreements with other promoters to carry out the CDM project activity on their behalf.

A.4. Technical description of the project activity:

A.4.1. Location of the project activity:

A.4.1.1. Host Party(ies):

India

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

Tamil Nadu and Karnataka

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

The wind turbine generators are located in Dindigul, Erode, Coimbatore and Tirunelveli districts of Tamil Nadu and Hassan and Gadag districts of Karnataka.

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

The project sites are well connected by road and railways. The location of the project sites are furnished in Table 2.

Table 2: Location of project sites

Village	District	Village	District
Range: Palladam		**Range: Surandai**	
Pushpathoor	Dindigul	Azhagiapandiapuram	Tirunelveli
Palappampatti	Coimbatore	Sambavarvadakarai	Tirunelveli
Kundadam	Erode	Navaneetha krishnapuram	Tirunelveli
Ponnapuram	Erode	Keelakalangal	Tirunelveli
Range: Sankeneri		**Range: Hassan North**	
Udaythoor	Tirunelveli	Rangapurakavalu	Hassan
Vijayapathi	Tirunelveli	**Range: Kapathguda**	
		Keluru	Gadag

Please refer to APPENDIX B for details of geo-coordinates and location of each WTG.

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

The project activity is a grid connected electricity generation using renewable energy sources (wind) and power generation capacity is more than 15 MW, hence can be categorized as

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

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

The purpose of the proposed project is to generate power using zero-emission wind energy and deliver it to southern grid. The project activity involves installation of 31 wind turbine generators of different capacities in the states of Tamil Nadu and Karnataka, India. The WTGs are being supplied by the approved manufacturer Suzlon Energy Limited and Vestas Wind Technology. The electricity generated will be sold to Tamil Nadu and Karnataka State Electricity Board respectively. The project activity will supply an annual average generation of 86,913MWh to southern grid and replace same amount of electricity from grid connected fossil fuel power plants.

The southern region grid provided same quantity of electricity using fossil fuels prior to the implementation of the project activity.

The main greenhouse gas that is prevented from being emitted into atmosphere is CO_2 which would have otherwise been emitted from the fossil fuel fired power plants that are connected to the grid. It is estimated that implementation of project activity will generate approximately 79,709 tCO_2 emission reduction annually.

The project activity has employed Horizontal Axis WTGs of different capacities (Suzlon make 1250 kW and 1500 kW and Vestas make 750 kW). All the WTGs deployed in the project activity are tested and ideal for Indian meteorological conditions. The technical specifications of the individual WTG models are given in ANNEX 2.

All the WTGs deployed in project activity will be composed by WTG of 3 blades each (with power control) and an active system for rotor orientation. Under high speed winds, a control system will keep the power at the plant's nominal value. Under slow speed winds, a control system will optimize the energy production, selecting an optimal combination of revolutions and angle of attack. The major equipment in wind based power generation project is WTG, the useful life of the WTGs are 20 years. The comprehensive operation and maintenance agreement covers all types of overhauling costs during the life of the project, which is 20 years. The Plant Load Factor (PLF) of WTGs is[2]:

Tamil Nadu : 25.44%
Karnataka : 26.50%

As already indicated in section A.2, the project proponent has ventured into the renewable energy sector with this project activity.

The project activity is based on emission free wind energy and does not emit pollutants associated with common electricity generation i.e. CO_2, SO_2, NO_x and the particulates. The technology used in the project activity is environment friendly and safe to operate.

The transfer of technology is not involved, as the technology employed in the project activity and knowhow is well developed in India.

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

Years	Annual estimation of emission reductions in tonnes of CO_2 e
2011	79,709
2012	79,709
2013	79,709
2014	79,709
2015	79,709
2016	79,709
2017	79,709

[2] Based on study report determined by a third party engineering company contracted by PP

2018	79,709
2019	79,709
2020	79,709
Total estimated reductions (tonnes of CO_2e)	**797,090**
Total number of crediting years	**10**
Annual average over the crediting period of estimated reductions (tonnes of CO_2e)	**79,709**

A.4.5. Public funding of the project activity:

The total project cost of the project activity is met by the project proponents. No public funding from parties included in Annex 1 or Overseas Development Assistance will be used for 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:

Approved baseline and monitoring methodology applied for the project activity is

Methodology Applicable	ACM0002
Version	12.1.0
Sectoral scope	01
EB	58
Reference	http://cdm.unfccc.int/methodologies/PAmethodologies/approved.html

The methodology refers to the following tools in order to calculate the emission reduction from the project activity.

a) Tool to calculate the emission factor for an electricity system (version 02)
b) Tool for the demonstration and assessment of additionality (version 05.2)
c) Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion (version 02)
d) Combined tool to identify the baseline scenario and demonstrate addition (version 02.1)

For the project activity, the following methodological tools have been used.

a) Tool to calculate the emission factor for an electricity system (version 02)
b) Tool for the demonstration and assessment of additionality (version 05.2)

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

The project activity avoids the expansion of grid connected fossil fuel based power generation, as it utilises renewable resources (wind energy) to generate power.

The adopted baseline methodology ACM0002 has been chosen for the project activity based on fulfilment of the applicability conditions as described below.

Applicability conditions as per ACM0002 Version 12.1.0	**Status of the project activity**	**Remarks**
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 proposed project activity has installed a new wind energy based power plant where prior to the implementation of the project activity no renewable power plant was operational. Thus, the proposed project activity is a greenfield plant (option a).	Since the proposed project activity is a greenfield plant, this condition is satisfied.
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 proposed project activity has installed wind power plant.	Since the proposed project involves installation of wind power plant, this condition is satisfied.
In the case of capacity additions, retrofits or replacements (except for wind, solar, wave or tidal power capacity addition projects which use Option 2: on page 10 to calculate the parameter $EG_{PJ,y}$): the existing plant started commercial operation prior to the start of a minimum historical reference period of five years, used for the calculation of baseline emissions and defined in the baseline emission section, and no capacity expansion or retrofit of the plant has been undertaken between the start of this minimum historical reference period and the implementation of the project activity.	The proposed project activity has installed a new wind energy based power plant and will not involve capacity additions, retrofits or replacement.	Since the proposed project activity will not involve capacity additions, retrofits or replacement this condition is not applicable.
In case of hydro power plants, one of the following conditions must apply: • The project activity is implemented in an existing reservoir, with no change in the volume of reservoir; or • The project activity is implemented in an existing reservoir, where the volume of reservoir is increased and the power	The proposed project activity has installed a new wind energy based power plant and des not involve hydro power plant.	Since the proposed project involves installation of wind power plant, this condition does not apply to the project case.

density of the project activity, as per definitions given in the Project Emissions section, is greater than 4 W/m^2; or • The project activity results in new reservoirs and the power density of the power plant, as per definitions given in the Project Emissions section, is greater than 4 W/m^2.		
The methodology is not applicable to the following: • Project activities that involve switching from fossil fuels to renewable energy sources at the site of the project activity, since in this case the baseline may be the continued use of fossil fuels at the site; • Biomass fired power plants; • Hydro power plants1 that result in new reservoirs or in the increase in existing reservoirs where the power density of the power plant is less than 4 W/m^2.	The proposed project activity has installed a new wind energy based power plant and will not involves fuel switch, biomass fired power plant or hydro plant.	Since the project activity will not involve fuel switch, biomass fired power plant or hydro plant, this condition is not applicable.
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 has installed a new wind energy based power plant and will not involve retrofit, replacement or capacity additions.	Since the proposed project will not involve retrofit, replacement or capacity additions, this condition is not applicable.
In addition, the applicability conditions included in the tools referred to above apply.	The proposed project activity meets the applicability conditions of *"Tool to calculate the emission factor for an electricity system" Version 02* and *"Tool for the demonstration and assessment of additionality" Version 05.2*. Please refer section following this table.	Since the proposed project activity meets the applicability conditions of the tools applied, this condition is satisfied.

It can be seen from the above table that the approved methodology ACM0002 is applicable to the project activity.

The methodological tool 'Tool to calculate the emission factor for an electricity system' is applicable as below.

This tool may be referred to in order to estimate the OM, BM and/or CM for the purpose of calculating baseline emissions for a project activity substitutes electricity from the grid, i.e. where a project activity supplies electricity to a grid or a project activity that results in savings of electricity that would have been provided by the grid (e.g. demand-side energy efficiency projects). Note that this tool is also referred to in the "Tool to calculate baseline, project and/or leakage emissions from electricity consumption" for the purpose of calculating project and leakage emissions in case where a project activity consumes electricity from the grid or results in increase of consumption of electricity from the grid outside the project boundary.

The project activity supplies electricity to the grid and in turn substitutes electricity from the grid. Thus the project activity can use this methodological tool for estimation of OM, BM and CM for the purpose of calculating baseline emissions.

The methodological tool 'Tool to calculate the emission factor for an electricity system' is applicable as below.

The document provides a general framework for demonstrating and assessing additionality and is applicable to a wide range of project types. Some project types may require adjustments to this general framework. This tool does not replace the need for the baseline methodology to provide a step-wise approach to identify the baseline scenario.

The project activity has used this tool as specified in the applicable baseline methodology. There is no specific applicability and this is a general framework. The project activity has used the tool with appropriate adjustment as evident in section B.5.

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

The proposed project is the installation of a new grid connected renewable power plant and 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".

The spatial extent of the power plants that are physically connected through transmission and distribution lines to the project activity and that can be dispatched without significant transmission constraints is defined as the project electricity system. For the proposed project, the spatial extent of the project boundary includes the wind power project and all power plants connected physically to the Southern Regional Grid of India.

The schematic diagram of project boundary is represented in Figure 1.

