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

CONTENTS

Annexes

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 small-scale project activity

A.1 Title of the small-scale project activity:

3.7 MW Bundle Wind Power Project in Maharashtra
Version: 1
Date : 17/10/2007

A.2 Description of the small-scale project activity:

The proposed project is a bundled project activity which involves the establishment of a Wind Power Project of 3.7 MW installed capacity enabling generation of electricity by 1.25 MW and 0.6 MW Wind Electricity Generators (WEGs) in the State of Maharashtra by M/s Arvind Cotsyn (India) Ltd. (hereafter ACIL or project participant). The proposed activity is a bundled CDM project activity. The project activity involves two bundles of similar capacity by ACIL and Arvind Dying & Bleaching Mills Ltd. (hereafter ADBML). The project activity is proposed by ACIL as small scale CDM project activity.

The bundled project activity consists of 2 bundles:

- Bundle I : At Sangli (1 No. x 1.25 MW & 1 No. x 0.60 MW)
- Bundle II : At Sangli (1 No. x 1.25 MW & 1 Nos. x 0.60 MW)

The electricity generation from this project will contribute to GHG reductions estimated at 74573 tCO2 over period of 10 years, although the project life is envisaged as 20 years. It is proposed that the project activity needs to mitigate the risks involved in Renewable Energy Technology. The project activity will evacuate approximately 83.79 lakh kWh of renewable power annually (after deducting 2% internal loss) to the power deficit Western Region Grid.

Purpose of the project activity:

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 selling it to the state electricity utility to contribute to climate change mitigation efforts.

Apart from generation of renewable electricity, the project has also been conceived for the following:

- To enhance the propagation of commercialisation of wind turbines in the region.
- To contribute to the sustainable development of the region, socially, environmentally and economically.
- To reduce the prevalent regulatory risks for this project through revenues from the CDM.

Contribution of project activity to sustainable development:

Indian economy is highly dependent on "Coal" as fuel to generate energy and for production processes. Thermal power plants are the major consumers of coal in India and yet the basic electricity needs of a large section of population are not being met.

This results in excessive demands for electricity and places immense stress on the environment. Changing coal consumption patterns will require a multi-pronged strategy focusing on demand, reducing wastage of energy and the optimum use of Renewable Energy (RE) sources.

Government of India has stipulated following indicators for sustainable development in the interim approval guidelines[1] for CDM projects.

1. Social well-being

The proposed project activity leads to alleviation of poverty by establishing direct and indirect employment benefits accruing out of ancillary units for manufacturing towers, for erecting the WEGs and for maintenance during operation of the project activity. The infrastructure in and around the project area will also improve due to project activity. This includes development of road network and improvement of the quality of electricity in terms of its availability and frequency as the generated electricity is fed into a deficit grid.

2. Economic well-being

The project activity leads to an investment of about INR 196 million to a developing region which otherwise would not have happened in the absence of the project activity. The generated electricity is fed into the Western Regional Grid through 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 also leads to diversification of the national energy supply, which is dominated by conventional fuel based generating units.

3. Environmental well-being

The project utilizes wind energy for generating electricity which otherwise would have been generated through alternate fuels (most likely - fossil fuel) based power plants, thereby contributing to the reduction in specific emissions (emissions of pollutant/unit of energy generated) including GHG emissions. As wind power projects produce no end products in the form of solid waste (ash etc.), they address the problem of solid waste disposal encountered by most other sources of power. Being a renewable source, 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.

[1] Ministry of Environment and Forests web site: http://envfor.nic.in:80/divisions/ccd/cdm_iac.html

4. Technological well-being

The project activity leads to the promotion of 1.25 MW WEGs into the region, demonstrating the success of wind turbines, which feed the generated power into the nearest sub-station, 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.3 Project participants:

Name of Party involved (*) ((host) indicates a host Party)	Private and/or public entity(ies) project participants (*) (as applicable)	Kindly indicate if the Party involved wishes to be considered as project participant (Yes/No)
India.	• Private entity - M/s Arvind Cotsyn (India) Ltd.	No.
(*) In accordance with the CDM modalities and procedures, at the time of making the CDM-PDD public at the stage of validation, a Party involved may or may not have provided its approval. At the time of requesting registration, the approval by the Party(ies) involved is required.		

A.4 Technical description of the small-scale project activity:

In wind energy generation, kinetic energy of wind is converted into mechanical energy and subsequently into electrical energy.

Wind has considerable amount of kinetic energy when blowing at high speeds. This kinetic energy when it passes through the blades of the wind turbines it is converted into mechanical energy and rotates the wind blades. When the wind blades rotate, the connected generator also rotates, thereby producing electricity.

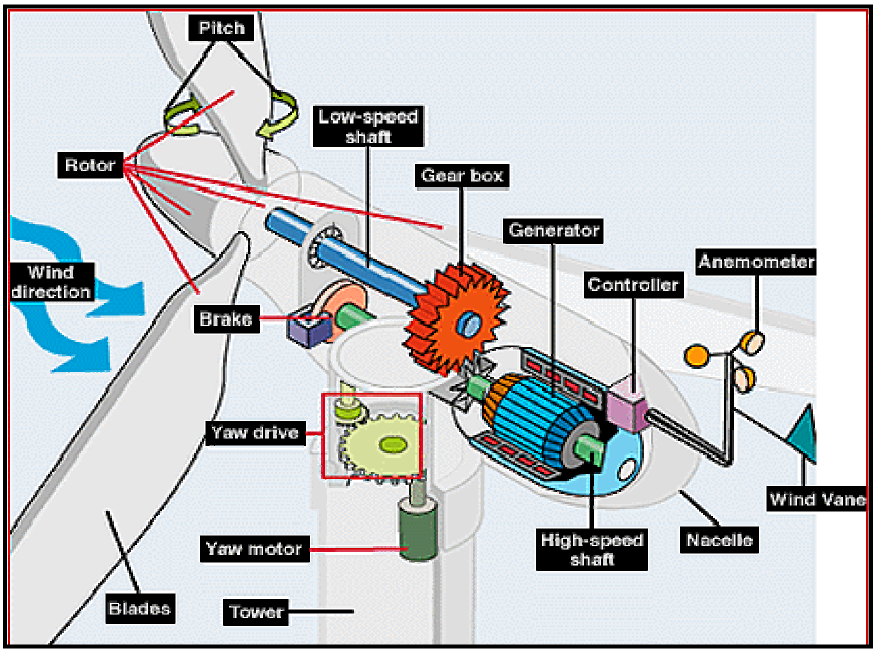

Figure 01, Major Mechanical Parts of a Wind Turbine.

The technology is a clean technology since there are no GHG emissions associated with the electricity generation. The project installs 4 nos. (S 66 – 2 nos. & S 52 – 2 nos.) Suzlon make WEGs of individual 1.25 MW and 0.60 MW capacities. Salient features of S66 & S52 WEGs are as follows.

Salient Features of 1.25 MW (S 66) WEG

Sr. No.	Particulars	Specifications
1.	Rotor diameter	66 m
2.	Hub height	74 m
3.	Installed electrical output	1250 kW
4.	Cut-in wind speed	3 m/s
5.	Rated wind speed	14 m/s
6.	Cut-out wind speed	22 m/s
7.	Rotor swept area	3421 m^2
8.	Rotational speed	1006 / 1506 rpm (50 Hz) 1208 / 1810 rpm (60 Hz)
9.	Rotor material	GRP
10.	Regulation	Pitch
11.	Generator	Asynchronous Generator, 4/6 pole
12.	Rated output	250/1250 kW
13.	Rotational speed	1010/1515 rpm
14.	Operating voltage	690 V

Salient Features of 1.25 MW (S 66) WEG (contd.)

