Project design document form for CDM project activities

(Version 07.0)

PROJECT DESIGN DOCUMENT (PDD)	
Title of the project activity	24.8 MW Wind power project by Belgaum Wind Farms Private Ltd. in Gadag, Karnataka
Version number of the PDD	04
Completion date of the PDD	20/05/2016
Project participant(s)	Belgaum Wind Farms Pvt. Ltd.
Host Party	India
Applied methodology(ies) and, where applicable, applied standardized baseline(s)	Methodology: - ACM0002/Version 16.0, Sectoral Scope: 01, "Consolidated baseline methodology for grid-connected electricity generation from renewable sources"
Sectoral scope(s) linked to the applied methodology(ies)	Sectoral Scope 1: Energy Industries (renewable - /non renewable sources)
Estimated amount of annual average GHG emission reductions	54,653

SECTION A. Description of project activity

A.1. Purpose and general description of project activity

The project is promoted by M/s Belgaum Wind Farms Pvt. Ltd. The project activity proposes to generate ~ 56 million units/annum of clean electricity with utilization of the available wind energy. The project proponent proposes to install 24.8 MW wind farm in Gadag Plains, Karnataka. The project activity will displace energy generated through fossil fuel based power plants, contributing to sustainable development and conservation of natural resources through use of wind, a renewable source. The power produced by this activity will be sold to Karnataka Power Transmission Corporation Limited (KPTCL) / Hubli Electricity Supply Company Limited (HESCOM) as per the Power Purchase Agreement (PPA) between them. HESCOM is a licensed electricity distribution company owned and controlled by the State Government of Karnataka and is an integral part of the Indian Grid.

The estimate of annual average GHG emission reductions are 54,653 tCO_2 and total GHG emission reductions for the chosen crediting period are 382,571 tCO_2.

The 24.8 MW Wind Power Project comprises of 31 Nos. of Wind Turbine Generators (WTGs) of Enercon E-53 make each of capacities 800 kW. Green power of approximately 56 Million Units per annum would be fed to the grid. Enercon (India) Ltd. is responsible for supplying and erecting the WTGs, completing construction of on-site infrastructure, and connecting the wind farm to the local electricity grid. Enercon (India) Ltd. is also responsible for operation and maintenance of the wind farm under an O&M contract for an initial term of 10 years.

Though wind power in India is not a promising investment owing to various uncertainties inherent to wind based power generation, the group has valuated its options and decided to go ahead considering Carbon credit benefits under Clean Development Mechanism protocol of Kyoto Protocol.

Project's contribution to Sustainable Development:

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

Social well being –
The proposed project activity leads to alleviation of poverty by establishing direct and indirect benefits through employment generation and improved economic activities by strengthening of local grid of the state electricity utility. The infrastructure in and around the project area will also improved due to project activity. This includes development of road network and improvement of electricity quality, frequency and availability as the electricity is fed into a deficit southern grid.

Economic well-being -
The project activity leads to an investment of Rs.1430.6 Million to a developing region which otherwise would not have happened in the absence of the project activity. The generated electricity will be fed into the Indian Grid though local grid, thereby improving the grid frequency and availability of electricity to the local consumers (villagers and sub-urban habitants) which will provide 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 will also lead to diversification of the national energy supply, which is dominated by conventional fuel based generating units.

Environmental well being –
Harnessing the wind is one of the cleanest and sustainable ways to generate electricity. Wind power produces no toxic emissions (like SOX, NOX, Particulate Matter, etc.) and none of the heat trapping gases that contribute to global warming, thereby leading to emission reductions. Being a renewable resource, using wind energy to generate electricity contributes to resource

conservation. The project causes no negative impact on the surrounding environment contributing to environmental well being.

Technological well being -
The project activity leads to the promotion of WTG‟s in the region, and thus increasing energy availability and improving quality of power under the service area of the substation. Hence the project leads to technological well being.

A.2. Location of project activity

A.2.1. Host Party

India

A.2.2. Region/State/Province etc.

Karnataka

A.2.3. City/Town/Community etc.

District: Gadag

A.2.4. Physical/Geographical location

Gadag Plains are located in the North-Central part of the state of Karnataka, in the southern region of India. The Proposed Project will fall under the following villages in the Gadag District.

1. Kurtkoti
2. Harti
3. Kanavi
4. Mulgund
5. Malasamudra
6. Nagavi
7. Hulakoti
8. Asundi
9. Hosur

The town of Gadag is the headquarters of Gadag district. The town is situated nearly 2,145 ft (650 m) above sea-level. The town is situated in plains. The population of the town is about 2, 00,000. The region of the proposed site is slightly undulated plateau with a very gentle slope towards west and the east. The site encompasses the elevated portion of the plateau with an elevation of 710 – 680 m, The district of Gadag is connected with main transport links to the rest of India via road, rail and air.
The Co-ordinates of WTGs at BWFL Wind farm are tabulated below:

Sl. No	Location/ WTG No	Latitude (N) (Deg Min Sec)	Longitude (E) (Deg Min Sec)
1	126	15° 20' 32.376"	75° 33' 30.937"
2	132	15° 20' 34.384"	75° 33' 47.916"
3	127	15° 20' 39.312"	75° 33' 29.513"
4	131	15° 20' 41.581"	75° 33' 46.492"
5	128	15° 20' 45.404"	75° 33' 27.483"
6	128A	15° 20' 52.118"	75° 33' 24.046"
7	192N	15° 23' 37.426"	75° 33' 13.749"
8	193N	15° 23' 47.056"	75° 33' 28.671"
9	457	15° 23' 35.905"	75° 32' 57.170"
10	456	15° 23' 27.641"	75° 32' 55.639"
11	455	15° 23' 20.738"	75° 32' 56.929"
12	142A	15° 21' 22.201"	75° 33' 46.568"
13	122	15° 20' 11.403"	75° 33' 22.529"

Sl. No	Location/ WTG No	Latitude (N) (Deg Min Sec)	Longitude (E) (Deg Min Sec)
14	210N	15° 24' 11.258"	75° 33' 46.955"
15	209N	15° 24' 18.196"	75° 33' 45.094"
16	194	15° 23' 53.054"	75° 33' 25.030"
17	195N	15° 24' 1.736"	75° 33' 28.375"
18	196N	15° 24' 8.735"	75° 33' 27.789"
19	208N	15° 24' 23.348"	75° 33' 41.489"
20	148A	15° 22' 7.340"	75° 33' 10.223"
21	133	15° 20' 27.446"	75° 33' 50.044"
22	119	15° 20' 31.181"	75° 33' 14.297"
23	211N	15° 24' 5.199"	75° 33' 49.086"
24	254	15° 23' 30.778"	75° 34' 8.486"
25	255	15° 23' 37.322"	75° 34' 7.732"
26	248A	15° 20' 17.381"	75° 34' 43.584"
27	197N	15° 24' 28.57"	75° 33' 35.929"
28	249A	15° 20' 30.937"	75° 34' 49.995"
29	247A	15° 20' 6.279"	75° 34' 32.116"
30	241A	15° 20' 43.737"	75° 34' 46.977"
31	242A	15° 20' 15.405"	75° 34' 27.512"

Figure 1 Location of Karnataka State in India

Figure 2 Location of District Gadag in Karnataka

A.3. Technologies and/or measures

Technology:

In wind energy generation, kinetic energy of the wind is converted into mechanical energy and subsequently into electrical energy. Wind turbines capture the 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 shorter and less turbulent wind at 100 feet or more above the

ground. As wind blows through the blades of windmill, a pocket of low-pressure air forms on the downwind side of the blade. The low-pressure air 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.

The Wind Turbine used for this project activity is Enercon make E-53 Wind Turbine Generator which has a rated capacity of 800 kW. Some of the salient features of Enercon E-53 Wind Turbine Generator are:

1. Gearless construction
2. Operation at variable speed: It operates at a continuous variable speed in synchronism with the varying wind speeds.
3. Optimum adaptation to many different grid voltages at different location.
4. Maximum utilization of grid connection capacity for feeding in power.

The technical specifications of E-53 are given in table below:

Table 1 Technical specification of the WTGs

Particulars	
Rated capacity	800 kW
Rotor diameter	52.9m
Hub height	72-74 m steel / concrete
Rotor	With pitch control
Type	Upwind rotor with active pitch control
Direction of rotation	Clockwise
Number of blades	3
Swept area	2198 sq. m
Blade material	Fibreglass (reinforced epoxy) with integral lightning protection
Rotor speed	Variable, 12-29 rpm
Pitch control	ENERCON blade pitch system, one independent pitching system per rotor blade with allocated emergency supply
Hub	Rigid
Bearings	Single row cylindrical roller bearings
Generator	ENERCON direct-drive synchronous annular generator
Grid feeding	ENERCON Inverter
Braking system	3 independent blade pitch systems with emergency supply
Yaw control	Active through adjustment gears, load-dependent damping
Cut-out wind speed	28-34 m/s

The detailed technical description of the turbines used in the project activity is furnished in Annex 1.

Grid Evacuation

The proposed wind project is connected with a dedicated 33kV line to 220/33 kV Enercon substation near the site. From the Enercon substation which will be dedicated for Enercon wind farms, the power will be transmitted to the Government owned substation.

The availability of the Enercon substation will be over 99.5%. Being connected to the 220kV Enercon substation which in turn will be connected to the state owned 220kV substation, the project will have the highest grid availability possible.

A.4. Parties and project participants

Party involved (host) indicates host Party	Private and/or public entity(ies) project participants (as applicable)	Indicate if the Party involved wishes to be considered as project participant (Yes/No)
India (host)	Belgaum Wind Farms Pvt. Ltd. (Private Entity)	No

A.5. Public funding of project activity

There is no ODA financing involved in the project.

SECTION B. Application of selected approved baseline and monitoring methodology and standardized baseline

B.1. Reference of methodology and standardized baseline

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

Reference: ACM0002, Version 16.0 (EB 81), Sectoral scope: 1.
It has been referred from the list of approved methodologies for CDM project activities in the UNFCCC CDM website (http://cdm.unfccc.int/methodologies/PAmethodologies/approved.html).

The approved methodology also draws upon
- Tool for the demonstration and assessment of additionality[1]
- Tool to calculate the emission factor for an electricity system - Version 5.0.0

B.2. Applicability of methodology and standardized baseline

The project activity meets the applicability conditions of the approved consolidated baseline and monitoring methodology ACM0002, Version 16.0, Sectoral Scope 1, EB 81 as described below:

Applicability	Project activity vis-à-vis applicability Conditions
This methodology is applicable to grid-connected renewable power generation project activities that: • install a Greenfield power plant; • involve a capacity addition to (an) existing plant(s); • involve a retrofit of (an) existing operating plants/units; • involve a rehabilitation of (an) existing plant(s)/unit(s) or • involve a replacement of (an) existing plant(s)/unit(s).	The project activity is installation of a new grid connected wind power plant at a site where no renewable power plant was operated prior to the implementation of the project activity (Greenfield plant) and hence this criterion is applicable. The generated power is sold to the grid via Karnataka Power Transmission Corporation Limited (KPTCL)/Hubli Energy Supply Company Ltd. (HESCOM)
The project activity may include renewable energy power plant/unit of one of the following types: hydro power plant/unit with or without reservoir, wind power plant/unit, geothermal power plant/unit, solar power plant/unit, wave power plant/unit or tidal power plant/unit;	The proposed project activity is an installation of a new grid connected wind power plant and hence this condition is met.