Figure 1: Schematic diagram of project boundary

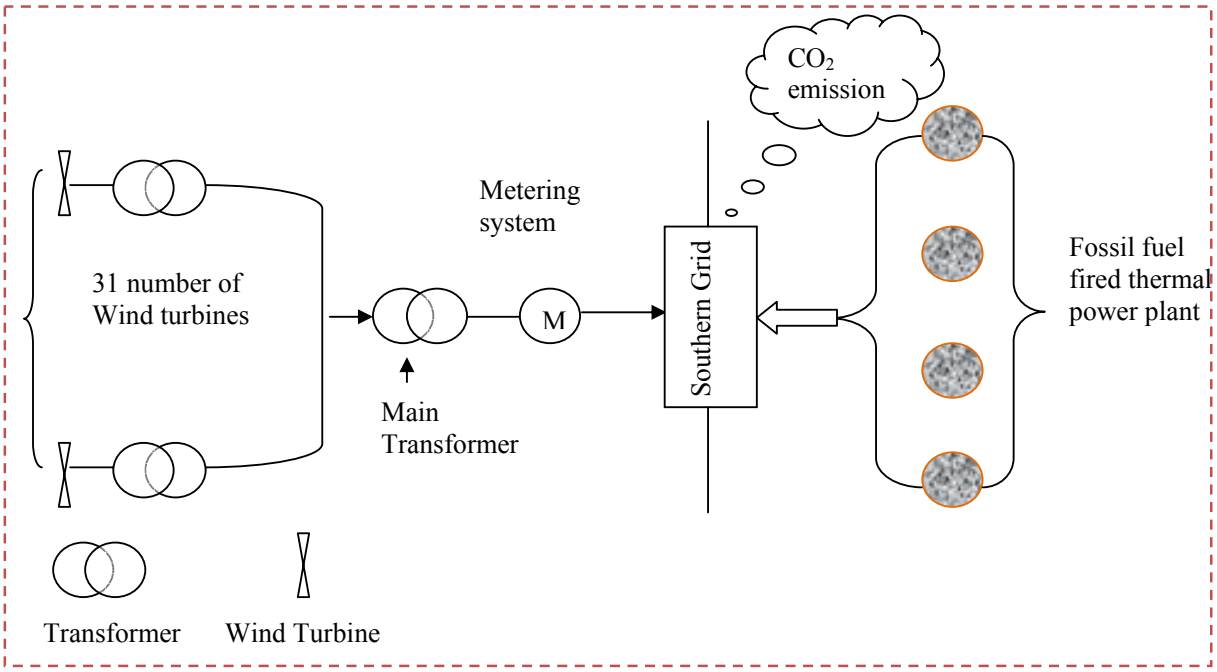

Table 4: Overview of emission sources included or excluded in project boundary

	Source	Gas	Included/ Excluded	Justification/Explanation
Baseline	CO_2 emissions from electricity generation in fossil fuel fired power plants that are displaced due to the project activity	CO_2	Included	The proposed project activity will displace the equivalent amount of electricity that in the absence of the project activity would have been generated in the fossil fuel dominated south grid of India. Hence, this emission source is included.
		CH_4	Excluded	Excluded for simplification. This is a conservative approach.
		N_2O	Excluded	
Project Activity	For geothermal power plants, fugitive emissions of CH_4 and CO_2 from non-condensable gases contained in geothermal steam	CO_2	Excluded	The project activity will not involve geothermal power plant. Hence this emission source is excluded.
		CH_4	Excluded	
		N_2O	Excluded	
	CO_2 emissions from combustion of fossil	CO_2	Excluded	The project activity will not involve solar or geothermal power plant. Hence this emission source

	fuels for electricity generation in solar thermal power plants and geothermal power plants	CH_4	Excluded	is excluded.
		N_2O	Excluded	
	For hydro power plants, emissions of CH_4 from the reservoir	CO_2	Excluded	The project activity will not involve hydro power plant. Hence this emission source is excluded.
		CH_4	Excluded	
		N_2O	Excluded	

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

As per ACM0002 Version 12.1.0,
If the project activity is the installation of a new grid-connected renewable power plant/unit, the baseline scenario is the following:
Electricity delivered to the grid by the project activity would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources, as reflected in the combined margin (CM) calculations described in the .Tool to calculate the emission factor for an electricity system.

The proposed project has installed a new grid connected wind energy based power plant. Therefore as per ACM0002 Version 12.1.0, the baseline scenario is:

In the absence of the proposed project activity, the electricity delivered to the grid by the project activity would have otherwise been generated by the operation of existing (and future additions) power plants connected to south grid.

The baseline emissions are calculated using following formula:

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

Where,

$\mathbf{BE_y}$ Baseline emissions in year *y* (tCO_2/yr)

$\mathbf{EG_{PJ,y}}$ 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)

$\mathbf{EF_{grid,CM,y}}$ Combined margin CO_2 emission factor for grid connected power generation in year *y* calculated using the "Tool to calculate the emission factor for an electricity system" Version 02 (tCO_2/MWh)

CO_2 emission factor of the grid ($EF_{grid,CM,y}$)

As per ACM0002 Version 12.1.0, the CO_2 emission factor of the grid has to be calculated using the following approach:

a. Combined margin (CM), consisting of the combination of operating margin (OM) and build margin (BM) according to the procedures prescribed in the approved methodology "Tool to calculate the emission factor for an electricity system".

OR

b. The weighted average emissions (in tCO_2e/MWh) of the current generation mix. The data of the year in which project generation occurs must be used.

Calculations must be based on data from an official source (where available) and made publicly available.

The project proponent has opted for approach (a) i.e. The CM is calculated according to the procedures prescribed in the '*Tool to calculate the emission factor for an electricity system, Version 02, EB 50'*.

All data related to the CO_2 emission factor ($\mathbf{EF_{grid,CM,y}}$) calculation is sourced from *CO_2 baseline database for the Indian Power Sector Version 06*- a database published by the 'Central Electrical Authority of India'[3]

A detail calculation approach of *Baseline Emissions* ($\boldsymbol{BE_y}$) as per ACM0002 and *CO_2 Emission Factor of grid* ($\mathbf{EF_{grid,CM,y}}$) is provided in the section B.6.1 below.

The key parameters and data sources applied for ex ante calculations are furnished below.

Table 5: Key parameters and data sources used for ex ante calculations

Variable	**Data Source (Ex-ante)**
EG_y – Net electricity generated	PO(for rated capacity), third party PLF report
Parameter	**Data Source (Ex-ante)**
$EF_{grid,OM\ ,\ y}$ - Build Margin Emission Factor (tCO_2/MWh)	CO_2 baseline database for the Indian Power Sector, version 06, March 2011
$EF_{grid,BM\ ,\ y}$ = Operating Margin Emission Factor (tCO_2/MWh)	
$EF_{grid,CM,}y$ – CO_2 emission factor of the grid (tCO_2/MWh)	Calculated as the weighted average of the operating margin and build margin as per the procedures prescribed in the '*Tool to calculate the emission factor for an electricity system, Version 02, EB 50'*.

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):

The project activity is connected to southern grid, which is dominated by fossil fuel based power generation plant. In the absence of the project activity, in view of the substantial energy deficit situation in the states of Tamil Nadu and Karnataka's respective state electricity grid would have considered a new fossil fuel based thermal power plant or capacity addition in existing plants.

The project activity has displaced fossil fuel based electricity that would otherwise be provided by the operation and expansion of the southern regional grid, hence reducing the emission of green house gases.

Within the scope of the adopted baseline methodology, tool for the demonstration and assessment of additionality, version 05.2 has been used to demonstrate the additionality as per the guidelines of CDM Meth Panel, for the baseline methodology adopted ACM0002, Version 12.1.0 for this project activity. Step-wise approach to demonstrate and assess additionality is listed below.

[3] http://www.cea.nic.in/planning/c%20and%20e/government%20of%20india%20website.htm

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

Step 1a: Identification of alternatives to the project activity

1. 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 alternatives are to include:

   - The proposed project activity not undertaken as a CDM project activity
   - If applicable, continuation of the current situation (no project activity or other alternatives undertaken).

The alternatives available to the project participant or similar project developers are:

- Proposed project activity not undertaken as CDM project activity
- Continuing with the current situation i.e. no project activity

Outcome of step 1a: The entire above identified alternative is realistic and credible alternative available to project participants.

Step 1b: Enforcement of applicable laws and regulations

2. 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.
3. If an alternative does not comply with all applicable legislation and regulations, then show that, based on an examination of current practice in the country or region in which the law or regulation applies, those applicable legal or regulatory requirements are systematically not enforced and that non-compliance with those requirements is widespread in the country. If this cannot be shown, then eliminate the alternative from further consideration.
4. If the proposed project activity is the only alternative amongst the ones considered by the project participants that is in compliance with all regulations with which there is general compliance, then the proposed CDM project activity is not additional.

   In state of Karnataka and Tamil Nadu there is no legal and regulatory requirement that prevents the following alternatives from occurring.
   - Proposed project activity not undertaken as CDM project activity
   - Continuing with the current situation i.e. no project activity

Outcome of Step 1b: Both alternatives are in compliance with all applicable legal and regulatory requirements (Indian Electricity Act 2003, The National Electricity Policy) including the environmental regulations (Environmental Protection Act 1987).

Step 2: Investment analysis

Determine whether the proposed project activity is the economically or financially less attractive than other alternatives without the revenue from the sale of certified emission reductions (CERs). To conduct the investment analysis, use the following sub-steps.

Step 2a: Determine appropriate analysis method

1. Determine whether to apply simple cost analysis, investment comparison analysis or benchmark analysis (sub-step 2b). If the CDM project activity generates no financial or economic benefits other than CDM related income, then apply the simple cost analysis (Option I). Otherwise, use the investment comparison analysis (Option II) or the benchmark analysis (Option III).

Step 2b: Option I - Apply simple cost analysis

2. Document the costs associated with the CDM project activity and demonstrate that the activity produces no economic benefits other than CDM related income.

The project activity generate revenue by sale of electricity to state electricity board, hence simple cost analysis is not applicable. SDPL proposes to use **Option III – Benchmark analysis** and the financial indicator that is identified is the project IRR.