Sr. No.	Particulars	Specifications
15.	Frequency	50 / 60Hz
16.	Protection	IP 56
17.	Insulation class	H
18.	Cooling system	Air cooled
19.	Gear box	3-stage gearbox, 1 planetary & 2 helical.
20.	Manufacturer	Winergy
21.	Gear ratio	74.917:1
22.	Nominal load	1390 kW
23.	Type of cooling	Oil cooling system
24.	Yaw drive system	4 active electrical yaw motors
25.	Yaw bearing	Polyamide slide bearing
26.	Safety system	
26.1	Aerodynamic brake	3 times independent pitch regulation
26.2	Mechanical brake	Spring power disc brake, hydraulically released, fail safe. Microprocessor controlled, indicating.
27.	Control unit	Actual operating conditions, UPS back-up system
28.	Tower	Tubular
29.	Design standards	GL/IEC

Salient Features of 0.60 MW (S 52) WEG

Sr. No.	Particulars	Specifications
1.	Rotor diameter	52m
2.	Hub height	75 m
3.	Installed electrical output	600 kW
4.	Cut-in wind speed	4 m/s
5.	Rated wind speed	13 m/s
6.	Cut-out wind speed	25 m/s
7.	Rotor swept area	2124 m^2
8.	Rotational speed	24 rpm
9.	Rotor material	Glass reinforced epoxy, vacuum injected
10.	Regulation	Pitch Regulated
11.	Generator	Single speed asynchronous generator
12.	Rated output	600 kW
13.	Rotational speed	1539 rpm
14.	Operating voltage	690 V
15.	Frequency	50 Hz
16.	Protection	IP 56
17.	Insulation class	Class H
18.	Cooling system	Air cooled
19.	Gear box	3 stage (1 planetary and 2 helical).
20.	Manufacturer	Flender - Winergy / Equivalent

Salient Features of 0.60 MW (S 52) WEG (contd.)

Sr. No.	Particulars	Specifications
21.	Gear ratio	1: 63.633
22.	Nominal load	660 kW
23.	Type of cooling	Oil cooling system
24.	Yaw drive system	2 Active electrical yaw motors
25.	Yaw bearing	Polyamide slide bearing
26	Aerodynamic brake	3 Independent systems with blade pitching
27.	Control unit	Microprocessor control indicating operation conditions. Control includes thyristor switchgear watchdog for operation, monitoring, log with real time, local control and servicing interface. Optional remote monitoring & operation. UPS back up system.
28.	Tower	Free standing, lattice tower, hot dip galvanised
29.	Design standards	GL class II

A.4.1 Location of the small-scale project activity:

A.4.1.1 Host Party(ies):

India.

A.4.1.2 Region/State/Province etc.:

Maharashtra.

A.4.1.3 City/Town/Community etc:

	Bundle - I		Bundle - II	
Capacity	1.250 MW	0.600 MW	1.250 MW	0.600 MW
Model	S-66	S-52	S-66	S-52
Machine No.	G-377	W-66	G-335	W-11
Survey No.	237	161	353/P	969
Village	Dhondewadi	Tisangi	Tisangi	Nagaj
Tehsil	Tasgaon	Kawathe Mahankal	Kawathe Mahankal	Kawathe Mahankal
District	Sangli	Sangli	Sangli	Sangli
Commissioning Date	06.07.2006	21.06.2006	31.03.2006	21.06.2006

A.4.1.4 Details of physical location, including information allowing the unique identification of this small-scale project activity :

Site	Tisangi	Latitude	17 08 38.0 N
Machine no.	W-66		
District	Sangli	Longitude	74 51 55.8 E
R. S. No. – 161			

Site	Tisangi	Latitude	17 08 55.9 N
Machine no.	G-335		
District	Sangli	Longitude	74 50 17.7 E
R. S. No. – 353/P			

Site	Dhondewadi	Latitude	17 11 56.6 N
Machine no.	G-377		
District	Sangli	Longitude	74 43 15.4 E
R. S. No. – 237			

Site	Nagaj	Latitude	17 07 53.6 N
Machine no.	W-11		
District	Sangli	Longitude	74 54 19.1 E
R. S. No. – 969			

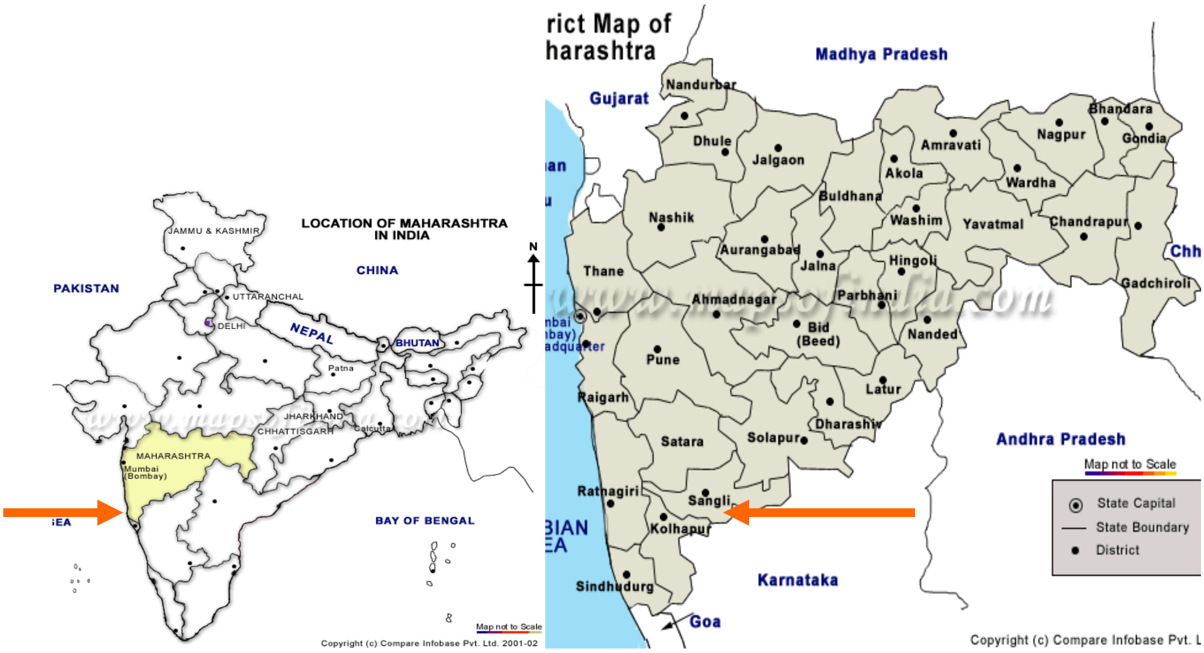

Figure 02, Location Map

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

As defined under Appendix B of the simplified modalities and procedures for small-scale CDM project activities, the project activity proposes to apply following project types and categories:

- **Type** : **I – Renewable Energy Projects**
- **Project Category** : **I.D. – Grid connected renewable electricity generation (Version13, EB 36)**

Requirements with respect to technology/measure under AMS I.D. – Grid connected renewable electricity generation **(Version 13, EB 36)**

1. This category comprises renewable energy generation units, such as photovoltaics, 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.
2. If the unit added has both renewable and non-renewable components (e.g.. a wind/diesel unit), the eligibility limit of 15 MW for a small-scale CDM project activity applies only to the renewable component. If the unit added co-fires fossil fuel1, the capacity of the entire unit shall not exceed the limit of 15 MW.
3. Combined heat and power (co-generation) systems are not eligible under this category.
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.

