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

CONTENTS

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:

Grid connected bundled small-scale wind project at Satara, Maharashtra, India
Version: 01
Date : 27/08/2007

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

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The main activity of the proposed CDM project is generation of electricity using wind potential by small sized 0.35 MW WEGs, in the Satara District of Maharashtra state and exporting the generated electricity to a Maharashtra State Electricity Board (MSEB).

The project activity has established 2 number of sophisticated, Wind Energy Generators (WEG) of 350 kW capacities aggregating to a total installed capacity of 0.7 MW in Satara District. The gross electricity generation from the power plant is 1.2 GWh and the net electricity export to power deficit grid is 1.10 GWh after an auxiliary consumption of 7%. The generated electricity is sold to the nearest grid sub-station. The electricity generation from this wind project will contribute to GHG reductions estimated at 9,745 tCO2e (tonnes of carbon dioxide equivalent) over the crediting period of 10 years, although project life is envisaged as 20 years. Details of the investors are given in Annex 5.

The project activity includes planning, installation and operation of a 0.7MW wind power project which has been set up in two phase at Satara districts of Maharashtra, India. The commissioning details are given below:

Phase	Capacity (MW)	Commissioning dates	Location (District)
I	0.35	18th September 2000	Satara
II	0.35	25th March 2001	Satara

Purpose of the project activity
The project activity was essentially conceived to generate electricity from sustainable / clean source of energy and selling it to Maharashtra State Electricity Board (MSEB) and strengthening the western regional grid through improvement of frequency and availability of local grid. In the context of power and energy shortage and the ever-increasing demand for more electricity, the implementation of project with installed capacity of 0.7 MW contributed in partially meeting the shortage of power and energy in the state of Maharashtra.

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

- To enhance the propagation of commercialization of wind turbines in the region
- To contribute to the sustainable development of the region, socially, environmentally and economically
- To reduce the prevalent regulatory risk for this project through revenues from the CDM
- Climate change mitigation, through renewable energy generation and reducing the demand for fossil fuel based power
- Contributing to the national electricity capacity through additional power generation

View of project participant about the project activity's contribution to Sustainable Development:

Ministry of Environment and Forests (MoEF), Government of India, has stipulated Social well-being, Economic-well being, Environmental well being and Technological-well being as the indicators for sustainable development in the interim approval guidelines for CDM projects. The project activity contributes to the above indicators in the following manner.

Social Well-being
The proposed bundled CDM project activity leads to alleviation of poverty by establishing direct and indirect employment benefits accruing out of ancillary units for manufacturing lattice towers for erecting the WEGs and for maintenance during operation of the project activity. The infrastructure in and around the project area also improved due to project activities, which otherwise would not have happened in the absence of project. This includes development of road network and improvement of electricity quality, frequency and availability as the electricity is fed into a deficit grid.

Economic Well-being
The project activity leads to an investment of about INR 34 millions to a developing region, which otherwise would not have happened in the absence of the project activity. This was a significant investment in the region. The project activity also leads to diversification of the national energy supply, which is dominated by conventional fuel based generating units.

This project helped the poor and vulnerable sections of the society who are often hit by inadequate power supply, load shedding and poor power quality to receive more reliable supply of power to commercial, residential and agricultural needs.

Environmental Well-being
The project utilizes wind energy for generating electricity which otherwise would have been generated through alternate fossil fuels based power plants, contributing to 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. Further, the project activity does not result in degradation of any natural resources, health standards, etc. at the project areas. Being a renewable resource, using wind energy to generate electricity contributes to resource conservation. Thus the project causes no negative impact on the surrounding environment contributing to environmental well-being.

Technological Well-Being
The project activity leads to the promotion of 0.35 MW Wind Electric Generators (WEGs) into the region by a government institution, demonstrating the success of small sized 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.

The above benefits due to the project activity ensure that the project contributes to the sustainable development of the region.

A.3. Project participants:

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Name of the party involved	Private and/or public	Whether party involved wishes

((Host) indicates a host party)	entity(ies) project participants	to be considered as project participant
Government of India (Host Country)	**Private Entity:** Patankar Wind Farms Pvt. Ltd. & Shri Padmawati Wind Energy Pvt. Ltd.*	No

** Shri Padmawati Wind Energy Pvt. Ltd being one of the project proponents authorizes Patankar Wind Farms Pvt. Ltd to be the bundling agency and also to be the authorized representative of the project for the entire CDM cycle.*

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

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

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A.4.1.1. Host Party(ies):

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India

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

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State: Maharashtra

A.4.1.3. City/Town/Community etc:

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District: Satara
Taluk: Patan
Village: Vankusavade

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

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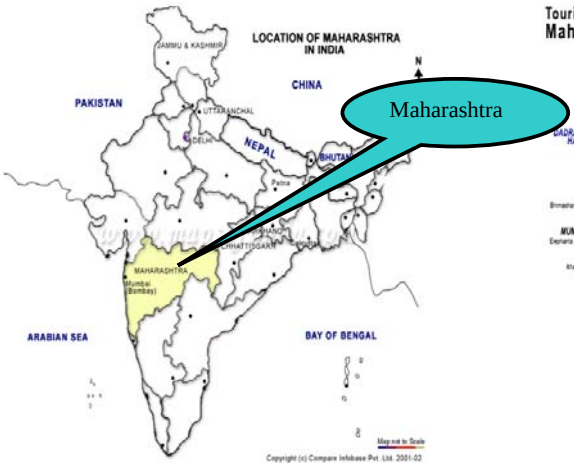
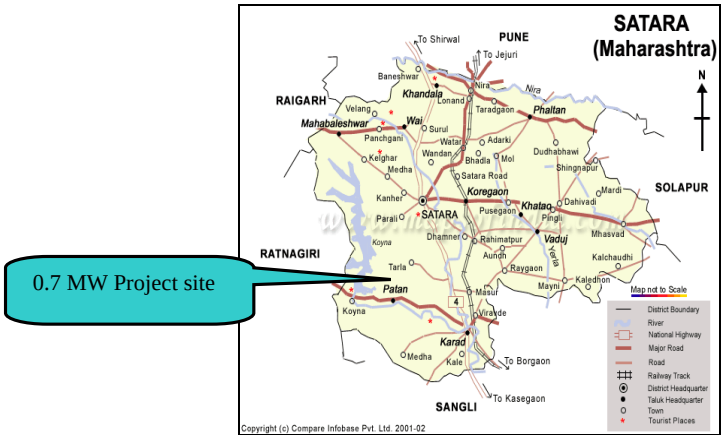
The project is located at a village named Vankusawade. The nearest railway station is Satara and airport is Pune. The elevation at the site of the project activity is approximately 1100 meters above mean sea level and is located in a wind zone of geographic location 17°27'N and 73°50'E. The mean annual wind speed at the site is approximately 21.7 km/h at 30m height and 230.6 w/m^2 at mast (25m).