[1] The additionality section of the PDD has not been revised in accordance with para 300 of Project Standard (version 09.0)

In the case of capacity additions, retrofits, rehabilitations or replacements (except for wind, solar, wave or tidal power capacity addition projects the existing plant/unit started commercial operation prior to the start of a minimum historical reference period of five years, used for the calculation of baseline emissions and defined in the baseline emission section, and no capacity expansion, retrofit, or rehabilitation of the plant/unit has been undertaken between the start of this minimum historical reference period and the implementation of the project activity;	The project does not involve any capacity additions, retrofits or replacements and therefore this condition is not applicable.
In case of hydro power plants, one of the following conditions shall apply: • The project activity is implemented in existing single or multiple reservoirs, with no change in the volume of any of the reservoirs; or • The project activity is implemented in existing single or multiple reservoirs, where the volume of the reservoir(s) is increased and the power density calculated using equation (3), is greater than 4 W/m^2; or • The project activity results in new single or multiple reservoirs and the power density, calculated using equation (3), is greater than 4 W/m^2.	The project activity is a grid connected wind power project and not a hydro power plant. Therefore, these criteria are not applicable for the project activity.
The project activity is an integrated hydro power project involving multiple reservoirs, where the power density for any of the reservoirs, calculated using equation (3), is lower than or equal to 4 W/m^2, all of the following conditions shall apply: • The power density calculated using the total installed capacity of the integrated project, as per equation (4), is greater than 4 W/m^2; • Water flow between reservoirs is not used by any other hydropower unit which is not a part of the project activity; • Installed capacity of the power plant(s) with power density lower than or equal to 4 W/m^2 shall be; ✓ Lower than or equal to 15 MW; and ✓ Less than 10 per cent of the total installed capacity of integrated hydro power project.	The project activity is a grid connected wind power project and not a hydro power plant. Therefore, these criteria are not relevant to the project activity.
In the case of integrated hydro power projects, project proponent shall: • Demonstrate that water flow from upstream power plants/units spill directly to the downstream reservoir and that collectively constitute to the generation capacity of the integrated hydro power project; or • Provide an analysis of the water balance covering the water fed to power units, with all possible combinations of reservoirs and without the construction of reservoirs. The purpose of water balance is to demonstrate the requirement of specific combination of reservoirs constructed	The project activity is a grid connected wind power project and not a hydro power plant. Therefore, these criteria are not relevant to the project activity.

under CDM project activity for the optimization of power output. This demonstration has to be carried out in the specific scenario of water availability in different seasons to optimize the water flow at the inlet of power units. Therefore this water balance will take into account seasonal flows from river, tributaries (if any), and rainfall for minimum five years prior to implementation of CDM project activity.	
Methodology is not applicable to the following • Project activities that involve switching from fossil fuels to renewable energy sources at the site of the project activity, since in this case the baseline may be the continued use of fossil fuels at the site; • Biomass fired power plants/units	• The project activity is installation of a new grid connected wind power project and does not involve switching from fossil fuel to renewable energy and hence this criterion is not relevant to the project activity. • This is a wind power plant and not a biomass fired plant and hence this criterion is not applicable to the project activity.
In the case of retrofits, rehabilitations, replacements, or capacity additions, this methodology is only applicable if the most plausible baseline scenario, as a result of the identification of baseline scenario, is "the continuation of the current situation, that is to use the power generation equipment that was already in use prior to the implementation of the project activity and undertaking business as usual maintenance".	The project activity is a new grid connected wind power plant and not a retrofits, replacement or capacity additions and therefore this criterion is not applicable to the project activity.
Applicability conditions of "Tool to calculate the emission factor for an electricity system"	
This tool may be applied to estimate the OM, BM and/or CM when calculating baseline emissions for a project activity that substitutes grid electricity that is where a project activity supplies electricity to a grid or a project activity that results in savings of electricity that would have been provided by the grid (e.g. demand-side energy efficiency projects).	This condition is applicable. OM, BM and CM are estimated using the tool under section B.6.1 for calculating baseline emissions.
Under this tool, the emission factor for the project electricity system can be calculated either for grid power plants only or, as an option, can include off-grid power plants. In the latter case, the conditions specified in "Appendix 2: Procedures related to off-grid power generation" should be met. Namely, the total capacity of off-grid power plants (in MW) should be at least 10 per cent of the total capacity of grid power plants in the electricity system; or the total electricity generation by off-grid power plants (in MWh) should be at least 10 per cent of the total electricity generation by grid power plants in the electricity system; and that factors which negatively affect the reliability and stability of the grid are primarily due to constraints in generation and not to other aspects such as transmission capacity.	Since the project activity is grid connected, this condition is applicable and the emission factor has been calculated accordingly.
In case of CDM projects the tool is not applicable if the project electricity system is located partially or totally in an Annex I country.	The project activity is located in India, a non-Annex I country. Therefore, this criterion is not applicable for the project activity.

Under this tool, the value applied to the CO2 emission factor of biofuels is zero.	The project activity is a grid connected wind power project and not a hydro power plant. Therefore, this criterion is not applicable for the project activity.

B.3. Project boundary

Project boundary

The project boundary is defined as the notional margin around a project within which the project's impact (in terms of GHG reduction) will be assessed. According to the methodology ACM0002, for the baseline emission factor, the spatial extent of the project boundary includes the project site and all power plants connected physically to the electricity system that the CDM project plant is connected to.

Source		GHGs	Included?	Justification/Explanation
Baseline scenario	Electricity generation from power plants connected to the Indian grid	CO_2	Included	Main emission source
		CH_4	Excluded	This source is not required to be estimated for wind energy projects under ACM0002
		N_2O	Excluded	This source is not required to be estimated for wind energy projects under ACM0002
Project scenario	Electricity generation from the project activity	CO_2	Excluded	Wind energy generation does not have any indirect GHG emissions
		CH_4	Excluded	
		N_2O	Excluded	

Description of project boundary

Initially the Indian electricity sector is divided into five regional grids: Northern grid, Eastern grid, Western grid, Southern grid and North-Eastern grid. Each grid covers several states. As the regional grids are interconnected, there is inter-state and inter-regional exchange.

However since 2007-08 as the four regional grids except the Southern grid has been synchronized, they are now being considered as one and named as NEWNE grid. As of 31 December 2013, the Southern grid has also been synchronised with the NEWNE grid, hence forming one unified Indian Grid. Since the project supplies electricity to the Indian grid, emissions generated due to the electricity generated by the Indian grid as per CM calculations will serve as the baseline for this project.

Table: Grid Classification

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

Uttarakhand				

Figure 3 States connected to different regional grids[2]

Power generation and power supply within the regional grid is managed by Regional Load Dispatch Centre (RLDC). The Regional Power Committees (RPCs) provide a common platform for discussion and solution to the regional problems relating to the grid. Each state in a regional grid meets its demand with its own generation facilities and also with allocation from power plants owned by Central Sector such as NTPC and NHPC, etc. Specific quotas are allocated to each state from the Central Sector power plants. Depending on the demand and generation, there are electricity exports and imports between states in the regional grid. The regional grids thus represent the largest electricity grid where power plants can be dispatched without significant constraints and thus, the „project electricity system" for the project. As the project is connected to the Indian electricity grid, the Indian grid is the "project electricity system".

Accordingly, the project boundary encompasses the physical extent of the Indian electricity grid which includes the project site and all the power plants connected physically to the electricity system.

[2] http://cea.nic.in/reports/others/thermal/tpece/cdm_co2/user_guide_ver11.pdf

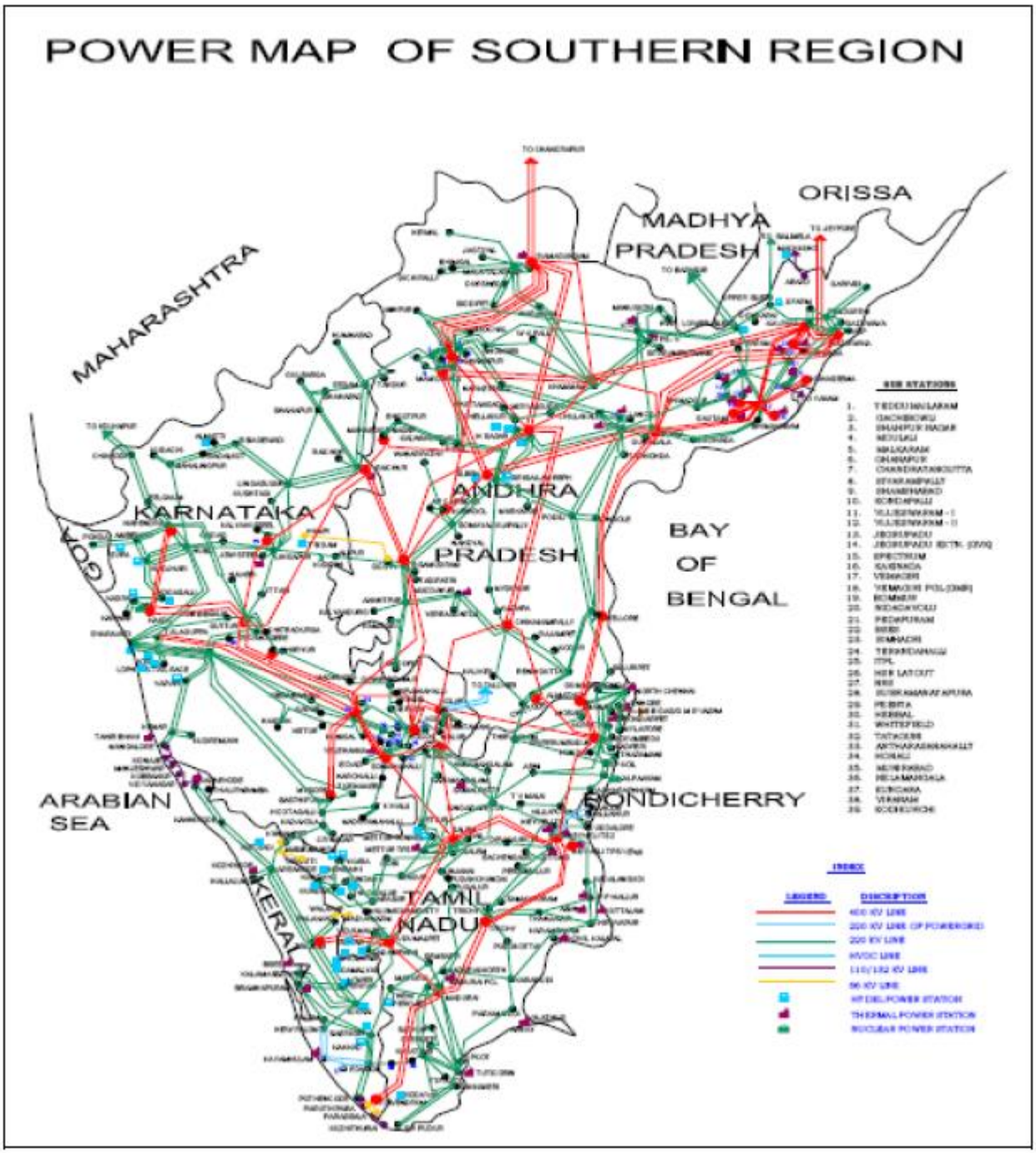


Figure 4 The proposed project boundary Southern region (part of Indian Grid) for the project activity

B.4. Establishment and description of baseline scenario

Updated baseline for the second crediting period in line with the “Assessment of the validity of the original/current baseline and update of the baseline at the renewal of the crediting period.” Version 03.0.1.