Step 2b: Option II - Apply investment comparison analysis

3. Identify the financial indicator, such as IRR, NPV, cost benefit ratio, or unit cost of service (e.g., levelized cost of electricity production in $/kWh or levelized cost of delivered heat in $/GJ) most suitable for the project type and decision-making context.

Step 2b: Option III - Apply benchmark analysis

4. Identify the financial indicator, such as IRR, NPV, cost benefit ratio, or unit cost of service (e.g., levelized cost of electricity production in $/kWh or levelized cost of delivered heat in $/GJ) most suitable for the project type and decision context.

Project IRR, being nothing but the return earned by the project, has to be compared with a benchmark or cut-off rate to determine the adequacy of the return. The equity IRR is inbuilt as per CERC norms in the tariff calculations in such projects in India. Also, as the tariff is also fixed, the cost of generation calculation is also not relevant. Thus, the PP has chosen post tax project IRR as the most suitable financial indicator for the investment decision.
PP has chosen WACC as the benchmark. *WACC alone* represents the weighted average of the costs of various sources of financing in the financial structure of the project. In other words, WACC represents the minimum rate of return which the project should earn to merit consideration, as failure to earn the minimum rate of return is indicative of the erosion in the value of investment. Therefore, no other benchmark is more suitable than WACC in cases where project IRR is used to demonstrate the additionality.

The WACC has been calculated as demonstrated below:

$$WACC = CoE * \{E/(E+D)\} + CoD_{post\ tax} * \{D/(E+D)\}$$

Where:

CoE – Cost of equity
CoD – Cost of Debt

CoE – Cost of Equity:

The Capital Asset Pricing Model (CAPM) approach is a generally accepted methodology for determining the Cost of Equity. CAPM is based on the portfolio theory of finance in which risks are classified into:

- Systematic risk - risk applicable to the market as a whole, such as inflation, tax rises, interest rates, etc.
- Specific risk - residual risk unique to an individual firm or a small group of companies that form a subset of the market.

The theory stipulates that specific risks can be eliminated through diversification and hence, only systematic risks determine the return expectation of investors. The basis of CAPM is the relationship between risk and return. Whilst there has been considerable debate on the strength of the risk/return relationship, evidence indicates that there is a strong linear and positive relationship over the long term, which can be expressed by the following formula[4]

$E(r_e) = r_f + Equity\ Beta\ (\beta) * [E(r_m) - r_f]$

Where:

$E(r_e)$ - the expected rate of return on equity (cost of equity)
r_f is the risk-free rate of return (e.g. return on government bonds)
$E(r_m)$ - the expected rate of return on a market portfolio
Equity Beta (β) - coefficient reflecting the volatility (risk) of the stock relative to the market, which measures the systematic risk of the stock

There are total 4 investors namely,

- KBDL
- SDPL
- DA Satyprabha
- DA Srivivas

The investment decision years, project size and location of the WTGs for each of the investor is mentioned in the table below:

Sr no	Investor	Investment decision year	Project size	Location
1	KBDL	2006	4X1.25MW	Tamil Nadu
2	SDPL	2007	4X1.5MW	Karnataka
3	SPDL	2007	14X1.5MW	Tamil Nadu
4	DA Satyprabha	2007	5X750kW	Tamil Nadu
5	DA Srinivas	2007	4X750kW	Tamil Nadu

Since the investment decisions for installation of WTGs by the above mentioned investors were taken in two years i.e in 2006 and 2007. WACC has been calculated for both the years and has been applied according to the investment decision year.

[4] *Cost of Capital for Central Sector Utilities by Crisil Advisory Services*

The ***Risk free rate (r_f)*** has been taken from the long term government bond rates at the time of the investment decision of the project activity in 2006 and 2007. The weighted average interest rate on Central Government date Securities i.e. bond rate during year 2005-06 is 7.34%[5]. The weighted average interest rate on Central Government date Securities i.e. bond rate during year 2006-07 is 7.89%[6].

The ***Market Risk Premium ($E(r_m) - r_f$)***, as measured and applied in practice, is the premium above the risk-free rate of return that investors expect to earn on a well-diversified portfolio of equities.

The ***expected rate of return on a market portfolio ($E(r_m)$)*** has been calculated as the compounded annual growth rate of the market portfolio. In calculating market risk premium, it is usual to use an established stock market index as a proxy for the market portfolio. In India, a choice of possible indices are available – BSE SENSEX, BSE 100, CNX 500, Nifty, etc.

Choice of stock market index will also be considerably influenced by the availability of historical data. In this regard, BSE SENSEX has the advantage of having the longest history and data is available for 30 years. The data on other indices, viz. CNX 500 and Nifty, are available only since 1991. Hence BSE SENSEX has been considered for calculating the Expected market return at the time of taking decision of project activity.

Equity Beta is the measure of the expected volatility of a particular stock relative to a well-diversified market portfolio. It measures the systematic risk of a stock, i.e. the risk that cannot be eliminated in a well-balanced, diversified portfolio. The beta of equity is calculated as the covariance between its return and the return on a well-diversified market portfolio, divided by the variance of the return on a well-diversified market portfolio. As the project activity involves the wind power generation, so the beta are taken from the companies involved in the power generation. Five year beta when available and a minimum of 2.5 years is considered good duration[7]. The beta values of power companies listed in the stock exchange at the time of investment decision have been used. The values are taken from Bloomberg and the screenshots are furnished in IRR analysis excel spread sheets. Beta is calculated by taking average of equity beta values of the identified companies. The beta for investment decision year 2005-06 is 1.373 and for 2006-07 is 1.25.

The ***Cost of Debt*** has been considered as *Prime Lending Rate (PLR)* at the time of investment decision of the project activity. For the post tax cost of debt, the income tax will be deductible at prevailing rate at the time of conceptualization of the project activity.
The prime lending rate (PLR) during 2005-06 was in the range of 10.25% - 10.75%[8]; the lowest value of 10.25% has been considered as the cost of debt. Interest costs are tax deductible, therefore in order to arrive at the post tax cost of debt, the cost of debt is multiplied with marginal tax rate. The tenure of the repayment of the term for the project activity is less than 10 years. It may be noted that the prevailing income tax as per IT Act of 33.99% at the investment decision time is applicable to the project activity. Therefore, the marginal tax rate has been considered as 33.99%.

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[5] http://rbidocs.rbi.org.in/rdocs/Publications/PDFs/80303.pdf

[6] http://rbidocs.rbi.org.in/rdocs/Publications/PDFs/80303.pdf

[7] Quoted from Reuters.com (http://www.bu.edu/library/management/tutorials/beta/index.html)

[8] http://www.rbi.org.in/scripts/BS_ViewBulletin_Test.aspx?Id=7517

The prime lending rate (PLR) during 2006-07 was in the range of 11.00% - 11.50%[9]; the lowest value of 10.25% has been considered as the cost of debt. Interest costs are tax deductible, therefore in order to arrive at the post tax cost of debt, the cost of debt is multiplied with marginal tax rate. The tenure of the repayment of the term for the project activity is less than 10 years. It may be noted that the prevailing income tax as per IT Act of 33.99% at the investment decision time is applicable to the project activity. Therefore, the marginal tax rate has been considered as 33.99%.

The ***Debt Equity ratio*** as per the wind power policy norms[10] has been considered as 70:30.

Calculation of WACC:

$$WACC = CoE * \{E/(E+D)\} + CoD_{post\ tax} * \{D/(E+D)\}$$
$$= \{r_f + Equity\ Beta\ (\beta) * [E(r_m) - r_f]\} * \{E/(E+D)\} + CoD_{post\ tax} * \{D/(E+D)\}$$

So WACC for year 2005-06 is 13.09% and for year 2006-07 is 13.37%.
Project IRR has been evaluated by for each of the above investor. The project IRR is then compared with WACC.

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

For the investment analysis, a useful life of 20 years has been considered for projections of cash flow. The sub projects have been considered for investment analysis of the project activity. All the relevant cost i.e. capital cost, operations and maintenance (O&M) cost and revenue (excluding CER revenue and including subsidies/fiscal incentive wherever applicable) for investment analysis. The following table, Table 5, shows the common parameters used for calculation of IRR and project specific parameter are mentioned with references.

Table 5: Common parameters

Description	Value	Reference
O&M expense	1.1% of capital cost with annual escalation of 5% every year after 5th year	TNERC Tariff Order[11] No. 3, dt. 15/05/2006 Pg. 90 (http://tnerc.tn.nic.in/orders/nces%20order%20-approved%20order%20host%20copy.pdf)
Insurance charges	0.75% of capital cost for 5 years and reduction of 0.5% every year	
HT tariff in Tamil Nadu	INR 2.9 per kWh	KERC order dated 18.01.2005 and TNERC order dated 15.05.2006
HT tariff in Karnataka	INR 3.4 per kWh	
Insurance cost		Including both general insurance and machine breakdown insurance cost

[9] http://www.rbi.org.in/scripts/BS_ViewBulletin_Test.aspx?Id=7973

[10] [10] http://www.cercind.gov.in/

[11] In the matter of : Power purchase and allied issues in respect of Non-Conventional Energy Sources based Generating Plants and Non-Conventional Energy Sources based Co-Generation Plants

Income tax rate	30%	The Indian Income Tax Act Rates prevalent in the financial year when investment decision is made
Surcharge	10%	
Cess	3%	
MAT	10%	
Useful life of project	20 years	TNERC Tariff Order No. 3, dt. 15/05/2006 Pg. 90
Book depreciation - SLM	5.28% on plant & machinery 3.34% on civil works	The Companies Act
IT depreciation rate	80	TNERC Tariff Order No. 3, dt. 15/05/2006 Pg. 90
Book depreciation (% of asset value)	90	

The project IRR has been evaluated for each of the investor as mentioned above. The results of the project IRR are mentioned in the table below:

Sr no	Investor	Project IRR	Benchmark
1	KBDL (4X1.25MW)	9.86%	13.09%
2	SDPL (4X1.5MW)	9.93%	13.37%
3	SPDL (14X1.5MW)	6.83%	13.37%
4	DA Satyaprabha (5X750kW)	9.37%	13.37%
5	DA Srinivas (4X750kW)	9.37%	13.37%

From the above results, it is clear that none of project IRR without CDM revenue crosses the benchmark. With the CDM benefits, the project IRRs for each investor crosses the benchmark and hence CDM benefit overcomes the investment barrier[12].

