CLEAN DEVELOPMENT MECHANISM
PROJECT DESIGN DOCUMENT FORM (CDM-SSC-PDD)
Version 03 - in effect as of: 22 December 2006

CONTENTS

Annexes

Appendix I: (Abbreviation)

Revision history of this document

Version Number	Date	Description and reason of revision
01	21 January 2003	Initial adoption
02	8 July 2005	• The Board agreed to revise the CDM SSC PDD to reflect guidance and clarifications provided by the Board since version 01 of this document. • As a consequence, the guidelines for completing CDM SSC PDD have been revised accordingly to version 2. The latest version can be found at <http://cdm.unfccc.int/Reference/Documents>.
03	22 December 2006	• The Board agreed to revise the CDM project design document for small-scale activities (CDM-SSC-PDD), taking into account CDM-PDD and CDM-NM.

SECTION A. General description of project activity

A.1 Title of the project activity:

13.75 MW wind power project in Davangere, Karnataka, India.
Version: 02
Dated: 02/12/2009

A.2. Description of the project activity:

The proposed project activity is an initiative by Sargam Retails Private Limited (SRPL), towards clean electricity generation using wind energy resources in the state of Karnataka. SRPL is engaged in Trading and Marketing Packaged Tea & Tobacco.

The project activity leads to the installation of 10 Wind Turbine Generators (WTGs) of total generating capacity of 13.75 MW (5 nos of Suzlon make S 82 WTGs each having generating capacity of 1500 kW & 5 nos of Suzlon make S 64 WTGs each having generating capacity of 1250 kW). Their locations will be in Davangere district of Karnataka state of India.

The main purpose of the project activity is to generate electrical energy through sustainable means using wind power resources, to utilize the generated output for supply to Karnataka Power Transmission Company Limited (KPTCL) and to contribute to climate change mitigation efforts. This renewable energy produced will partially contribute to the electricity provided by the KPTCL.

The project will be utilizing wind energy for generating electricity which otherwise would have been generated through alternate fuels (most likely - fossil fuel) based power plants thus, contributing to reduction in specific emissions (emissions of pollutant) including GHG emissions. Being a renewable resource, using wind energy to generate electricity contributes to resource conservation. SRPL will be developing this project keeping in consideration the funding available under the Clean Development Mechanism (CDM) of the United Nations Framework Convention on Climate Change. The project activity is also responsible for sustainable economic growth and conservation of environment through use of wind as a renewable source. The Project activity would generate 13.75 MW of electricity with efficient utilization of the available wind energy through adoption of the latest, efficient and modern technology. The generated electricity will displace equivalent electricity (generated from fossil sources) that may have been supplied to KPTCL.

Sustainable development criteria

The following criteria have been considered for demonstrating sustainable development.

- *Social well being*
- *Economic well being*
- *Environmental well being*
- *Technological well being*

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

Social Well-being

- The proposed project activity will lead to alleviation of poverty by establishing direct and indirect employment benefits. Such benefits will, for example, be accrued out during maintenance operations of the project activity or as generation of permanent labor in the form of security services. The infrastructure in and around the project area will also improve due to project activities. This includes development of road network and improvement of electricity quality, frequency and availability.
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Economic Prosperity

- The project activity leads to an investment of about INR 786 million to a developing region which otherwise would not have happened in the absence of project activity. The generated electricity is fed into the Southern Regional Grid through local grid, thereby improving the grid frequency and availability of electricity to the local consumers (villagers & sub-urban habitants). This attracts new opportunities for industries and economic activities to be setup in the area thereby resulting in greater local employment, ultimately leading to overall development. The project activity also leads to diversification of the national energy supply, which is dominated by conventional fuel based generating units.

Environmental Well-being

- The project will utilize wind energy for generating electricity which otherwise would have been generated through alternate fuels (most likely - fossil fuel) based power plants, contributing to reduction in specific emissions (emissions of pollutant) including GHG emissions. Being a renewable resource, using wind energy to generate electricity contributes to resource conservation. Thus the project causes no negative impact on the surrounding environment contributing to environmental well-being.

Technological Up-gradation

- The project activity involves the installation of state-of–art technology. The wind turbine generators used for the project activity are of the latest technology. This project will therefore motivate other proponents in the surrounding area to put up high-efficiency techniques.

Thus, it is ensured that the project activity meets all the criteria for Sustainable development.

A.3. Project participants:

Name of Party involved	Private and/or public entity (ies) project participants	Kindly indicate if the Party involved wishes to be considered as project participant (Yes/ No)
India (Host)	Private Entity: Sargam Retails Private Limited (SRPL)	No

A.4. Technical description of the project activity:

A.4.1. Location of the project activity:

A.4.1.1. Host Party (ies):

India

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

Karnataka

A.4.1.3. City/Town/Community etc:

Davangere

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

The project activity is located at Davangere in the state of Karnataka.

Davangere: 14º 27’13.39’’N, 75º 55’08.15’’E,

Latitude & Longitude:

Location Details of M/s Sargam Retails

Capacity	Location No.	R.S. No.	Village	Taluka	District
1.5 MW	K-543	111	Yaraganal	Honnali	Davangere
1.5 MW	K-544	111	Yaraganal	Honnali	Davangere
1.5 MW	K-549	28	Kudurekonda	Honnali	Davangere
1.5 MW	K-550	28	Kudurekonda	Honnali	Davangere
1.5 MW	K-551	28	Kudurekonda	Honnali	Davangere
1.25 MW	K-538	111	Yaraganal	Honnali	Davangere
1.25 MW	K-539	111	Yaraganal	Honnali	Davangere
1.25 MW	K-540	111	Yaraganal	Honnali	Davangere
1.25 MW	K-541	111	Yaraganal	Honnali	Davangere
1.25 MW	K-542	111	Yaraganal	Honnali	Davangere

WEG	Capacity (MW)	Taluka	District	Latitude	Longitude
K-543	1.5 MW	Honnali	Davangere	14°09'17.4"	75°30'11.9"
K-544	1.5 MW	Honnali	Davangere	14°09'10.4"	75°30'17.6"
K-549	1.5 MW	Honnali	Davangere	14°09'03.2"	75°30'23.1"
K-550	1.5 MW	Honnali	Davangere	14°08'57.2"	75°30'29.9"
K-551	1.5 MW	Honnali	Davangere	14°08'51.2"	75°30'36.7"
K-538	1.25 MW	Honnali	Davangere	14°08'45.3"	75°30'43.7"
K-539	1.25 MW	Honnali	Davangere	14°08'39.5"	75°30'50.9"
K-540	1.25 MW	Honnali	Davangere	14°08'13.3"	75°31'32.4"
K-541	1.25 MW	Honnali	Davangere	14°08'07.4"	75°31'38.8"
K-542	1.25 MW	Honnali	Davangere	14°07'59.5"	75°31'44.1"

Davangere (Proposed wind Site)

A.4.2. Type and category (ies) and technology/measure of the small-scale project activity:

Type & Category

The project activity compiles with the applicability criteria of the small scale CDM project activity category. The capacity of the proposed project is 13.75 MW, which is less than the maximum qualifying capacity of 15 MW, the project activity has been considered as a small scale CDM project activity and UNFCCC indicative simplified modalities and procedures are applied. The project activity utilizes the wind potential for power generation and exports the generated electricity to the grid. According to small-scale CDM modalities the project activity falls under the following category:

Sectoral Scope: 1 Energy industries (renewable / non renewable sources)

Type I: *Renewable Energy Projects* and **Category D:** '*Grid connected renewable electricity generation'* (Version 15, EB 50, valid from 30th October, 2009[1]).
As per the provisions specified, the projects that come under the purview of AMS.I.D (Version 15.0) "*comprise of renewable energy generation units, such as photovoltaic, hydro, tidal/wave, wind, geothermal and renewable biomass, that supply electricity to and/or displace electricity from an electricity distribution system that is or would have been supplied by at least one fossil fuel fired generating unit.".*

Technology

In wind energy generation, kinetic energy of wind is converted into mechanical energy and subsequently into electrical energy. Wind turbines capture wind's energy with two or three propeller-like blades, which are mounted on a rotor to generate electricity. The turbines sit high atop towers, taking advantage of the stronger and less turbulent wind as the wind blows through the blades of windmill, a pocket of low-pressure forms on the downwind side of the blade. The low-pressure pocket then pulls the blade towards it, causing the rotor to spin. The rotor turns the shaft that further spins the connected generator. The spinning of this generator produces the required electricity.
For the project activity, SRPL has placed the purchase order to procure Wind Turbine Generators (WTGs) from M/S Suzlon Energy Limited (SEL) and it's associate companies for supply of 5 nos S 82 1500 kW capacity and 5 nos S 64 1250 kW capacity.
PLF (Plant Load Factor) = [Guaranted generation/WTG (Lacs unit) - estimation x 10^5/Installed Capacity (MW) x10^3x24x365] * 100.
PLF =[(36 x 5 + 26 x 5) x 10^5/13.75 x 10^3 x 24 x 365] * 100 = 25.74%.
PLF For 1.25 MW WTG:
PLF =[(26 x 5) x 10^5/6.25 x 10^3 x 24 x 365] * 100 = 23.74%.
PLF For 1. 5 MW WTG:
PLF =[36 x 5) x 10^5/7.5 x 10^3 x 24 x 365] * 100 = 27..39%.
The salient features of the technology are:

S_82_1.5 MW_50Hz

Rated Power	1,500 kW
Rotor diameter	82 m
Swept area	5,281 m^2
No. of blades	3
Cut in wind speed	4 m/s
Cut out wind Speed	20 m/s
Rotor Speed	20.3 rpm
Regulation	Pitch
Hub Height	78.5 m
Generator Type	Asynchronous
Insulation	Class 'H'

[1] (http://cdm.unfccc.int/methodologies/SSCmethodologies/approved.html)

S_64_1.25 MW_50Hz:-

Rated Power	1,250 kW
Rotor diameter	64 m
Swept area	3,217 m^2
No. of blades	3
Cut in wind speed	3.5 m/s
Cut out wind Speed	25 m/s
Rotor Speed	20.3 rpm
Regulation	Pitch
Hub Height	74.5 m
Generator Type	Asynchronous
Insulation	Class 'H'

A.4.3 Estimated amount of emission reductions over the chosen crediting period:

The expected emission reductions are calculated based on the electricity fed to the southern regional grid. The estimated annual quantity of emission reductions due to the project activity is 26475 tCO_2e. A renewable crediting period of 7 (Seven) years is selected for the small-scale project activity.

Year wise estimation of emission reductions during the crediting period is shown below in Table 1.

Table 1

Years	Annual estimation of emission reductions in tCO_2e
2010	26475
2011	26475
2012	26475
2013	26475
2014	26475
2015	26475
2016	26475
Total estimated reductions (tCO2e)	**185325**
Total number of crediting years	7 years
Annual average over the crediting period of estimated reductions (tCO2e)	26475

A.4.4. Public funding of the project activity:

There is no public funding involved in the project activity. The project activity has been developed on the basis of in-house resources of the company & loan from the bank.