This tool provides a stepwise procedure to assess the continued validity of the baseline and to update the baseline at the renewal of a crediting period, as required by paragraph 305 of Project Standard version 09 & 49 (a) of the modalities and procedures of the clean development mechanism.

The tool stipulates the following steps to be carried out.

Step 1: Assess the validity of the current baseline for the next crediting period

Step 1.1: Assess compliance of the current baseline with relevant mandatory national and/or sectoral policies

The baseline scenario remains unchanged and is in compliance with all the relevant mandatory national and/or sectoral policies.

Step 1.2: Assess the impact of circumstances

The baseline scenario identified at the validation of the project activity was the electricity delivered to the grid by the project activity would have otherwise been generated by the operation of grid connected power plants and by the addition of new generation sources into the grid. Thus this project activity was a voluntary investment which intends to replace equivalent amount of electricity at grid from renewable source. PP was not bound to incur this investment; hence absence of project activity (i.e. the investment) does not lead to any continued baseline practice for PP within their scope whereas the continued operation of the project activity would continue to replace equivalent amount of electricity at grid. Hence, the same baseline as identified in the previous crediting period is still valid for the project. Therefore, the assessment of the changes in market characteristics is not required for the renewal of the project's crediting period under CDM.

Nevertheless, there is an impressive growth attained by the Indian Power Sector within the recent years, the installed capacity has grown from mere 1,713 MW in 1950 to 267,637 MW as on 31.03.2015, consisting of 188897.78 MW Thermal, 31692.14 MW Renew and 5,780 MW Nuclear. Sector-wise details of installed capacity are shown in Table 1. However, it is evident from Table 1[3] that the installed capacity is predominantly coal based and therefore, is a major source of carbon dioxide emissions in India. Hence, there exists scope for reducing the CO_2 emissions in the country by increased use of renewable energy sources. Furthermore, project participant has considered the latest available CO_2 Baseline Database (CEA database, version 11) at the time of requesting renewal of the crediting period for establishing the baseline emission factor, which itself considered all the new circumstances. Hence, the new circumstances do not have an impact on the baseline emission.

Table 1: Sector- wise installed capacity (MW) as on 31.03.2015 (CEA Database version 11)

Sector	Hydro	Thermal				Nuclear	Renew.	Total
		Coal	Gas	Diesel	Total			
State	27482.00	58100.50	6974.42	602.61	65677.53	0.00	3803.67	96963.20
Central	11091.43	48130.00	7519.73	0.00	55649.73	5780.00	0.00	72521.16
Private	2694.00	58405.38	8568.00	597.14	67570.52	0.00	27888.47	98152.99
All India	41267.43	164635.88	23062.15	1199.75	188897.78	5780.00	31692.14	267637.35

Step 1.3: Assess whether the continuation of the use of current baseline equipment(s) or an investment is the most likely scenario for the crediting period for which renewal is requested

As explained in step 1.2, the baseline scenario was the electricity import/generation from the power plants connected to the electricity grid. Therefore this condition is not applicable to the project activity.

Step 1.4: Assessment of the validity of the data and parameters

[3] http://cea.nic.in/reports/others/thermal/tpece/cdm_co2/user_guide_ver11.pdf

This step stipulates that “Where emission factors, values or emission benchmarks are used and determined only once for the crediting period, they should be updated, except if the emission factors, values or emission benchmarks are based on the historical situation at the site of the project activity prior to the implementation of the project and cannot be updated because the historical situation does not exist anymore as a result of the CDM project activity.”

In the context of the present project activity the emission factor has been updated along with the approach used to calculate the emission factor.

Step 2: Update the current baseline and the data and parameters

As evident from the explanation provided above the baseline scenario remains unchanged. Only the approach used to calculate the baseline emission factor is updated as per the latest version available at the time of PDD submission for renewal.

In line with the paragraph 13.9.1 of the project standard version 9, the impact of new relevant national and/or sectoral policies and circumstances on the baseline taking into account relevant EB guidance with regard to renewal of the crediting period at the time of requesting renewal of crediting period; and the correctness of the application of an approved baseline methodology for the determination of the continued validity of the baseline or its update, and the estimation of emission reductions for the applicable crediting period

Impact of the national and/or sectoral policies and circumstances upon the baseline scenario of the project activity

The Government of India enacted the Electricity Act in the year 2003 to harmonize and rationalize the provisions in the then existing laws. The Act consolidated the laws relating to generation, transmission, distribution, trading and use of electricity. With the Enactment of the act, the then existing laws viz, The Indian Electricity Act 1910, The Electricity Supply Act, 1948 and The Electricity Regulatory Commissions Act, 1998 were repealed. The Electricity Act 2003 was in force at the time of the completion of the baseline study for the registered PDD.

Section 3 of the said act required the Central Government to prepare the national electricity policy and tariff policy, in consultation with the State Governments and the Authority for development of the power system based on optimal utilization of resources such as coal, natural gas, nuclear substances or materials, hydro and renewable sources of energy. In accordance with the section 3 of the Electricity Act 2003, the Central Government notified the National Electricity Policy on 12th February 2005 which was in force at the time of completion of the baseline study as stated in the registered PDD of the project activity. This policy has not been revised since then and is currently in force as well.

In addition to the above policies, State Electricity Regulatory Commissions (SERCs) have announced preferential tariffs and Indian Renewable Energy Development Agency (IREDA) provides term loan assistance towards establishing biomass power projects. All these fiscal and financial incentives were in force at the time of completion of the baseline study for the registered PDD of the project activity and still continue to exist.

However, in spite of the financial incentives given by the government to renewable power projects in India the generation from the low cost must run resources connected to the Indian Grid has not increased to such an extent that this would lead to more than 50% contribution from the low cost must run resources towards the total generation from the indian Grid.

The approved consolidated baseline methodology, ACM0002, (Version 16), has been used to determine the baseline and the estimation of emission reductions for the applicable crediting period. As referred in the methodology “*Tool to calculate the emission factor for an electricity*

system" *(version 05.0)* has been used to determine continued validity of the baseline based on combined margin (CM) calculations.

In light of the above discussion it is to be concluded that in accordance with relevant guidelines stipulated in the Project Standard para 13.9.1, national and/or sectoral policies and circumstances had been considered towards formulating the OM & BM baseline scenario .Hence the baseline scenario as applied for the present project activity remains justified.

As per the approved consolidated methodology ACM 0002,

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

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

The project activity involved setting up of WTGs to harness the power of wind to produce electricity and supply to the grid. In the absence of the project activity, the equivalent amount of power would have been supplied by the Indian grid which is fed mainly by fossil fuel fired plants.

In the absence of the project activity, the equivalent amount of power would have been drawn from the Indian grid. Hence, the baseline for the project activity is the equivalent amount of power from the Indian grid.

The combined margin ($EF_{grid,CM,y}$) is the result of a weighted average of two emission factor pertaining to the electricity system: the operating margin (OM) and build margin (BM). Calculations for this combined margin must be based on data from an official source[4] (where available) and made publically available.

The combined margin of the Indian grid used for the project activity is as follows:

Parameter	Value	Nomenclature	Source
$EF_{grid,CM,y}$	0.9777 tCO_2/MWh	Combined margin CO_2 emission factor for the project electricity system in year y	Calculated as the weighted average of the operating margin (0.75) & build margin (0.25) values, sourced from Baseline CO_2 Emission Database, Version 11.0 published by Central Electricity Authority (CEA), Government of India
$EF_{grid,OM,y}$	0.9941 tCO_2/MWh	Operating margin CO_2 emission factor for the project electricity system in year y	Calculated as the last 3 year (2012-13, 2013-14, 2014-15) generation-weighted average, sourced from Baseline CO_2 Emission Database, Version 11.0, published by Central Electricity Authority (CEA), Government of India
$EF_{grid,BM,y}$	0.9285 tCO_2/MWh	Build margin CO_2 emission factor for the project electricity system in year y	Baseline CO_2 Emission Database, Version 11.0, published by Central Electricity Authority (CEA), Government of

[4] http://cea.nic.in/reports/others/thermal/tpece/cdm_co2/user_guide_ver11.pdf

			India

B.5. Demonstration of additionality

The project produces electricity in a clean manner, in other words, leads to zero GHG emissions and would also help in the strengthening of the Indian grid which is electricity deficit[5]. Additional energy supplied from the project activity will help in meeting the energy demand of the region and later increasing the reliability of the central grid. This in the business-as usual scenario would have been met with the help of conventional fossil fuel based power plants.

Thus it would displace usage of conventional fossil fuels in electricity generation and help in reducing emissions by 384,139 tCO2 e for the entire second crediting period (7 years).

ADDITIONALITY
As per the decision 17/cp.7 Para 43, a CDM project activity is additional if anthropogenic emissions of greenhouse gases by sources are reduced below those that would have occurred in the absence of the registered project activity. As per the selected methodology ACM0002, the project developer is required to establish that the GHG emission reductions due to the project activity are additional to those that would have occurred in the absence of the current project activity as per the **"Tool for the demonstration and assessment of additionality"**.