Sub-step 2d: Sensitivity analysis

As per guideline provided by EB41 meeting report, Annex 45, the criteria for choosing the sensitivity analysis parameter is:

Guidance: Only variables, including the initial investment cost, that constitute more than 20% of either total project costs or total project revenues should be subjected to reasonable variation (all parameters varied need not necessarily be subjected to both negative and positive variations of the same magnitude), and the results of this variation should be presented in the PDD and be reproducible in the associated spreadsheets.. Where a DOE considers that a variable which constitute less than 20% have a material impact on the analysis they shall raise a corrective action request to include this variable in the sensitivity analysis.

The parameters subjected to sensitivity analysis are:

- PLF
- O&M cost
- Project cost

[12] Detailed workings of project IRRs with and without CDM for each investor are provided to DOE.

The above parameters were subjected to +10 to -10% sensitivity analysis. The worksheets for sensitivity analysis for project IRR are submitted to DOE. From the workings, it is clear that none of the project IRR crosses the benchmark in any sensitivity case. This justifies the robustness of IRRs.

Outcome of step 2:
It can be concluded from above analysis that the project activity without CDM is financially not attractive as it is below the benchmark and hence project is additional.

Step 3: Barrier analysis
This step is not done as option is not chosen.

Step 4: Common practice analysis

Sub-step 4a: Analyze other activities similar to the proposed project activity
Provide an analysis of any other activities implemented previously or currently underway those are similar to the proposed project activity. Projects are considered similar if they are in the same country/region and/or rely on a broadly similar technology, are of a similar scale, and take place in a comparable environment with respect to regulatory framework, investment climate, access to technology, access to financing, etc. Other CDM project activities are not to be included in this analysis. Provide quantitative information where relevant.

Since the project WTGs are spread across Tamil Nadu and Karnataka, common practice analysis has been carried out for both the states.
Analysis of similar projects within comparable regulatory regime and investment climate in Tamil Nadu:

Over the years there have been two different regulatory / investment regimes in the state of Tamil Nadu for wind power projects.

Regime 1 – Central regime (MNES policy)

- Projects installed prior to September 2001
- Wind power projects were governed by MNES policy with tariff set at Rs. 2.25 per unit for the base year 1994-95 with a 5% annual escalation, wheeling and banking charges of 2%, etc.

Regime 2 – State regime (TNEB and TNERC policies / orders)

- Projects installed after September 2001
- Wind power projects were governed by (a) TNEB order of 2001 with fixed tariff of Rs. 2.70 per unit, wheeling and banking charged of 5%, etc. (b) TNERC order of 2006 with fixed tariff of Rs. 2.9 per unit, etc.

The different tariffs under regime 1 and regime 2 are presented below:

Electricity tariff (Rs/kWh)	**2006 - 2007**	**2007 - 2008**	**2008 - 2009**	**2009 - 2010**	**2010 - 2011**	**2011 - 2012**	**2012 - 2013**	**2013 - 2014**	**2014 - 2015**	**2015 - 2016**	**Average**

REGIME 1 MNES Policy[13]	3.60	3.72	3.83	3.94	4.05	4.17	4.28	4.39	4.50	4.62	**4.11**
REGIME 2 TNEB order 2001[14] TNERC Order 2006[15]	2.70 2.90	2.70 2.90	2.70 2.90	2.70 2.90	2.70 2.90	2.70 2.90	2.70 2.90	2.70 2.90	2.70 2.90	2.70 2.90	**2.70** **2.90**

Wind projects prior to September 2001 were governed by the MNES policy. However this regime was superseded by the state policy and post September 2001 all project fell into the state regime (regime 2). As can be seen above, Regime 1 projects are of a different regulatory and investment environment and hence cannot be compared to the proposed project activity which falls under the Regime 2.

The proposed CDM project activity is a large scale project and hence an analysis of all private wind farm owners with an installed capacity of 15 MW or above, in the state of Tamil Nadu, under the Regime 2 i.e. after September 2001 till the project activity commissioning year, has been presented below.

S.No	Name of the project Owner	Total Capacity in MW	CDM Status
1	Madras Cement Ltd.[16]	41.6	Yes
2	Mohan Breweries & Distilleries[17]	53.25	Yes
3	Vishal Export Overseas Ltd[18][19]	29.275	Yes
4	Soundararaja Mills Ltd.[20][21]	34.8	Yes
5	KPR Mill Pvt. Ltd.[22][23]	33.17	Yes
6	Ashok Leyland Fin. Ltd[24]	29.175	Yes
7	Tamilnadu Newsprint & Paper Ltd[25]	28	Yes
8	Lakshmi Machine Works[26]	26.5	Yes

[13] Rs.2.25 for 1994-95 and 5% annual escalation thereafter

[14] Rs.2.70 for 2001 fixed for next 10 years

[15] Rs. 2.90 for 2006, fixed for next 10 years

[16] **http://cdm.unfccc.int/Projects/Validation/DB/AOLO0C51SE7IUL19FP3B27HORLRSK0/view.html**

[17] http://www.processregister.com/Wind_Energy/Project/pid10358.htm

[18] http://vishalexports.co.in/annual%20reports/Annaul%20Report-2005-06.pdf

[19] http://cdm.unfccc.int/UserManagement/FileStorage/7KIF6E0R55YEPEH7ANN715FEMB0WYK

[20] http://cdm.unfccc.int/Projects/Validation/DB/LO3RUNJBAVPC94GWP0N3IPQZM866Y0/view.html

[21] http://cdm.unfccc.int/Projects/Validation/DB/1VD4I971NMFAB70C0LGFR01GV4RI4H/view.html

[22] http://www.kprmilllimited.com/admin/uploads/KPR%20Mill%20Q1%20FY2009.pdf

[23] http://cdm.unfccc.int/Projects/Validation/DB/KBAXDG75UAPOH4J4P20YB2AIQKM36G/view.html

[24] http://cdm.unfccc.int/Projects/Validation/DB/37X42BG16GG63VK5L84D6WZ0UM8YGG/view.html

[25] http://cdm.unfccc.int/Projects/Validation/DB/QIJV59ENWGKVMRV8VFVC7SDNJTCHM6/view.html

9	Shanmugavel Group[27]	25.5	Yes
10	Best & Co.[28]	25	Yes
11	Grace Infrastructure (P) Ltd.[29]	25	Yes
12	TCS Textiles Ltd.[3031]	20.75	Yes
13	Chettinad Cement Corp.[32]	17.35	Yes
14	Dalmia Cements (B) Ltd.[33]	16.525	Yes
15	Rasi Seeds (P) Ltd.[34]	16.25	Yes
16	Bannari Amman Spinning Mills Ltd.[35]	16.2	Yes
17	Jayajyoti & Co. Ltd[36]	15.7	Yes
18	Arvind A Traders[37]	15.6	Yes
19	Loyal Textile Mills Ltd[38]	15.35	Yes
20	MRF Ltd[39]	15.3	Yes
21	Suzlon Infrastructure Limited[40]	17.5	Yes

It can be seen all private wind farm installations, in the similar regulatory and investment climate as that of the project activity and with capacity of over 15 MW in the state of Tamil Nadu, are CDM projects.

The analysis presented in the table above, shows that almost all similar project activities are CDM projects, i.e. and non-CDM large scale wind energy investments is not a common practise in the region.

Scenario in Karnataka

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[26] http://cdm.unfccc.int/UserManagement/FileStorage/7LXZLFECVXR5YBOJ5TH8J6XNHIPOCN

[27] http://cdm.unfccc.int/UserManagement/FileStorage/AE2042RXII12SBXNF29XDKVT2BCEWG

[28] http://cdm.unfccc.int/UserManagement/FileStorage/AE2042RXII12SBXNF29XDKVT2BCEWG

[29] http://cdm.unfccc.int/Projects/Validation/DB/FFZD3FVFDVCBV7VFLEO18LOFADFR7Z/view.html

[30] http://cdm.unfccc.int/UserManagement/FileStorage/AE2042RXII12SBXNF29XDKVT2BCEWG

[31] http://cdm.unfccc.int/UserManagement/FileStorage/F6UP274DD1DCT3XJTKRJCJZDZNPZY7

[32] http://www.windpowerindia.com/statpriv.asp

[33] http://www.windpowerindia.com/statpriv.asp

[34] http://cdm.unfccc.int/UserManagement/FileStorage/AE2042RXII12SBXNF29XDKVT2BCEWG

[35] http://www.dnv.com/focus/climate_change/upload/version%202%20-%20pdd%20%20sept%2005.pdf

[36] http://cdm.unfccc.int/UserManagement/FileStorage/AE2042RXII12SBXNF29XDKVT2BCEWG

[37] http://cdm.unfccc.int/UserManagement/FileStorage/XGCBWXVO0BCUYOG0R3OGBXZGSW9HJ8

[38] http://cdm.unfccc.int/UserManagement/FileStorage/TPAONMX73CHPZ69AQ5CSP9BI1UKU99

[39] http://www.sgsqualitynetwork.com/tradeassurance/ccp/projects/272/MRF%20PDD.pdf

[40] http://cdm.unfccc.int/UserManagement/FileStorage/FM6BIMO4FTLNNUKVLSTLYJLM14NRCM

The projects excluded from the definition of a similar scale project and the justification for the exclusions is provided below:

1. Small scale wind power project activities bundled together from a large scale CDM project have not been considered for the analysis as the scale of these projects and the scale of investment is not comparable to the project activity under consideration.

2. Project activities seeking additional funding from carbon – Projects which are under the CDM pipeline or are seeking additional revenues through carbon have to be excluded as per the guidance provided by the tool for demonstration and assessment of additionality.