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.

Justification:

– This project activity is 3.7 MW (< 15 MW) bundled wind power (renewable energy) project that supply electricity to a grid that is or would have been supplied by at least one fossil fuel or non-renewable biomass fired generating unit.

– So, in light of the above the applicability of this type & category of methodology to this project is justified.

This category comprises renewable energy, including wind power, which supplies electricity to an electricity distribution system (grid). The proposed project will generate 83.79 lakh kWh per annum of electricity (after 2% of internal loss) from a renewable source (Wind Energy). This electricity will be supplied to the Western Region Electricity Grid, where the major part of electricity comes from non-renewable electricity generation. As the proposed project will supply electricity from a renewable source to the regional grid, the application of Type ID is justified.

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

Years	**Estimation of annual emission reductions in tonnes of CO2 e**
2008-09	7457
2009-10	7457
2010-11	7457
2011-12	7457
2012-13	7457
2013-14	7457
2014-15	7457
2015-16	7457
2016-17	7457
2017-18	7457
Total estimated reductions (tonnes of CO2 e)	**74573**
Total number of crediting years	**10**
Annual average of the estimated reductions over the crediting period (tCO2 e)	7457

It is considered that project activity will be registered with CDM – EB up to March 31, 2008. Hence, crediting period will start from 1st April 2008.

A.4.4 Public funding of the small-scale project activity:

The project has not received any public funding from Annex I countries and Official Development Assistance (ODA). The project is a unilateral project.

Kindly refer to Annex 2 for details on funding and investment plan for implementation of the project.

A.4.5 Confirmation that the small-scale project activity is not a de-bundled 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 de-bundled 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 the project boundary of the proposed small scale activity

None of the above applies to the above project and project participant has not registered or applied for registration of another wind power project. Therefore, the proposed project is not a de-bundled component of a larger CDM 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 small-scale project activity:

Project Type : **I –** Renewable Energy Projects
Project Category: **D –** Grid connected renewable electricity generation
(Version 13, EB 36)

Reference: Appendix B of the simplified M&P for small-scale CDM project activities (UNFCCC, 2003b)

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

The project is a renewable energy project generating electricity (Type ID) – the monitoring methodology and baseline are selected here as suggested in the document 'Simplified Modalities and Procedures for Small-Scale CDM project activities'

B.3 Description of the project boundary:

Project boundary specified in the Appendix B of simplified modalities and procedures is that encompasses the physical and geographical site of the renewable generation source. This includes the wind turbine installation, pooling and MSEDCL sub-stations. The proposed project activity evacuates the power to the Western Region Grid. Therefore, all the power plants contributing electricity to the Western Grid are taken in the connected (project) electricity system for the purpose of baseline estimation. The meter which is used to measure the electricity supplied to grid is at substation and is an integral part of project boundary.

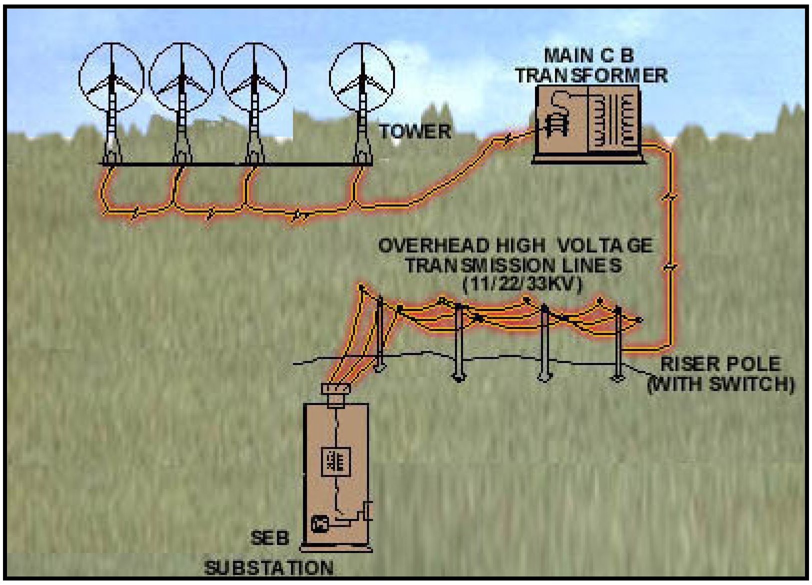

Figure 03, Project Boundary

B.4 Description of baseline and its development:

Baseline Estimation:

According to Point 9, Methodology AMS I D, Version 13 -

For all other systems, the baseline is the kWh produced by the renewable generating unit multiplied by an emission coefficient (measured in kg CO2e/kWh) calculated in a transparent and conservative manner as:

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

OR

(b) The weighted average emissions (in kg CO2e/kWh) of the current generation mix. The data of the year in which project generation occurs must be used. Calculations must be based on data from an official source (where available)3 and made publicly available.

The project opted to choose for the option (b) i.e. weighted average emission factor and the value has been used from the latest version of **Baseline Carbon Dioxide Emissions from Power Sector** provided by the Central Electricity Authority, Govt. of India.[2]

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:**

The installed capacity of the project is 3.7 MW, 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.

✓ **Justification for additionality of the project:**

UNFCCC simplified modalities seek to establish additionality of the project activity as per Attachment A to Appendix B, which listed various barriers, out of which, at least one barrier shall be identified due to which the project would not have occurred any way. Project participants identified following barriers for the proposed project activity.

✓ **Investment Barrier:**

Wind energy has not been exploited widely in India. It is only during the last couple of years that a commercial exploitation of wind energy started in a big way. Wind energy has been the most unpredictable of all the other common sources of generating energy i.e. coal, water or sun. Further wind power plant has the lowest plant load factor of all other sources. In the concerned cases it is between 18 to 30 %[3].

Sub-step 2a: Determining appropriate analysis method: Since the CDM Project activity generates financial benefits other than CDM related income the sub-step 2b-Option I of "**Tool to demonstration and assessment of additionality**" is not followed. The investment analysis is carried out by 'Benchmark Analysis' as referred in Sub-step 2b – Option III.

Bundle – I: ACIL

Sub-step 2b: Option III: Benchmark Analysis

Project IRR is identified as the appropriate financial indicator. The benchmark is derived from the estimates of the cost of financing i.e. 12.5% and required rate of return on investors (equity) capital i.e.16%.

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

[3] http://www.ficci.com/media-room/speeches-presentations/2006/may/may13-elec/PlenaryVI-DG/Ajay.pdf

As per Maharashtra Electricity Regulatory commission report dated. 24.11.2003 a private sector investor participating in electricity generation is expected to earn a minimum return of 16% p.a. on the equity contribution. We have considered the same rate as the rate required by the equity investors. The debt component was estimated at 70%.

Following further assumptions were made for the investment analysis.