[5] http://powermin.nic.in/indian_electricity_scenario/pdf/SR1007.pdf , Page No. 4

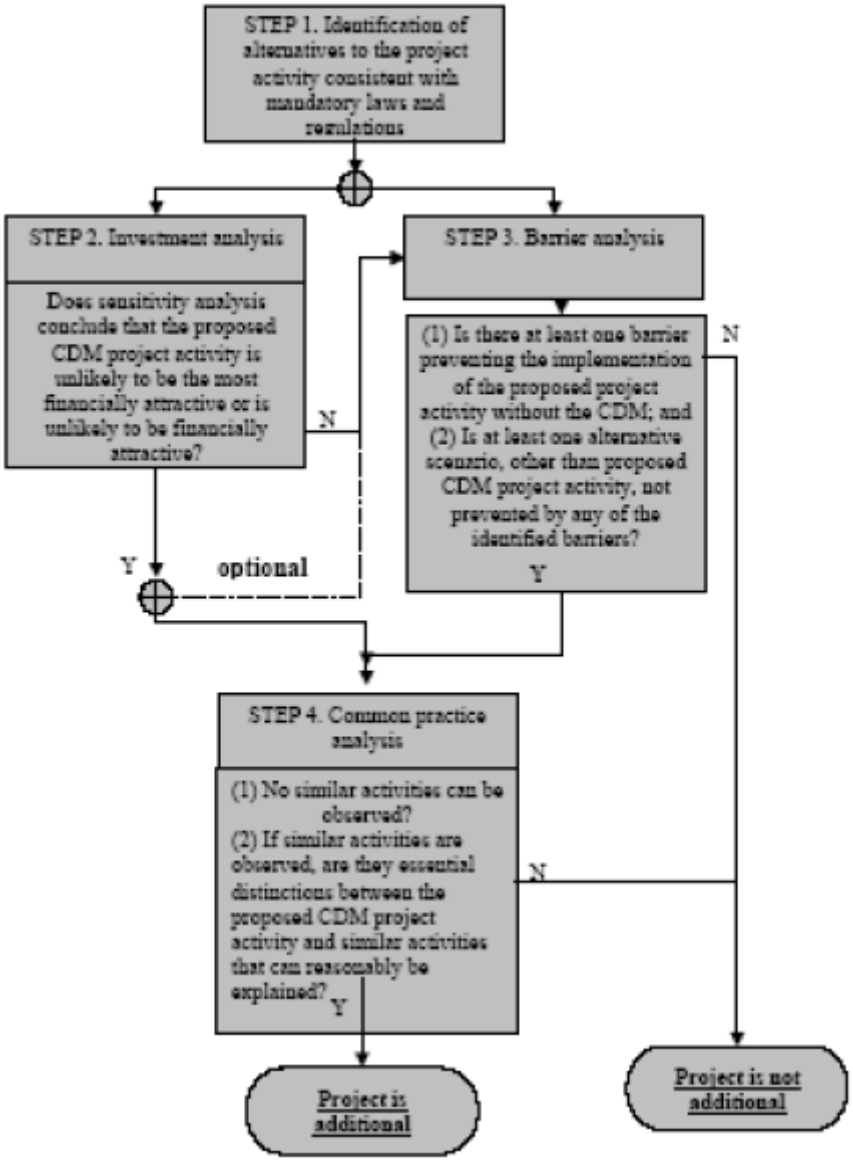


Figure 6 Tool for Demonstration of additionality

This provides for a step-wise approach to demonstrate and assess additionality. These Steps include:

1. Identification of alternatives to the project activity;
2. Investment analysis to determine that the proposed project activity is either: 1) not the most economically or financially attractive, or 2) not economically or financially feasible;
3. Barriers analysis; and
4. Common practice analysis.

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

We shall define realistic and credible alternatives to the project activity that can be part of credible baseline in following sub steps.

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

Alternative(s) available to the project participants or similar project developers include:

1. The Project is undertaken as a non-CDM project activity.
2. No BWFPL project activity; continuation of the current scenario.

The alternatives are discussed in detail below.

Alternative 1- The project is undertaken as a non-CDM project activity
The project activity is a GHG free source of power and hence implementation of it would help in educed emissions in power generation. However, this alternative is financially non-viable as per the investment analysis conducted and detailed in the following sections (please refer section B.5) and thus is not a baseline option.

Alternative 2- No BWFPL project activity; continuation of the current situation
In this alternative, BWFPL project activity is not implemented resulting in the continued current grid mix of KPTCL and there is no displacement of electricity of the grid mix of KPTCL.

In this alternative, an equivalent amount of electricity would be generated by the power plants comprising the KPTCL grid mix. An equivalent amount of Carbon Dioxide would be generated at the thermal power generation end. This alternative is in compliance with all applicable legal and regulatory requirements and may be a part of the baseline.

Outcome of step 1a: Continuation of present scenario of grid-supplied power would be a conservative approach to baseline establishment.

Sub-Step 1b. Consistency with mandatory laws and regulations

There are no legal and regulatory requirements that prevent Alternative 1 and 2 from occurring.

Outcome of Step 1b: The alternative scenario i.e. the continuation of power generation through a mix of existing and new generation sources in the Indian grid is in compliance with mandatory legislation and regulations taking into account the enforcement in the region and EB decisions on policies of region or sector.

Step 2. Investment analysis
As per the tool for additionality, it is determined that the proposed project activity is not an economically or financially feasible option without CER income.

To conduct the investment analysis, **„Guidance on the Assessment of Investment Analysis" Version 02**, EB 41, Annex 45 has been referred.

Sub-step 2a Determine appropriate analysis method
Since the project activity shall generate financial income from sale of power to the grid, we shall rule out Option I (simple cost analysis) and apply either Option II (Investment comparison analysis) or Option III (Benchmark analysis). Option III is selected for the analysis in this project case.

Sub-step 2b: Option III - Apply Benchmark analysis
To analyze the financial viability of the project, Project IRR has been chosen as the financial indicator.
As per „Guidance on the Assessment of Investment Analysis" **para 11**,

In cases where a benchmark approach is used the applied benchmark shall be appropriate to the type of IRR calculated. ***Local commercial lending*** *rates or weighted average costs of capital (WACC) are appropriate benchmarks for a project IRR.*

In the project activity, BWFPL has considered the local lending rate as the benchmark. The local lending rate in the project activity is 11.75% in the project activity. As explained in the section below, the returns (Project IRR) from the project activity is well below the benchmark. The

sensitivity analysis further corroborates the fact that with out CER income made available to the activity, project is not a financially viable option.

Sub-Step 2c. Calculation and comparison of financial indicator (only applicable to Options II and III)

Details of data/ information and assumptions used by the project proponent in the financial analysis and the results of financial analysis for BWFPL are presented below:

Table 4 Detailed assumptions used in the financial analysis

PARAMETER	VALUE	UNIT	SOURCE
Generation capacity of each WTG	800	kW	Purchase order
Number of WTGs	31	#	Purchase order
Capacity Utilization Factor	25.73	%	Study undertaken by the project proponent through Garrad Hassan
Total No. of units supplied	55.9	Million units	Calculated
Tariff rate (Fixed for 10 years)	3.40	Rs./kWh	Karnataka Electricity Regulatory Commission (KERC) January 2005 order
O&M Cost	14.26	Rs. Million/ annum	Free for the first year and is applicable from second year onwards as per O&M contract with WTG provider for all WTGs
Escalation in O&M cost	6	%	O&M contract with WTG provider
Book Depreciation rate	4.50	%	SLM for 20 years
Service Tax Rate	12.36	%	Income Tax Act
Minimum Alternate Tax (MAT)	11.33	%	
Corporate Tax Rate	33.99	%	
Total Project Cost	1430.6	Rs. Million	As per agreement with supplier
Debt: 63%	900.0	Rs. Million	Loan sanction letter from bank
Equity: 37%	530.6	Rs. Million	
Interest Rate	11.75	%	
Repayment Period	12.25	Years	
Grid Emission Factor	0.930	tCO2/MWh	Carbon Dioxide Baseline Database, Version 03 published by Central Electricity Authority, Ministry of Power, Govt. of India. (please refer annex 3 for details)
Rs./Euro	62	Rs.	
Price per CER	14	Euro	

BWFPL also considered tax holiday as per 80 IA of Income Tax Act in India. However, the tax benefit due to accelerated depreciation is not utilized by the project proponent. Based on the information mentioned above, it is estimated that the Project IRR of the project activity is at 9.34 % and is clearly below the benchmark.

Sub-step 2d Sensitivity Analysis

The purpose of sensitivity analysis is to conclude that financial un-attractiveness is robust to reasonable variations in the critical assumptions. The financial performance of the project activity is found to be sensitive to the following factors –

1. Project cost
2. Capacity Utilization Factor
3. Tariff post 10th year (tariff is fixed for first 10 years)

1. Project cost:

The project cost as envisaged by BWFPL is Rs. 1430.6 million. Out of this, Rs. 1251.16 million is towards EPC (ex land) cost. This makes about 87% of the total project cost. The EPC cost is the contracted cost with WTG supplier M/s Enercon India. Hence there is no possibility of project cost undergoing any change. However even with an assumed 10% decrease in the project cost (excluding EPC cost) does not seem to help much and the Project IRR improves marginally and is not able to touch the benchmark rate.

Change in Project cost (excluding EPC cost)	Project IRR
0% (Base case)	9.34%
-10%	9.53%

Even a decrease of 20% in the relevant project cost component won't be able to make up for the difference in the Project IRR and benchmark rate. A decrease of this level in project cost is practically seems not possible.

2. Capacity Utilization Factor (CUF):

This is the most critical of all factors that can have a major impact on the financial performance of the project activity. However, CUF is based on many factors which project proponent has no control on and it carries a lot of uncertainty. BWFPL has conducted a study on the wind profile on the project site from M/s Garad Hassan and it could be established that average CUF is close to 25.73%. There is little chance of it going up. A change of even +10% in CUF however is not able to make the project financially attractive as Project IRR remains below the benchmark.

Change in CUF	**Project IRR**
0% (Base case)	9.34%
+10%	10.87%

An increment of ~16% in CUF value helps project IRR cross over the lending rate of 11.75% but this seems highly unlikely as suggested by the Garad Hasan study report on power generation potential in the region.

3. Tariff Rate post 10th year:

As per the power purchase agreement, tariff is fixed for first 10 years at Rs. 3.40/ kWh. In the base financial analysis, same tariff has been considered for the entire project life time. A change of 10% beyond 10th year does not make much impact on Project IRR.

Change in Tariff post 10th year	**Project IRR**
0% (Base case)	9.34%
+10%	9.77%

Only an increase of 70% will be able to make project IRR cross over the lending rate of 11.75%. Increment of this level is definitely out of question.

Even the combination of favourable conditions of all the above factors is not able to make it attractive as shown below.

Factor	**Project IRR**
(Base case)	9.34%
+10% increase in tariff (post 10th year), 10% decrease in project cost (ex EPC cost) component, 10% in CUF	11.49%

As evident, Project IRR is below the benchmark.

All the scenarios discussed above indicate that CDM revenue is an important part of the project activity to make it financially viable.

Step 3: Barrier Analysis

The wind power development in the country and in the state of Karnataka has been supported by government preferential tariff policies. However, even with this support the developer realizes the fact that CDM funds would still be needed to make the project a viable investment due to the reasons as outlined below:

Regulatory Barriers:

Tariff : In January 2005, Karnataka Electricity Regulatory Commission (KERC) came out with an order to determine tariff policy for renewable energy projects.

If the parameters considered in the tariff order and the project activity are compared for estimation of the rate of return, it can be said that the parameters are not compatible with the project activity scenario which directly affects the internal rate of return of the project activity. The project cost, the CUF and escalation in O&M expense for instance are less than what is applicable for the project activity.

Table 5 Comparison of the parameters as considered in the tariff order and project activity for estimation of rate of return (as considered by KERC)[6]

Parameter	As per KERC Tariff Order	As per the project scenario	Net effect on the IRR
Project Cost	Rs. 42.5 Million per MW	Rs. 51.25 Million per MW	Decrease in IRR
Capacity Utilization Factor	26.5%	25.73%	Decrease in IRR
O&M Expenses Escalation	5%	6%	Decrease in IRR

Comparison of tariffs across the states:

Karnataka state has one of the lowest tariff rates among other states. Investing in a state with higher tariff would have fetched the promoters" higher returns. Thus, low tariff is indeed barrier to the viability of the project.