Physical location of the project is marked in the maps below:



Map1: Location of Maharashtra in India **Map 2: Location of Satara District in Maharashtra**



Map 3: Location of Project Site in Satara District

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

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According to the Appendix B to the simplified modalities and procedures for small-scale CDM project activities the proposed bundled CDM project activity falls under the following type and category.

Project Type **:** I – Renewable Energy Projects
Category **: D -** Grid connected renewable electricity generation

The project activity utilizes renewable wind potential for power generation and exports the generated power to the regional grid system. Accordingly, the applicable methodology for the project activity shall be AMS I.D/ Version 12, Scope 01, 25th to 27th July 2007, which includes wind for electricity generation for a grid system.

Since, the capacity of the CDM project is 0.7 MW, which is less than the qualifying capacity of 15 MW, the project activity is regarded as small-scale CDM project activity and UNFCCC indicative simplified modalities and procedures are applied.

Technical details of the 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 passes through the blades of the wind turbines is converted into mechanical energy and rotates the wind blades. When the wind blades rotate, the connected generator also rotates, thereby producing electricity. The technology is a clean technology since there are no GHG emissions associated with the electricity generation. The project installs Suzlon make WEGs of individual capacity 0.35 MW.

The salient features of 0.35 MW WEGs is as follows:

1. Specially designed for tropical climates and remote operations
2. A High Coefficient of Power for ensuring optimum harnessing capacities
3. Integrated power transmission mechanism to ensure high efficiency
4. Carefully devised electrical system to withstand weak grid conditions
5. Microprocessor-based fully automatic control system deploying user-friendly operation and remote monitoring
6. Highest levels of safety systems (4 levels)
7. Active yaw gear drive
8. Polyamide slide bearings for yawing
9. Unique soft braking logic
10. ISO-certified vendors confirm high quality components
11. ISO 9001:2000 for Design, Development, Manufacture and Supply of Wind Turbines
12. ISO 9001:2000 certification for Installation, Commissioning, Operation and Maintenance
13. Type certification by Germanischer Lloyd, Germany
14. Approved by the Ministry of Non-Conventional Energy Sources (MNES)

The technical description of the 0.35 MW capacity turbine used in the project activity is as below:

Suzlon S.33 - 350 kW Wind Turbine is a stall-regulated turbine with a three-bladed high efficiency rotor. The rotor is coupled to the generator through flange. This unique integrated power-train design incorporates torsionally flexible coupling to avoid problems of misalignment and vibration. The salient features of this technology are as follows:

ROTOR
Suzlon S.33 - 350 kW has 15.4 m long FRP blades aerodynamically optimized to take varying wind velocities while delivering the maximum power. Their fail-safe tip brakes operate hydraulically and can bring a Wind Turbine to a soft stop within a few seconds without putting any undue stress on the machine. The total swept area covered by the rotor is 876.13 sq. m.

GEARBOX
Keeping the conversion & transmission efficiency to the maximum is probably the most important task, which was taken on with German perfection. Our association with some of the most renowned German manufacturers resulted in a highly efficient gearbox. The gearbox with its integrated design ensures precise assembly with a high level of efficiency, which requires an extremely low level of maintenance.

This leads to an extensively trouble-free operational life, devoid of any alignment problems. It has the most advanced splash-type lubricating system.

GENERATOR

The heart of the system had to be designed with extreme ambient temperatures and humid conditions in consideration. From maintenance and reliability point of view, use of a totally closed generator to keep the moisture and dust out was paramount to Suzlon. The generator used in Suzlon S.33 - 350 kW is an asynchronous type with two speeds of operation. The generator has pole changing at 100 kW level of operation to go into the next range of generation capacity. The rated rotational speed is 756 RPM with 8 poles to generate up to 100 kW in low wind conditions and 1006 RPM with 6 poles from 100kW to 350 kW in the high wind conditions. IP 55 enclosure prevents any ingestion of air and moisture into the generator thus ensuring a long life of the generator.

CONTROL SYSTEM

The Control unit is microprocessor-based with an 8 x 40 digital display indicating all operating and error conditions. It also has a built-in graphical display showing average wind speeds and power output with daily, monthly and annual outputs amongst other parameters. The control unit keeps the Wind Turbine fully automated in the optimal operation state. Its digital interface unit helps it to be interfaced with other digital devices to be monitored and controlled remotely. The control unit can also transfer information about the Wind Turbine to remote places via modem. Its robust design gives a highly reliable operation even in the most severe conditions encountered.

YAW SYSTEM

To get the maximum from the available wind resources means that the Wind Turbine is in line with the wind direction. This important task is handled by the yaw system equipped with two motors with reduction gearbox. The system employs a hydraulic braking system to keep the Wind Turbine fixed in the direction facing the wind. The system ensures exact alignment of the rotor to the wind direction. This is achieved through an intelligent network of sensors for wind direction and wind speed, talking to the control unit in real time resulting in higher efficiency and reduced loads caused by oblique incident flows.

The Yaw System is incorporated with twist sensors, which direct the control unit to untwist the cables if they are twisted beyond the set levels. This ensures the safety of cables even under frequent wind direction changes in the same direction.