A.4.5. Confirmation that the small scale project activity is not a debundled component of a Large Scale Project activity:

According to paragraph 2 of Appendix C to the Simplified Modalities and Procedures for Small-Scale CDM project activities (FCCC/CP/2002/7/Add.3), a small-scale project is considered a debundled component of a large project activity if there is a registered small-scale activity or an application to register another small-scale activity:

- With the same project participants
- In the same project category and technology
- Registered within the previous two years; and
- Whose project boundary is within 1 km of project boundary of the proposed small scale activity

The project proponent hereby confirms that there is no registered small scale project activity registered within the two years in the same project category and technology whose project boundary is within 1km of the project boundary of the proposed small scale activity. Thus the project is not a debundled component of any other large-scale 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:

The methodology followed will be "AMS I.D.Version 15.0 (Valid from 30 Oct 09 onward) Approved methodology for Small Scale Projects" under the sectoral scope "Grid connected renewable electricity generation" which is most appropriate for this Project and is listed as per the UNFCCC norms.

Project Type **:** I – Renewable energy project

Project category **:** D – Grid connected renewable electricity generation
(AMS I.D. Version 15.0, EB 50 (Valid from 30 Oct 09 onward))
Methodology AMS I.D. also refers to:-
Revision to the approved consolidated methodology **ACM0002 "Consolidated baseline methodology for grid-connected electricity generation from renewable sources**" Version: 10, EB 47
Scope No: 1
Sectoral Scope Energy Industries: (Renewable/non-renewable)
Date: 30th October 2009.

Reference **:** Appendix B of simplified M&P for small scale project activities (UNFCCC, Recent norms).

B.2 Justification of the choice of the project category:

In accordance with Appendix B of the simplified modalities and procedures for small-scale CDM Project activities, the project category are categorized as Type – AMS I.D.: Version 15.0, Scope 1, "Grid Connected renewable electricity generation". Category ID is applicable to projects that use renewable energy technologies that supply electricity to a grid.

The CDM project is leading to reduction in the emission of GHG due to the use of renewable energy source, i.e., wind, for power generation.

Sr.	Technology/measure	Justification

1.	This category comprises renewable energy generation units, such as photovoltaic, hydro, tidal/wave, wind, geothermal and renewable biomass, that supply electricity to and/or displace electricity from an electricity distribution system that is or would have been supplied by at least one fossil fuel fired generating unit.	The project activity is the installation of windmills, which utilizes the renewable energy of wind to generate electricity connected to grid.
2.	If the unit added has both renewable and non-renewable components (e.g. a wind/diesel unit), the eligibility limit of 15MW for a small-scale CDM project activity applies only to the renewable component. If the unit added co-fires fossil fuel, the capacity of the entire unit shall not exceed the limit of 15MW.	The project activity involves the installation of 10 units of WTGs (5 nos of 1250 kW & 5 nos of 1500 kW capacity, which contributes to total of 13.75 MW which is less than the limiting capacity of 15 MW.
3.	Combined heat and power (co-generation) systems are not eligible under this category.	The activity includes only wind mills of 13.75 MW capacities and does not include any co-generation process. Hence it satisfies the condition.
4.	In the case of project activities that involve the addition of renewable energy generation units at an existing renewable power generation facility, the added capacity of the units added by the project should be lower than 15 MW and should be physically distinct from the existing units.	The project activity is installation of 13.75 MW new windmills and not any addition to existing units. It is not applicable.
5.	Project activities that seek to retrofit or modify an existing facility for renewable energy generation are included in this category. To qualify as a small-scale project, the total output of the modified or retrofitted unit shall not exceed the limit of 15 MW.	The project activity is neither retrofit nor modify an existing facility. The proposed Project activity is installation of 13.75 MW new wind mills Thus it is not applicable.
6.	Hydro power plants with reservoirs that satisfy at least one of the following conditions are eligible to apply this methodology: • The project activity is implemented in an existing reservoir with no change in the volume of reservoir; • The project activity is implemented in an existing reservoir, where the volume of reservoir is increased and the power density of the project activity, as per definitions given in the Project Emissions section, is greater than 4 W/m^2; • The project activity results in new reservoirs and the power density of the power plant, as per definitions given in the Project Emissions section, is greater than 4 W/m^2.	This is a wind power project. Hence not applicable.

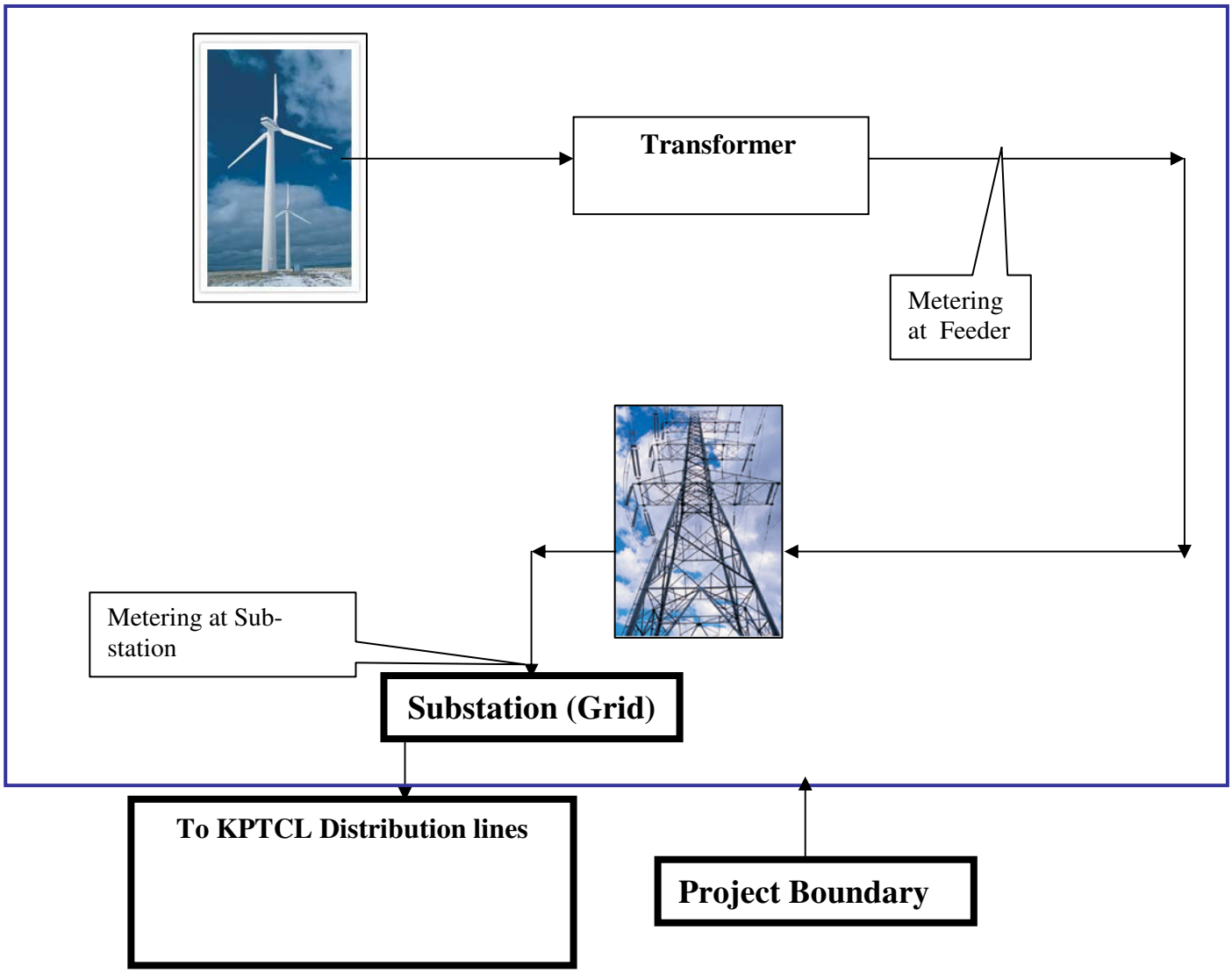
In this project, total electricity generation capacity of all ten windmills is 13.75 MW, which is less than the limit of 15 MW of maximum output capacity as specified in Annex-II "Simplified Modalities & Procedures for Small Scale CDM Project Activities" for Type (I) project activities: renewable energy

project activities with a maximum output capacity equivalent to up to 15 megawatts (or an appropriate equivalent) (decision 17/CP.7, paragraph 6 (c) (i)). Thus, this project reduces anthropogenic emissions by sources and its maximum output capacity is less than 15 MW. Therefore it confirms to this category thereby qualifying as a small-scale project activity.

B.3. Description of the project boundary

As per the Appendix B of simplified modalities & procedures for small-scale CDM-project activities, the project boundary is "The project boundary encompasses the physical, geographical site of the renewable generation source."

In this project activity, the project boundary is composed of 10 Wind Turbine Generators and the metering equipment for each generator and substation, and the grid (Southern regional grid) which is used to transmit the generated electricity.



B.4. Description of baseline & its development

The baseline methodology followed is one specified under Project category I.D in Appendix B of the Simplified M&P for small scale CDM project activities. As per the applied methodology, AMS ID, (Version 15), the baseline is the kWh produced by the renewable generating unit multiplied by an emission coefficient which is to be measured in $kgCO_2e/kwh$. The emission coefficient is to be calculated in a transparent and conservative manner as per the procedures laid in paragraph 11 (a) or 11 (b). For the estimation of the baseline the project proponent has chosen to use paragraph11 (a) which requires the calculation of the combined margin, consisting of the combination of the operating margin (OM) and the build margin (BM) according to the procedures laid out in the Tool to calculate the Emission Factor for an electricity system (Version 2.0, EB 50) . The monitoring methodology would be based on the guidance provided in the paragraph 17 of Type I.D. The Central Electricity Authority (CEA) under the

Ministry of Power, Government of India, has estimated the Combined Margin for the Southern grid, the details of which are available on the following website.
http://www.cea.nic.in/planning/c%20and%20e/Government%20of%20India%20website.htm

Steps	Description	Equation used	Methodological choices
1.	Procedure followed for calculating Baseline emissions	$BE_y = EG_y * EF_y$	The EFy has been calculated using operating and built margin emission factor taken from CEA published data.
2.	Procedure followed for calculating Project emissions (PE_y)	No project emissions are applicable to this small scale wind electric power project, since the electricity generation is based on Wind resources, which does not involve in combustion or generation of emissions from fossil fuels. (Para 14 of AMS ID, Version 15.0)	
3.	No leakage emissions are considered for this Project activity since no energy generating equipment is transferred from another activity and/or the existing equipment is transferred to another activity. (L_y)	No leakage emissions are considered for this Project activity since no energy generating equipment is transferred from another activity and/or the existing equipment is transferred to another activity. (Para 15 of AMS ID, Version 15.0)	
4.	Procedure followed for calculating Emission reduction (ER_y)	The emission reductions are calculated as per equation $ER_y = BE_y - PE_y - L_y$	

The latest version of the said tool, Version 04, has been used by the CEA for the calculation. The procedures followed, the assumptions made and the formulae applied by the CEA for the calculation of the OM and the BM is detailed below. In the absence of the project activity taken up by the Project Proponent, the renewable energy source from the wind power would not have been generated. This would have resulted in equivalent power generation from the fossil fuel based Southern Region Grid, India. Therefore the energy base line will be the electrical energy displaced by the wind mill installed by the project proponent in the Southern Grid that would have continued without implementation of project activity.
Calculation of the Baseline Emission Factor.