Table 6. Comparison of the tariff rates across the states[7]

Parameter	Karnataka	Madhya Pradesh	Maharashtra	Rajasthan	Gujarat	Tamil Nadu	West Bengal
Buy-back rate by State Electricity Board	Rs. 3.40 per kWh without any escalation for 10 yrs of commercial operation	Year wise rates (Rs./kWh) from 1st to 20th year 1st Yr – 4.13	Rs.3.50/kWh (First year of commissioning) . (escalation of 15 paise per year for 13yrs)	For Jaisalmer, Jodhpur and Barmer district Rs.3.60 per unit	Rs.3.37 per kWh (without any escalation for 20 yrs.)	Rs.2.90 per kWh	Rs.4 per kWh

[6] www.kerc.org/order2005/Order%20on%20NCE%20Tariff%20(FINAL).doc

[7] http://www.windpowerindia.com/govtinc.html

		2ND Yr – 3.86 3RD Yr – 3.69 4TH Yr – 3.52 5TH Yr – To 20TH Yr – 3.36		for injection in 33kV or 11kV system & Rs.3.71 per unit for injection in EHV system. For other district Rs.3.78 per unit for injection on 33kV or 11 kV system & Rs.3.89 per unit for injection in EHV system			

Other barriers:

Delays in construction and commissioning of the project: Any delay or possible problems with the construction of the wind farm could have an effect on the projected revenue levels. Construction period and the capital required to complete the wind farm may be affected by different factors such as delays or disputes with the suppliers, workers or contractors, price increases, shortages or increases in the cost of raw materials, transportation and components, accidents or unforeseen difficulties or changes n governmental policies. For example, there are more than 7000 components in turbines and their assembly has traditionally been a bottleneck in WTG manufacturing process, demonstrating the importance of relationships with suppliers. Such events may give rise to cost over-runs, and there can be no guarantee that the wind farm will be operational within the expected timeframe or budgeted cost. Also, liquidated damages contract with the supplier does not cover all escalations/loss of profit arising as a result of delays or other factors.

Difficulties in Financial Closure: These types of projects are assessed to be risky by financial institutions due to low financial returns from the project. Therefore when the Promoters approached Banks/FIs for arranging debt they were asked to include CER revenue to make project more viable and to provide banks the comfort for debt repayments.

Step 4 Common practice analysis

From the Step 2 Investment Analysis it can be concluded that Alternative 1 (Implementation of the project activity not undertaken as a CDM project activity) was found to be less financially viable without CDM revenues, which would prevent BWFPL from implementing the project activity as elaborated in the Step 2 „Investment Analysis".

BWFPL is further required to conduct the common practice analysis as a credibility check to complement the investment analysis. BWFPL is required to identify and discuss the existing the common practice through the following sub-steps:

Sub-step 4a Analyze other activities similar to the proposed project activity

Contribution of wind power to total installed capacity

Wind power due to several inherent problems is not the commonly followed investment decision in Karnataka till now. As of 31.03.07, Karnataka contributed only 11% to the total installed capacity of wind power India. The following table gives the proportion of other states as well.

Table 7. Contribution of wind power to the total installed capacity of wind power in India (As on March 2007)[8]

State	Contribution
Tamil Nadu	49.2 %
Maharashtra	20.9 %
Karnataka	11.5 %

Annual addition in installed capacity:

The trend of annual addition in the installed capacity of wind power has been shown in the figure below (1992-93 to 2006-07). Karnataka has one of the lowest annual capacity additions in wind power.

Table 8. State-wise annual installed capacity addition in wind power (MW)[9]

State	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07
Karnataka	22.5	52.4	81.4	200.4	170.9	264.7
Maharashtra	196.5	2	6.25	48.75	545.1	483.6
Tamil Nadu	46.9	132.9	355.1	688.3	860.6	564.9
Rajasthan	8.3	44.4	129.5	93.8	74.5	111.7

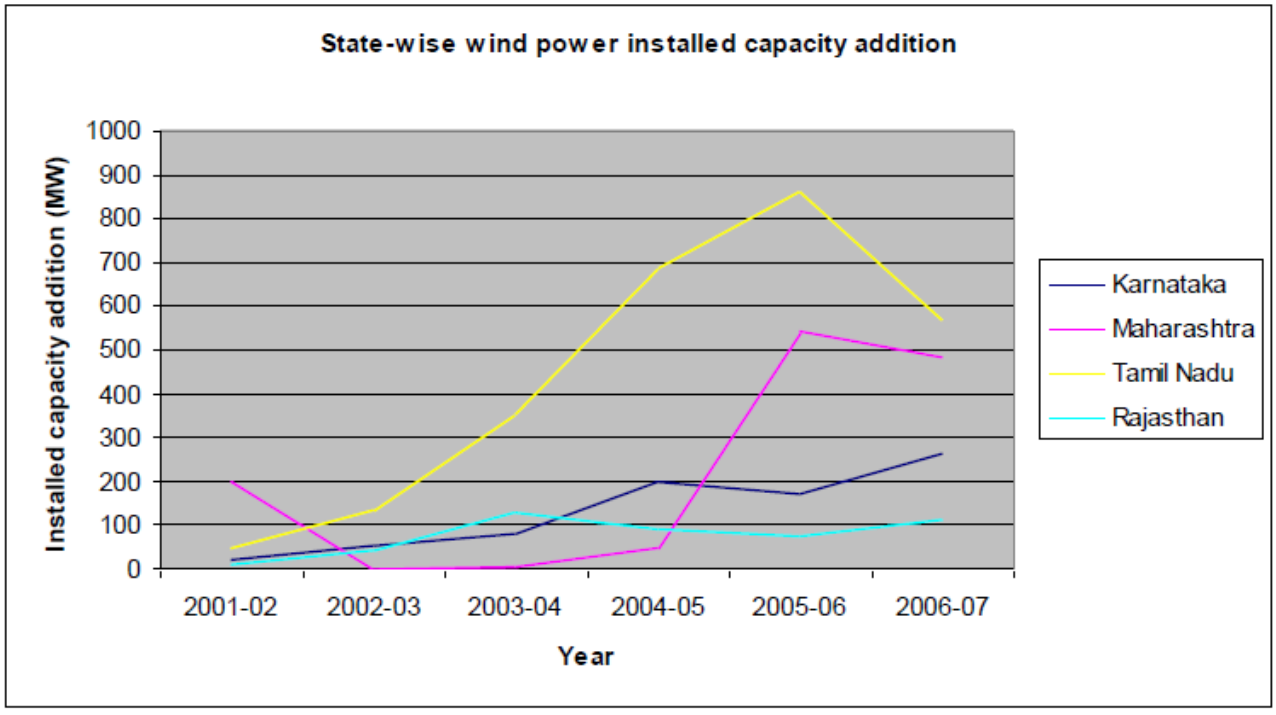


Figure 8 Annual capacity additions in wind power

[8] http://www.inwea.org/installedcapacity.htm

[9] http://windpowerindia.com/statyear.html

Looking at the current scenario, approximately 75% of the wind power projects in Karnataka have considered CDM revenue as an important factor in the financial viability of the project. This clearly shows that wind power projects in Karnataka are financially unviable without revenue from the sale of CERs. For more details on wind power projects in Karnataka, please refer to Annex 3.

Table 9 Percentage of total wind power installations in the total installed power in Karnataka

Total installed capacity (MW) as on March 2007[10]	**Total installed capacity of wind power project as on March 2007 (MW)[11]**	**% of wind power installation in Karnataka out of total installed capacity as on March 2007 (MW)**
7090.8	821.1	~11%

Table 10 Percentage of total wind power installations with CDM consideration

State	**Total installed wind power (MW) up to March 2008[12]**	**Total installation with CDM consideration (MW)**	**Total installation up to 2001 [13] (MW)**	**% of installation with CDM consideration from 2001-2008**
Karnataka	1011.4	722.05	44.65	~75%

Moreover, the proposed project activity is operated by IPP unlike other wind power projects in the region which are linked to their other businesses.
At the time of project installation there were only 5 projects which have installed capacities (20 MW or more and WTG size of 600 kW or more) comparable to that in the project activity, which are detailed below -

Table 1: *Cumulative Capacities Installed by Project Developers*

Name of the developer	**Installed Cap (MW)**	**WTG Capacity**	**No of WTGs**	**CDM (Yes/ No)**	**CDM Reference**	**CDM Reg. ID**
VRL Logistics (VRL)	30.00	1250 kW	24	Yes	http://cdm.unfccc.int/Projects/DB/SGS-UKL1225104443.35/view	2265
Nuzveedu Seeds Limited (NSL)	32.65	750/ 950/ 1250/ 1500 kW	16/7/8/2	Yes	http://cdm.unfccc.int/Projects/DB/DNV-CUK1173772302.89/view	998
Ramgad Mineral & Mining Pvt. Ltd. (RMMP)	41.40	750/950/1250 kW	1/2/31	Yes	http://cdm.unfccc.int/Projects/DB/DNV-CUK1142448670.58/view	0315
MSPL	89.65	600/750/950/1250 kW	10/7/22/46	Yes	http://cdm.unfccc.int/Projects/DB/DNV-CUK1142448670.58/view	0315
Enercon	150.40	600/ 800 kW	116/101	Yes	http://cdm.unfccc.int/Projects/DB/SGS-UKL1187708460.15/view http://cdm.unfccc.int/Projects/DB/	1299 1291 1286

[10] http://powermin.nic.in/indian_electricity_scenario/pdf/Annual_Report2006_07.pdf

[11] http://www.inwea.org/installedcapacity.htm

[12] http://www.inwea.org/installedcapacity.htm

[13] http://www.windpowerindia.com/statyear.html

					SGS-UKL1187092432.51/view http://cdm.unfccc.int/Projects/DB/ SGS-UKL1186566570.26/view http://cdm.unfccc.int/Projects/DB/ DNV-CUK1185867846.4/view	1268

However, all these above cases have come up only after considering CDM benefits.

4 other projects of comparable capacities by individual project proponents which completed installations in a later date are also listed as below. All these project have also considered CDM benefits –

Name of the developer	Project Capacity (MW)	WTG Capacity	No of WTGs	CDM (Yes/No)	CDM Reference	CDM Registration ID
Hindustan Zinc Limited	34.4	800 kW	43	Yes	http://cdm.unfccc.int/Projects/DB/BVQI1208874936.63/view	1824
DLF	25.6	800 kW	32	Yes	http://cdm.unfccc.int/Projects/DB/BVQI1239021527.94/view	2474
VSL	27.5	1250 kW	22	Yes	http://cdm.unfccc.int/UserManagement/FileStorage/1V5DW5ZJNU9BGYUL8N04SIF0NERRP4	Under validation
Accion	29.7	1650 kW	18	Yes	http://cdm.unfccc.int/Projects/DB/DNV-CUK1216117082.43/view	1949

Hence, it is evident that there is no project of comparable capacity in the region that has come up without considering CDM benefits and it is not a common practice.[14]
Hence, Sub-step 4b is not required to be discussed.