Life of project	20 yrs
Installation period	6 months
Term loan interest	12.5%
Income tax rate	33.67%
Depreciation on WTG	80%
Tariff Rate per unit	Rs. 3.50
Escalation per year in tariff upto 13th year	Rs. 0.15
Escalation in Tariff for further 10 yrs	nil

Thus with cost of financing as 12.5% and required rate for investors as 16%, the project is expected to generate a post tax project IRR of 10.76%. This rate is used as a benchmark.

The project set up by the proponent generate a Project IRR of 8.75% only which is substantially below the benchmark. Hence the project activity cannot be considered as financially attractive.

Sub-step 2c: Calculating & Comparison of Financial Indicator:

All the reasonable costs and benefits accruing to the project have been considered in the calculation of the project return.

Sub-step 2d: Sensitivity Analysis

The Project IRR is arrived at on the assumption that estimated generation of units, operation & maintenance expenses and all other variables materialize as expected. The main variable which can adversely affect the desired results are found to be 'Salable units'. The impact of the risk factors is shown in the following sensitivity analysis.

Sensitivity Analysis

Exportable units change by ..	**-5.0%**	**-2.5%**	**Normal**	**2.5%**	**5.0%**
Project IRR	8.01%	8.38%	8.75%	9.11%	9.47%

<u>Bundle – II: ADBML</u>

Sub-step 2b: Option III: Benchmark Analysis

Project IRR is identified as the appropriate financial indicator. The benchmark is derived from the estimates of the cost of financing i.e. 12.5% and required rate of return on investors (equity) capital i.e.16%.

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Exportable units change by ..	-5.0%	-2.5%	Normal	2.5%	5.0%
Project IRR	8.01%	8.38%	8.75%	9.11%	9.47%

Difficulty in Arranging for Finances:

A major problem area for this sector has been high capital investment. The investment required for a wind power project is higher[4] than most other renewable energy projects. For e.g. the investment[5] required for a typical 1 MW biomass based power plant varies from Rs. 3.5 to 4.0 crores where as the investment that was required for this project per MW is approximately Rs. 6.02 crores (Rs. 18.35 crores for 3.05 MW). A straight away 50 percent higher than biomass project. Similarly the investment on small hydroelectric power (SHP) plant comes to around 2.5-5 crores/MW. Moreover the plant load factor of biomass based cogen plant or SHP varies from 60 - 85 percent whereas for wind energy it comes to a maximum of 27 percent. This results into lower rate of return on the investment. Thus the promoters have taken considerable risk by investing in higher capital intensive and lesser reliable wind energy generation.

Sector	Capital cost (million $/MW)	Generation cost ($/KWh)
Small hydroelectric	0.69 to 1.38	0.023 to 0.046
Wind energy	**0.80 to 0.92**	**0.046 to 0.063**
Biomass power	0.69 to 0.92	0.040 to 0.046
Bagasse cogeneration	0.57 to 0.69	0.040 to 0.046
Biomass gasification	0.57 to 0.69	0.030to 0.340
Solar photovoltaic	5.70 to 6.89	0.230 to 0.370

Moreover the dire lack of financing institutions to back the huge capital cost investment required by wind farms is another major hurdle. The wind power sector is still predominantly debt-based for 60-75 per cent of the project cost. IREDA and a handful of other banks are not enough to meet the installation needs, due to which wind energy did not even take off in many states. Financing through IREDA is also not very encouraging. The following excerpt from the 39th STANDING COMMITTEE ON ENERGY (2003) REPORT[6] justifies this statement.

"The Committee has observed that in spite of being a developmental agency, the lending rates of IREDA are more than commercial financial institutions, which charges anything between 9% to 9.5% as against IREDA lending rate of 11.32%. Even REC lend at 9.2%. As a result, an entrepreneur is tempted to approach commercial FIs for obtaining loans rather than to IREDA. This raises a question of very existence of developmental agency like IREDA, which is totally dedicated to the cause of renewable energy. The Committee, therefore, feels that the difference between the cost of acquisition and lending of funds should not in anyway exceed 2%. The Committee is of the view that IREDA has now become a commercial financial institution, rather than a development promoting agency. The Committee views this seriously and recommends that ways and means should be found out to correct this imbalance, lest the goal to source 10% power by 2012 will remain a distant dream"

[4] *Source:* Indian Renewable Energy Development Agency.
United Nations Conference on Trade and Development (19th Oct 2006)

[5] http://greenbusinesscentre.com/Documents/biomass.pdf

[6] file://localhost/F:/bundled%20wind%20project/standing%20committee%20report.htm

Barrier due to Generation Risk

The companies were aware of the associated risks involved in investing in wind energy, primarily due to the non availability of wind energy over a significant part of the year. This is the biggest constraint in the project as various factors like wind speed, direction, intensity and others; determine the production of electricity and efficiency of the windturbines, at all times. Any parameter that is non-conducive at a given point in time, will significantly affect the electricity generation capacity and output, thereby generating less revenue from sale of power. These parameters are controlled by nature and thus, it is an investment barrier of paramount importance. Despite the higher establishment costs in comparison to the conventional generation methods (Hydro, Thermal etc.), the installed WEGs deliver a CUF that is much lower than the former. For instance, the CUF estimated for the project is 20% percent only (Exhibit A, Facility Description, and Wind Energy Purchase Agreement). Thus, to produce the same amount of electricity, the project costs of WEGs will be much higher as compared to the conventional power plants. The investment in this project is as high as INR 196.3 million, while the alternative would have been to invest in thermal energy, where the national average PLF is 80% and thereby reduce the costs by less than half. The companies were also aware of the risks due to the non-availability of wind energy over a significant part of the year. This is the biggest constraint in the project as various factors like wind speed, direction, intensity and others; determine the production of electricity and efficiency of the windmills, at all times.

Availability Based Tariff (ABT)

All SERCs have been advised to introduce the ABT regime at the state level[7]. According to the ABT, all future tariffs shall be determined on the basis of a confirmed delivery by the generator. Here, the producer shall be required to provide prior schedules of the quantity of electricity expected to be generated from the source, over a time frame of 24 hours and, at an interval of every 15 minutes. In case the electricity generated is lower than the specified amount, the producer shall be penalized for the deficit electricity at the UI (Unscheduled Interchange) rate prevailing at that time. Introducing the ABT to Maharashtra for investors in renewable energy occurs as a barrier. Investment in wind carries has an inherent risk, as the generation cannot be guaranteed (because there is no control over the fuel supply – wind). This could lead to a situation where the MSEB may prefer to buy energy from risk free energy sources such as thermal power plants. As per the ATB the MSEB buys this safe energy for Rs. 5.70 per kWh whereas the price for wind energy is Rs. 3.50 per kWh. The investors were aware of the possibility of ABT being introduced in Maharashtra at the time of purchase of the WEGs, and also that even at lower prices they were at a risk of not selling his energy.

[7] According to Section 5.7.b of the National electricity Policy (Feb 2005) "the Availability Based Tariff (ABT) regime introduced by CERC at the national level has had a positive impact. It has also enabled a credible settlement mechanism for intra-day power transfers from licenses with surpluses to licenses experiencing deficits. SERCs are advised to introduce the ABT regime at the State level within one year".