Step 1: Identifying the relevant electric power system

A "project electricity system" is defined by the spatial extent of the power plants that are physically connected through transmission and distribution lines to the project activity and that can be dispatched without significant transmission constraints.
A "connected electricity system" is defined as an electricity system that is connected by transmission lines to the project electricity system. Power plants within the connected electricity system can be dispatched without significant transmission constraints but transmission to the project electricity system has significant transmission constraint. The tool requires the following considerations while determining whether significant transmission constraints exist or not:

- In case of electricity systems with spot markets for electricity: there are differences in electricity prices (without transmission and distribution costs) of more than 5% between the systems during 60% or more of the hours of the year.

- The transmission line is operated at 90% or more of its rated capacity during 90% percent or more of the hours of the year.

In the Indian context, as no well established spot markets exist, the first criterion is not applicable. Similarly, a transmission line fulfilling the second criteria is an exception in Indian Context. Hence the use of these criteria does not result in a clear grid boundary. In such a scenario, the use of a regional grid definition in case of large countries with layered dispatch systems (e.g. provincial, regional/national) is recommended. Further, it states that a provincial grid definition may in many cases be too narrow given significant electricity trade among provinces that might be affected, directly or indirectly, by a CDM project activity.
The Indian power system is divided into two grids, namely the Integrated Northern, Eastern, Western, and North-Eastern regional grid (NEWNE) and the southern Grid. Each grid covers several states. The southern grid covers four states and two Union Territories including the states of Tamil Nadu, Andhra Pradesh, Kerala and Karnataka (where the project activity is located).
Each state in a regional grid meets its own demand with its own generation facilities and also with allocation from power plants owned by the central sector. Depending on the demand and generation, there are electricity exports and imports between states in the regional grid. The volume of the net transfers between the regions in India is relatively small and electricity is largely produced and consumed within the same states. Consequently, it is appropriate to assume that the impacts of the project activity will be confined to the regional gird in which it is located. Hence for the purpose of estimation of the baseline emission factor, the Southern Regional grid has been chosen as the relevant electricity system.

Step 2: Selection of an Operating Margin method

The project proponent wishes to use the Simple Operating Margin (OM) method for the estimation of the baseline. The use of the Simple OM method is justified as the share of the low cost/ run resources constitute less than 50% of the total grid generation. The Ex ante option has been chosen where in a three year generation weighted average based on the most recent data would be calculated ex ante and would be fixed for the entire crediting period. Hence, the parameters for the calculation of OM do not need to be monitored and the OM does not need to be calculated during the chosen crediting period of seven years.

Step 3: Calculation of the OM according to the Simple OM method

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

The data provided by the Central Electricity Authority (CEA), an official data source has been relied upon for the calculation of the OM[2]. The same has been detailed in Annex 3. The latest version of the database, Version 4 (CEA website Version: 04 (Valid from 1st September 2008) has been used. The OM calculations is been based upon generation data, fuel consumption and the Gross Calorific value (GCV) of the fuel.

Calculation Approach

The Simple OM has been calculated using the following formula:

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

Where:

$EF_{grid,OMsimple,y}$ = Simple operating margin CO_2 emission factor in year y (tCO_2/MWh)

$FC_{i,m,y}$ = Amount of fossil fuel type i consumed by power plant / unit m in year y (mass or volume unit)

$NCV_{i,y}$ = Net calorific value (energy content) of fossil fuel type i in year y (GJ / mass or volume unit)

$EF_{CO2,i,y}$ = CO_2 emission factor of fossil fuel type i in year y (tCO_2/GJ)

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

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

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

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

The Operating Margin thus calculated is 1.00

OM = 1.00

Step 4: Identification of the cohort of power units to be included in the Build Margin

The sample group of power units m selected for calculation of the build margin consists of the set of power capacity additions in the electricity system that comprise 20% of the system generation (in MWh) and that have been built most recently. The data pertaining to the units thus identified are detailed in the Version 4 [CEA website Version: 04 (Valid from 1st September 2008)] of the Baseline Carbon Dioxide Emissions database of the CEA[3].

With regards to data vintage, the project participant wishes to use Option 1 viz., For the crediting period, calculate the build margin emission factor ex-ante based on the most recent information available on units already built for sample group m at the time of CDM-PDD submission to the DOE for validation.

Step 5: Calculate the build margin emission factor

The build margin emissions factor is the generation-weighted average emission factor (tCO_2/MWh) of all power units m during the most recent year y for which power generation data is available and will be calculated as follows:

[2] http://www.cea.nic.in/planning/c%20and%20e/Government%20of%20India%20website.htm

[3] http://cea.nic.in/planning/c%20and%20e/Government%20of%20India%20website.htm

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

Where:
$EF_{grid,BM,y}$ = Build margin CO_2 emission factor in year y (tCO_2/MWh)
$EG_{m,y}$ = Net quantity of electricity generated and delivered to the grid by power unit m in year y (MWh)
$EF_{EL,m,y}$ = CO_2 emission factor of power unit m in year y (tCO_2/MWh)
m = Power units included in the build margin
y = Most recent historical year for which power generation data is available
The Build Margin would be calculated ex ante during the crediting period. For ex ante calculation the most recent data available has been used and the build margin thus calculated is 0.71
Therefore,
BM = 0.71

Step 6: Calculation of the combined Build Margin

The combined margin will be calculated as follows:

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

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 (%)
The default values to be used for Wind Power projects are
w_{OM}= 0.75 w_{BM}= 0.25
Hence, the Baseline Emission Factor is calculated as below:

$EF_{Grid,CM}$ = w_{OM} * OM + w_{BM} * BM
= 0.75 * 1.00 + 0.25*0.71
= 0.927 tCO_2/MWh

Southern Grid	2005-06	2006-07	2007-08	Average
Simple operating margin	1.01	1.00	0.99	1.00
Built Margin	0.71	0.70	0.71	
Combined Margin	0.75 * 1.00 + 0.25*0.71 = 0.927 tCO_2/MWh			

The baseline calculations are taken from draft CDM baseline CO2 emission published by Central Electricity Authority (CEA) (Version 04, dated 1st September 2008).

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 small-scale CDM project activity:

Considering the criticality of CDM funds for the viability of the project, the project proponent initiated steps to secure CDM status for the project. The board of SRPL resolved to setup the project considering CDM funds and the consultant was appointed immediately. Board of directors of SRPL on 10th September 2008 passed the resolution stating that the monetary benefits from CDM will only make the project viable. Accordingly PP sent enquiries to various consultants on 3rd October 2008. The appointed consultant issued its proposal for the wind power project on 6th October 2008 which is before the placement of Purchase Order i.e.; start date of project activity. Following this, the PP and consultant

were engaged in constant communication and negotiations during the period of 16th October – 21st October 2008 and evidences for the same have been submitted to DOE. PP raised the PO for WTGs on 14th October, 2008. The CDM consultant was finally appointed on 12th November 2008 after deliberate negotiations. This was then followed by UNFCCC intimation on 09th December 2008. In turn UNFCC acknowledged the receipt of intimation on the same day i.e. 9th December 2008. The stakeholder meeting was conducted on 10th December, 2008. DOE was appointed on 5th January 2009. The project was open for global stakeholder comments during the period 5th February, 2009 – 6th March, 2009. Thereafter, MoEF presentation was held on 3rd March, 2009. Following this, DOE conducted site visit on 14th March, 2009. The entire chronology of the events for securing CDM status for the project is presented below.

Events	Dated :
Proposal from the Suzlon	06/09/2008
Board Decision for implementation of the project	10/09/2008
Enquiry with various consultants	03/10/2008
Proposal by consultant appointed	06/10/2008
PP negotiation with consultant	16/10/2008 – 21/10/2008
P.O of WTG,s	14/10/2008
Appointment of CDM Consultant	12/11/2008
UNFCCC intimation	09/12/2008
UNFCCC acknowledgement to intimation	09/12/2008
Stakeholder meeting	10/12/2008
Appointing DOE	05/01/2009
Web Hosting of the PDD	05/02/2009 – 06/03/2009
MOEF Presentation	03/03/2009
DOE visit to site	14/03/2009 – 15/03/2009
HCA Granted	29/09/2009

The installed capacity of the project is 13.75 MW, which is less than the limiting capacity of 15 MW and is thus eligible to use small-scale simplified methodologies. Further, the project activity is generation of electricity for a grid system using wind energy. Hence, the type and category of the project activity matches with I.D. as specified in Appendix B of the indicative simplified baseline and monitoring methodologies for small-scale CDM project activities.

Referring to attachment A to appendix B document of "indicative simplified baseline and monitoring methodologies for selected small scale CDM project activity categories" Version 6.0, project participants are required to provide a qualitative explanation to show that the project activity would not have occurred anyway, **at least one** of the listed elements. should be identified in concrete terms to show that the activity is either beyond the regulatory and policy requirement or improves compliance to the requirement by removing barrier(s); The guidance provided herein has been used to establish project additionality. Investment analysis has been considered to justify the project additionality. Technological barrier has not been taken into consideration.

The barriers that were considered are listed below:

(a) Investment barrier

Investment Barrier

Step 1:

The project activity involves setting up of 13.75 MW of wind power in Davangere which will be supplied to KPTCL. Thus, Benchmark analysis is selected to depict the investment barrier. The benchmark for the project was taken as prime lending rate (PLR) provided by Reserve Bank of India (RBI). The project IRR was compared against PLR of [4]12.25 % (2008) corresponding to the period. The IRR for the project is coming around 9.20 % which is below the returns expected of 12.25 % for this project. However the Benchmark Prime Lending Rate for the month of August 2008 was ranging from 12.75 – 14.00 % (Link: (http://rbi.org.in/scripts/WSSView.aspx?Id=12696). However PP has taken a conservative approach in taking the benchmark for the proposed wind power project at the time of financial decision which is 12.25% (prime lending rate (PLR) (Link: http://rbidocs.rbi.org.in/rdocs/AnnualReport/PDFs/86591.pdf) provided by Reserve Bank of India (RBI) 2008.

Step 2:

Wind power projects are investment intensive and hence the IRR analysis is selected for comparing the investment to the project with respect to standardized benchmarks. Total investment in this project activity is INR 786 million to install 13.75 MW capacities wind turbines in Davangere, Karnataka.

According to CEA (Central Electricity Authority) 2003 a study was conducted to compare the installation cost & the cost involved in generation of power from various fuels were analyzed and a detailed report was submitted on February 2004. The final conclusion is the capital cost of setting up wind power project is the most expensive. [5]Table below shows the capital cost of various power plants using various type of fuel as per the estimation of the committee & PLF.(Report of expert committee on fuels for power generation).

Source of power generation	Capital Cost/MW (Rs in Crore)	Average PLF (%)
Wind	**5.6** [6]	**22% - 26%**
Domestic Coal	4.0	75% - 90%
Imported Coal	4.0	75% - 90%
Lignite	4.2	75% - 90%
LNG	2.7	75% -90%
Naphtha	2.7	75% -90%
Gas	2.7	75% -90%
Diesel	3.5	75% -90%

The table above proofs that the wind power project are not financially attractive projects.

The Project proponent was completely aware of the risk involved in investing in wind power generation. Wind is totally unreliable source as its availability is on seasons. In comparison to the conventional generation methods (thermal, hydro, etc), the establishment costs are higher for WTGs. To add to the situation, the PLFs obtained by WTGs are very low as compared to thermal plants. The investment in this project is as high as INR 786 million, while the alternative would have been to invest in thermal energy having higher returns. Thus the project proponents took a risk by investing in wind power. The PLF assumed in the investment analysis for the project activity is 25.74% (based on equipment supplier's (Suzlon) generation estimation as referred in the Purchase orders).