SAFETY SYSTEM

- Safety System consists of four levels of independent systems:
- Electronic sensing of faults by the computer for immediate action.
- Independent electrical circuitry to act when over-speed is detected.
- Hydraulic sensing and active device to prevent over-speeding.
- Mechanical flexible couplings with shearing studs.

SOFT BRAKING

It consists of a specially designed unique mechanism for protecting the Wind Turbine against heavy loads due to sudden loss in grid power. The aerodynamic brakes are applied first and the rotor disc brakes are applied subsequently, which protect Wind Turbine components against wear & tear and fatigue.

LIGHTNING PROTECTION

Lightning arrestors are provided along with earthing cables connected to earthing pits. This has been done at various levels of the Wind Turbine, thereby protecting the entire Wind Turbine against lightning.

Technology transfer

No technology transfer from other countries is involved in the project activity.

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

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Emissions reductions due to the project activity mainly depend on the energy fed to the state grid and the content of fossil fuel based generation in the grid system. Hence, the power fed to the state grid and the generation mix in the baseline region becomes the basis for estimating emissions reductions.

The expected emission reductions are calculated based on the net electricity fed to the grid and simple weighted average emission factor of 882.9 tCO_2/GWh[1] for the Western Grid. Emission factor is based on compiled database by Central Electricity Authority (CEA) for the Fiscal Year 2005-06. The estimated annual quantity of emission reductions due to the project activity is 974 tCO_2 eq. A fixed crediting period of 10 (ten) years is selected for the small-scale project activity.

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

Years	**Annual estimation of emission reductions in tones of CO2 eq.**
2008	974
2009	974
2010	974
2011	974
2012	974
2013	974
2014	974
2015	974
2016	974
2017	974
Total estimated reductions (tones of CO_2 eq.)	**9,740**
Total number of crediting years	**10**
Annual average over the crediting period of estimated reductions (tones of CO_2eq.)	**9740**

In the above table the year 2008 corresponds to the period starting from 01.02.2008 to 31.01.2009. Similar interpretation shall apply for subsequent years.

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

[1] CO2 Baseline Database for Indian Power Sector, User Guide, Version 2, June 2007, Government of India, Ministry of Power, Central Electricity Authority (CEA). http://www.cea.nic.in/planning/c%20and%20e/Government%20of%20India%20website.htm

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No public funding from Annex I Party is involved in this project activity.

A.4.5. Confirmation that the small-scale project activity is not a debundled component of a large scale project activity:

The 0.7 MW small scale wind project is not a debundled component of a larger project activity as explained below.

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

- with the same project participants
- in the project category and technology measure and
- whose boundary is within 1 km of the project boundary of the proposed small scale activity at the closest point.

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:

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Project Type	: I - Renewable energy project
Project Category	: D - Grid connected Renewable electricity generation
Version	: 12
Date	: 33rd CDM EB Meeting. (25, 26, 27th July 2007)

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

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With a capacity of 0.7 MW, the proposed bundled wind project activity qualifies as small scale and therefore is eligible to use AMS I.D. There are no other applicability conditions for AMS I.D. The application of the methodology is described below.

Selection and justification of calculation approach
As per the Para 9 of methodology I.D. Version 12, the baseline emissions are calculated based on the net energy provided to the grid (in GWh /yr) by renewable generating unit, and an emission factor for the displaced grid electricity (in tCO_{2equ} /GWh).

AMS I.D. Ver. 12 requires that the baseline emission factor be calculated in a transparent and conservative manner, based on either

(i) the average emissions intensity i.e the weighted average emissions (in $kgCO_2$ equ/kWh) of the current generation mix.

OR

(ii) the 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.

The project participants have opted for approach (i). The average emissions intensity is expected to be somewhat lower than the combined margin, because must-run sources such as hydro enter the calculation at full weight, while in the combined margin approach; they are only counted if included in the build margin. In addition, the build margin in all Indian regions is known to be heavily dominated by thermal generation. Hence the choice of approach (i) is considered conservative.

Grid System of the proposed project activity

There are three choices available for choosing the grid system for the project activity, viz. national grid, regional grid or state grid.

In India, electricity is a concurrent subject between the State and the Central Governments. The perspective planning, monitoring of implementation of power projects is the responsibility of Ministry of Power, Government of India. At the state level the state utilities or State Electricity Boards (SEBs) are responsible for generation, transmission, and distribution of power. With power sector reforms there have been unbundling and privatisation of this sector in many states. Many of the state utilities are engaged in power generation also. In addition, there are different central / public sector organizations involved in generation like National Thermal Power Corporation (NTPC), National Hydro Power Corporation (NHPC), etc. in transmission e.g. Power Grid Corporation of India Ltd. (PGCIL) and in financing e.g. Power Finance Corporation Ltd. (PFC).

There are five regional grids: Northern, Western, Southern, Eastern and North-Eastern. Different states are connected to one of the five regional grids as shown in the Table below:-

States connected to different regional grids

Regional grid	**Northern**	**Western**	**Southern**	**Eastern**	**North Eastern**
States	Haryana, Himachal Pradesh, Jammu & Kashmir, Punjab, Rajasthan, Uttar Pradesh, Chandigarh, Uttaranchal, Delhi	Gujarat, Madhya Pradesh, Maharashtra, Goa, Chattisgarh	Andhra Pradesh, Karnataka, Kerala, Tamil Nadu, Puducherry	Bihar, Orissa, West Bengal, Jharkhand, Sikkim	Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland, Tripura

The management of generation and supply of power within the state and regional grid is undertaken by the state load dispatch centres (SLDC) and regional load dispatch centres (RLDC). Different states within the regional grids meet the demand from their own generation facilities plus generation by power plants owned by the central sector i.e. NTPC and NHPC etc. Specific quota is allocated to different states from the Central sector power plants. Depending on the demand and generation there are exports and imports of power within different states in the regional grid. Thus there is an exchange of power among states in the regional grid. Similarly there exists imports and export of power between regional grids.