State Power Sector Performance Ranking

The state of Maharashtra is not the best suitable destination for investment in power sector. According to the performance rating of the state power sectors across all states carried out by ICRA / CRISIL at the instance of the Ministry of Power (MoP), Maharashtra is placed only sixth amongst the states with wind potential. This rating is taken from the report of 2004. Though a third review of the report based primarily on the data obtained till December 2005, has been released in June 2006, when the commissioning of the project took place there was only data of 2004 available and therefore this data is considered. It is clear from the report that investment in the states of Andhra Pradesh, Karnataka, Tamil Nadu and Gujarat are better options than Maharashtra. Based on their analysis carried out for all the states in India, the results specific to the states with available wind potential are summarized in Table below –

Table - Score of the ICRA / CRISIL Report on State Power Sector

Rank	State	State Govt.	SERC	GENERATION	T&D	Financial Risk	Others	Commercial Viability	Total
Maximum score		**17.00**	**13.00**	**6.0**	**21.00**	**23.00**	**5.00**	**15.00**	**100**
1	Andhra Pradesh	8.75	10.75	4.75	11.75	14.75	2.75	3.25	56.75
2	Karnataka	9.50	9.50	5.50	7.25	13.75	3.75	2.00	51.25
3	Gujarat	9.69	2.50	3.75	9.30	15.50	3.75	6.50	50.99
4	Rajasthan	9.00	4.00	5.20	7.25	12.63	3.75	-	41.83
5	Tamil Nadu	4.75	9.00	3.00	9.50	9.63	1.75	2.00	39.63
6	**Maharashtra**	**7.25**	**4.00**	**4.00**	**4.50**	**12.25**	**1.25**	**4.50**	**37.75**
7	Kerala	4.00	0.50	2.50	13.00	10.00	3.00	1.25	34.25
8	Madhya Pradesh	6.90	3.00	2.00	6.10	4.75	-	2.00	24.75

Furthermore, the 2006 edition of the Report on State Power Sector Performance Ratings shows that Maharashtra is not the best state to invest in, even today. The report lists various problems that are being faced in the Maharashtra power sector. The report states that the problems in the power sector have led to stagnancy in the generation capacity of the state for the last 5 years. Addition to power generation by the private sector in this period has been minimal. There has also been an increase in the rate of failures in the distribution network. The issuance of tariff orders has been delayed and all these problems have resulted in the MSEB incurring an accumulated loss of a whopping INR 19.08 billion as on March 31 2005.

The two ICRA reports of 2004 and 2006 clearly suggest that Maharashtra, as of today as well as during the timethe investor purchased the WEGs, was not the best state for investment in the power sector and the project proponent has undertaken a considerable risk while investing in this state.

Other Barriers:

Grid Related Problems -

Wind generated electricity do not form part of the base load to the grid. The infrequent nature of wind power is the main reason behind it. In case of low demand or the requirement of maintaining the grid stability, wind power is often disconnected from the grid. This leads to loss of the generated electricity and thus loss to the revenue earned by the investors.

There are various other grid related problems which face wind power for example poor grid availability, grid outages etc. For instance, on the 25th February, 2007, a major grid disturbance occurred where in the 400 kV and 220 kV lines in Western Maharashtra tripped. Below is an extract from the press release of the incident (Source: http://www.wrldc.com/): *"Preliminary reports indicate that a fault occurred around Phadge, Nagothane, Bableshwar area of Maharashtra causing multiple line trippings. These trippings led to islanding of Gujarat, Western Maharashtra and Mumbai system and loss of generation of around 4000 MW in Western grid including Tarapur nuclear station."* Such incidences cause loss of the generated electricity. Although the loss is applicable to all sources, it is more crucial for a renewable energy sources as these are not as competitive and efficient on other grounds like technology, cost of electricity etc.

Barrier Due to Prevailing Practice:

State Grid Penetration[8]

Available information on grid penetration for wind power projects in Indian States indicate that Tamilnadu is by far the leader having achieved over 17% penetration, whereas the penetration level of wind farms in Maharashtra is merely 2.83% which clearly demonstrates that wind power generation is not a common practice in Maharashtra..

State	Grid Penetration
Andhra Pradesh	1.08%
Gujarat	2.59%
Karnataka	5.29%
Maharashtra	2.83%
Rajasthan	3.69%
Tamilnadu	17.17%
West Bengal	0.02%
Kerala	0.06%
Madhya Pradesh	0.50%

Moreover addition in wind power capacity during the year 2004-05 reveals that Maharashtra did not witness a substantial addition during this period.

[8] Grid penetration = installed wind capacity (in MW) as a percentage of the total installed capacity available to the state grid (including shares from Central Sector Power Utilities). Source of data is Ministry of Power Annual Report 2005 - 06. Data as on 31 December 2005.

State	As on 31.03.2004			As on 31.03.2005			Addition During 2004-05
	Demonstration Projects (MW)	Private Sector Projects (MW)	Total Capacity (MW)	Demonstration Projects (MW)	Private Sector Projects (MW)	Total Capacity (MW)	
Andhra Pradesh	5.4	93.4	98.8	5.4	115.2	121	21.8
Gujarat	17.3	184.7	202	17.3	236.2	254	51.5
Karnataka	4.6	204.6	209.2	7.1	403.6	411	201.5
Kerala	2	0	2	2	0	2	0
Madhya Pradesh	0.6	22	22.6	0.6	28.3	28.9	6.3
Maharashtra	8.4	399.1	407.5	12.2	444.1	456	48.8
Rajasthan	6.4	172.1	178.5	6.4	278.4	285	106.3
Tamil Nadu	19.4	1342.1	1362	19.4	2018	2037	675.4
West Bengal	1.1	0	1.1	0	1.1	0	0
Others	0.5	0	0.5	0	0	0	0
Total (all India)	65.7	2418	2484	71.5	3523	3595	1111

Source: Electrical India[9]; December 2006

The table above demonstrates that capacity addition in Maharashtra was only 4.39% of all India total where as for states like Tamil Nadu and Karnataka the increase was 60.79 and 18.13 percent respectively.

The total installed electricity-generation capacity in India, as on 31st March 2005 was about 118425.70 MW. This includes 68.31% thermal (80900 MW), 26.13% hydro (30942 MW), 2.35% nuclear (2770 MW) and 2.15% wind based generation (2979 MW)[10]. Coal based thermal power generation has been the mainstay of electricity generation.

To bridge India's peak power shortage of 13-15% and average shortage of 8-10%, in the business as usual scenario, nearly 100,000 MW of fresh capacity addition would be required by 2012 of which more than 75% is likely to be coal based[11].

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9 Volume 46 No 12, page-40

10 http://cea.nic.in/power_sec_reports/general_review/0405/ch2.pdf

11 Power on Demand by 2012: Perspective Plan Studies, CEA, GOI.s

The installed capacity of Western Region at the end of financial year 2004-05 as per CEA was 33242.76 MW. The total installed capacity comprises of Hydro – 5876.33 MW, Gas – 5035.72 MW, Coal- 20816.50 MW, Nuclear- 760 MW, Wind–658.70 MW and Diesel – 17.48 MW. The hydro, gas, thermal and nuclear energy generation in the region during 2004-05 was 10577.22 MUs, 25807.25 MUs, 141961.97 MUs & 5099.68 MUs respectively (WREB Annual Report 2004-05). As per the 2006 CEA General Review, gross electrical energy generation by wind in Western Region at the end of year 2004-2005 is only 884.12 MUs which clearly shows that the share of electricity generation from wind is very low in the region and the current practice being followed in the region is preferential generation of electricity from fossil fuel based power plants.