[4] http://rbidocs.rbi.org.in/rdocs/AnnualReport/PDFs/86591.pdf

[5] Link:http://cdm.unfccc.int/UserManagement/FileStorage/ZBEFC58QMKTB9WHAKCPOOQGCZAXZT7 (Report of Expert Committee on fuels for power generation Page No 11

[6] Calculated on the actual basis (Total Cost/Total Capacity; 77.4 Crore/13.75 MW = 5.6 Crore / MW)

PLF (Plant Load Factor) = [Guaranted generation/WTG (Lacs unit) - estimation x 10^5/Installed Capacity (MW) x10^3x24x365] * 100.
PLF =[(36 x 5 + 26 x 5) x 10^5/13.75 x 10^3 x 24 x 365] * 100 = 25.74%.
PLF For 1.25 MW WTG:
PLF =[(26 x 5) x 10^5/6.25 x 10^3 x 24 x 365] * 100 = 23.74%.
PLF For 1. 5 MW WTG:
PLF =[36 x 5) x 10^5/7.5 x 10^3 x 24 x 365] * 100 = 27..39%.

Step 3:

The benchmark is taken as per the Reserve bank of India (RBI) Benchmark Prime lending rate (BPLR) for 2008 is in the range of 12.25% - 13.50%.
(Link: http://rbidocs.rbi.org.in/rdocs/AnnualReport/PDFs/86591.pdf).
Benchmark during the period of financial decision in august 2008 was in the range of 12.75% – 14.00% (Link: http://rbi.org.in/scripts/WSSView.aspx?Id=12696)..
However PP has taken a conservative approach in taking the benchmark for the proposed wind power project at the time of financial decision which is 12.25% (prime lending rate (PLR) (Link: http://rbidocs.rbi.org.in/rdocs/AnnualReport/PDFs/86591.pdf) provided by Reserve Bank of India (RBI) 2008.

Step 4:

Project financial analysis:

Project Details:	**Karnataka**	**Karnataka**	**TOTAL**
Size of the Project(MW)	**7.50**	**6.25**	**13.75**
Location of the Project	**Kudurekonda, Dist.: Davangere, in the state of Karnataka (INDIA)**		
No of WTGs	**5**	**5**	**10**
Project Cost:			
Wind Mill, Overhead Line etc , (Rs. Lakhs)	**4475.00**	**3220.00**	**7695**
Land (Rs. Lakhs)	**90.00**	**75.00**	**165**
Total Cost(Rs. Lakhs)	**4565.00**	**3295.00**	**7860**
Recurring Cost:			
Operation and Maintenance Cost (Rs. Lakhs) - Per windmill (First year free)	**14.50**	**11.50**	**26.00**
Escalation in Operation and Maintenance cost(%)	**5.00%**	**5.00%**	**5.00%**
Insurance (Fire/Burglary/Breakdown + Service Tax)	**0.0028**	**0.0028**	**0.0028**
Annual Depreciation as per companies act(%)	**5.28%**	**5.28%**	**5.28%**
Rate of Depreciation as per Income tax Act(%) - 1st Year	**50.00%**	**50.00%**	**50.00%**
Rate of Depreciation as per I tax Act(%) - 2nd Year onwards	**80.00%**	**80.00%**	**80.00%**

Project Financials:			
Equity (Rs. Lakhs) 25%	**1205.00**	**875.00**	**2090.00**
Debt (Rs. Lakhs) 75%	**3360.00**	**2420.00**	**5770.00**
Loan Duration (Years) including Moratarium Period	**6.50**	**6.50**	**6.50**
Moratorium (Months)	**6**	**6**	**6**
Interest(%)	**11.75%**	**11.75%**	**11.75%**
Tariff Details:			
Tariff (Rs./KWh)			
1st Year	**3.40**	**3.40**	**3.40**
2nd Year	**3.40**	**3.40**	**3.40**
3rd Year	**3.40**	**3.40**	**3.40**
4th Year	**3.40**	**3.40**	**3.40**
5th Year	**3.40**	**3.40**	**3.40**
6th Year	**3.40**	**3.40**	**3.40**
7th Year	**3.40**	**3.40**	**3.40**
8th Year	**3.40**	**3.40**	**3.40**
9th Year	**3.40**	**3.40**	**3.40**
10th Year	**3.40**	**3.40**	**3.40**
11th Year	**4.08**	**4.08**	**4.08**
12th Year	**4.08**	**4.08**	**4.08**
13th Year	**4.08**	**4.08**	**4.08**
14th Year	**4.08**	**4.08**	**4.08**
15th Year	**4.08**	**4.08**	**4.08**
16th Year	**4.08**	**4.08**	**4.08**
17th Year	**4.08**	**4.08**	**4.08**
18th Year	**4.08**	**4.08**	**4.08**
19th Year	**4.08**	**4.08**	**4.08**
20th Year	**4.08**	**4.08**	**4.08**
Tax Components:			
MAT(%)	**11.33%**	**11.33%**	**11.33%**
Corporate Tax(%) / (Tax Shield Rate)	**33.99%**	**33.99%**	**33.99%**
CDM Components:			
CER Price (in Euros)	**15.00**	**15.00**	**15.00**
Emission Factor	**0.927**	**0.927**	**0.927**
Euro-Rupee Conversion Factor	**68.00**	**68.00**	**68.00**
Generation:			

Generation/WTG (Lac Units) - Estimation at 100% Grid at Controller	**36.00**	**26.00**	
Grid Avaliability Correction Factor	**5.00%**	**5.00%**	
Transmission Loss percentage from controller to metering point	**3.00%**	**3.00%**	
Generation/WTG (Lac Units) - Net billable/WTG (Lac units)	**33.17**	**23.96**	
Indirect Expenses:			
Admin salary (6 months for Year 0) (Rs. Lakhs)			**6.00**
Escalation in Admin salary every year			**10.00%**
Consultants and Validators fee (For Year 1 only) (Rs. Lakhs)			**15.00**
Processing fees for Term Loan(For year 0 only) as % of loan amount			**1.00%**

The major assumptions for the project financial analysis are listed below:

Project Details:	**Source**
Size of the Project(MW)	Capacity finalized in Board Resolution dated 10th September 2008
Location of the Project	
No of WTGs	
Project Cost:	Proposal by Suzlon dated 6th September 2008
Wind Mill, Overhead Line etc , (Rs. Lakhs)	
Land (Rs. Lakhs)	
Recurring Cost:	Proposal by Suzlon dated 6th September 2008.
Operation and Maintenance Cost (Rs. Lakhs) - Per windmill (First year free)	
Escalation in Operation and Maintenance cost (%)	
Insurance (Fire/Burglary/Breakdown + Service Tax)	Bajaj Allianz policy dated 22nd April 2008 for SRPL Maharashtra Wind Mill.
Annual Depreciation as per companies act (%)	As per Company act (http://www.mca.gov.in/Ministry/actsbills/pdf/Companies_Act_1956_Part_2.pdf) page 77
Rate of Depreciation as per Income tax Act(%) - 1st Year	Refer Point 1
Rate of Depreciation as per I tax Act(%) - 2nd Year onwards	

Project Financials:	Letter from Bank of Maharashtra dated 8th September 2008.
Equity (Rs. Lakhs)	
Debt (Rs. Lakhs)	
Loan Duration (Years) including Moratarium Period	
Moratorium (Months)	
Interest (%)	
Tariff Details:	
Tariff (Rs./KWh)	KERC Order dated 18-01-2005
1st Year	
2nd Year	
3rd Year	
4th Year	
5th Year	
6th Year	
7th Year	
8th Year	
9th Year	
10th Year	
11th Year	Assumed with 20% escalation
12th Year	
13th Year	
14th Year	
15th Year	
16th Year	
17th Year	
18th Year	
19th Year	
20th Year	
Tax Components:	
MAT(%)	Refer Point 2
Corporate Tax(%) / (Tax Shield Rate)	Refer Point 3
Generation:	
Generation/WTG (Lac Units) - Estimation at 100% Grid at Controller	Proposal by Suzlon dated 6th September 2008.
Grid Avaliability Correction Factor (5%)	Proposal by Suzlon dated 6th September 2008.

Transmission Loss percentage from controller to metering point (3%)	Proposal by Suzlon dated 6th September 2008.
Indirect Expenses:	
Admin salary (6 months for Year 0) (Rs. Lakhs)	Company inter office communication 7th September 2008
Escalation in Admin salary every year	Company inter office communication 7th September 2008
Processing fees for Term Loan(For year 0 only) as % of loan amount	Bank of Maharashtra Service Charges Booklet Page no 17

Point 1: As per the IT Act the rate of depreciation is for a wind mill is 80%. Moreover there is an additional depreciation of 20% on new machinery or plant. This means the total allowable depreciation is 100%. However if the machine is put to use for the purposes of business for a period of less than 180 days, the depreciation on such assest will be allowed at 50%. (Refer pages 110 & 112 of V.G.Mehta's Income tax Ready Reckoner, Assessment year 2009- 10).

Point 2: (i) As per Section 115JB of IT act the minimum tax on book profit is 10%. (ii) There is a surcharge of 10% on such income tax, this sum to 11%. (iii) There is an Education Cess @ 2% of income tax and surcharge, this sum to 11.22%. (iv)Further additional surcharge (i.e. Secondary & Higher Education Cess is 1% of such aggregate amount of income tax and surcharge, this sums to 11.33%. (Refer pages 130,31 & 35 of V.G.Mehta's Income tax Ready Reckoner, Assessment year 2009- 10).

Point 3: (i) As per IT act for a domestic company the rate of income tax is 30% of the total income (ii) There is a surcharge @ 10% on such income tax, this sums to 33%. (iii) There is a Education Cess @ 2% of income tax and surcharge, this sums to 33.66%. (iv)Further additional surcharge (i.e. Secondary & Higher Education Cess is 1% of such aggregate amount of income tax and surcharge, this sums to 33.99%. (Refer pages 31 & 35 of V.G.Mehta's Income tax Ready Reckoner, Assessment year 2009- 10).

Step 5:

Summary:

Sensitivity Analysis with & without CDM revenues are as follows:

Parameter	Sr. No.	Change % Over base value	Value (Without CDM Benefit)	Value (With CDM Benefit)	Benchmark RBI Prime Lending Rate
Change in PLF	1	5%	10.12%	13.50%	**(12.25 % (Benchmark Prime Lending Rate) RBI 2008 (Link: http://rbidocs.rbi.org.in/rdocs/AnnualReport/PD**
	2	10%	11.01%	14.43%	
	3	**Normal**	**9.20%**	**12.61%**	
	4	-5%	8.26%	11.62%	
	5	-10%	7.35%	10.67%	
Change in Power rate	6	5%	10.12%	13.35%	
	7	10%	11.01%	14.14%	
	8	**Normal**	**9.20%**	**12.61%**	

	9	-5%	8.26%	11.78%	**Fs/86591.pdf)**
	10	-10%	7.35%	11.01%	
O&M cost	11	5%	9.04%	12.47%	
	12	10%	8.87%	12.33%	
	13	**Normal**	**9.20%**	**12.61%**	
	14	-5%	9.37%	12.75%	
	15	-10%	9.53%	12.88%	
Project Cost	16	5%	8.48%	11.82%	
	17	10%	7.80%	11.14%	
	18	**Normal**	**9.20%**	**12.61%**	
	19	-5%	9.98%	13.39%	
	20	-10%	10.83%	14.33%	

The above table reflects the IRR with & without CDM revenues for Normal Generation Guarantee, 5 % increase in Generation,10% increase in Generation, 5% decrease in generation & 10% decrease in generation. The sensitivity analysis was done for Generation Guarantee, Project Cost, O&M cost & Tariff rate values as it remains the important parameters impacting financials of the project. Analyzing the above sensitivity chart the IRR of the project is below the desired benchmark without CDM revenues. The IRR is attractive only after considering the CDM revenues.