3. Project activities implemented post the investment decision for the project activity, since for common practice analysis as per the guidance is only for those projects which are operational can be compared with the proposed project activity..

This common practice analysis test is a credibility check to complement the investment analysis (Step 2). Similar project activity has been defined as any large scale project activity with size above 15MW and set up by a single project proponent within a particular time frame in the state of Karnataka primarily for the sale of power to the grid is considered for analysis.

Analysis of Similar projects in Karnataka

The wind projects of similar scale commissioned/operational in state of Karnataka at the time of investment in the project activity were analysed.

An analysis of the data indicate that there were only 10 projects of similar scale in the state of Karnataka and all the 10 projects have been setup considering CDM funds

Investor Name	Size in Karnataka (MW)
VSL Mining Company (P) Ltd	27.5 MW[41]
Ramgad Minerals & MiningPvt.Ltd,	41.4 MW[42]
Nuziveedu Seeds Ltd.	27.65[43]
MSPL	89.65 MW[44]
Enercon India Limited	125.20[45]
V.M. Salgaokar & Bros. Ltd.	17.5 MW[46]
VRL Logistics Ltd.	42.5 MW[47]
MMTC Ltd.	15.0 MW[48]
Hindustan Zinc Ltd.	34.4[49]

[41] http://cdm.unfccc.int/UserManagement/FileStorage/1V5DW5ZJNU9BGYUL8N04SIF0NERRP4
[42] http://cdm.unfccc.int/Projects/DB/DNV-CUK1142448670.58/view
[43] http://cdm.unfccc.int/Projects/DB/DNV-CUK1173772302.89/view
[44] http://cdm.unfccc.int/Projects/DB/DNV-CUK1142448670.58/view
[45] http://cdm.unfccc.int/Projects/DB/DNV-CUK1185356859.49/view
[46] http://cdm.unfccc.int/Projects/Validation/DB/OE71SJJEQBVK6P1V2WMGSYR 72E8TEM/view.html
[47] http://cdm.unfccc.int/Projects/DB/SGS-UKL1225104443.35/view
[48] http://cdm.unfccc.int/Projects/DB/RWT UV1207728922.94/view

Minerals Enterprises Ltd	15 MW[50]

Thus if we were to exclude CDM project activities from the list of projects commissioned from further analysis, there are no other large scale project activities implemented in the state of Karnataka without CDM.

Thus, after exclusion of the above project activities which are under CDM as stipulated by the guidance for conducting common practice analysis provided by the additionality tool, it was found that there were no similar scale project activities under operation in the state of Karnataka. It is thus even more evident that the development of similar wind power projects has been heavily dependent on CDM funds.

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

(1) If similar activities are widely observed and commonly carried out, it calls into question the claim that the proposed project activity is financially unattractive (as contended in Step 2) or faces barriers (as contended in Step 3). Therefore, if similar activities are identified above, then it is necessary to demonstrate why the existence of these activities does not contradict the claim that the proposed project activity is financially/economically unattractive or subject to barriers. This can be done by comparing the proposed project activity to the other similar activities, and pointing out and explaining essential distinctions between them that explain why the similar activities enjoyed certain benefits that rendered it financially/economically attractive (e.g., subsidies or other financial flows) and which the proposed project activity cannot use or did not face the barriers to which the proposed project activity is subject. If necessary data/information of some similar projects are not accessible for PPs to conduct this analysis, such projects can be excluded from this analysis. In case similar projects are not accessible, the PDD should include justification about non-accessibility of data/information.

From sub-step 4a it is clear that similar activities are not widely observed or commonly carried out and that all similar projects have been undertaken only as CDM projects. Therefore Sub-step 4b is not applicable. Based on the above considerations, the project activity is considered to be additional.

The above common practice analysis satisfies the sub steps 4a and 4b through point (i) that similar activities are not widely observed and hence wind electricity generation is not a common practice.

Sub-steps 4a and 4b are satisfied.

Prior CDM consideration and real-continuous action

As per Para 6.a of Annex 22 of EB 49,

The project participant must indicate awareness of the CDM prior to the project activity start date, and that the benefits of the CDM were a decisive factor in the decision to proceed with the project. Evidence to support this would include, inter alia, minutes and/or notes related to the consideration of the decision

[49] http://cdm.unfccc.int/Projects/DB/BVQI 1208874936.63/view

[50] http://cdm.unfccc.int/Projects/DB/BVQI1207721413.19/view

by the Board of Directors, or equivalent, of the project participant, to undertake the project as a CDM project activity.

During the investment decision, each of the investor has considered CDM benefits which is evident from the extracts of the board meeting minutes/investment decision notes.

The following table explains the prior consideration details for each investor.

Sr. no	Investor	Decision date	Evidence
1	KBDL (4X1.25MW)	15/07/2006	Extracts of Board meeting minutes
2	SDPL (18X1.5MW)	05/01/2007	Extracts of Board meeting minutes
3	DA Satyprabha (5X750kW)	12/02/2007	Investment decision by DA Satyprabha
4	DA Srinivas (4X750kW)	15/02/2007	Investment decision by DA Srinivas

Chronology of project implementation and CDM consideration are as follows.

Sr. No	Date	Project Execution Step	CDM registration efforts	Evidence
1	15/07/06	KBDL board resolution – investment in 4 WTGs	Board considered CDM revenue for the project viability	Extracts of Board meeting minutes[51]
2	14/08/06	POs for first 4 WTGs in the bundle	Starting date of CDM project activity (4 POs)	PO to Suzlon Energy by KBDL
3	30/09/06	First WTG commissioned. PPAs signed for WTGs sale to TNEB grid.	-	Commissioning certificate to KBDL. PPA of KBDL with TNEB
4	05/01/07	SDPL Board resolution	Board considered CDM revenue	Extracts of Board meeting minutes
5	12/02/07		Investment decision by DA Satyprabha	Investment decision note by DA Satyprabha
6	15/02/07		Investment decision by DA Srinivas	Investment decision note by DA Srinivas
7	26/02/07	POs of WTGs by remaining four sub-project	-	Copies of purchase orders from SDPL,

[51] Original Board Meeting Minutes book shown to DOE

		owners		
8	03/03/07	Supply agreement by DA Satyprabha and DA Srinivas		Agreement copies
9	14/03/07	-	CDM Consultancy proposal from CDM Consultancy	Copy of Proposal
10	22/03/07	J&K Bank approved term loan	Loan sanction considering CDM revenue	Loan sanction letters from J&K Bank Bank loan application had considered CDM revenue
11	29-31/03/09	Commissioning of rest of the WTGs	-	Copies of Commissioning Certificates
12	13/07/07	-	CDM Consultancy services agreement for the bundled project activity	Agreement with CantorCO_2e India Pvt. Ltd.
13	05/02/08	-	CDM Authorization to SDPL – bundling agreement between the sub-project owners	Authorization letter
14	26/04/08 16/09/08 27/09/08	-	Stakeholders' meeting in Pushpathur, Tamil Nadu Stakeholders' meeting in Kappathguda, Karnataka Stakeholders' meeting in Hassan, Karnataka	Minutes of the meeting and photographs
15	Oct, 08	-	Validation contract with DOE has been signed	Contract with Validator
16	Oct, 08	-	Application to NCDMA for host country approval	Copy of application letter
17	16/10/08	-	Meeting of the NCDMA for the Host Country Approval for the project activity	

18	17/12/08	-	PDD web hosted for the global stakeholder comments	UNFCCC CDM web site[52]
19	05/02 2010		ERPA	

As per the Guidance of EB49, Annex 22, clause No. 7 and 8,

'7. Assessment of real and continuing actions shall be validated by the DOE and the validation should focus on real documented evidence as indicated in paragraph 6 (b), including an assessment by the DOE of the authenticity of the evidence.

8. In validating proposed CDM project activities where:

(a) there is less than 2 years of a gap between the documented evidence the DOE shall conclude that continuing and real actions were taken to secure CDM status for the project activity;'

From the above chronology, it can be seen that the gap between two consecutive CDM related events is less than 2 years. Hence applicability condition 8(a) of EB49, Annex 22 is met. Hence, the project activity can be considered as additional.

B.6. Emission reductions:

B.6.1. Explanation of methodological choices:

EMISSION REDUCTION CALCULATION:

As per equation 11 of ACM0002 Version 12.1.0, the emission reductions are calculated as:

$$ER_y = BE_y - PE_y \text{ ……..(1)}$$

Where

ER_y Emission reductions in year *y* (t CO_2 e/yr)

BE_y Baseline emissions in year *y* (t CO_2 e/yr)

PE_y Project emissions in year *y* (t CO_2 e/yr)

BASELINE EMISSIONS

As per equation 06 of ACM0002 Version 12.1.0 baseline emissions are calculated using following formula:

$$BE_y = EG_{PJ,y} * EF_{grid,CM,y} \text{ .....(2)}$$

Where

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

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

$EF_{grid,CM,y}$ Combined margin CO_2 emission factor for grid connected power generation in year *y* calculated using the "Tool to calculate the emission factor for an electricity system" Version 02 (tCO_2/MWh)

Since the proposed project activity is a greenfield power plant, $EG_{PJ,y}$ is calculated using following formula:

$$EG_{PJ,y} = EG_{facility,y} \text{.....(3)}$$

[52] http://cdm.unfccc.int/Projects/Validation/DB/ZSGOS9T3629EQQBKKJ8S3S5KQCSRP9/, re hosting due to project size change

Where

$\mathbf{EG_{PJ,y}}$	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)
$\mathbf{EG_{facility,y}}$	Quantity of net electricity generation supplied by the project plant/unit to the grid in year y (MWh/yr). $\mathbf{EG_{facility,y}}$ *is calculated based on the rated capacity of the power plant and PLF of 20%. Annual operating hours are considered as 8,760.*

Calculation of CO_2 emission factor of the grid in year y ($EF_{grid,CM,y}$):

According to the *Tool to calculate the emission factor for an electricity system, version 02*, $EF_{grid,CM,y}$ i.e. baseline emission factor is calculated as a combined margin (CM), consisting of the combination of operating margin (OM) and build margin (BM) factors according to the following below steps.