The technical wind power potential of the State of Maharashtra, which is in the western part of the country, is approximately 3650 MW[12]. The current practice followed by investors (investing in WEGs) is to set up wind power projects in Southern states of India because of higher generation potential (these states observe two monsoon seasons, leading to a higher PLF). Owing to this fact, the total capacity exploited in the State of Maharashtra (as on March 31, 2005) was just about 456.2 i.e. 12.5%[13]of the technical potential, which is far behind the potential harnessed in Southern States. Hence, a wind power project in Maharashtra needs to be encouraged.

✓ **Other Barrier:**

➢ **Regulatory Risks:**

MERC in exercising its power under Sec 22(i) c and 29 of the erstwhile ERC Act 1998, and also under Sections 62 & 86 (i) e of the EA 2003, fixed the tariff rates of electricity when sold to the state owned utility for wind power projects that are commissioned after 1st April, 2003. This is a regulatory barrier as the rate at which electricity is to be sold to State utility was fixed by MERC and binding on the project promoter who had no say in the matter.

Further, a negative impact was created in the whole set-up owing to defaults in payment of revenue by the State owned utility, to earlier investors in wind energy projects. While the former statement is a direct regulatory risk, the later statement is an indirect regulatory risk to the project promoter.

The project promoter has entered into an agreement with Maharashtra State Electricity Distribution Company Ltd. (MSEDCL) (a sub-division of Maharashtra State Electricity Board) for the sale of electricity to them. This Agreement (Article 18 Section 18.02 CDM Benefit) stipulates "MERC shall be approached to review the tariff structure (contained in the Agreement) once the project becomes eligible for CDM benefit or similar credits and any mechanism for sharing of CDM or similar credit between the seller (in this case ACIL) and MSEDCL. The decision of the MERC will be binding on both parties." Hence, though an Agreement has been signed, the rate at which electricity is sold to MSEDCL may change if ACIL obtain any benefit under CDM or they may have to share the benefit with MSEDCL. The extent of sharing of the CDM benefit has not been specified by MERC. Hence, this is a big risk undertaken by the project promoter as revenue, either from the sale of electricity or from the CDM benefit may be affected depending upon the decision of MERC.

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[12] http://www.windpowerindia.com/statest.html

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

- **Due to Uncertainty in Power Generation:**

  The major additional risk faced by the promoters is the uncertainty in the amount of electricity that can be generated and sold. Generation of electricity from a wind power project is mainly dependant on the available wind. As the electricity generation from the WEG is a function of the cube of the wind speed, even small variations in the wind speed contribute to relatively large variations in the electricity generated.

- **Due to Natural Calamities:**

  The generation of electricity from wind is, of necessity, an entirely an outdoor activity which is usually located in a remote location, beyond the control of project promoter. The wind generators and the grid are constantly subject to natural elements such as high winds and rain and a calamity such as a severe thunderstorm and lightning can damage the generators and/or the grid. Whereas the cost of repairing the generators or grid can be recovered by insuring them, the loss in revenue due to the turbine not generating electricity when it is damaged or the grid not functioning cannot be recovered as insurance companies normally do not provide liquidated damages in their insurance cover. Even if, the insurance company agrees for liquidated damages cover, the insurance premium will be prohibitively very high.

✓ **Impact of CDM**

The project registration will result in the following

- More investment in wind / other renewable energy technologies in State.
- The investment through new investors will strengthen the grid and would result in a reduced peak shortage.
- Reduction of burden of the Government to commission additional power plants.
- Improvement in IRR from with CER’s sale, hence will improve financial viability of project.
- Reduction of overall grid transmission losses, as power generated from the project activity will be used locally. Government will not require transmitting the equivalent power from far off located conventional power projects.
- Reduction in GHG emission through non-conventional fuel based installations in the State.
- Sustainable economic development as most of the wind sites in the State are in the remote corners & under developed areas, new installations at these locations will bring in economic development of these far flung locations.
- New employment opportunities as the investment in wind sector in the State would also bring in direct and indirect employment benefits. As per World Institute of Sustainable Energy (Quarterly magazine, July – August, 2006, Volume 2, No. 4), it is estimated that for Suzlon make wind turbines generated direct and indirect potential to the tune of 5.7 personnel per MW installed capacity and 22.8 personnel per MW installed capacity, respectively. Totaling both direct and indirect employment, project activity of 3.7 MW has generated 105 employments per annum.

To mitigate the risks mentioned in the above paragraphs and encourage the setting up of a wind power project in Maharashtra, CDM support to the project promoter is required.

The proposed activity thus satisfies the additionality conditions as required under Attachment A to Appendix B of the simplified modalities and procedures for small-scale CDM project activities, and thus qualifies as a CDM project.

B.6 Emission reductions:

B.6.1 Explanation of methodological choices:

Baseline methodology for projects under Type I.D has been detailed in paragraphs 7-11 (Type I.D) of the above-mentioned document. Paragraph 9 (Type I.D) applies to this project activity, which states that:

For all other systems, the baseline is the kWh produced by the renewable generating unit multiplied by an emission coefficient (measured in kg CO_2equ/kWh) calculated in a transparent and conservative manner as:

(a) 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 ACM0002. Any of the four procedures to calculate the operating margin can be chosen, but the restrictions to use Simple OM and the Average OM calculations must be considered.

OR

(b) The weighted average emissions (in kg CO_2equ/kWh) of the current generation mix.

Baseline emission reductions have been estimated using the weighted average emission (in kgCO_2 equ/kWh) of the current generation mix, using the most recent statistics available at the time of PDD submission. (Paragraph 9, sub point (b))

In the proposed baseline, Western Region grid is used as the reference region for estimating the current generation mix. Using the methodology available for small-scale project activities, the weighted average emissions (in tCO_2 e/GWh) of current generation mix of Western Region grid of India is used for the calculation of baseline. The weighted average emission factor data calculated and provided by Central Electricity Authority (CEA)[14] is used for the proposed project activity.

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

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

(Copy this table for each data and parameter)

Data / Parameter:	CO_2 Emission Factor
Data unit:	t CO_2 / MWh
Description:	Grid Emission Factor
Source of data used:	Central Electricity Authority – CDM - Carbon Dioxide baseline database
Value applied:	0.9
Justification of the choice of data or description of measurement methods and procedures actually applied :	The used data is from an official source.
Any comment:	The archive of data will be maintained for crediting period + 2 years. The archiving will be done both on paper and electronically.

B.6.3 Ex-ante calculation of emission reductions:

- Gross electricity generation (as committed by Suzlon) : 8550 MWh/yr
- Internal loss : 2%
- Net electricity supplied to the grid : 8379 MWh/yr

Baseline Emission = Net electricity supplied to grid X Weighted Av. Emission Factor
= 8379× 0.89 t CO_2 / MWh
= 7457 t CO_2 / annum

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

Year	**Project Emission (tonnes CO_2e /yr.)**	**Baseline Emissions (tonnes CO_2e /yr.)**	**Leakage (tonnes CO_2e / yr.)**	**Emission Reductions (tonnes CO_2e /yr.)**
2008 - 09	0	7457	0	7457
2009 - 10	0	7457	0	7457
2010 - 11	0	7457	0	7457
2011 - 12	0	7457	0	7457
2012 - 13	0	7457	0	7457
2013 - 14	0	7457	0	7457
2014 - 15	0	7457	0	7457
2015 - 16	0	7457	0	7457
2016 - 17	0	7457	0	7457
2017-18	0	7457	0	7457
Total (tonnes CO_2e)	**0**	**74573**	**0**	**74573**

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

B.7.1 Data and parameters monitored:

(Copy this table for each data and parameter)

Data / Parameter:	Energy
Data unit:	MWh
Description:	Gross Electricity Generation
Source of data to be used:	MSEDCL
Value of data	8379
Description of measurement methods and procedures to be applied:	The data can be very accurately measured. The meters installed measure mentioned variables on a continuous basis. Every month these meter readings will be recorded by plant personnel, these records will be archived for cross-checking yearly figures.
QA/QC procedures to be applied:	The meter maintained by MSEDCL
Any comment:	The archive of data will be maintained for crediting period + 2 years. The archiving will be done both on paper and electronically.