Sensitivity Analysis:

i) *Variation in Generation Levels (PLF)*

	IRR (Without CDM)%	**IRR (With CDM)%**	**Benchmark**
5% increased generation	10.12%	13.50%	12.25%
10% increased generation	11.01%	14.43%	
Base Case	**9.20%**	**12.61%**	
5% reduced generation	8.26%	11.62%	
10% reduced generation	7.35%	10.67%	

Each of the Suzlon WTGs of 1.5 MW capacity implemented by the project proponents is expected to generate 3119.436 MWh per annum and that by the 1.25 MW WTG of Suzlon is expected to be 2999.205 MWh units per annum. But due to variable nature of wind it may result in lower utilization and consequently lesser generation. The following table demonstrates the sensitivity of IRR to the change in the generation levels for Sargam Retails Pvt Ltd.

ii) *Variation in Tariff (Power Rate)*

	IRR (Without CDM)%	**IRR (With CDM)%**	**Benchmark**
5% increased Tariff	10.12%	13.35%	12.25%
10% increased Tariff	11.01%	14.14%	
Base Case	**9.20%**	**12.61%**	
5% reduced Tariff	8.26%	11.78%	
10% reduced Tariff	7.35%	11.01%	

The project proponents have entered into a PPA with Karnataka Power Transmission Company Limited (KPTCL) for the sale of electricity. The tariff offered by the Karnataka Power Transmission Company

Limited (KPTCL) is fixed for the first ten years of the project activity and hence is not expected to vary. The escalation of 20% of the tariff rate from 11th year onwards is truly on assumption basis, which is considered on higher side.

iii) *Variation in Capital Cost (Project Cost)*

	IRR (Without CDM)%	IRR (With CDM)%	Benchmark
5% increased in Capital Cost	8.48%	11.82%	12.25%
10% increased in CapitalCost	7.80%	11.14%	
Base Case	**9.20%**	**12.61%**	
5% reduced in Capital Cost	9.98%	13.39%	
10% reduced in Capital Cost	10.83%	14.33%	

The above sensitivity analysis of the capital cost reflects that the IRR is below the benchmark even with 5% to 10% variation.

iv) *Variation in O&M cost*

	IRR (Without CDM)%	IRR (With CDM)%	Benchmark
5% increased in O&M Cost	9.04%	12.47%	12.25%
10% increased in O&M Cost	8.87%	12.33%	
Base Case	**9.20%**	**12.61%**	
5% reduced in O&M Cost	9.37%	12.75%	
10% reduced in O&M Cost	9.53%	12.88%	

The cost of O&M for the installation of the wind mills have been fixed as per the agreement between the Sargam Retails Pvt. Ltd. and the Technology supplier for a period of 6 years with 5% escalation every year. So the probability of decrease in the O&M cost from 7th onwards is unlikely.

In the Indian power sector, the common practice is investing in only medium or large scale fossil fuel fired power projects. Generation of power through a small wind project of 13.75 MW is not a common practice. This can be seen from the published statistics in respect of installations of wind projects in India in the Southern region as well as in the state of Karnataka vis-à-vis the total installed capacity (of power generation).[7]The All-India installed power generation capacity in MW as on 31.10.2008 published by Ministry of Power was 146753 MW comprising of 92892 MW thermal, 36498 MW hydro, 4120 MW nuclear and 13242 MW of Renewable energy sources (RES) comprising solar, wind, geothermal, tidal,& biomass energy. The most prominent energy generation mediums in India are solar energy, wind energy & biomass energy. The % of wind power generation in India is [8]6.5%.

B.6. Emission Reduction

[7] http://www.cea.nic.in/power_sec_reports/Executive_Summary/index_Executive_Summary.html (Page 7)

[8] http://www.windpowerindia.com/statstate.html

B.6. 1 Explanation of the Methodology choices

The procedure followed for estimating the emissions reductions from this project activity during the crediting period are as per the following steps which corresponds with AMS-I.D (Version 15.0, EB 50).

Steps	Description	Equation used	Methodological choices
1.	Procedure followed for calculating Baseline emissions	BEy = EGy*EFy	The EFy has been calculated using operating and built margin emission factor taken from CEA published data.
2.	Procedure followed for calculating Project emissions (PEy)	No project emissions are applicable to this small scale wind electric power project, since the electricity generation is based on Wind resources, which does not involve in combustion or generation of emissions from fossil fuels. (Para 14 of AMS ID, Version 15.0)	
3.	No leakage emissions are considered for this Project activity since no energy generating equipment is transferred from another activity and/or the existing equipment is transferred to another activity. (L_y)	No leakage emissions are considered for this Project activity since no energy generating equipment is transferred from another activity and/or the existing equipment is transferred to another activity. (Para 15 of AMS ID, Version 15.0)	
4.	Procedure followed for calculating Emission reduction (ERy)	The emission reductions are calculated as per equation $ER_y = BE_y - PE_y - L_y$	

Project emissions

No project emissions are applicable to this small scale wind electric power project, since the electricity generation is based on Wind resources, which does not involve in combustion or generation of emissions from fossil fuels. Hence, the baseline emissions will be equivalent to the emission reductions in the project activity.

Leakage:

No leakage emissions are considered for this Project activity since no energy generating equipment is transferred from another activity and/or the existing equipment is transferred to another activity.

Emission Reductions:

Since the project emissions as well as the leakage are zero, the emission reductions are equal to the baseline emissions. These are calculated based on the monitored net amount of electricity supplied to the grid, and the baseline emission factor.

$ER_y = BE_y - PE_y - L_y$

B.6.2. Data and Parameters that is available at Validation:

Data and parameters not monitored

(a) EFy

Data / Parameter:	EFy
Data unit:	tCO_2/Mwh
Description:	Combined Margin grid emission factor
Source of data used:	[9]CEA website Version :04 (Valid from 1st September 2008)
Value applied:	0.927
Justification of the choice of data or description of measurement methods and procedures actually applied :	The value applied is taken from the plant from CEA reviews. The weights used for calculating combined margin emission factor are 0.75 and 0.25 for operating margin and built margin respectively and EFy is calculated for ex – ante.
Any comment:	Data will be kept for crediting period + 2 Years. & Emission factor will be calculated as per the latest CEA version published.

(b) $EF_{OM, y}$

Data / Parameter:	$EF_{OM,y}$
Data unit:	tCO_2/Mwh
Description:	CO_2 Operating Margin emission factor of the grid
Source of data used:	[10]CEA website Version :04 (Valid from 1st September 2008)
Value applied:	1.00
Justification of the choice of data or description of measurement methods and procedures actually applied :	The value applied is taken from the plant from CEA reviews and EF_{OM} is calculated for ex – ante.
Any comment:	Data will be kept for crediting period + 2 Years.

(c) $EF_{BM, y}$

Data / Parameter:	$EF_{BM,y}$
Data unit:	tCO_2/Mwh
Description:	CO_2 Built Margin emission factor of the grid
Source of data used:	[11]CEA website Version :04 (Valid from 1st September 2008)

9 http://www.cea.nic.in/planning/c%20and%20e/Government%20of%20India%20website.htm

10 http://www.cea.nic.in/planning/c%20and%20e/Government%20of%20India%20website.htm

11 http://www.cea.nic.in/planning/c%20and%20e/Government%20of%20India%20website.htm

Value applied:	0.71
Justification of the choice of data or description of measurement methods and procedures actually applied :	The value applied is taken from the plant from CEA reviews and EF_{BM},y is calculated for ex- ante.
Any comment:	Data will be kept for crediting period + 2 Years.

B.6.3 Ex-ante calculation of emission reductions:

Combined Margin Emission factor

$EFy = 0.75*EF_{OM} + 0.25*EF_{BM}$

Applying the values given in section B.6.2 the value of EFy comes out to be 0.927 tCO_2/MWh.

Baseline Emission Calculation

The baseline emission is calculated as: $BE_y = EG_y * EF_y$
where,
BE_y = Baseline Emissions due to displacement of electricity during the year y (in tons of CO_2)
EG_y = Net units of electricity due to substituted in the grid during the year y (in MWh)
EF_y = Emission Factor of the grid (in tCO_2/ MWh) and y is any year within the crediting period of the project activity.
Net Losses @ 8% (Transmission Loss 3% & Grid availability correction factor 5% of gross generation)
Applying the values given in section B.6.2 and B.7.1 the value of BE_y comes out to be 26475 tCO_2.

13.75 MW wind power project in Davangere, Karnataka, India		
SRPL (Sargam Retails Pvt Ltd)		
Installed Capacity (MW)	13.75	MW
Number of WEGs	5	
Capacity of individual WEG (MW)	1.25	MW
PLF	0.2374	
Number of days of operation	365	Days
Number of hours	8760	
Gross Generation of one WEG in an year	2599.53	MWh
Gross Generation from 5 WEG in an year	12997.65	MWh
Loss @ 5% (Grid availability correction factor 5% of gross generation)	12347.7675	MWh
Loss @ 3% (Transmission Loss)	11977.33448	MWh
Net Generation from the project	11977.33448	MWh
Baseline emission factor Southern region grid	0.9270	tCO_2/MWh
Emission reductions	**11103**	**tCO_2**

Number of WEGs	5	
Capacity of individual WEG (MW)	1.5	MW
PLF	0.2739	
Number of days of operation	365	Days
Number of hours	8760	
Gross Generation of one WEG in an year	3599.046	MWh
Gross Generation from 5 WEG in an year	17995.23	MWh
Loss @ 5% (Grid availability correction factor 5% of gross generation)	17095.4685	MWh
Loss @ 3% (Transmission Loss)	16582.60445	MWh
Net Generation from the project	16582.60445	MWh
Baseline emission factor Southern region grid	0.9270	tCO_2/MWh
Emission reductions	**15372**	**tCO_2**

Particulars	**Units**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
Baseline emission factor	tCO_2/MWh	0.927	0.927	0.927	0.927	0.927	0.927	0.927
Net Generation from the project	MWh	28560	28560	28560	28560	28560	28560	28560
Baseline emissions	tCO2e	26475	26475	26475	26475	26475	26475	26475
Project activity emissions	tCO2e	0	0	0	0	0	0	0
Leakage	tCO2e	0	0	0	0	0	0	0
Emission reductions	tCO2e	26475	26475	26475	26475	26475	26475	26475

Emission reduction calculations:

$ER_y = BE_y - PE_y – L_y = 26475 – 0 - 0 = 26475\ tCO_2e$

Applying the values given in section B.6.2 and B.7.1 the value of ER_y comes out to be 26475