The Western Region grid managed by Western Region Electricity Board (WREB) constitutes five states (viz Maharashtra, Madhya Pradesh, Chhatisgarh, Gujarat and Goa) and two Union territories (Daman & Diu and Dadar & Nagar Haveli). These states under the regional grid have their own power generating

stations as well as centrally shared power-generating stations. While the power generated by own generating stations is fully owned and consumed through the respective state's grid systems, the power generated by central generating stations is shared by more than one state depending on their allocated share. WREB facilitates the share of power generated by the central generating stations. Presently the share from central generating stations is a small portion of their own generation.

Map 4: Grid Map of the Western Region (As on 31.03.2006)[2]

The total energy demand in Maharashtra state and also in the whole Western region is increasing rapidly. As of now the share of thermal power is around 74.14[3] % in the total installed capacity of the Western region. Based on the information available on Western regional grid and state of Maharashtra it is observed that grid system is carbon intensive due to major share of power coming from coal, lignite, gas, and diesel based thermal power plants. As per the latest records of power generation capacity as on 30 April 2006[4], the share of thermal power in all India is around 74 %, whereas the Non-conventional sources like Hydro (19 %), Renewable energy sources (3.12 %) are minimal. Presently, the electricity supply position in the regional grid[5] is deficit by 20.5 % (Peak) and the energy shortage is 13.5 %. The state of Maharashtra presently has installed capacity of 16,068.2 MW including central sector projects of 2229.8 MW[6]. At present the state faces huge shortage as far as energy availability is concerned. The present share of power generation in India through renewable is about a mere 5 %. Further, as per the 16th Electric Power Survey by Central Electricity Authority, the growth in the energy requirement is around 6.2% till 2017. To meet the present energy demand and growth in the energy requirement, it would be required to add additional capacities for power generation. Based on the proposed conventional power projects in the state of Maharashtra, it appears that the dependence will be more on conventional power projects.

[2] Western Regional Power Committee, Central Electricity Authority, Govt. of India http://www.wrpc.nic.in/wrgrid.html

[3] http://www.wrpc.nic.in/inst_cap.pdf

[4] Page No: 27, Power Scenario at a Glance - 2006, Central Electricity Authority, www.cea.nic.in

[5] Page No: 27, Actual Power Supply Position, Power Scenario at a Glance - 2006, Central Electricity Authority, www.cea.nic.in

[6] Page No: 35, Table 2, Power Scenario at a Glance – 2006, Central Electricity Authority, www.cea.nic.in

Since the CDM project would be supplying electricity to the western regional grid it is preferable to take the regional grid as project boundary than the state boundary. It also minimizes the effect of inter state power transactions, which are dynamic and vary widely. Considering free flow of electricity among the member states and the union territory through the Western Region Load Dispatch Centre (WRLDC), the entire western grid is considered as a single entity for estimation of baseline.

The baseline emission factor has been considered from the "**CO2 Baseline Database for the Indian Power Sector**" published by CEA. The emission factor published by CEA for the latest year 2005-06 is 882.9 tCO_2/GWh based on weighted average approach and 906.4 tCO_2/GWh based on combined margin approach. As required by the methodology, the project proponent, following conservative approach, has considered weighted average emission factor for determining the emission reductions. The CEA calculations are based on generation, fuel consumption and fuel quality data obtained from the power stations. Details on the Western Region Grid and a justification of this choice are provided in Section B.3 (Definition of the project boundary).

B.3. Description of the project boundary:

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Project boundary specified in the Appendix B of simplified modalities and procedures is that encompasses the physical, geographical site of the renewable generation source. This includes the wind turbine installation, pooling and MSEB sub-stations. The proposed bundled project activity evacuates the power to the MSEB. 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.

B.4. Description of baseline and its development:

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The baseline for the project activity is constructed according to the AMS I.D Version 12, para 9.b. i.e. weighted average emissions of the current generation mix (in kg CO_2eq./kwh), applicable for Type I.D CDM project activities, as contained in the Appendix B of the simplified modalities and procedures for small scale CDM project activities.

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:

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a) Justification for application of simplified methodology to the project activity

The installed capacity of the project is 0.7 MW, which is less than the limiting capacity of 15 MW and is thus eligible to use small-scale simplified methodologies. Further, the project activity is generation of electricity for a grid system using wind potential. 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.

National Policies and Circumstances

The Ministry of Power (MoP), Government of India has set an agenda of providing power for all by the year 2012. To meet the present national deficit of 8.4%[7] and to achieve the above target, about 100,000

[7] Power Scenario at a glance-2006, Central Electricity Authority, www.cea.nic.in

MW of new capacity needs to be added by the end of 2012 to the existing installed capacity of 126,089[8] MW. In line with the Five Year Plan system being followed by the Planning Commission of India, the MoP decided to add about 46,000 MW during the period 2002-2007 and about 61,000 MW during the period 2008-2012. Emphasis has been laid on setting up large pithead stations to avoid high costs associated with transporting high ash bearing Indian coal and over-straining the already stretched rail network.

To push forward the power sector reforms further, the Government of India has opened up the coal sector for private participation. Captive coal mining is allowed by the Ministry of Coal to facilitate coal mining by power generating units for their fuel needs. In addition, coal imports are allowed for power projects. This has significantly strengthened the preference of the private sector for coal-based mega power projects over other energy sources.

The Government of India has also opened oil and natural gas exploration for private sector participation. In the oil and natural gas sector, both central sector and private sector organisations are involved and already exploring the potential available in India. The discovery of new reserves is not significant enough to meet the increasing demand for natural gas. As yet the natural gas consumption is limited to a small extent and significant investments are required for natural gas infrastructure.