Data / Parameter:	Energy
Data unit:	MWh
Description:	Net Electricity Generation
Source of data to be used:	MSEDCL
Value of data	--
Description of measurement methods and procedures to be applied:	The data can be very accurately measured. The meters installed measure mentioned variables on a continuous basis. Every month these meter readings will be recorded by plant personnel, these records will be archived for cross-checking yearly figures.
QA/QC procedures to be applied:	The meter maintained by MSEDCL
Any comment:	The archive of data will be maintained for crediting period + 2 years. The archiving will be done both on paper and electronically.

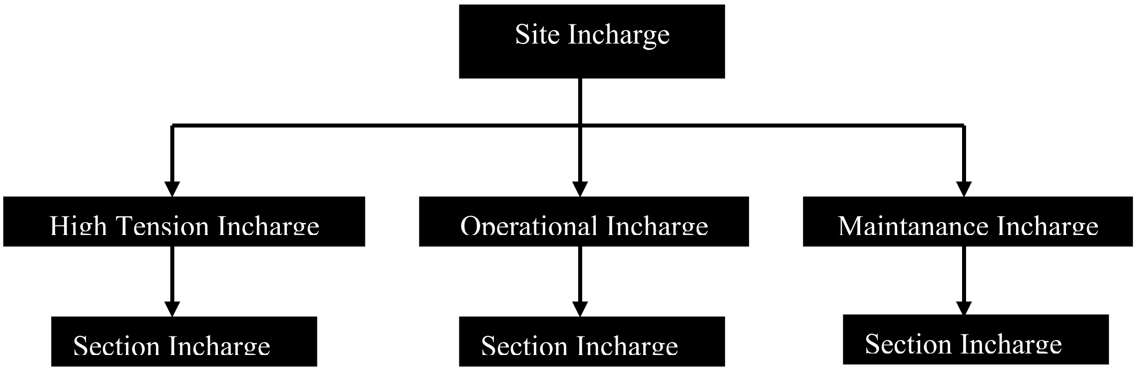
Data / Parameter:	CO_2 Emission Factor
Data unit:	t CO_2/MWh
Description:	Carbon Emission Factor
Source of data to be used:	Central Electricity Authority – CDM - Carbon Dioxide baseline database
Value of data	0.89
Description of measurement methods and procedures to be applied:	The used data is from an official source.
QA/QC procedures to be applied:	The data source is regularly updated by the responsible authority.
Any comment:	The archive of data will be maintained for crediting period + 2 years. The archiving will be done both on paper and electronically.

B.7.2 Description of the monitoring plan:

The project participant sighed an operation and maintenance agreement with the supplier of the wind turbines i.e. Suzlon. The agreement is for a period of 10 years. The performance of the turbines, safety in operation and scheduled /breakdown maintenances is responsibility of Suzlon and are organized and monitored by them. So the authority and responsibility of project management lies with the O & M contractor.

ISO 9001:2000 standard has been adopted by Suzlon, who is responsible for monitoring, calibration and O & M of the project. Training is an essential part of the ISO system. To comply with the ISO standard the training has to be provided to personnel according there responsibility with in organization.

The organizational hierarchy of Suzlon for O& M management is as follows –



Routine Maintenance Services:

Routine Maintenance Labour Work involves making available suitable manpower for operation and maintenance of the equipment and covers periodic preventive maintenance, cleaning and upkeep of the equipment including –

a) Tower Torquing
b) Blade Cleaning
c) Nacelle Torquing and Cleaning
d) Transformer Oil Filtration
e) Control Panel & LT Panel Maintenance
f) Site and Transformer Yard Maintenance

Security Services:

a) This service includes watch and ward and security of the wind farm and the equipment.

Management Services:

a) Data logging in for power generation, grid availability, machine availability.
b) Preparation and submission of monthly performance report in agreed format.
c) Taking monthly meter reading jointly with utility of power generated at Wind Farm and supplied to grid from the meter/s maintained by utility for the purpose and co-ordinate to obtain necessary power credit report/ certificate.

Technical Services:

a) Visual inspection of the WEGs and all parts thereof.
b) Technical assistance including checking of various technical, safety and operational parameters of the equipment, trouble shooting and relevant technical services.

The project activity essentially involves generation of electricity from wind, the employed WEG can only convert wind energy into electrical energy and cannot use any other input fuel for electricity generation. As the operation of WEGs is emission free and no emissions are produced during the lifetime of the WEG.

Although it is being anticipated that there would be no unintended emissions/leakages from this project, however, if any such condition arises, and leakage effect is found due to the project, such leakage will be accounted accordingly as mentioned in the chosen applied baseline methodology.

- The proposed project activity requires evacuation facilities for sale to grid and the evacuation facility is essentially maintained by the state power utility (MSEDCL).
- The electricity generation measurements are required by the utility and the investors to assess electricity sales revenue.
- 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 power utility (MSEDCL). Turbines for sale to utility 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.
- Metering equipment - Metering is carried out through electronic trivector meters of accuracy class 0.2% required for the project. The main meter shall be installed and owned by MSEDCL, whereas the project participant owns the check meters. The metering equipments are maintained in accordance with electricity standards.
- 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. At the conclusion of each meter reading an appointed representative of the MSEDCL and the company signs a document indicating the number of kWh exported to the grid.

- The secondary monitoring, which will provide a backup (fail-safe measure) in case the primary monitoring is not carried out, would be done at the individual WEGs. Each WEG is equipped with an integrated electronic meter. These meters are connected to the Central Monitoring Station (CMS) of the entire wind farm through a wireless Radio Frequency (RF) network (SCADA). The generation data of individual machine can be monitored as a real-time entity at CMS. The snapshot of generation on the last day of every calendar month will be kept as a record both in electronic as well as printed (paper) form.

  All the relevant data & reports for maintaining accuracy in future monitoring and reporting of GHGs emission reductions is with the project participant, which follows Quality Management System (QMS) procedure as per ISO 9001 and is ISO certified organization.

  SEPL has appointed a full time project in-charge to manage the overall project activity after commissioning. The project in-charge supervises the functioning of the wind farm in close coordination with the officials & technical personnel of Suzlon Energy Limited (SEL).

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

Date of completion of Baseline and Monitoring methodology – 15th January 2007.

Name and other details of the responsible person are as follows –

Mr. Shyamsunder Mardha
M/s Arvind Cotsyn(India) Ltd.
Plot No. –1-12, Phase-II, Sector-A,
Shri Laxmi Co-Op. Industrial Estate,
HATKANANGALE , Kolhapur
Maharashtra – 416109
Telephone: +91 230-2366280 & 2366185
FAX: +91 230-2433422
Email : acilich@bsnl.in

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:

27/10/2005 (based on purchase order issued to Suzlon)

C.1.2 Expected operational lifetime of the project activity:

20 Years

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

C.2.1 Renewable crediting period

Not opted for.