Step 1: Identify the relevant electricity system

The project is located in the state of Tamil Nadu and Karnataka and will be supplying the electricity to the south grid that would have been generated in this grid. Therefore the proposed project would have impact on all the generation facilities in this grid. Thus all the power generation facilities connected to this grid form the boundary for the purpose of baseline estimation. The south grid is also connected with other regional grids. However, the net exchange of energy within the regional grids is very small and negligible and hence other regional grids are not included in the boundary for estimation of baseline emissions.

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

The PP has been chosen Option I to calculate operating margin and build margin factor i.e. only grid power plants included in the calculation.

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

The calculation of the operating margin emission factor ($EF_{grid,OM,y}$) is based on one of the following methods:

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

Due to non-availability of archived dispatch data in the public domain for the southern grid, 'Dispatch Data Analysis' (1c) has not been chosen, though it should be the first methodological choice.

As per *Tool to calculate emission factor of an electricity system, Version-02*, the simple operating margin (Simple OM) can be used only if low-cost/must-run resources constitute less than 50% of total grid generation in (a) average of the five most recent years, or 2) based on long-term averages for hydroelectricity production.

From the available information published by CEA "*CO_2 baseline database for Indian Power Sector Version 06 March 2011*[53]", it can be seen from the table below that low cost/must run sources for southern grid accounts for less than 50% of the total generation in the last five years. Hence the Simple OM method has been used to calculate the operating margin emission factor applicable.

Share of Must-Run (Hydro/Nuclear) (% of Net Generation)					
Year	2005-06	2006-07	2007-08	2008-09	2009-10
Share	27.0%	28.3%	27.1%	22.8%	20.6%

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

The simple OM emission factor is calculated as the generation-weighted average CO_2 emissions per unit net electricity generation (tCO_2/MWh) of all generating power plants serving the system, not including low cost/must-run power plants / units, using the following equation:

$$EF_{OM,y} = [\Sigma_{i,j} F_{i,j,y} * COEF_{i,j}] / [\Sigma_j GEN_{j,y}] \text{.....(4)}$$

Where $F_{i,j,y}$ and $COEF_{i,j}$ are the fuel consumption and associated carbon coefficient of the fossil fuel i consumed by power plant j in the grid in year(s) y. $GEN_{j,y}$ is the electricity generation by power plant j connected to the grid excluding zero- or low-operating cost sources in year(s) y.

As per *"Tool to calculate the emission factor for an electricity system" Version 02*, the OM emission factor can be calculated using *ex ante* generation-weighted average of the most recent 3 years for which data is available or using *ex post* generation data in the year in which the project generation occurs. The OM emission factor is calculated using *ex ante* generation weighted average of the most recent 3 years (2007-08, 2008-09 and 2009-10) and hence does not require yearly monitoring of the OM emission factor. The Central Electricity Authority, Ministry of Power, Government of India has published a database of Carbon Dioxide Emission from the power sector in India based on detailed authenticated information obtained from all operating power stations in the country. This database i.e. The CO_2 Baseline Database provides information about the Combined Margin Emission Factors of all the regional electricity grids in India.

Step 5. Identify the group of power units to be included in the build margin

CO_2 Baseline Database for the Indian Power Sector Version 06, March 2011", published by CEA has calculated the build margin in accordance with the *Tool to calculate emission factor for an electricity system Version 02*, as the average emissions intensity of the 20% most recent capacity additions in the grid based on net generation. Depending on the region, the build margin covers units commissioned in the last five to ten years.

Step 6. Calculate the build margin emission factor

The Build Margin emission factor $EF_{grid,BM,y}$ is calculated ex-ante based on the most recent information available on plants already built .The Build Margin emission factor $EF_{grid,BMy}$ is given as the generation weighted average emission factor of the selected representative set of recent power plants represented by

[53] http://www.cea.nic.in/planning/c%20and%20e/government%20of%20india%20website.htm

the 5 most recent plants or the most recent 20% of the generating units built (summation is over such plants specified by *k*). The most 20% of the generating units built recently is used for build margin emission factor calculation.

Step 7. Calculate the combined margin emissions factor

The combined margin emissions factor is calculated as follows:

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

Where:

$EF_{grid,BM,y}$	Build margin CO_2 emission factor in year y (tCO_2/MWh)
$EF_{grid,OM,y}$	Operating margin CO_2 emission factor in year y (tCO_2/MWh)
w_{OM}	Weighting of operating margin emissions factor (%)
w_{BM}	Weighting of build margin emissions factor (%)

For wind and solar projects, as per *"Tool to calculate the emission factor for an electricity system Version 02",* the default weights are as follows:

w_{OM} =0.75 and w_{BM} = 0.25.

$EF_{grid,CM,y} = 0.75*EF_{grid,OM,y} + 0.25*EF_{grid,BM,y}$

The $EF_{OM,y}$ is calculated as average of latest three years values of OM emissions factors for the SOUTH grid as follows. The values are sourced from CO_2 baseline database published by Central Electricity Authority of India (CEA) Version 06 (http://www.cea.nic.in/planning/c%20and%20e/Government%20of%20India%20website.htm):

Operating margin for South grid

$EF_{grid,OM, (2007-08)} = 0.9906\ tCO_2 / MWh$
$EF_{grid,OM, (2008-09)} = 0.9729\ tCO_2 / MWh$
$EF_{grid,OM, (2009-10)} = 0.9415\ tCO_2 / MWh$

$EF_{grid,OM,y} = 0.9684\ tCO_2/MWh$

The value of $EF_{grid,BM,y}$ has been taken from CEA data (Version 06) as latest value (2009-10) of build margin for Southern grid as follows:

Build margin for South grid

$EF_{grid,BM,y} = EF_{grid,BM,(2009-10)} = 0.7633\ tCO_2/MWh$

Now,

Combined margin for south grid

$EFgrid_{,CM,y} = 0.75 * 0.9684 + 0.25 * 0.7633 = 0.9171\ tCO_2/MWh$

Project Emissions
As per ACM0002 Version 12.1.0,
For most renewable energy 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:
$PE_y = PE_{FF,y} + PE_{GP,y} + PE_{HP,y}$ ……(6)
Where

PE_y	Project emissions in year *y* (tCO_2 e/yr)
$PE_{FF,y}$	Project emissions from fossil fuel consumption in year *y* (tCO_2/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_2 e/yr)
$PE_{HP,y}$	Project emissions from water reservoirs of hydro power plants in year *y* (tCO_2 e/yr)

*The project activity will not consume fossil fuel. Hence, **$PE_{FF,y}$** is considered as zero.*
*The project will not involve operation of geothermal power plant. Hence, **$PE_{GP,y}$** is considered as zero.*
*The project will not involve hydro power plant. Hence, **$PE_{HP,y}$** is considered as zero.*
Therefore,
PE_y = 0 tCO_2e/y

LEAKAGE
As per ACM0002 Version 12.1.0,
No leakage emissions are considered. The main emissions potentially giving rise to leakage in the context of electric sector projects are emissions arising due to activities such as power plant construction and upstream emissions from fossil fuel use (e.g. extraction, processing, and transport). These emissions sources are neglected.

Therefore,

LE_y = 0 tCO_2e/y

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

Data / Parameter:	**$EF_{grid,CM,y}$**
Data unit:	tCO_2/MWh
Description:	The combine margin CO_2 emission factor for south grid
Source of data used:	Estimated figure based on 75% of OM and 25% of BM values calculated using data obtained from "*CO_2 Baseline Database for the Indian Power Sector Version 06 March 2011*[54]"published CEA of India.
Value applied:	0.9171
Justification of the choice of data or description of measurement methods and procedures actually	Calculated as per ACM0002 with 3years vintage data and option of ex ante calculation based on "75% of OM and 25% of BM values approach".

[54] http://www.cea.nic.in/planning/c%20and%20e/government%20of%20india%20website.htm

applied :	
Any comment:	

Data / Parameter:	**$EF_{grid,OM,y}$**
Data unit:	tCO_2/MWh
Description:	The operating margin CO_2 emission factor of south grid
Source of data used:	This is calculated as the average of the three recent most years (2007-08, 2008-09 and 2009-10) data on Operating Margin provided by Central Electricity Authority. The values used are sourced from "*CO_2 Baseline Database for the Indian Power Sector Version 06 March 2011*"published CEA of India.
Value applied:	0.9684
Justification of the choice of data or description of measurement methods and procedures actually applied :	
Any comment:	

Data / Parameter:	**$EF_{grid,BM,y}$**
Data unit:	tCO_2/MWh
Description:	The build margin CO_2 emission factor of south grid
Source of data used:	This is the value of build margin emission factor of recent year 2008-09. The values used are sourced from "*CO_2 Baseline Database for the Indian Power Sector Version 06 March 2011*"published CEA of India.
Value applied:	0.7633
Justification of the choice of data or description of measurement methods and procedures actually applied :	
Any comment:	The Build Margin emission factor of Southern grid is Recent year 2009-10= 0.7633

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

The emission reduction ER_y due to project activity during a given year y is calculated as the difference between baseline emissions (BE_y), project emissions (PE_y) and emissions due to leakage (LE_y) as per the formula given below:

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

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

$$\mathbf{EF_{grid,CM,y}}\ (tCO_2e/MWh) = w_{OM}\ EF_{OM,y}\ (tCO_2e/MWh) + w_{BM}\ EF_{BM,y}\ (tCO_2e/MWh)$$
$$= 0.75*0.9684 + 0.25*0.7633$$

= 0. 9171 tCO_2e/MWh

$\mathbf{EG_{PJ,y}}$ = Rated capacity (MW)* PLF (%)* Annual operating hours
= 86,913 MWh/year