The Ministry of Non-conventional Energy Sources (MNES) is engaged in development renewable energy sources. Inspite of Ministry's resolve to encourage setting up of renewable energy projects by providing incentives such as interest subsidy, tax holiday etc., these projects could not be established in a large scale due to various barriers prevailing in the sector. Inspite of all the propagation by MNES, the focus of power generation is on thermal projects based primarily on coal. As indicated earlier the share of thermal power generation in the Maharashtra is over 74% and the same is expected to continue based on the planned projects in Maharashtra.

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 the following barriers for the project activity.

Barrier Analysis:

Investment Barriers:

The project proponents invested around Rs.34 millions, which is high compared to investments required for conventional power projects. Presently, the principal barrier for wide spread implementation of small scale wind projects is the investment per unit of electricity generated and the higher investment costs per MW of capacity.

The project proponent chooses for 100% equity, in spit of easy availability of financial incentives such as soft loans, Green Energy Support, tax incentive or financial aids given from the fund constituted by levying carbon tax on Conventional Energy Sources.

[8] Power scenario at a Glance – 2006, Central Electricity Authority, www.cea.nic.in

The investment in wind energy generation involves certain amount of risk, because the electricity generation depends on various natural parameters.

Apart from the perceived investment barriers, the project activity also faced the following perceived risks and barriers that prevented project proponents investing in the proposed project activity.

Geographical Location

The project activity carried out in the hills of Satara (project site) which is a remote and inaccessible location with no infrastructure facility for executing electricity generation project. Additional infrastructure in terms of road network and electricity evacuation facilities was required at the site. This infrastructure facility was created for execution of the complete project activity.

- At the time of implementation of project, the site was not connected through any of the metalled roads and thus access to the site was almost impossible during monsoon seasons. The complete site was required to be made accessible through contraction of road network for day to day operations as well as transportation of plant & machinery to the site. Complete road network has been developed by EPC contractor, project proponent and MEDA. The site is well connected now to the main city and state transport buses are now plying on these routes.

- The project site has many villages without any health care facility. This facility was also required for the operation and maintenance team going to be at the site. A full dispensary has been established with all necessary medical facilities at the site which is open for villagers and other human habitation near the project site.

Regulatory Risk

The project proponent during the stage of finalizing the investment had taken massive regulatory risk prevailing in the state of Maharashtra at that point of time. The major risks pertaining to regulatory uncertainty are as follows:

- The wind energy projects that were put up in the state of Maharashtra were based on the Government of Maharashtra policy for promotion of wind energy. However, since the notification of the independent electricity regulatory commission on 27th December, 1999 and the implementation of ERC Act 1998 (Electricity Regulatory Commissions Act), it was clear that all tariff matters pertaining to all electricity generation were under the preview of the MERC.

- The transmission losses fixed by the commission (5%) are of interim nature and are subject to change in the future.

- As per **MERC Order dated 24th November, 2003** projects commissioned during the period 27/12/1999 to 31/03/2003 falls into Group II. For this group tariff rate fixed is Rs.2.25 per unit in the base year 94-95. The purchase rate shall be increased at 5% per year simple escalation (i.e 11 paisa per year). The validity of the Electricity Purchase Agreement (EPA) shall be only eight years for the date of commissioning.

  As the project activity commissioned in the year 2000, it fall into Group II category. As the EPA is on the verge on expiry by 2008, afterwards MSEB is not in agreement with project developer for purchasing electricity. This is an open ended risk taken by the project proponent as in case of refusal of further purchasing of electricity by the state electricity utility, the complete investment can go waste. The investor will have to look for alternate buyer or may decide to sell

the electricity to the third party, the CDM revenue will act as a risk mitigation tool because the production of electricity cannot be stopped during the switchover period.

- During the year 2000-01, the investment in wind electricity generation was not the common in the state because of the reasons beyond control of the investor – policy (No policy till December 27, 1999), certainty of revenue realization from sale of electricity to the utility etc. were the major concerns along with associated risks involved in power sector investments.

  Following table shows that the installations of wind turbines in the state of Maharashtra until the year 1999 were not at all a common practice.

Year	**MW**
Up to March 1992	1.1
1992-93	0.0
1993-94	0.0
1994-95	1.5
1995-96	0.0
1996-97	2.8
1997-98	0.2
1998-99	23.3

Source: Directory for Indian Wind Power 2005

The project proponent was aware about these regulatory risks before the investments was made, and thus was trying to buy-out or mitigate the regulatory risks by using the revenue that may emulate by generating carbon credits and thereby selling the same.

Barriers due to Prevailing practice

As a general practice, the Independent Power Producers in India are operating through thermal installations from which guaranteed generation against the demand is possible. RE technologies, especially wind energy projects can provide electricity. However because of non-consistent generation, additional electricity banking is required, which adds to the financial burden and reduces the profits of the operator. Additionally because generation is controlled by nature, the power producer cannot commit firm delivery of electricity.

Above all, the capital expenditure of WEG installation is more because the PLF of the wind machines is considerably lower as compared to the conventional plants. Thus it can be inferred that the project is not a part of the prevailing practice of IPP in India.

The proponent financed the project through in-house resources, thus the proponent has taken 100% of equity exposure (whereas in the general structured financing in India the Equity Debt ratio is kept as 30:70), which may provide long term additional benefits, but short term costs. Additionally, as discussed in the prevailing practice, the project activity through IPP in India is carried out through thermal installations and not RE technologies (except large hydro – in very few cases).

Thus it is inferred from the above explanations, that the project activity can mitigate the risks both at the regulatory levels as well as generation levels through mobilization of additional CDM revenue. At the time of project planning and currently also, wind electricity is not the most profitable option among the investment options available to the project proponent.

Early Consideration of CDM

The project proponent was aware of the various barriers associated with project implementation. However it is felt that the additional revenue against the sale consideration of carbon credits generated due to the project activity would help in augmenting these barriers to certain extent.

The EPC contractor "Suzlon Energy Limited" apprised the investor (project proponent) about the chances of availability of additional revenue through investment in renewable energy projects, which can be used to mitigate the associated risks pertaining to change in regulatory changes as well as loss of generation because of non-availability of grid and / or natural reasons. The project proponent also investigated the same and decided to take up the renewable energy project activity.