C.2.1.1 Starting date of the first crediting period:

Not applicable

C.2.1.2 Length of the first crediting period:

Not applicable

C.2.2 Fixed crediting period:

Opted

C.2.2.1 Starting date:

1st April 2008 or date of registration which is later.

C.2.2.2 Length:

10 years and 0 months.

SECTION D. Environmental impacts

D.1 If required by the host Party, documentation on the analysis of the environmental impacts of the project activity:

The project activity does not fall under the purview of Environmental Impact Assessment notification of the Ministry of Environment and Forests (MoEF), Government of India (GOI) and the project activity is exempted from environmental clearances. The project activity has no significant impact on the environment. However, certain foreseen impacts due to the project activity are discussed below:

Impact on air
Wind power 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.

Impact due to noise
Noise is generated due to the movement of rotor blades. Noise is very much below the regulatory norms. It has no direct effect on the population, as the area is less populated and noise generated will be attenuated by ambient conditions. The considering the overall impact of the project in reducing GHG's, creation of employment etc., makes this effect negligible.

Socio-economic impacts
There is no inconvenience to the local community due to the transmission lines. The locals have benefited economically through land sales. The project activity helps the upliftment of skilled and unskilled manpower in the region. The project provided employment opportunities not only during the construction phase, but will also provide 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:

Not Applicable.

SECTION E. Stakeholders' comments

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

Project participant identified local communities, farmers, and villagers, as the stakeholders with an interest in the CDM activities. The meeting was conducted for the site Sangli. Accordingly, Project participant issued letters to the respective stakeholders requesting them to attend meeting or depute representatives at respective venues:

Sr. No.	Site	Venue	Date
1.	Sangli	Wagholi CMS, Tal.Kavthe Mahankal, Dist. Sangli.	11/09/2007

The agenda of the meeting was fixed as follows:

- Welcome
- Description of the project
- Queries and responses from the participant and the stakeholders.
- Vote of thanks

The stake holder's view is project participant in its own small way is contributing positively to local economy & development.

Photo : All stakeholders of the project

E.2 Summary of the comments received:

Stakeholders had no objections from installations of WEGs instead they have openly said that wind power projects helped them by…

- Additional revenue generated thro' land / lease to outsiders like contractors & their employees.
- Job opportunities for day -to - day maintenance and security of WEGs

- Developments of roads.
- No any adverse impact on rains, agriculture.

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

The stakeholders have given positive feedback and thus no measures are required to be taken.

Annex 1

CONTACT INFORMATION ON PARTICIPANTS IN THE PROJECT ACTIVITY

Organization:	M/s Arvind Cotsyn(India) Ltd.
Street/P.O.Box:	Plot No. –1-12, Phase-II, Sector-A, Shri Laxmi Co-Op. Industrial Estate
Building:	HATKANANGALE
City:	Kolhapur
State/Region:	Maharashtra
Postfix/ZIP:	416109
Country:	India
Telephone:	+91 230-2366280 & 2366185
FAX:	+91 230-2433422
E-Mail:	acilich@bsnl.in
URL:	
Represented by:	
Title:	Managing Director
Salutation:	Mr.
Last Name:	Marda
Middle Name:	--
First Name:	Shyamsunder
Department:	Management
Mobile:	+ 91 9910173010
Direct FAX:	--
Direct tel:	--
Personal E-Mail:	acilich@bsnl.in

Annex 2

INFORMATION REGARDING PUBLIC FUNDING

- The project has not received any public funding and Official Development Assistance (ODA).
- The project is a unilateral project.

Investment plan for the project are as follows:

Participants	ACIL	ADBML
Project Cost	981 Lakh	981 Lakh
Equity	314.5 Lakh	314.5 Lakh
Loan	666.5 Lakh	666.5 Lakh

Annex 3

BASELINE INFORMATION

Baseline emissions are calculated as the kWh produced by the project activity multiplied by an emission coefficient for the Western Regional grid, calculated as the weighted average emissions (in kg CO_2equ/kWh) of the current generation mix.

BE = EGy * CEF_{grid}

Where EGy is the net quantity of electricity generated by the project in year y, and CEF_{grid} is the carbon emissions factor of the Western grid.

CEF_{grid} is taken from CDM database provided by CEA and it is approved by DNA i.e Ministry of Environment and Forest, India.

Baseline Emission				**0.89**	**tCO2/MWh**
Project Emission				**0**	**tCO2/MWh**
Baseline Emission Reductions					
Year	**Units MWh)**	**Baseline Emission tCO2**	**Project Emission tCO2**	**Leakage tCO2**	**Emission Reduction tCO2**
2008-09	8379	7457	0	0	7457
2009-10	8379	7457	0	0	7457
2010-11	8379	7457	0	0	7457
2011-12	8379	7457	0	0	7457
2012-13	8379	7457	0	0	7457
2013-14	8379	7457	0	0	7457
2014-15	8379	7457	0	0	7457
2015-16	8379	7457	0	0	7457
2016-17	8379	7457	0	0	7457
2017-18	8379	7457	0	0	7457
Total	**83790**	**74573**	**0.00**	**0**	**74573**
Annual Average	**8379**	**7457**	**0**	**0**	**7457**

Annex 4

MONITORING INFORMATION

The points given below detail the monitoring plan:

- The electronic meter that is used for monitoring is the Export-Import Energy Meter and is, installed before the grid.
- Its is a three phase, Four wire, 50 Hz, 110 Volts, 6 Amp, Time of Day (ToD), 0.2 class Export-Import tri- vector Energy meter.
- The calibration procedure followed, requires calibrating the meter once in a 12 month, by the MSEDCL. MSEDCL is State Electricity Utility Company which functions under Government of Maharashtra (GoM) as per Central Electricity Act & it is responsible for Energy Meter calibration check with their calibrated Reference Standard Meter having tracability with International Standards through Institute for Design of Electric Measuring Instruments, Sion, Mumbai (IDEMI, Govt. of India Institution). The Purchaser/ wheeling agent of power, performs calibration check in presence of representative of owner.
- The import and export of electricity is continuously monitored by the export/ import meter and the data is recorded on a monthly basis jointly by the participant and the electricity utility
- This meter is located at the delivery point of wind power in MSEDCL grid. This accounts for the import of electricity that is used by the Project participant. Hence the net electricity generated is calculated from the joint meter reading and recorded /archived in paper/electronic.

The complete monitoring responsibility is carried out as follows:

- Monitoring is joint responsibility of both owner as well as MSEDCL hence, daily monitoring is in the scope of owner
- Monthly monitoring is a joint responsibility. All services are provided by MSEDCL to the owner of wind farm.
- Though the ownership of the meter is with owner, but it is in possession of utilities sealed meter box under lock & key as per statutory requirements. Owner can only see readings through glass window of sealed meter box.

Quality control (QC) and quality assurance (QA) procedures are being undertaken for data monitored		
Data *(Indicate table and ID number e.g. 3.-1.; 3.2.)*	Uncertainty level of data (High/Medium/Low)	Explain QA/QC procedures planned for these data, or why such procedures are not necessary.
1	Low	This Data will be directly used for calculating emission reduction. Sales record to grid to be used with other record to check for consistency
2	Low	Default data (for emission factors) and CEA statistics (for energy data) are used to check the local data.

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