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

Year	Estimation of project activity emissions (tCO_2 e)	Estimation of baseline emissions (tCO_2 e)	Estimation of leakage (tCO_2 e)	Estimation of overall emission reductions (tCO_2 e)
2010	0	26475	0	26475
2011	0	26475	0	26475
2012	0	26475	0	26475
2013	0	26475	0	26475
2014	0	26475	0	26475
2015	0	26475	0	26475
2016	0	26475	0	26475
Total (tCO2)	**0**	**185325**	**0**	**185325**

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

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B.7.1 Data and parameters monitored:

>>

Data / Parameter:	$EG_{Net\ Exported}$ ($EG_{Net\ Exported} = EG_{Exported} - EG_{import} - EG_{Transmission\ Losses}$)
Data unit:	MWh
Description:	Net Electricity exported
Source of data to be used:	Calculated from credit report Sheets. (As per KPTCL/ BESCOM Form B)/ Invoice (whichever is conservative).
Value of data applied for the purpose of calculating expected emission reductions in section B.5	28560 MWh/yr
Description of measurement methods and procedures to be applied:	Net Electricity generated is in kWh. However for the calculation purpose Net electricity generated is calculated / converted in MWh. Net electricity generated will be calculated from the readings of electricity exported to the grid and electricity imported from the grid indicated by the main meter connected to the incoming feeder of KPTCL. The WTGs of a single customer (SRPL in this case) at

	a particular site are connected to a Vacuum Circuit Breaker metering yard (VCB) which inturn connects to a feeder that ultimately leads to the shared main KPTCL meter at the substation maintained by Suzlon Power Infrastructure Limited. Data monitoring takes place at the VCB metering yard and WTG. The electricity metered at the KPTCL meter is proportionally divided among the customers connected to the meter on the basis of the prorate readings taken at the VCB end.
QA/QC procedures to be applied:	Calibration of all the meters will be undertaken and faulty meters will be duly replaced immediately. The KPTCL meter will be calibrated as per the KPTCL requirement. Suzlon is ISO 9000 accredited. Therefore ISO 9000 Quality management system will be used and the same procedure will be available in the project site. Net electricity exported mentioned in Form B will be cross- checked with the invoices raised by the PP for the project activity. Whichever is the conservative value will be considered for emission reduction calculation during verification for the project activity.
Any comment:	The data will be kept for two years after the end of the crediting period or the last issuance of CERs for this project activity, whichever occurs later.

Data / Parameter:	$EG_{Exported}$
Data unit:	MWh
Description:	Electricity exported
Source of data to be used:	Calculated from credit report Sheets. (As per KPTCL/ BESCOM Form B)
Value of data applied for the purpose of calculating expected emission reductions in section B.5	-
Description of measurement methods and procedures to be applied:	Monitoring: Trivector meter will be used for monitoring. The meter will be 0.2 class. Electricity exported is in kWh. However for the calculation purpose electricity exported is calculated / converted in MWh.
QA/QC procedures to be applied:	Data Type: Measured/Calculated Frequency: (Monthly) Archiving Policy: Paper & Electronic Responsibility: Head (Wind Power Project) would be responsible for regular calibration of the meter. Calibration Frequency: Once a year.

	Yes, Quality Management System will be used and the same procedures would be available at the project site
Any comment:	The data will be kept for two years after the end of the crediting period or the last issuance of CERs for this project activity, whichever occurs later.

Data / Parameter:	EG_{import}
Data unit:	MWh
Description:	Electricity imported
Source of data to be used:	Calculated from credit report Sheets. (As per KPTCL/ BESCOM Form B)
Value of data applied for the purpose of calculating expected emission reductions in section B.5	-
Description of measurement methods and procedures to be applied:	Monitoring: Trivector meter will be used for monitoring. The meter will be 0.2 class. Electricity imported is in kWh. However for the calculation purpose electricity imported generated is calculated / converted in MWh.
QA/QC procedures to be applied:	Data Type: Measured/Calculated Frequency: (Monthly) Archiving Policy: Paper & Electronic Responsibility: Head (Wind Power Project) would be responsible for regular calibration of the meter. Calibration Frequency: Once a year. Yes, Quality Management System will be used and the same procedures would be available at the project site
Any comment:	The data will be kept for two years after the end of the crediting period or the last issuance of CERs for this project activity, whichever occurs later.

Data / Parameter:	$EG_{Transmission\ Losses}$
Data unit:	kWh
Description:	Electricity Losses in Transmission
Source of data to be used:	Calculated from credit report Sheets. (As per KPTCL/ BESCOM Form B).
Value of data applied for the purpose of calculating expected emission reductions in section B.5	-
Description of measurement methods and procedures to be applied:	Monitoring: Trivector meter will be used for monitoring. The meter will be 0.2 class. Electricity Loss in Transmission is in kWh. However for the calculation purpose electricity loss in transmission is calculated / converted in MWh. **Calculation Procedure (**$EG_{Transmission\ Losses}$**)** **Z= % of line losses**

	X= Cumulative of all the exported energies from the all the metering points connected to the sub – station. **i.e $X= X_1+ X_2+X_3+.....X_n$** **Y= Sub – Station Bulk meter readings** **Z= [(X-Y)/X]*100** **$(EG_{Transmission\ Losses}) = Z* EG_{Exported}$**
QA/QC procedures to be applied:	Data Type: Measured/Calculated Frequency: (Monthly) Archiving Policy: Paper & Electronic Yes, Quality Management System will be used and the same procedures would be available at the project site.
Any comment:	The data will be kept for two years after the end of the crediting period or the last issuance of CERs for this project activity, whichever occurs later.

Data / Parameter:	$EG_{Controller}$
Data unit:	kWh
Description:	Electricity generated at Controller (MCS)
Source of data to be used:	Plant
Value of data applied for the purpose of calculating expected emission reductions in section B.5	-
Description of measurement methods and procedures to be applied:	Monitoring: MCS (Microprocessor Control Systems) meter is a micro-processor based intelligent controller which has been specially designed for control of wind turbines. The analog values of current / voltage is converted into digital signal internally using A/D Converters at very high sampling rate. A software program reads these values and displays instantaneous parameters such as voltage, current, power factor, kVAh, kVArh and kWh.
QA/QC procedures to be applied:	Data Type: Measured Frequency: (Daily) Archiving Policy: Electronic In case of any problem related to the MCS meter, the WTG will automatically get shut down and the meter will be replaced by a new meter immediately.
Any comment:	This value will only be used for deriving the apportioning ratio. Data archived: Crediting period + 2 yrs

CDM – Executive Board

B.7.2 Description of the monitoring plan:

The project activity is in accordance with approved small scale methodology AMS I.D, and therefore, can use the monitoring methodology for type I.D of 'Appendix B of the simplified M&P for small-scale CDM project activities-Version 15.0, - Grid connected renewable electricity generation.

This approved monitoring methodology requires monitoring of the following:

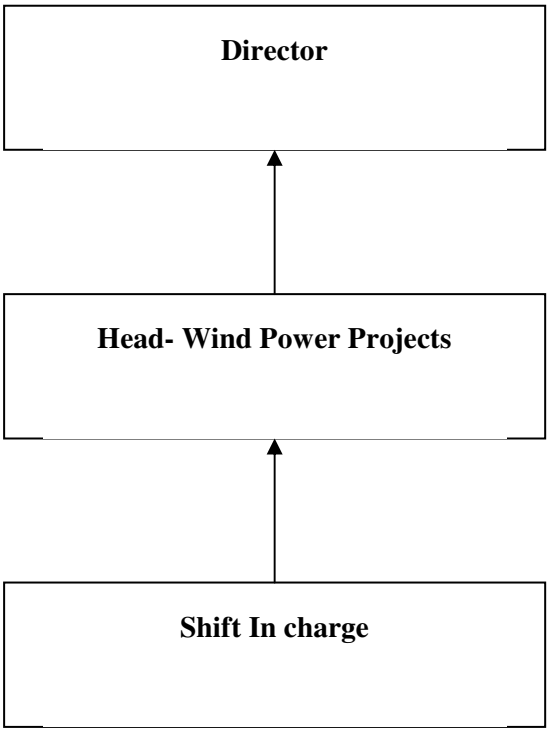
- ✓ Electricity generation from the project activity; and
- ✓ Computation of Emission Factor from published CEA database.

The monitoring methodology that will be incorporated for project-monitoring plan consist of metering the electricity generated by the individual WTG,s. In order to monitor the mitigation of GHG due to the project activity, the total energy exported needs to be measured. The net energy supplied to grid by the project activity multiplied by emission factor for regional grid, would form the baseline for the project activity.

Since the baseline methodology is based on ex ante determination of the Emission factor, the monitoring of baseline emission factor is not required. The sole parameter for monitoring is the electricity supplied to the grid.

The Project is operated and managed by M/s Suzlon Energy Limited and/ or its Associate Companies. The operational and management structure implemented by the project participant will implement in order to monitor emission reductions and any leakage effects generated by the project activity:

Total electricity exported is the most important parameter required for the financial reporting and sustainability of the project and monitored with due care by both the parties (project proponent and KPTCL). For emission reductions project proponents proposes the following structure.



Roles and responsibilities:

Director: In the project management structure Director is responsible for the project management. He is responsible to plan and allocate the annual budget for operation, estimation of the likely operating cost, electricity dispatch, organising third party contractors, revenue collection from BESCOM etc.

The Director will check the monthly electricity generated and annual emission reduction calculations. He is responsible for any leakage of emissions in the project boundary.

Operation and maintenance of wind generators will be done by Suzlon Infrastructure Services Limited and they will be responsible to Director.

Head- Wind Power Projects: Head- Wind Power Projects is assisting to director for completing the task discussed above. He is responsible for the electricity generations at the individual wind turbine installations. He will crosscheck the log book regularly and report to Director for any abnormality.

Shift In-charge: Shift in charge is responsible for recording the electricity meter reading in the KPTCL meter.

Record Handling: OEM contractors are collecting daily report with all the related parameters. All the records is given to Director on every month. The Director has final responsibility for record keeping.

The O&M personnel are qualified engineers and are trained at the WTG manufacturing facility of Suzlon Energy Limited at Daman & Pondicherry for operating and ensuring best performance of the WTGs. The general conditions set out for metering, recording, meter readings, meter inspections, Test & Checking and communication shall be as per the PPA (power purchase agreement) with KPTCL.

1. **Metering:** The Delivered Energy shall be metered by the Parties at the high voltage side of the step up transformer installed at the Receiving Station. The electricity generated by the Project shall be metered by the Parties at the high voltage side of the step up transformer installed at the Project Site. The WTGs of a single customer (SRPL in this case) at a particular site are connected to a Vacuum Circuit Breaker metering yard (VCB) which in turn connects to a feeder that ultimately leads to the shared main KPTCL meter at the substation maintained by Suzlon

Power Infrastructure Limited . Data monitoring takes place at the VCB metering yard and WEG (through SCADA system). The electricity metered at the KPTCL meter is proportionally divided among the customers connected to the meter on the basis of the prorata readings taken at the VCB end. The emission reduction calculations are done on the basis of the KPTCL Main meter reading.

For example 5 x 1.5 MW WTGs of Sargam Retails Pvt. Ltd. has 1 main meter and 1 check meter at location K 543. This meter will show the power generation of 5 WTGs. These two meters are calibrated by EB authorities in state of Karnataka. Every month the reading for these 5 nos of WTGs will be taken from this meter.