$\mathbf{BE_y}$ = 86,913* 0. 9171
= 79,709tCO_2e

As described in section B.6.1 above,
$\mathbf{PE_y}$ = 0 tCO_2e

Therefore,
$\mathbf{ER_y}$ = 79,709 - 0
= 79,709 tCO_2e

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

Year	Estimation of project activity emissions (tCO_2e)	Estimation of baseline emissions (tCO_2e)	Estimation of leakage (tCO_2e)	Estimation of overall emission reductions (tCO_2e)
2011	0	79,709	0	79,709
2012	0	79,709	0	79,709
2013	0	79,709	0	79,709
2014	0	79,709	0	79,709
2015	0	79,709	0	79,709
2016	0	79,709	0	79,709
2017	0	79,709	0	79,709
2018	0	79,709	0	79,709
2019	0	79,709	0	79,709
2020	0	79,709	0	79,709
Total (tonnes of CO_2e)	0	**797,090**	0	**797,090**

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

B.7.1 Data and parameters monitored:

Data / Parameter:	$\mathbf{EG_{PJ,y}}$
Data unit:	GWh/ year
Description:	Net electricity supplied to southern grid by the project activity
Source of data to be used:	Join meter reading copy
Measurement Procedures (if any):	Metering system for the project activity consists of one main (tri-vector) meter of accuracy class 0.5 and one check meter on local control system of WTG. Net electricity supplied to grid will be measured through meter readings of the two-way export/ import meter installed by TNEB and KSEB

	on continuous basis. A joint meter reading will be taken by TNEB/KESB in presence of PP once in a month. Based on joint meter reading, a specimen reading copy will be issued. Based on this copy, PP will raise sales invoice.
Monitoring frequency :	Continuous measurement and monthly recording
QA/QC procedures:	The meters installed by TNEB and KESB will be calibrated once in a year. The net electricity exported will be cross-checked through sales invoices.
Any comment:	Presently Tamil Nadu has 0.5 class meters and Karnataka sites have 0.2 class meters. A minimum 0.5% accuracy is planned to be maintained for the crediting period. The monitoring records will be archived for whole crediting period + 2 years.

B.7.2. Description of the monitoring plan:

Monitoring plan for the state of Tamil Nadu

The project has a two metering system, first is LCS (Local Control System) meter installed by the WTG supplier which is pre-calibrated and sealed by the supplier that meets the Indian and regional electricity authority's standards. Another meter (common for few WTGs with multiple WTGs at a location) is installed and owned by State Electricity Boards (SEB).

The electricity generated is monitored at each wind mill using LCS on weekly basis by the site operator or supervisor. The daily meter reading will be taken and maintained at the wind farms in respective wind farm's electricity meter log books. There is also a main electricity meter installed by the state electricity board (that is common for a group of WTGs – all under this project activity). The reading of the individual/ joint EB meter reading is recorded on monthly basis by the official from state electricity board in presence of site operator/ supervisor.

The receipt of the sales to grid is then cross-checked with the data recorded by each individual meter to avoid any differences. The individual LCS meter is pre-calibrated and sealed by the supplying company and is not interfered by project proponent with out the presence of manufacturing company or its accredited representatives. Whereas, the main EB meter is owned by the state electricity board and will be calibrated annually. If the error observed in the calibration is more than the standard variation allowed, the same error will be applied to all the readings from the last calibration. The invoices are raised based on the joint meter readings, so this can also be considered as the third party certified electricity generation. The same data will be used for the emission reduction calculation.

Data uncertainty is nil with high accuracy class meters, continuous check meter record at Central Monitoring Stations (CMS) for most sites and annual calibration plan.

Designation	**Responsibilities**
Project head (in-charge person from project proponent)	• Registration • Data storage and electronic archiving • Secondary monitoring
Project executor and controller (WTG owner or appointed person on behalf)	• Recording • Verification • Storage of data
Site main controller	• Operation, monitoring and verification of data • Data recording

	• Storage of data
Operation and maintenance contractor	• Operation and maintenance • Storage of data • Data recording

The project proponents have undertaken an operation and maintenance agreement with the supplier of the wind turbines i.e. Suzlon and Vestas. The performance of the mills, safety in operation and scheduled /breakdown maintenances are organized and monitored by the contractor. So the authority and responsibility of O&M lies with the contractor.

Secondary Monitoring and Contingency Plan
The secondary monitoring, which will provide a backup (fail-safe measure), in case of failure of the primary monitoring due to unforeseen reasons, data recording would be done at the individual WTGs with the help of LCS meter attached with each WTGs. The total electricity generation will also be cross checked with the invoices raised for the particular month. In some cased where the WTG is monitored continuously at the CMS. Thus, the check meter reading will be either at the LCS meter or at the CMS of the O&M agency.

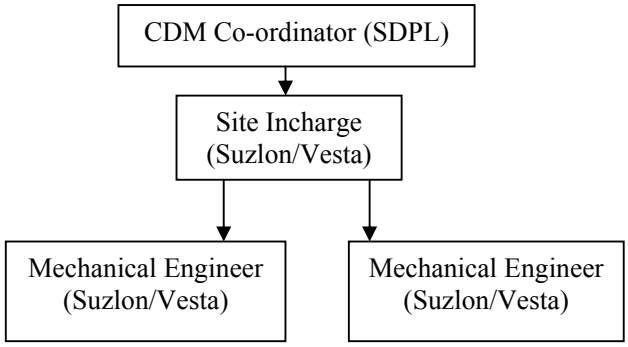
In case of any error observed in the meter readings of the individual WTGs and joint meter, site engineers will set correct value in presence of the supervisor and a written report will be sent to the project proponent. In cases, where the joint meter reading is taken on monthly basis and the data of the few days within a particular month is required, the individual meter readings of the WTG will be used. Also, when there is difference of values for the same reading in two meters, the lower meter reading will be used as a conservative approach.

All the relevant data & reports for maintaining accuracy in future monitoring and reporting of GHGs emission reduction is with Sapthagiri Distilleries Private Limited (SDPL).

Monitoring Plan for the state of Karnataka
The WTGs in Kappathguda are situated on hills and CMS system set up takes care of particular hills. The Sapthagiri WTGs are situated on Hill number 9 and 10 and the CDM building for that region is on Hill Number 10.

For the two WTGs (H23 & H24) at Hassan, there is joint meter installed at one site and same is followed for Kappathguda (K301 & K311). The Form B issued by the electricity purchaser will be used for the CDM monitoring data and is a third party approved value of the electricity supply to grid.

Operational and Management Structure
The SDPL has appointed a full time project in-charge to manage the overall project activities after commissioning. The project in-charge supervises the functioning of the Wind farm in close coordination with the official technical personnel of Suzlon Energy Limited (SEL) and Vestas Wind Technology India Pvt. Ltd. Authority and responsibility for registration is with the SDPL and the contact details of the person responsible have been provided in ANNEX I. The operational and management structure is as follows:



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 and monitoring methodology:
21/01/2011
Name of the responsible entity:
Sapthagiri Distilleries Private Limited
The entity mentioned above is a project participant.

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:

14.08.2006 (PO placed by KBDL for 4X1.25MW WTGs)

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

20 years and 0 months (from date of commissioning)

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

Fixed crediting period is chosen.

C.2.1. Renewable crediting period:

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

N.A.

C.2.1.2. Length of the first crediting period:

N.A.

C.2.2. Fixed crediting period:

C.2.2.1. Starting date:

01/12/2011 or the date of registration whichever is later.

C.2.2.2. Length:

10 years 0 months

SECTION D. Environmental impacts

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

As per the Schedule 1 of the EIA notification 2006[55], given by the Ministry of Environment and Forests under the Environment (Protection) Act 1986, the proposed project doesn't fall under the list of activities requiring EIA. The project will not involve any negative environmental impacts, as the WEGs are installed for generation of power using wind which is a clean source of energy, thus no EIA study was conducted.

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:

The environmental impacts from the proposed CDM project activity are not considered significant evident from the exclusion of EIA study requirement by the Host Country.

SECTION E. Stakeholders' comments

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

SDPL has conducted the stakeholder meeting with identified stakeholders with the objective to inform about environmental and social impact of project activity in the region and discuss their concern on the same. Invitation[56] for stakeholder consultation meeting was sent out requesting the nearby village representatives and local governing bodies to participate and communicate any suggestions/objections regarding the project activity. 15days prior to the stakeholders meeting SDPL has published a bulletin on bulletin board of Village panchayat office in nearby villages at respective site to ensure the participation of interested parties. The stakeholder meeting was conducted with the representative of village panchayat, employee of Suzlon and SDPL on 25-26th June, 2008 at project sites in Tamil Nadu and on 16-29th September, 2008 at project sites in Karnataka.

At respective sites CA P.S. Chakrapani, has explained about the project activity and consultant to the project made a brief explanation of CDM. After introductory statement, a chairman has been elected from the stakeholder present in the meeting. The chairman has invited participants present in the meeting to express their comments and concerns about the project activity.

[55] http://envfor.nic.in/legis/eia/circular-eia-2006.pdf
[56] Reference for Invitation letter: The stakeholders at Radhapuram, Pushpathur, Kappathguda and Hassan sites has been reached out through panchayat board office and personal invitations

The interested local stakeholders who failed to attend the meeting were given option to send their comments by e-mail, fax or phone within 15 days of date of meeting.

No comments by e-mail, fax or phone have been received.

E.2. Summary of the comments received:

No negative comment were received, overall finding was that the participants expected the local villagers would benefit from the project activity. The general queries raised during the stakeholder consultation meetings were:

- Mr Krishnappa of Basavaghatta village, asked does the project activity will affect the precipitation pattern in the region. How deforestation causes to increase global warming?
- Mr. Chandragowda of Basavaghatta village, asked how the villagers will get benefit by the project activity and requested for financial help for renovation of temple.

The stakeholders at Pushapathur village, asked whether it is possible to do tree plantation around WTGs?