In view of the above, the proposed project is additional and not the same as the baseline scenario.

B.6. Emission reductions:

B.6.1. Explanation of methodological choices:

>>

The project activity is generation of electricity using wind potential and exporting the same to the grid system, which is also fed by other fuel sources such as fossil and non-fossil types. Emission reductions due to the project activity are considered to be equivalent to the emissions avoided in the baseline scenario by displacing the grid electricity. Emission reductions are related to the electricity exported by the project and the actual generation mix in the grid system.

Hence, the proposed methodology well suits the project activity.

Baseline

As the project activity does not modify or retrofit an existing electricity generation facility, the baseline scenario is: electricity delivered to the grid by the project that would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources.

The baseline emissions are calculated based on the net energy provided to the grid (in GWh/year), and an emission factor for the displaced grid electricity (in tCO2 /GWh).

Central Electricity Authority (CEA) (which is an official source of Ministry of Power, Government of India) have worked out baseline emission factor for various grids in India and made them publicly available i.e "**CO_2 Baseline Database for the Indian Power Sector**" at
http://www.cea.nic.in/planning/c%20and%20e/Govertment%20of%20India%20website.htm

The baseline emission factor is adopted from the **"CO2 Baseline Database"** based on the weighted average emissions of the current generation mix for the fiscal year 2005/06 and will be updated ex-post during the crediting period. The data to be monitored to ascertain emission reductions out of the project activity is to measure the quantum of electricity generated through energy meters and the emission factor each year based on data available form CEA. With this information, a reliable estimate of the quantum of emission reduction can be made.

Leakage:

No leakage is identified by the project proponent due to the project being hydroelectric scheme.

Emission Reductions:

As per AMS I.D Version 12, the baseline emissions are calculated as the net electricity generated by the project activity, multiplied with the baseline emission factor calculated in a transparent and conservative manner as the weighted average emissions (in $kgCO_2/kWh$):

$$BE_y = EG_y \times EF_y$$

where:

BE_y *Baseline emissions in year y (t CO_2)*
EG_y *Net electricity generated by the project activity (GWh)*
EF_y *Baseline emission factor for the project grid (t CO_2/GWh)*

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

Values obtained when applying the above formulae are provided in the following table.

S. No	Year	Gross Energy (GWh)	Export for Baseline Emission (GWh)	Emission Factor (tCO_2/GWh)	Baseline Emissions (tCO_2eq.)
1	2008	12.00	1.10	882.9	974
2	2009	12.00	1.10	882.9	974
3	2010	12.00	1.10	882.9	974
4	2011	12.00	1.10	882.9	974
5	2012	12.00	1.10	882.9	974
6	2013	12.00	1.10	882.9	974
7	2014	12.00	1.10	882.9	974
8	2015	12.00	1.10	882.9	974
9	2016	12.00	1.10	882.9	974
10	2017	12.00	1.10	882.9	974
				Total Emission Reductions	**9,740**

In the above table the year 2008 corresponds to the period starting from 01.02.2008 to 31.01.2009. Similar interpretation shall apply for remaining years.

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

Central Electricity Authority (CEA) have worked out baseline emission factor for various grids in India and made them publicly available i.e **"CO2 Baseline Database for Indian Power Sector"**, User Guide, Version 2, June 2007, Government of India, Ministry of Power, Central Electricity Authority (CEA) http://www.cea.nic.in/planning/c%20and%20e/Govertment%20of%20India%20website.htm

All the data has been taken from "**CO2 Baseline Database".** The CEA calculations are based on power generation, fuel consumption and fuel quality data obtained from the power stations.

Data / Parameter:	EF_y
Data unit:	tCO_2/GWh
Description:	Baseline Emission Factor of the Western grid, during the year *y*
Source of data used:	Central Electricity Authority (CEA) "**CO2 Baseline Database for the Indian Power Sector**", Version 2, June 2007, Government of India, Ministry of Power, Central Electricity Authority (CEA) http://www.cea.nic.in/planning/c%20and%20e/Government%20of%20India%20website.htm
Value applied:	For the Western region CEA has published the following emission factors. Simple Operating Margin (OM) : 993.3 tCO_2/GWh Build Margin (BM) : 630.0 tCO_2/GWh Combined Margin (CM) : 906.4 tCO_2/GWh Simple Weighted Average : 882.9 tCO_2/GWh
Justification of the choice of data or description of measurement methods and procedures actually applied :	Central Electricity Authority (CEA) values have been used for authenticity of the data, available publicly by Govt of India with a view to obtain uniformity of approach in the country towards a common objective.
Any comment:	

B.6.3 Ex-ante calculation of emission reductions:

>>

Baseline emissions

Baseline emissions calculated as explained in section B.6.1 above are summarised as below.

Year (Season)	**Estimation of baseline emissions**
2008	974
2009	974
2010	974
2011	974
2012	974
2013	974
2014	974
2015	974
2016	974
2017	974
Total	**9,740**

In the above table the year 2008 corresponds to the period starting from 01.02.2008 to 31.01.2009. Similar interpretation shall apply for remaining years.

Project emissions

No project emissions are applicable

Leakage

No leakage is applicable

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

>>

Summary of the ex-ante estimation of emission reductions are furnished below.

Year (Season)	Estimation of Project activity Emissions	Estimation of baseline emissions	Estimation of Leakage	Estimation of emission reductions
2008	0	974	0	974
2009	0	974	0	974
2010	0	974	0	974
2011	0	974	0	974
2012	0	974	0	974
2013	0	974	0	974
2014	0	974	0	974
2015	0	974	0	974
2016	0	974	0	974
2017	0	974	0	974
Total	**0**	**9,740**	**0**	**9,740**

In the above table the year 2008 corresponds to the period starting from 01.02.2008 to 31.01.2009. Similar interpretation shall apply for remaining years.