Now what 1 WTG has generated KPTCL has to do nothing, but if WTG owner want to know what 1 WTG has generated than one has to do following thing:

i) Each WTG has microprocessor based system, which records all parameter viz Generated Energy, Consumed Energy, Reactive power etc.

ii) Collect these reading from each WTG.

iii) Take readings of main meter at metering point that is location K543.(For SRPL 5 x 1.5 Mw, WTG,s).

For example:

Let say each WTG shows 100 units in microprocessor, for 5 WTGs, 500 units.

Main meter at metering point shows 475 units.

In this case the difference i.e 25 units will be divided to each WTG.proportionately , that means 1 WTG has generated 95 units., but this is internal calculation, KPTCL is not concerned with this. Only in case of failure of metering point i.e. K543 (i.e. both meter main & check meter fails), the metering point in Main Substation i.e Kudurekonda substation will be referred.

Similar arrangement is for 5 x 1.25 MW WTG, having metering point at location K539.

2. **Metering Equipment:** Metering equipment shall be electronic trivector meters of accuracy class 0.2% required for the Project (both main and check meters).Dedicated core of both CT's and PT's of required accuracy shall be made available by the Company to Corporation. The metering equipment shall be maintained in accordance with electricity standards. Such equipment shall have the capability of recording a months reading.
3. **Meter Readings:** The monthly meter readings (both main and check meters) at the Project Site and the Receiving Station shall be taken simultaneously and jointly by the Parties on the first day of the following month. The recorded metering data shall be downloaded through meter recording Instrument by KPTCL officer as and when required.
4. **Inspection of Energy Meters:** All the main and check energy meters (export and import) and all associated instruments, transformers installed at the Project shall be of 0.2% 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.

Data Adjustments and Uncertainities:

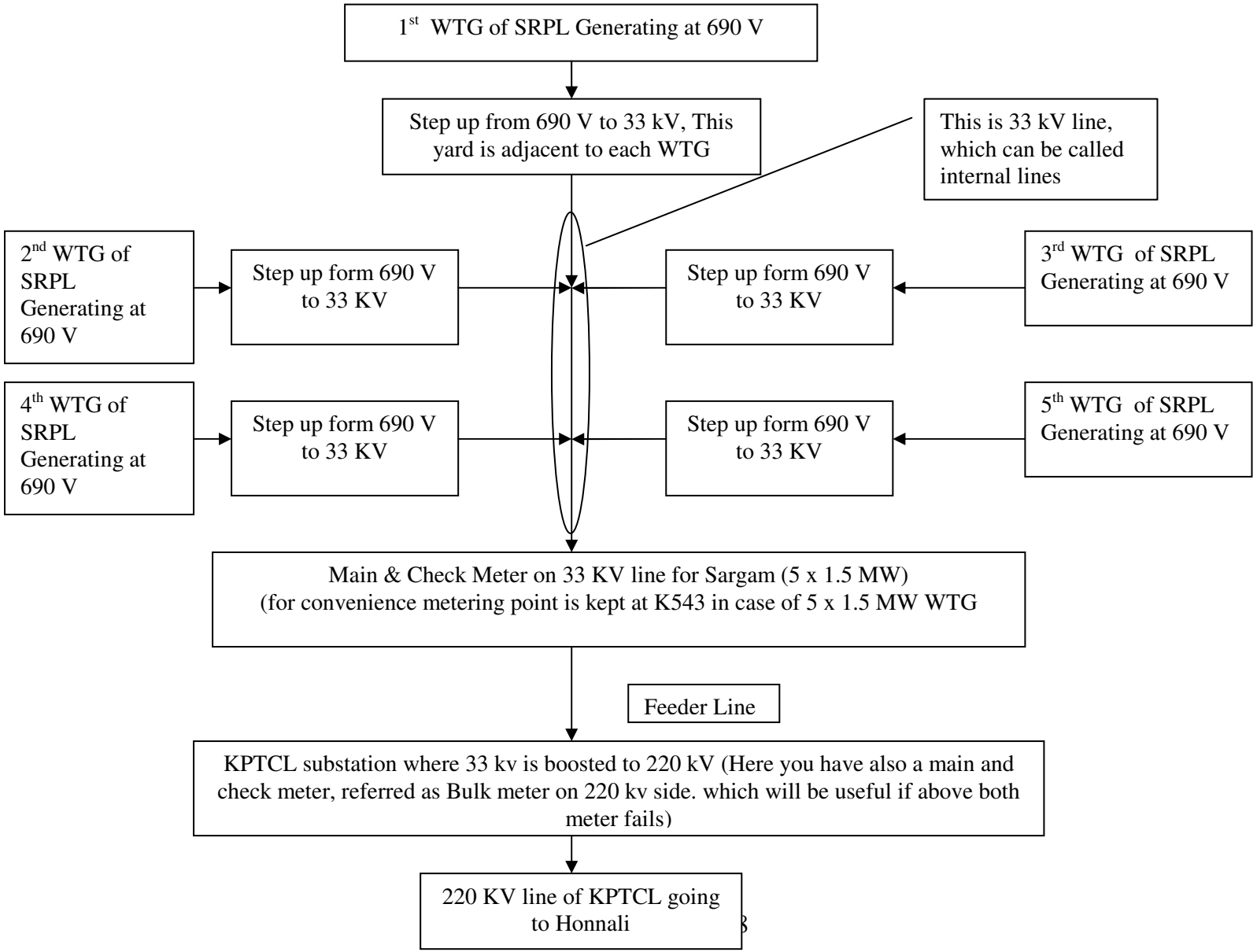
5. **Meter Test Checking:** All the main and check meters shall be tested for accuracy as per requirement with reference to a portable standard meter which shall be of an accuracy class of 0.1%. The portable standard meter shall be owned by the Corporation at its own cost and expense and tested and certified at least once every year or as per requirement against an accepted laboratory standard meter in accordance with electricity standards. The meters shall be deemed to be working satisfactorily if the errors are within specifications for meters of 0.2%

accuracy class. The consumption registered by the main meters alone will hold good for the purpose of billing as long as the error in the main meter is within the permissible limits.

a. If during the 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.
b. If during the tests, the main meter is found to be beyond permissible limits of error, but the corresponding check meter is found to be within permissible limits of error, then the billing for the month upto the date and time of such test shall be as per 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.
c. 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 meters shall be immediately calibrated and the correction applied to the reading registered by the main meter to arrive at the correct reading of energy supplied for billing purposes for the period from the last month's meter reading upto the current test. Billing for the period thereafter till the next monthly meter reading shall be as per the calibrated main meter.
d. If during any of the monthly meter readings, the variation between the main meter and the check meter is more than that permissible for meters of 0.2 % accuracy class, all the meters shall be re-tested and calibrated immediately

6. **Records:** O&M Contractor Suzlon will maintain an accurate and up-to-date operating log at the wind farm site with records of:
    a. Hourly logs of real and reactive power generation, frequency, transformer tap position, bus voltage(s), Main meter and Back up meter readings and any other data mutually agreed.
    b. Any unusual conditions found during operation/inspections
    c. Chart and printout of event loggers, if any, for system disturbances/outages
    d. All the records will be preserved for 2 years beyond the crediting period.
7. The billing will be on monthly basis. The BESCOM will be billed by Sargam Retails pvt Ltd based on statement given by BESCOM at the end of each month for the energy supplied.

M/s Suzlon Infrastructure Services Limited (SEL) will have a designated Site-In-Charge (O&M) on site who will be responsible for monitoring the emission reductions of the project activity. The electrical layout of the WTGs is as follows:


1st WTG of SRPL Generating at 690 V
Step up from 690 V to 33 kV, This yard is adjacent to each WTG
This is 33 kV line, which can be called internal lines
2nd WTG of SRPL Generating at 690 V
Step up form 690 V to 33 KV
Step up form 690 V to 33 KV
3rd WTG of SRPL Generating at 690 V
4th WTG of SRPL Generating at 690 V
Step up form 690 V to 33 KV
Step up form 690 V to 33 KV
5th WTG of SRPL Generating at 690 V
Main & Check Meter on 33 KV line for Sargam (5 x 1.5 MW)
(for convenience metering point is kept at K543 in case of 5 x 1.5 MW WTG
Feeder Line
KPTCL substation where 33 kv is boosted to 220 kV (Here you have also a main and check meter, referred as Bulk meter on 220 kv side. which will be useful if above both meter fails)
220 KV line of KPTCL going to Honnali

On the 1st of every month, the KPTCL designated official shall arrive at the site and record the readings of meters placed at the 33/220 kV Sub-Station and as well as at the individual customer metering point. Keeping in view, the total generation supplied to Grid from the sub-station, the electricity generation data for every particular customer will be computed on ***Form B*** as per the apportioning procedure mentioned below:

SRPL (Head- Wind Power Projects & Director) will be keeping the daily / monthly data generated from all the WEG,s provided by Suzlon.

Internal audits & Performance review

The records are regularly audited and checked by the SRPL representatives during their site visit. The SRPL representative visit once in a year and audit the records. The SRPL representatives will crosscheck the emissions reductions claimed in PDD with respect to actual emissions reduction. For any deviation from the actual emission reduction values and reported values corrective action will be suggested by SRPL representatives to calculate the conservative emission reduction. All corrective actions will be recorded in the log book. The person taking readings at site are adequately trained and go through training procedures regularly.

Apportioning Procedure:

The following generation apportioning procedure will be followed, if the crediting period date of the project activity falls in – between the billing cycles of KPTCL:

Partial days generation of the Month at Controller (kWh): X

Total generation at Controller (kWh) for the same month: Y (kWh/month)

% Generation for partial days of generation (%): Z= (X/Y) *100

Generation as per BULK metering point KPTCL generation report for the month: G (kWh/month)

Partial days of generation as per KPTCL generation report: (G*Z/100)

Form B, which contains the generation data, is certified by the Site-in-Charge (O&M) for SEL and also by the Asst. Executive Engineer of KPTCL. The Form B is now forwarded to Executive Engineer of KPTCL and is certified thereof. Copies of this document are forwarded to the State Load Dispatch Center of Karnataka Power Transmission Company Limited (KPTCL), Asst. Electrical Engineer of KPTCL and the customer (in this case, Sargam Retails Pvt. Ltd. - SRPL). The monthly generation shall be derived from Form B and the same shall be used in monitoring report and during verification. Head - Wind power projects of SRPL will be responsible for keeping the copies of Form B sent to SRPL from KPTCL.

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)

1st Phase before site visit by DOE (12/12/2008).

Date of completion: Phase II (02/12/2009) based on the corrections applied to DOE findings.

Sargam Retails Pvt Ltd (SRPL) has determined the baseline for the project activity. The entity is a Project Proponent listed in Annex-I where the contact information has also been provided.

SECTION C. Duration of the project activity / crediting period

C.1 Duration of the project activity:

C.1.1. Starting date of the project activity:

14/10/2008 (Date of 1st Purchase order)

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

20 – 25 Years (as per the supplier)

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

The Project Proponent intends to apply for a **Renewable Crediting Period**.

C.2.1. Renewable crediting period

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

01/08/2010

(If the registration of the project is before or after 01/08/2010, the date of registration would be considered as the start date for the first crediting period. The project participants will not commence the crediting period prior to the date of registration.)