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

The concern raised by stakeholders being answered by Management as

- Mr. Vittal explained that the project activity will have no impact on precipitation pattern. Further he explained that due to increased in deforestation activity the carbon storage capacity is decreasing and hence more carbon dioxide will be released to atmosphere leading to Global Warming.
- Mr .Vittal informed that local villagers have been employed during construction and O&M activities. He also informed that the financial help has been provided by company to the local committee.
- Mr P.S. Chakarapani informed that wherever possible the local villagers being promoted to do tree plantation.

The Chairperson of the meeting of respective stakeholder meeting has appreciated the project activity as the project activity is a good initiative undertaken by the project proponents which contributes, to the sustainable development of the area. None of the concerns expressed by the stakeholders required an action to be taken by the SDPL during the project operation and at any other stage.

Annex 1

CONTACT INFORMATION ON PARTICIPANTS IN THE PROJECT ACTIVITY

Organization:	Sapthagiri Distilleries Private Limited
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Represented by:	-
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Represented by:	
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Annex 2

INFORMATION REGARDING PUBLIC FUNDING

This is a unilateral CDM Project Activity undertaken by the project proponent. Hence public funding from ANNEX 1 and diversion of Official Development Assistance (ODA) is not involved in this project.

Annex 3

BASELINE INFORMATION

Please refer Section B.6 of the PDD.

Annex 4

MONITORING INFORMATION

The general conditions set out for metering, recording, meter readings, meter inspections, test & checking and communication shall be as per the guidelines

Metering
The delivered energy shall be metered by the parties at the high voltage side of the step up transformer installed at the project site.

Metering Equipment
Metering equipment shall be electronic trivector meters of accuracy class 0.5% required for the project (both main and check meters) as per PPA TNEB/KSEB. The meters installed shall be capable of recording and storing half hourly readings of all the electrical parameters for a minimum period of 35 days with digital output.

Meter Readings
The net electricity supplied to the grid is recorded by taking a Joint Meter Reading (JMR) in the presence of officials from respective grid and Suzlon/Vestas (as applicable) as O&M contractor, on behalf of project proponents. The JMR contains the value of energy imported and exported and the net export to the grid during the recording period. The JMR is certified by the executive engineer of respective grid and by Suzlon/Vestas Officials. QA/QC of the JMR would be established through the calibration report of the joint meter.

Inspection of Energy Meters
The entire main and check energy meters (export and import) and all associated instruments, transformers installed at the metering shall be of minimum 0.5% accuracy class. Each meter shall be jointly inspected and sealed on behalf of the parties and shall not be interfered with by either party except in the presence of the other party or its accredited representatives.

Meter Test Checking
All the main and check meters shall be tested for accuracy every calendar quarter with reference to a portable standard meter which shall be of an accuracy class of minimum 0.5%. The portable standard meter shall be owned by the corporation at its cost and tested and certified at least once every year from an accepted laboratory in accordance with electricity standards. The meters shall be deemed to be working satisfactorily if the errors are within specifications for meters of 0.5 accuracy classes. The consumption registered by the main meters alone will hold well for the purpose of billing as long as the error in the main meters is within the permissible limits.

If during the quarterly tests, the main meter is found to be within the permissible limit of error and the corresponding check meter is beyond the permissible limits, then billing will be as per the main meter as usual. The check meter shall, however, be calibrated immediately.

If during the quarterly tests, the main meter is found to be beyond permissible limits of error, but the corresponding check meter is found to be within permissible of error, then the billing for the month up to the date and time of such test shall be as per the check meter. There will be a revision in the bills for the period from the previous calibration test up to the current test based on the readings of the check meter.

The main meter shall be calibrated immediately and billing for the period thereafter till the next monthly meter reading shall be as per the calibrated main meter.

If during the quarterly tests, both the main meters and the corresponding check meters are found to be beyond the permissible limits of error, both the main meters shall be immediately calibrated and the correction applied to the reading registered by the main meter to arrive the correct reading of energy supplied for billing purposes for the period from the last month's meter reading up to the current test. Billing for the period thereafter till the next monthly reading shall be as per the calibrated main meter. If during any of the monthly meter readings, the variation between the main meter and the check meter is more than the permissible limit for meters of 0.5% accuracy class; all the meters shall be re-tested and calibrated immediately.

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APPENDIX B

The geo-coordinates of each WTG with location

Table E: WTGs owned by KBDL located in Tamil Nadu

	Unique ID	HT SC No.	Capacity (kW)	SF No.	Latitude	Longitude	Taluka
1	Q195	1312	1250	709, Kundadam	N10^{0}50'07.9"	E77^{0}25'58.7"	Palladam
2	Q211	1329	1250	804/1(P), 2(P), 805(P), Kundadam	N10^{0}48'59.1"	E77^{0}25'54.9"	Palladam
3	G81	1337	1250	178(P) Chinnapudhur	N10^{0}44'30.9"	E77^{0}25'40.6"	Palladam
4	G89	1336	1250	136(P)	N10^{0}43'31.0"	E77^{0}25'51.5"	Palladam

Table F: WTGs owned by SDPL located in Tamil Nadu

	Unique ID	HT SC No.	Capacity (kW)	SF No.	Latitude	Longitude	Taluka
5	G936	1442	1500	576/2D(P).2E(P)	N10^{0}33'46.0"	E77^{0}19'19.0"	Palladam
6	G938	1440	1500	2(P)	N10^{0}33'45.4"	E77^{0}19'47.1"	Palladam
7	G953	1441	1500	-	N10^{0}33'32.4"	E77^{0}18'34.8"	Palladam
8	R73	2155	1500	69/2A(Part)/69/2B9Part) Udayathoor	N8^{0}17.383'	E77^{0}44.084'	Sankaneri
9	R166	2317	1500	414/1B (Part) Udayathoor	N8^{0}14.466'	E77^{0}44.764'	Sankaneri
10	R104	2309	1500	75/ 3B(Part), 132/1(Part) Udayathoor	N8^{0}17.343'	E77^{0}44.865'	Sankaneri
11	R116	2310	1500	153/3A(P), 3B(P), 3C(P), 3D(P) Udayathoor	N8^{0}16.728'	E77^{0}45.629'	Sankaneri
12	R124	2311	1500	179/5 (Part) Udayathoor	N8^{0}16.024'	E77^{0}45.860'	Sankaneri
13	R134	2312	1500	175/5(p), Udayathoor	N8^{0}16.036'	E77^{0}45.513'	Sankaneri
14	R138	2313	1500	218/2 (Part) Udayathoor	N8^{0}15.610'	E77^{0}45.302'	Sankaneri
15	R173	2314	1500	153/1 (Part) Vijaypathy	N8^{0}14.014'	E77^{0}45.702'	Sankaneri
16	R180	2315	1500	144/1 (Part) Vijay pathy	N8^{0}13.753'	E77^{0}45.703'	Sankaneri

17	R178	2316	1500	87/1 (Part) Vijaypathy	N8^{0}13.681’	E77^{0}45.199’	Sankaneri
18	R187	2318	1500	5 (Part) Vijaypathy	N8^{0}13.397’	E77^{0}43.764’	Sankaneri
19	R181	2325	1500	10/2 (Part) Vijaypathy	N8^{0}13.627’	E77^{0}43.759’	Sankaneri

Table G: WTGs owned by SDPL located in Karnataka

	Location No.	RR No.	Capacity (kW)	SF No.	Latitude	Longitude	Taluka
20	H23	HSN/TL&SS/WF/H23/04	1500	1 Rangapurakavalu	N76^{0}11’50.6”	E13^{0}10’81.6”	Arasikere
21	H24	HSN/TL&SS/WF/H23/04	1500		N76^{0}11’44.3”	E13^{0}10’95.8”	Arasikere
22	K310	GDG/TL&SS/WF/SDPLK/K-311/89	1500	72, 77 Keluru	N15^{0}08’38.6”	E75^{0}46’49.8”	Mundargi
23	K311	GDG/TL&SS/WF/SDPLK/K-311/89	1500		N15^{0}08’18.3”	E75^{0}47’15.5”	Mundargi

Table H: WTGs owned by DA Satyaprabha located in Tamil Nadu

	Unique ID	On Board at site	HT SC No.	Capacity (kW)	SF No.	Latitude	Longitude	Taluka
24	55255	G897/10	2319/TIN	750	178/7, Sampavarvadakarai	N9^{0}01’29.2”	E77^{0}24’00.6”	Surandai
25	55257	G897/18	2320/TIN	750	125/7 (p),/8 (p)/9(p)10(p), Sampavarvadakarai	N9^{0}00’58.1”	E77^{0}24’44.4”	Surandai
26	55258	G897/19	2321/TIN	750	44/2,3,4(P), Sampavarvadakarai	N9^{0}01’06.3”	E77^{0}22’45.5”	Surandai
27	55253	G897/8	2233/TIN	750	287/(p), Alagiapandiapuram	N9^{0}01’23.9”	E77^{0}31’34.8”	Surandai
28	55254	G897/9	2232/TIN	750	210/1a(p), Alagiapandiapuram	N9^{0}01’05.6”	E77^{0}30’29.7”	Surandai

Table I: WTGs owned by DA Srinivas located in Tamil Nadu

	Unique ID	HT SC No.	Capacity (kW)	SF No.	Latitude	Longitude	Taluka
29	55244	2270/TIN	750	145/10, 11, 12, 13, 14, 15, 16(P) Navaneethakrishnapuram	N8^{0}56’27.6”	E77^{0}38’06.4”	Surandai
30	55250	2306/TIN	750	144/3, 4 Navaneethakrishnapuram	N9^{0}01’ 25.9”	E77^{0}32’01.5”	Surandai

31	55245	2289 TIN	750	415/1A, 1B, 2 Keelakalangal	N8^{0}56’26.8”	E77^{0}38’41.9”	Surandai
32	55252	2307	750	378/ 2(P), 3(P) Keelakalangal	N9^{0}01’13.7”	E77^{0}30’28.8”	Surandai