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

The proposed bundled projects are of Type I Renewable Energy Project – I. D Renewable Electricity Generation for a grid. As per clause 13 of AMS I.D, Version 12 Appendix B of simplified modalities and Procedures for small-scale CDM project activities, monitoring methodology involves ***metering the electricity generated by renewable technology***.

B.7.1 Data and parameters monitored:

Data / Parameter:	EG_y
Data unit:	GWh
Description:	Electricity supplied to the grid by the project
Source of data to be used:	On-site measurements
Value of data	1.10 GWh
Description of measurement methods and procedures to be applied:	Measured monthly and aggregated annually.

QA/QC procedures to be applied:	Meters will be tested as per industry standards. Sales records to the grid and other records are used to ensure consistency.
Any comment:	Electric power sold to the grid will be measured by main meter (TOD) installed by MSEB. To monitor the generation & performance of individual turbine, Electronic meter will be integrated within the wind turbine the same will form the basis of sharing of revenue among the developers.

Data / Parameter:	EF_y
Data unit:	tCO_2 /GWh
Description:	Baseline Emission Factor of the western grid, during the year *y*
Source of data to be used:	Central Electricity Authority (CEA) "**CO2 Baseline Database for the Indian Power Sector**", Version 2, June 2007, Government of India, Ministry of Power, Central Electricity Authority (CEA) http://www.cea.nic.in/planning/c%20and%20e/Government%20of%20India%20website.htm
Value of data applied for the purpose of calculating expected emission reductions in section B.5	CEA Publishes this data. Project Participants have no control on these measurements. Hence, no measurements procedures are specified here.
Description of measurement methods and procedures to be applied:	CEA publishes the data once in a year. The same are used for estimations. Project Participants have no control on these measurements. Hence, no measurement procedures have specified here.
QA/QC procedures to be applied:	Project Participants have no control on these measurements. Hence, no QA/QC procedures are applicable here.
Any comment:	

B.7.2 Description of the monitoring plan:

>>

This monitoring plan is developed in accordance with the modalities and procedures for small-scale CDM project activities and is proposed for grid-connected small scale wind power project being implemented in Maharashtra state in India. The monitoring plan, which will be implemented by the project proponent, describes about the monitoring organisation, parameters to be monitored, monitoring practices, QA and QC procedures, data storage and archiving.

The project proponents have undertaken an operation and maintenance agreement with the supplier of the wind turbines i.e. Suzlon for a period of 20 years. The performance of the mills, safety in operation and scheduled /breakdown maintenances are organized and monitored by the contractor. So the authority and responsibility of project management lies with the contractor.

The monitoring personnel receive intensive training at the Suzlon Manufacturing facility in Daman before being appointed at the site to look after the operations.

As the operation of WEGs is emission free and no emissions are produced during the lifetime of the WEG, no specific procedures have been laid down for emergency preparedness for cases where emergencies can cause unintended emissions.

Various activities carried out by the Operations and Maintenance team is as follows:

1 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

2 Security Services

This service includes watch and ward and Security of the Wind Farm and the Equipment.

3 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 SEB, of power generated at the Wind Farm and supplied to SEB Grid from the meter/s maintained by SEB for the purpose and co-ordinate to obtain necessary power credit report/ certificate.

4 Technical Services

a) Visual inspection of the WTG 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. Thus no special ways and means are required to monitor leakage from the project activity.

1. The proposed project activity requires evacuation facilities for sale to grid and the evacuation facility is essentially maintained by the state power utility (MSEB).
2. The electricity generation measurements are required by the utility and the investors to assess electricity sales revenue and / or wheeling charges.
3. The project activity has therefore envisaged independent measurements of generated electricity from the wind turbines.
4. 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 (MSEB). Machines for sale to utility will be connected to the feeder.
5. 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.
6. Metering equipment- Metering is carried out through electronic trivector meters of accuracy class 0.5% required for the project. The main meter (TOD, Time of Day meter) shall be installed and

owned by MSEB. The metering equipments are maintained in accordance with electricity standards.

7. Meter Readings- The monthly meter readings at the project site and the receiving station shall be taken simultaneously and jointly by the parties on the first week of the following month. At the conclusion of each meter reading an appointed representative of the MSEB and the company signs a document indicating the number of kWh exported to the grid.

All the monitored data will be kept for 2 years after the end of crediting period or the last issuance of CERs for this project activity whichever occurs later. The monitored data will be presented to the DOE to whom verification of emission reductions is assigned.

Methodology adopted for determining base line emission factor is the weighted average emissions of the generating mix in the Western grid system, which will represent the intensity of carbon emissions of the grid system. The baseline emission factor is adopted from the **"CO2 Baseline Database"** published by CEA for the latest available year for the western grid and the same is used for the future projection. The monitored data will be presented to an independent verification agency or DOE to whom verification of emission reductions is assigned.

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 the baseline: 20th August 2007

Name of the Entity:

Senergy Global Private Limited,
9th Floor, Eros Corporate Tower, Nehru Place,
New Delhi - 110 019, India.
Phone : +91- 11- 4180 5501
Fax : +91- 11- 4180 5504
E.mail : mail@senergyglobal.com
Url : www.senergyglobal.com

The above entity is not a project participant.

SECTION C. Duration of the project activity / crediting period

C.1 Duration of the project activity:

C.1.1. Starting date of the project activity:

>>

18/09/2000 (date of commissioning of the first windmill)

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

>>

20 years

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

Fixed crediting period

C.2.1. Renewable crediting period

Not Chosen

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:

>>
The project proponent wishes to select the fixed crediting period.

C.2.2.1. Starting date:

>>
01st February 2008

C.2.2.2. Length:

>>
10 years – 0 month

SECTION D. Environmental impacts

>>

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

>>
According to Indian regulation, the implementation of the wind park does not require an Environmental Impact Assessment (EIA) study. As per the prevailing regulations of the Host Party i.e. India represented by the Ministry of Environment and Forests (MoEF), Govt. of India and also the line ministry for environmental issues in India, Environmental Impact Assessment (EIA) studies need not to be conducted for the projects which comes under the list whose investment is less than Rs. 1000 millions[9, 10] Since the Wind projects are not included in this list and also the total cost of the project is only Rs. 34 millions, the project activity doesn't call for EIA study.