Impact of CDM registration

Registering the project activity as a CDM activity provides a significant amount of revenue, improving the project's cash flow and improving the Project IRR. The revenues from the sale of Certified Emission Reductions would enhance the viability of the project and would partially offset the risks associated with the possible changes in policy, wind regime, project implementation risks (time and cost overruns), etc. Because of CDM benefits project promoters have been able to remove problems associated with financial closure (Banks/FIs not willing to fund the project activity without CDM benefits due to low financial returns). Further, CER revenues will be result in fixed cash flows every year. The CDM revenues will attract new players to wind investments in Karnataka, as they provide compensation for the regulatory and project risks implicit in the wind power projects.

Table 11 Impact of CER income on Project IRR

Project IRR without CDM benefits	Project IRR with CDM benefits
9.34%	13.35%

[14] Same is also supported by recently registered CDM project (Project ID: 1949) from the same region18.

CDM Consideration:

The following table lists the chronology of events associated with the project activity.

Table 12 Chronology of events associated with the project activity

Event	Date	Description
Board Resolution	3rd November 2007	The Board resolved that BWFPL will conceptualize the project as a Clean Development Mechanism (CDM) project under UNFCCC to avail carbon credits. The Board also highlighted that revenue from the sale of carbon credits would be an important part of the cash flow for the project.
CDM Project Cycle	2nd December 2007	BWFPL started the CDM project cycle and appointed Consultants to start working on the project.
Purchase Order Copies	14th December 2007	BWFPL placed purchase order on ENERCON for project related equipment
O&M Agreement	16th January 2008	BWFPL entered into an O&M agreement with ENERCON for the project
Loan Application Letter	30th January 2008	BWFPL approached various financial investment banks and considered CDM benefits during the financial closure
MoEF Presentation	17th March 2008	BWFPL presented the project activity before the Ministry of Environment & Forests (MoEF). All the relevant documents were submitted.
Loan Sanction Letter	16th April 2008	Letter of Intent from the Bank was released considering CDM as a part of the financial model
Appointed DOE	3rd March 2008	BWFPL appointed a DOE for the validation of the project
PDD Web-hosting on the UNFCCC website	9th April 2008 to 8th May 2008	PDD was web hosted on the UNFCCC website for Global Stakeholder Consultation process. No comments were received
Validation Site Visit	13th May 2008	Validation conducted by the DOE

B.6. Emission reductions

B.6.1. Explanation of methodological choices

According to the approved baseline methodology ACM0002 Version 16.0.0, EB 81, Annex 9

Baseline emissions:

The baseline emission calculation for the project activity is attributable to the CO_2 Emission that could have been produced by the fossil fuel based power plants in absence of the proposed project activity. Therefore the amount electricity supplied to the Indian grid will be multiplied by the grid emission factor to calculate the baseline emissions reduced by the proposed project activity.

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

Where,

BE_y	=	Baseline Emissions in year y; tCO_2
$EG_{facility,y}$	=	Quantity of net electricity supplied to the grid as a result of the implementation of the CDM project activity in year y (MWh)
$EF_{grid,CM,y}$	=	CO_2 emission factor of the grid in year y; tCO_2/MWh

The methodology provides following approaches for emission factor calculations:

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

OR

(b) *The weighted average emissions (in t CO_2/MWh) of the current generation mix. The data of the year in which project generation occurs must be used.*

Option (a) has been considered to calculate the grid emission factor as per the 'Tool to calculate the emission factor for an electricity system' since data is available from an official source.

CO_2 Baseline Database for the Indian Power Sector, Version 11, April 2016[15], published by Central Electricity Authority (CEA), Government of India has been used for the calculation of emission reduction.

As per the "Tool to calculate the emission factor for an electricity system" Version 05.0, the following steps have been followed.

STEP 1: Identify the relevant electricity systems;
STEP 2: Choose whether to include off-grid power plants in the project electricity system (optional);
STEP 3: Select a method to determine the operating margin (OM);
STEP 4: Calculate the operating margin emission factor according to the selected method;
STEP 5: Calculate the build margin (BM) emission factor;
STEP 6: Calculate the combined margin (CM) emission factor.

STEP 1: Identify the relevant electricity power systems

The tool defines that "*for determining the electricity emission factors, identify the relevant electricity system. Similarly, identify any connected electricity systems".* It also states that *"If the DNA of the host country has published a delineation of the project electricity system and connected electricity systems, these delineations should be used".* Keeping this into consideration, the Central Electricity Authority (CEA), Government of India has divided the Indian Power Sector into five regional grids viz. Northern, Eastern, Western, North-eastern and Southern.

However since 2007-08 as the four regional grids except the Southern grid has been synchronized, they are now being considered as one and named as NEWNE grid. As of 31 December 2013, the Southern grid has also been synchronised with the NEWNE grid, hence forming one unified Indian Grid. Since the project supplies electricity to the Indian grid, emissions generated due to the electricity generated by the Indian grid as per CM calculations will serve as the baseline for this project.

Table: Grid Classification

Indian Grid				
Northern	**Eastern**	**Western**	**North-Eastern**	**Southern**
Chandigarh	Bihar	Chhattisgarh	Arunachal Pradesh	Kerala

[15] http://cea.nic.in/reports/others/thermal/tpece/cdm_co2/user_guide_ver11.pdf

Delhi	Jharkhand	Gujarat	Assam	**Karnataka**
Haryana	Orissa	Daman & Diu	Manipur	Tamil Nadu
Himachal Pradesh	West Bengal	Dadar & Nagar Haveli	Meghalaya	Andhra Pradesh
Jammu & Kashmir	Sikkim	Madhya Pradesh	Mizoram	Telengana
Punjab	Andaman & Nicobar	Maharashtra	Nagaland	Puducherry
Rajasthan		Goa	Tripura	Lakshadweep
Uttar Pradesh				
Uttarakhand				

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

Project participants have the option of choosing between the following two options to calculate the operating margin and build margin emission factor:

Option I: Only grid power plants are included in the calculation.
Option II: Both grid power plants and off-grid power plants are included in the calculation.

The Project Participant has chosen only grid power plants in the calculation.

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

The calculation of the operating margin emission factor ($EF_{grid,OM,y}$) is based on one of the following methods, which are described under Step 4:

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

The data required to calculate simple adjusted OM or Dispatch data analysis is not possible due to lack of availability of this activity data to the project developers. The choice of other two options for calculating the operating margin emission factor depends on the generation of electricity from low cost/must run sources. In the context of the methodology low cost/must run resources typically include hydro, geothermal, wind, low cost biomass, nuclear and solar generation.

Share of Must-Run (Hydro/Nuclear) (% of Net Generation)

	2010-11	**2011-12**	**2012-13**	**2013-14**	**2014-15**
Indian Grid	18.4%	19.6%	16.9%	18.6%	16.8%

Data Source: Central Electricity Authority (CEA) database Version 11, April '2016

The above data clearly shows that the percentage of total grid generation by low cost/must run plants (on the basis of average of three most recent years) for the Indian grid is less than 50 % of the total generation. Thus the average emission rate method cannot be applied, as low cost/must run resources constitute less than 50% of total grid generation.

The "Simple operating margin" has been calculated as per the weighted average emissions (in tCO_2/MWh) of all generating sources serving the system, excluding hydro, geo-thermal, wind, low-cost biomass, nuclear and solar generation;

For the simple OM, the simple adjusted OM and the average OM, the emissions factor can be calculated using either of the two following data vintages:

- **Ex ante option:** If the ex ante option is chosen, the emission factor is determined once at the validation stage, thus no monitoring and recalculation of the emissions factor during the crediting period is required. **Or**

- **Ex post option:** If the ex post option is chosen, the emission factor is determined for the year in which the project activity displaces grid electricity, requiring the emissions factor to be updated annually during monitoring.

PP has chosen ex ante option for the calculation of OM with 3 years generation weighted average of the most recent years available at the time of submission of CDM-PDD to the DOE for validation.

OM determined at validation stage will be the same throughout the crediting period. There will be no requirement to monitor & recalculate the emission factor during the crediting period.

STEP 4: Calculate the operating margin emission factor according to the selected method

The operating margin emission factor has been calculated using a 3 year data vintage:

Net Generation in Operating Margin (GWh) (excl. Imports)			
	2012-13	2013-14	2014-15
INDIAN Grid	6,97,187	7,21,632	8,08,417

Simple Operating Margin (tCO_2/MWh) (incl. Imports)			
	2012-13	2013-14	2014-15
INDIAN Grid	0.99	1.00	0.99

Weighted Generation Operating Margin	
INDIAN Grid	**0.9941**

STEP 5: Calculate the build margin emission factor ($EF_{BM,y}$)

Option 1 as described above is chosen to calculate the build margin emission factor for the project activity. BM is calculated ex-ante based on the most recent information available at the time of submission of PDD and is fixed for the entire crediting period.

Build Margin (tCO_2/MWh) (not adjusted for imports)	
	2014-15
INDIAN Grid	**0.9285**

(With sample group constituting most recent capacity additions to the grid comprising 20% of the system generation)

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

Combined Margin – The combined margin is the weighted average of the simple operating Margin and the build margin. In particular, for intermittent and non-dispatchable generation types such as wind and solar photovoltaic, the Tool to calculate the emission factor for an electricity system, Version 05.0.0 allows to weigh the operating margin and Build margin at 75% and 25%, respectively**.**

The baseline emission factor is calculated using the combined margin approach as described in the following steps:

Calculation of Baseline Emission Factor $EF_{CM,y}$

The baseline emission factor $EF_{CM,y}$ is calculated as the weighted average of the Operating Margin emission factor **($EF_{OM,y}$)** and the Build Margin emission factor **($EF_{BM,y}$)**:

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

Where,

w_{OM}	75% weight for wind energy projects
w_{BM}	25% weight for wind energy projects
$EF_{OM,y}$	calculated as described in Steps 3&4 above (tCO_2/MWh)
$EF_{BM,y}$	calculated as described in Steps 5 above (tCO_2/MWh)

Baseline Emission factor (Indian Grid) = 0.75*0.9941 + 0.25*0.9285

= 0.9777 tCO_2/MWh

Project Emissions: For most renewable power generation projects activities PE_y =0. As per applied methodology only emission associated with the fossil fuel combustion, emission from operation of geo-thermal power plants due to release of non-condensable gases, emission from water reservoir of Hydro should be accounted for the project emission. Since the project activity is a wind power project,

Hence PE_y= 0

Leakage Emissions: No Leakage emissions are considered. The main emission potentially giving rise to leakage in the context of electrical sector projects is emission arising due to activities arising such as power plant construction and upstream emission from fossil fuel use (e.g. extraction, processing, and transport). These emission sources are neglected.