C.2.1.2. Length of the first crediting period:

7 Years

C.2.2. Fixed crediting period:

C.2.2.1. Starting date:

C.2.2.2. Length:

SECTION D. Environmental impacts

D.1. If required by the host party documentation on the analysis of the Environmental Impact

According to Indian regulation, the implementation of the wind park does not require an environmental impact assessment. The Ministry of Environment and Forests (MoEF), Government of India notification dated September 14, 2006 regarding the requirement of Environment Impact Assessment (EIA) studies as per the Environment Protection Rule, 1986 (Published in the Gazette of India, Extraordinary, Part-II, and Section 3, Sub-section (ii) MINISTRY OF ENVIRONMENT AND FORESTS) states that any project developer in India needs to file an application to the Ministry of Environment and Forests (including a public hearing and an EIA) in case the proposed industry or project is listed in a predefined list. Wind parks are not included in this list and thus an EIA is not required. The project activity has no significant impact on the environment. However, certain foreseen impacts due to the project activity are discussed below: Also, in the redefined EIA notification i.e. S.O. 1533[12], dated 14th September 2006, Ministry of Environment & Forests (MoEF), Govt. of India, the wind projects are not included in the list of projects that has to get Prior Environmental Clearance (EC) either from State or Central Govt. authorities and hence no EIA study was conducted.

The project does not fall under the purview of the Environmental Impact Assessment (EIA) notification of the Ministry of Environment and Forest, Government of India. However due weightage has been given to environmental aspects.

During construction

Impact on air

[12] Page No: 10, S. O. 1533, Ministry of Environment & Forests (MoEF), Govt. of India, http://envfor.nic.in/legis/eia/so1533.pdf

Movement of construction material during construction will have some impact on the air. As the transportation is quite less for the project activity, the impacts will be negligible.

Impact on water

Not much water discharge takes place during construction. However proper sanitary arrangements will be provided by project proponents.

Impact on Land use

The land on which the project activity takes place is largely unproductive. Prior to the project activity, most of the land had no beneficial use. The project proponents had bought the land for a worthwhile application and obtained necessary approvals for installation of windmills. No dislocation of people is involved in the course of the project activity.

The magnitude of the impacts during the construction phase is negligible and exists for a temporary period of time till the end of construction phase. Therefore, it would not effect the environment considerably. The impacts on the environment due to construction activities of wind turbines are negligible

Operation and Maintenance Phase

Suzlon maintains highest level of safety standards. Systematic and scientific maintenance of all equipments has been undertaken to ensure the best safety standards.

Impact on air

Wind energy plants are known to contribute to zero atmospheric pollution as no fuel combustion is involved during any stage of the operation.

Impact on water

There is absolutely no effluent discharge during operation of wind turbine generators.

Impact on ecology

There are no known migratory birds/endangered species in the region of project activity. Therefore no harm on the ecological environment is envisaged.

Socio-Economic Impacts

There is no inconvenience to the local community due to the transmission lines. The project activity helps up-liftment of skilled and unskilled manpower in the region. The project will be providing employment opportunities not only during the construction phase, but also during its operational lifetime. The project activity improves employment rate and livelihood of local populace in the vicinity of the project. Moreover, the project generates eco-friendly, GHG free power which contributes to sustainable development of the region.

Conclusion

The net impact under environmental pollution category would be positive as all necessary abatement measures would be adopted and periodically monitored. The project activity does not have any major adverse impacts on environment during its construction or operational phase. The human interest parameters would show positive impacts due to increased job opportunities at the facility as well as other ancillary units coming up.

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

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

SECTION E. Stakeholders' comments

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

The stakeholders identified for the project activity were as under:

1) Gram Sarpanch
2) Contract employees
3) Suzlon employees
4) Vendors
5) Local people

The identified stakeholders were invited by sending one to one invitation letters. The stakeholder consultation meeting was held on 10th December, 2008 at wind mill site of (SRPL) situated at Davangere (District). The minutes of the meeting will be provided to the DOE during validation.

E.2. Summary of the comments received:

SRPL has received all necessary approvals / clearances / permissions from various local bodies which represent the local stakeholders.
The local people are direct beneficiaries of the project. The construction and continuous operation of the wind mill constitutes local manpower. The project does not require any major displacement of any local population. Also, the installation of transmission lines would not create any inconvenience to the local population. In summing up, the project activity has received complete support from the local populace.

CDM – Executive Board

The Agenda for the meeting was:

Item

* Introduction of members
* Introduction and presentation of the details of the project activity
* Concept of CDM
* Invite members to give comments/ views on the project activity
* Open House/ Discussion
* Vote of Thanks

Minutes of the Meeting: (Kudurekonda/ Israpura) 10th December 2008

- Mr. Prafulla Khinvasara (Head – Wind Power Projects, SRPL) opened the meeting with welcome address to the audience.
- Mr. Vinay Nisal (Regional Sales Manager, SRPL) – briefed the audience about SRPL as a company and its operations. He also touched upon the level of importance environment within SRPL
- Mr. Shivaji Lalage (Asst. Sales Manager, SRPL) gave an introductory presentation on Climate Change issues covering topics like Kyoto Protocol, Greenhouse Gas Effect, and Clean Development Mechanism (CDM) by SRPL.
- The attendees walked through the construction site. Mr Kaushik Patel (Asst. Manager – Marketing, Suzlon Energy Limited) explained them the concepts of wind mill erection and its functioning & its environmental benefits.
- After the site visit the session was opened for discussions and comments. All stakeholders highly appreciated the project taken up by SRPL and requested the company to continue taking steps in area of environment and energy.
- Mr Prafulla Khinvasara (Head – Wind Power Projects, SRPL) concluded the meeting with Vote of thanks.

CDM – Executive Board

The following table summarizes all the question/ comments raised during the Stakeholder's meeting and SRPL's response in each case:

Sr. No.	Name	Question/ Comments	Project Proponent Response
1.	Mr. Gajanan B. Patil (Junior Engineer)	What are the benefits of wind power project?	Mr. Khinvasara explained clean & green way of power generation and utilizing the renewable resources effectively rather consuming the fossil fuel. He further explained the concept of Sustainability.
2.	Chandrakant Hase (Sales Executive)	What is CDM?	• A scope for industrialized (Annex 1) countries with a greenhouse gas reduction commitment to invest in emission reducing projects in a developing (non-Annex I) country • A Central body (UNFCCC) issues one Certified Emission Reduction (CER) to a project when it saves one tonne of CO2 equivalent • Financially attractive to both parties as developed countries achieve emission reduction at a lower cost while developing country gets money by selling the CERs and also gets cleaner technology .
4.	S. Gopinath (Junior Engineer)	Gave Mr Khinvasara, word of appreciation for the project and concluded that the project will contribute to the improvement of the local environment.	
5.	V. H. Shahajan (President, Gram Panchayat)	How does this project benefit local people?	The project has employed several local peoples both contractual & permanent.
6.	Mr. P. Rengaswamy (Dy. Manager)	Gave his word of appreciation for the project	

7.	Mr. D. V. Shanker (Field Asst.)	Quantum of GHG emission reductions that will be taking place?	Mr. Khinvasara briefed about GHG emissions and its accounting.
8.	Mr. Puriya Naik (Member, Gram Panchayat)	Gave his word of appreciation for the project	

The Government of India, through Ministry of New and Renewable Energy (MNRE), has been promoting energy conservation, demand side management and renewable energy projects including wind, small hydro and bio-mass power.
The Ministry of Environment & Forests is the Designated National Authority in India. The Government of India, through Ministry of Environment and Forests (MoEF) is encouraging project participants to take up such environment-friendly initiatives.

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

SRPL has taken care of all the conditions stipulated in the relevant clearances and no adverse comment has been raised. In summing up, the project has not received any negative or discouraging feedback from the stakeholders concerned. All the stakeholders have appreciated and encouraged the project proponent for taking up this project activity.
In view of various direct and indirect benefits (social, economical, and environmental), all the stakeholders have supported the project activity. The documents supporting the stakeholder consultation will be submitted to the DOE.

Annex 1

CONTACT INFORMATION ON PARTICIPANTS IN THE PROJECT ACTIVITY

Organization:	Sargam Retails Pvt. Limited
Street/P.O.Box:	Indira Gandhi Marg,
Building:	Malpani House,
City:	Sangamner
State/Region:	Maharashtra
Postcode/ZIP:	422605
Country:	India
Telephone:	+91 2425 225011
FAX:	+91 2425 225003
E-Mail:	prafulla@malpani.com
URL:	www.malpani.com
Represented by:	
Title:	Head- Wind Power Projects
Salutation:	Mr.
Last Name:	Khinvasara
Middle Name:	Premchand
First Name:	Prafulla
Direct Fax	+91 2425 225003
Mobile:	+91 9822322145
Direct tel:	+91 2425 225011 (Extension 215)
Personal E-Mail:	prafulla@malpani.com

Annex 2

INFORMATION REGARDING PUBLIC FUNDING

No public funding for this project activity including any funding form ANNEX 1 countries. Thus the project participant hereby confirms that no diversion of Official Development Assistance is caused due to the project activity.

Annex 3

BASELINE INFORMATION

Crediting Period	Installed Capacity (MW)	Plant Load factor %	Southern Grid Emission Factor (tCO2/MWh)	Emission reduction (tCO2e)
2010	13.75	23.74/27.39	0.927	26475
2011	13.75	23.74/27.39	0.927	26475
2012	13.75	23.74/27.39	0.927	26475
2013	13.75	23.74/27.39	0.927	26475
2014	13.75	23.74/27.39	0.927	26475
2015	13.75	23.74/27.39	0.927	26475
2016	13.75	23.74/27.39	0.927	26475
Total CERS				**185325**

The Central Electricity Authority (CEA) under the Ministry of Power, Government of India, has estimated the Combined Margin emission factor for the Southern grid, the details of which are available on the following website.
http://www.cea.nic.in/planning/c%20and%20e/Government%20of%20India%20website.htm
The procedures and formulas used for estimation of the baseline factor and the assumptions made have also been detailed in there.

Annex 4

MONITORING INFORMATION

The monitoring information has already been provided in section B.7 above.

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Appendix I (Abbreviation)

SRPL	Sargam Retails Pvt Ltd
BE	Baseline Emissions
BM	Build Margin
CDM	Clean Development Mechanism
CEA	Central Electricity Authority
CER	Certified Emission Reductions
CM	Combined Margin
EF	Emission factor
EIA	Environment Impact Assessment
SIL	Suzlon India Limited
ER	Emission Reductions
GHG	Green House Gas
IRR	Internal Rate of Return
KV	Kilo Volts
kW	Kilowatt
KERC	Karnataka Electricity Regulatory Commission
KPTCL	Karnataka Power Transmission Corporation Limited
MoEF	Ministry of Environment and Forest
MW	Megawatt
ODA	Official Development Assistance
OM	Operating Margin
PDD	Project Design Document
PE	Project activity emissions
PLF	Plant Load Factor
PPA	Power Purchase Agreement
QA	Quality Assurance
QC	Quality control
RES	Renewable Energy Sources
BPLR	Benchmark Prime Lending Rate (RBI)
SLDC	State Load Dispatch Centers
tCO_2e	Tonnes of Carbon Dioxide Equivalent
UNFCCC	United Nation Framework Convention of Climate Change
WTG,s	Wind Turbine Generators
DOE	Designated Operational Entity