Hence, LE_y= 0

Emission reduction (ER_y): The project activity mainly reduces carbon dioxide through substitution of grid electricity generation with fossil fuel fired power plant by renewable electricity. The emission reduction ER_y by the project activity during a given year y is the difference between Baseline emission and Project emission & Leakage emission.

$$ER_y = BE_y - PE_y - LE_y$$

Where,

ER_y = Emission Reduction in tCO_2/year
BE_y = Baseline emission in tCO_2/year
PE_y = Project emissions in tCO_2/year
LE_y = Leakage Emissions in tCO_2/year

B.6.2. Data and parameters fixed ex ante

Data / Parameter	$EF_{OM,y}$
Unit	tCO2/MWh
Description	Operating Margin emission factor for Indian grid
Source of data	Calculated from CEA database, Version 11, April 2016
Value(s) applied	0.9941 tCO2/MWh
Choice of data or Measurement methods and procedures	Calculated as per "Tool to calculate the emission factor for an electricity system, version 05.0.0" as 3-year generation weighted average using data for the years 2012-2013, 2013-2014 & 2014-2015. The data are obtained from "CO2 Baseline Database for Indian Power Sector" version 11.0, published by the Central Electricity Authority, Ministry of Power, Government of India.
Purpose of data	For the calculation of the Baseline Emission
Additional comment	This data will be archived for 2 years beyond the crediting period

Data / Parameter	$EF_{BM,y}$
Unit	tCO2/MWh
Description	Build Margin emission factor for Indian grid
Source of data	Calculated from CEA database, Version 11, April 2016
Value(s) applied	0.9285 tCO2/MWh
Choice of data or Measurement methods and procedures	Calculated as per "Tool to calculate the emission factor for an electricity system, version 05.0.0" for the year 2014-2015. The data is obtained from "CO2 Baseline Database for Indian Power Sector" version 11.0, published by the Central Electricity Authority, Ministry of Power, Government of India.
Purpose of data	For the calculation of the Baseline Emission
Additional comment	This data will be archived for 2 years beyond the crediting period.

Data / Parameter	$EF_{CM,y}$
Unit	tCO2/MWh
Description	Combined Margin CO2 emission factor for Indian grid
Source of data	Calculated from CEA database, Version 11, April 2016
Value(s) applied	0.9777 tCO2/MWh
Choice of data or Measurement methods and procedures	Calculated as per "Tool to calculate the emission factor for an electricity system, version 05.0.0". The data is obtained from "CO2 Baseline Database for Indian Power Sector" version 11.0, published by the Central Electricity Authority, Ministry of Power, Government of India.
Purpose of data	For the calculation of the Baseline Emission
Additional comment	This data will be archived for 2 years beyond the crediting period.

B.6.3. Ex ante calculation of emission reductions

Formula used to calculate the net emission reduction for the project activity is

$ER_y = BE_y - PE_y - LE_y$

Where,
ER_y = Emission Reduction in tCO_2/year
BE_y = Baseline emission in tCO_2/year
PE_y = Project emissions in tCO_2/year
LE_y = Leakage Emissions in tCO_2/year

Baseline Emission (BE_Y)

The baseline emissions are the product of electrical energy baseline $EG_{facility,y}$ expressed in MWh of electricity produced by the renewable generating unit multiplied by an emission factor.

$BE_Y = EG_{facility,y} * EF_{CM,y}$

Where,
$EG_{facility,y}$ = Total quantity of net electricity delivered to the Southern grid

Net electricity supplied to the grid by the project activity
= 24.8 MW (capacity) X 25.73% (CUF) X 8760 (running hours)
= 55900 MWh

Baseline emissions
= 55900 MWh X 0.9777 tCO2/ MWh
= 54,653 tCO2

As discussed in section B.6.1, Project emissions and leakage emissions will be zero for the project activity.

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

Year	Baseline emissions (t CO_2e)	Project emissions (t CO_2e)	Leakage (t CO_2e)	Emission reductions (t CO_2e)
Year 1	54,653	0	0	54,653
Year 2	54,653	0	0	54,653
Year 3	54,653	0	0	54,653
Year 4	54,653	0	0	54,653
Year 5	54,653	0	0	54,653
Year 6	54,653	0	0	54,653
Year 7	54,653	0	0	54,653
Total	382,571	0	0	382,571
Total number of crediting years	7			
Annual average over the crediting period	54,653	0	0	54,653

B.7. Monitoring plan

B.7.1. Data and parameters to be monitored

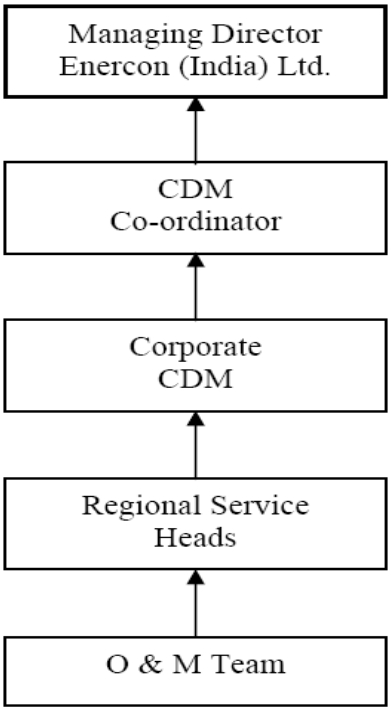
Data / Parameter	EG y net
Unit	kWh
Description	Net electricity supplied to the grid by the project activity
Source of data	Electricity share certificate by KPTCL/HESCOM
Value(s) applied	Annual electricity supplied to the grid = 24.8 MW X 25.73 % (CUF) X 8760 hours MWh = 55.9 Million units
Measurement methods and procedures	The net electricity supplied by the project activity will be calculated based on pro rata estimation since there will be other WTGs too in the wind farm. For this, the monitoring of electricity will be done at two points. 1. Common meter for the WTGs of the project proponent. 2. Sub-station meter connected with common meters of other project proponent WTGs. The pro rata estimation will be done as explained in Appendix 5. It is to be noted the calculation of net electricity supplied to grid is under purview of state electricity board and PP do not have any control on it.
Monitoring frequency	Monthly
QA/QC procedures	QA/QC procedures will be implemented by KPTCL/HESCOM pursuant to the provisions of the Power Purchase Agreement (PPA). The net electricity supplied to grid is cross checked with invoices and conservative value will be used for ER calculations. The calibration of meters are under purview of state electricity board and PP do not have any control on it. Refer Appendix 5 for provisions of the QA/QC procedures.
Purpose of data	To determine Baseline Emissions
Additional comment	The data (net electricity supplied to the grid) will be archived on electronic and/ or paper media. The archive will be kept for a period of up to two years after completion of the crediting period or the last issuance of CERs for the project activity whichever occurs later.

B.7.2. Sampling plan

Not Applicable

B.7.3. Other elements of monitoring plan

The project will be operated and maintained by Enercon (India) Ltd. The operational and management structure implemented by Enercon is as follows:



The parameter that needs to be monitored every year in this project is the net electricity supplied to the grid each year throughout the crediting period.

Metering and related issues:
The proposed CDM project activity requires evacuation facilities for connection to grid and the evacuation facility is essentially maintained by the state electricity utility. The electricity generation measurements are required by the utility and the investors to assess electricity sales revenue. The metering equipment at the delivery point is in accordance with the relevant provisions of the metering code. The project activity has therefore envisaged two independent measurements of generated electricity from the wind turbines. The primary recording of the electricity fed to the state utility grid will be carried out jointly at the incoming feeder of the state electricity utility. All the machines in the project will be connected to the feeder.

The joint measurement will be carried out once in a month in presence of both parties (the developer's representative and officials of the state power utility). Both parties will sign the recorded reading. The meters will be tested for accuracy and calibration of the machines would be taken care of.

Please refer to Annex 4 for more details on the monitoring information.

B.8. Date of completion of application of methodology and standardized baseline and contact information of responsible persons/ entities

Date of completion: 20/05/2016 is the date of completion of study on application of the selected methodology. Further, the standardized baseline is not applicable for this project activity.

Name of the responsible person/entity:

EKI Energy Services Ltd is the entity responsible for the application of the selected methodology This Entity is not the project participants for this project activity as indicated in Appendix 1 below.

SECTION C. Duration and crediting period

C.1. Duration of project activity

C.1.1. Start date of project activity

14/12/2007 (Date on which Purchase Orders were placed for the equipment)

C.1.2. Expected operational lifetime of project activity

20 Years

C.2. Crediting period of project activity

C.2.1. Type of crediting period

Renewable crediting period

C.2.2. Start date of crediting period

19/06/2016 (start date of second crediting period) or the date as per UNFCCC guidelines[16], whichever is later.

C.2.3. Length of crediting period

7 years

SECTION D. Environmental impacts

D.1. Analysis of environmental impacts

As per the Ministry of Environment and Forests (MoEF), India Environment Impact Notification S.O. 1533 (http://envfor.nic.in/legis/eia/so1533.pdf) dated 14th September 2006 wind power projects are not covered under Schedule and thus Environmental Impact Assessment is not required.

Wind power projects do not have any negative impact on the environment. All the more the project will lead to environmental well being by abating the greenhouse gases which could have otherwise been generated through fossil fuel based power plant. Wind power projects are not associated with other pollutants like SOX and NOX in the case of fossil fuel based power plants.

D.2. Environmental impact assessment

Not applicable as discussed in above section

SECTION E. Local stakeholder consultation

E.1. Solicitation of comments from local stakeholders

The stakeholders identified by the project proponents for the project activity are:

- Authorities of the local administration
- Village Panchayat
- Local villagers

A meeting was conducted by the project proponents with the local villagers at the plant site. The project proponents described them the project activity and the impacts it would make on the people of the nearby areas. Comments and suggestion were asked for from the local people. A letter to District Authority intimating them about the project activity was also sent.

[16] Since the request for renewal crediting period is after expiration of first crediting period, PP shall not be entitled to claim the issuance of CERs from first day of second crediting period until the last day before the renewal of crediting period is deemed renewed or until the number of days equivalent to the delay in the notification have elapsed since notification submission deadline whichever is earlier.

The local communities were positive to the project activity, as it would generate direct and indirect employment opportunities for the local people.

Please refer to Annex 2 for more details on the stakeholder consultation.

E.2. Summary of comments received

Village administration extended their support to the project activity and appreciated the efforts of the project proponents. Local people expressed their satisfaction on the project activity as a source of income

E.3. Report on consideration of comments received

No comments received; hence no report is applicable.

SECTION F. Approval and authorization

The host country approval having reference number 4/5/2008-CCC dated 21/07/2008 is submitted to DOE during registration of project activity.

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Appendix 1. Contact information of project participants and responsible persons/ entities

Project participant and/or responsible person/ entity	☒ Project participant ☐ Responsible person/ entity for application of the selected methodology (ies) and, where applicable, the selected standardized baselines to the project activity
Organization name	Belgaum Wind Farms Private Limited
Street/P.O. Box	528
Building	Laxmi Mall, Building No.5, Laxmi Industrial Estate, Link Road, Andheri (West)
City	Mumbai
State/Region	Maharashtra
Postcode	400053
Country	India
Telephone	+91-22-42086666 (Direct)
Fax	+91-22-42086699
E-mail	shantanu.bagchi@indianenergy.in
Website	www.indianenergy.in
Contact person	Shantanu Bagchi
Title	
Salutation	CEO & Director
Last name	Bagchi
Middle name	-
First name	Shantanu
Department	
Mobile	+91-9820239783
Direct fax	+91-22-42086699
Direct tel.	+91-22-42086666 (Direct)
Personal e-mail	shantanu.bagchi@indianenergy.in

Project participant and/or responsible person/ entity	☐ Project participant ☒ Responsible person/ entity for application of the selected methodology (ies) and, where applicable, the selected standardized baselines to the project activity
Organization name	EKI Energy Services Limited
Street/P.O. Box	Office No 201, Plot No 48, Scheme 78, Part 2, Vijay Nagar
Building	Enking Embassy
City	Indore
State/Region	Madhya Pradesh
Postcode	452010
Country	India
Telephone	+91-0731-4289086
Fax	+91-0731-4289086

E-mail	manish@enkingint.org
Website	www.enkingint.org
Contact person	Manish Dabkara
Title	CEO
Salutation	Mr.
Last name	Dabkara
Middle name	-
First name	Manish
Department	CDM Services Dept.
Mobile	+91-9907534900
Direct fax	+91-0731-4289086
Direct tel.	+91-0731-4289086
Personal e-mail	manish@enkingint.org

Appendix 2. Affirmation regarding public funding

The project activity does not involve any ODA financing or funding from Annex 1 countries

Appendix 3. Applicability of methodology and standardized baseline

Please refer section B.2 and B.4 of PDD

Appendix 4. calculation of emission reductions

Please refer section B.6.1 and B.6.3 of PDD for calculation emission factor and emission reductions.

Appendix 5. Further background information on monitoring plan

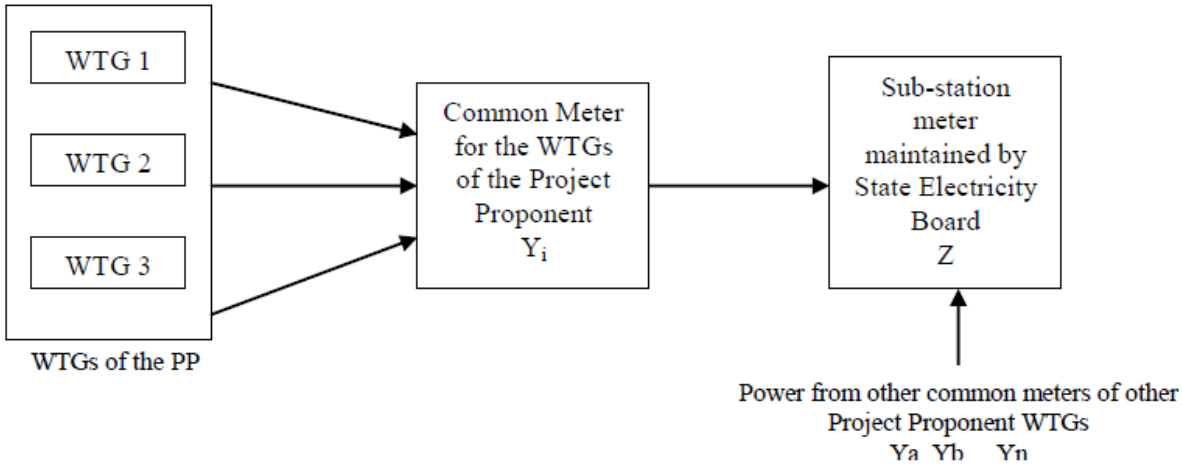
Metering: Electricity supplied to the grid will be metered by Parties (KPTCL/HESCOM and Enercon) at the project site.

Metering Equipment: Each WTG is equipped with a control system which has inbuilt integrator for measuring the gross power generated by each WTG. This controller unit is pulse based and state of art in terms of technology and accuracy. The generation from a group of WTGs will be supplied to grid via a sub-station, which is equipped with a Joint Meter owned by KPTCL/HESCOM. The export and import reading of this meter on a monthly basis will be taken and will be used to determine the net electricity exported by WTGs to the grid. The readings are authorized by personnel from KPTCL in presence of O & M team.

Meter readings: The monthly meter readings will be taken jointly by the parties.

Inspection of Main Meter: The KPTCL/HESCOM meters installed at the project will be of high accuracy class. Each meter will be jointly inspected and sealed on behalf of the Parties and will not be interfered with by either Party except in the presence of the other Party and its accredited representatives.
Meter Test Checking: The meters will be tested for accuracy with reference to a portable standard meter. The portable standard meter will be owned by KPTCL/HESCOM. The readings recorded by the meter will alone hold good for the purpose of metering electricity supplied to the grid as long as the error in the Main meter is within the permissible limit.

Pro-rata Estimation of Electricity Supplied by the Project Activity:



Share of electricity by the Project Activity = $Y_i*Z/ (Y_i + Y_a + Y_b + \ldots\ldots + Y_n)$

Appendix 6. Summary of post registration changes

Not Applicable

Annex 1

Technical Description of WTG

The figure below pictorially depicts the wind turbine E-53 used in the project activity.

1. Generator
2. Generator Stator
3. Generator Rotor
4. Main Pin
5. Rotor Blade
6. Blade Flange
7. Pitch Drive
8. Main Carrier
9. Wind Sensor
10. Tower

Annex 2

MoM of the Stakeholder Consultation carried out for the project activity

AWT
Real Customer Support
Asian Wind Tech
Consultants & Services

AQSR NABCB
ISO 9001 : 2000

Minutes

Date: 11/03/08

Type of meeting / Subject / no.: STAKEHOLDERS CONSULTATION/CDM FOR BWFL

Participants: GRAM PANCHAYAT, STAKEHOLDERS, UMA SHANKAR(ENERCON), NAVEEN KUMAR(ENERCON),ASISH TIWARI(BWFL),ANANTH(EVI), ASHOK KUMAR(AWT)

Excused:

Minutes sent to: GRAM PANCHAYAT, STAKEHOLDERS, UMA SHANKAR(ENERCON), NAVEEN KUMAR (ENERCON), ASISH TIWARI (BWFL), ANANTH(EVI) ASHOK KUMAR (AWT)

Anchor: ANANTH (EVI)

Convener: NAVEEN KUMAR (ENERGON)

Chairperson: ASISH TIWARI (BWFL)

Note taker: ASHOK KUMAR (AWT)

Date of meeting / Time / Place: 11.03.08, 11.30AM, HOTEL ANANTH RESIDENCY, HUBLI

Purpose: STAKEHOLDERS CONSULTATION MEETING

Expected result: PROJECT FEEDBACK FROM STAKEHOLDERS

Agenda:	Action:
1. Designation of chairperson / note taker.	Asish Tiwari was designated as the Chairperson and Ashok Kumar as the note taker.
2. Addressing	Addressing is done by Uma Shankar from enercon
3. Convener	Naveen Kumar was the convener from enercon who was explaining about the meeting.
4. Anchor	Ananth was the anchor from EVI, who was monitoring the meeting whether it was going in a proper way.

Agenda:	Action:
5.	All details about the CDM are explained to the stakeholders like, what is CDM? Why we are doing this? And what is purpose of it?
6.	After explaining about CDM, stakeholders feedback format was given to all the stakeholders and all the questions in the feedback form was explained to the stakeholders in local language and feedback was collected from them.
7.	Individual speech was given by the stakeholders about the project like, whether this project was useful to them or not? Whether they are encouraging this type of project or not?

Annex 3

CDM contribution in wind power projects in Karnataka State

Table 14. CDM Wind Power Projects in Karnataka State (Referred from UNFCCC-CDM website)[17]

Project	Capacity	Status	CDM Consideration
Bundled wind power project in Chitradurga (Karnataka in India) managed by Enercon (India) Ltd.	16.8 MW	Registered	Yes
125 MW Wind Power Project in Karnataka, India	125 MW	Registered	Yes
NSL 27.65 MW Wind Power Project in Karnataka, India	27.65 MW	Registered	Yes
Enercon Wind Farm (Hindustan) Ltd in Karnataka	68.8 MW	Request for review	Yes
Tungabhadra wind power project in Karnataka	22.8 MW	Request for review	Yes
Enercon Wind Farms in Karnataka Bundled Project - 73.60 MW	73.6 MW	Corrections (following Request for review	Yes
Enercon Wind Farms in Karnataka Bundled Project – 30.40 MW	30.4 MW	Corrections (following Request for review	Yes
Enercon Wind Farms in Karnataka Bundled Project	33 MW	Request for review	Yes
Bundled 15 MW Wind Power Project in India	3.75 MW	Registered	Yes
13.4 MW bundled wind power project in Chitradurga, Karnataka	13.4 MW	Registered	Yes
7.85 MW Bundled Wind Power Project in Southern India	5.35 MW	Registered	Yes
2.5 MW BEL grid-connected wind power project at Davanagere district, Karnataka, India	2.5 MW	Registered	Yes
3 MW Wind Power Project at Chikkasiddavanahalli village, Chitradurga district, Karnataka	3 MW	Registered	Yes
7.2 MW Wind Project at Chitradurga, Karnataka	7.2 MW	Registered	Yes
8.5 MW wind power project in Chitradurga district in Karnataka by Jindal Aluminium Ltd.	8.5 MW	Corrections (following Review)	Yes
25.6 MW grid connected Wind Power	25.6 MW	Registered	Yes

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[17] As on 22/10/2008

Document information

Version	*Date*	*Description*
07.0	15 April 2016	Revision to ensure consistency with the “Standard: Applicability of sectoral scopes” (CDM-EB88-A04-STAN) (version 01.0).
06.0	9 March 2015	Revisions to: • Include provisions related to statement on erroneous inclusion of a CPA; • Include provisions related to delayed submission of a monitoring plan; • Provisions related to local stakeholder consultation; • Provisions related to the Host Party; • Editorial improvement.
05.0	25 June 2014	Revisions to: • Include the Attachment: Instructions for filling out the project design document form for CDM project activities (these instructions supersede the "Guidelines for completing the project design document form" (Version 01.0)); • Include provisions related to standardized baselines; • Add contact information on a responsible person(s)/ entity(ies) for the application of the methodology (ies) to the project activity in B.7.4 and Appendix 1; • Change the reference number from *F-CDM-PDD* to *CDM-PDD-FORM;* • Editorial improvement.
04.1	11 April 2012	Editorial revision to change version 02 line in history box from Annex 06 to Annex 06b
04.0	13 March 2012	Revision required to ensure consistency with the “Guidelines for completing the project design document form for CDM project activities” (EB 66, Annex 8).
03.0	26 July 2006	EB 25, Annex 15
02.0	14 June 2004	EB 14, Annex 06b
01.0	03 August 2002	EB 05, Paragraph 12 Initial adoption.

Decision Class: Regulatory
Document Type: Form
Business Function: Registration
Keywords: project activities, project design document