[9] S.O. 60 (E), Environment Impact Assessment Notification, Ministry of Environment and Forests, Govt. of India dated 27th January 1994.

[10] Amendments made on 13th June 2002 vide S.O. 632 (E), Ministry of Environment and Forests, Govt. of India.

Also, in the redefined EIA notification i.e. S.O. 1533[11], dated 14th September 2006, Ministry of Environment & Forests (MoEF), Govt. of India, the wind projects are not included in the list of projects that has to get Prior Environmental Clearance (EC) either from State or Central Govt. authorities and hence no EIA study was conducted.

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

>>

The environmental impacts are not considered significant in the project activity.

SECTION E. Stakeholders' comments

>>

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

>>

The following stakeholders have been involved with the development of candidate CDM project

- Maharashtra Energy Development Agency (MEDA)
- Maharashtra State Electricity Distribution Company Limited (MSEDCL)
- Private Land Owners

The project has been executed after receiving the necessary consent of the involved state government agencies, MEDA is responsible for executing the state electricity policy as per MERC (Maharashtra Electricity Regulatory Commission) for implementation of wind electric generators, whereas the MSEDCL is responsible for entering into power purchase and wheeling & banking agreements with the individual project proponents for evacuation of electricity.

As both these agencies are under the domain of the state government, the standard application procedure followed by meeting the stipulated requirements of the state government was carried out. The final outcome of the procedure resulted in the following licences & permissions

- Commissioning & Grid Synchronization Certificates.
- No Objection Certificate

The private land owners were consulted / approached through the village governing council (Panchayat) for transfer of land for erection and commissioning of wind turbines and price negotiations were carried out through the intermediation of the revenue officials of the state government in presence of the head of the village council.

The comments / observations of involved villagers were invited during the various negotiation meetings held between the real estate agency & the villagers.

E.2. Summary of the comments received:

>>

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

No comments were received from the government agencies / stakeholders, whereas the villagers have made following observations
- They will continue to have the right of way in the wind farm except at places where security is required.
- The village was lacking basic amenities, and thus EPC contractor was request to consider some development of the villages.
- Employment, if possible should be given to the local villagers

No Objection certificates have been issued by the village Panchayats of the village that is part of the project.

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

>>

All the submissions from the villagers were considered by the management and

- The right of way was given to the villagers even after selling land to the EPC contractor.
- Hospital was developed for the local stakeholders, as well as local road network has been established through the efforts of the EPC contractor.
- Employment of O & M staff up to the level of technicians and machine supervisors has been done from the local villages only.

Annex 1

CONTACT INFORMATION ON PARTICIPANTS IN THE PROJECT ACTIVITY

Organization:	Patankar Wind Farms Pvt. Ltd.
Street/P.O.Box:	Shikka Mansion
Building:	
City:	Patan, Satara
State/Region:	Maharashtra
Postfix/ZIP:	415 206
Country:	India
Telephone:	+91- 2372- 83043
FAX:	+91-02372-83165
E-Mail:	
URL:	
Represented by:	
Title:	Director
Salutation:	Mr.
Last Name:	Patankar
Middle Name:	Vikramsingh
First Name:	Satyajit
Department:	
Mobile:	+91- 9822031524
Direct FAX:	+91- 02372-83165
Direct tel:	+91- 2372- 83043
Personal E-Mail:	patwind@sancharnet.in

Annex 2

INFORMATION REGARDING PUBLIC FUNDING

No public funding from the parties included in Annex I is involved in the project activity.

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Annex 3

References for Base Line Data

The methodology adopted for the calculation of the baseline is 'Simple weighted average of the current generation mix". The baseline emission factor has been adopted from the "CO_2 Baseline Database" published by CEA.
(http://www.cea.nic.in/planning/c%20and%20e/Govertment%20of%20India%20website.htm)

References for completing PDD

1. Website of United Nations Framework Convention on Climate Change (UNFCCC), http://unfccc.int
2. UNFCCC document: Clean Development Mechanism, Simplified Project Design Document For Small Scale Project Activities (CDM SSC-PDD), Version 03
3. UNFCCC document: Simplified modalities and procedures for small–scale clean development mechanism project activities
4. UNFCCC document: Indicative simplified baseline and monitoring methodologies for selected small-scale CDM project activity categories, Version 12, EB 33
5. UNFCCC CDM website (http://cdm.unfccc.int/methodologies/PAmethodologies/approved.html)

Annex 4

MONITORING INFORMATION

The project proponents have undertaken an operation and maintenance agreement with the supplier of the wind turbines i.e. Suzlon for a period of 20 years. The performance of the mills, safety in operation and scheduled /breakdown maintenances are organized and monitored by the contractor. So the authority and responsibility of project management lies with the contractor.

The monitoring personnel receive intensive training at the Suzlon Manufacturing facility in Daman before being appointed at the site to look after the operations.

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The data published by government agencies like Central Electricity Authority (CEA), regarding power generation by various plants, fuels used, station heat rates, baseline emission factor will be obtained from official sources like "**CO_2 Baseline Database for the Indian Power Sector**" at http://www.cea.nic.in/planning/c%20and%20e/Govertment%20of%20India%20website.htm. The data there from shall be recorded electronically. Similar data from imports shall also be recorded. The data shall be preserved for a period of at least two years. The OM and BM emission factors are used as given in "**CO_2 Baseline Database**". The documentation will be preserved for a period of 2 years after the last issuance of CERs.

Annex 5

DETAILS OF INVESTORS

Name of the Investor	No. of WTGs	Turbine No.	Capacity of each WTG	Total Installed capacity	Date of Commissioning	Location
M/s Patankar Wind Farms Pvt. Ltd	1	P-3	0.35 MW	0.35	18/09/2000	S.No 223, Village Vankusavade, Taluka-Patan, Dist-Satara
Shri Padmawati Wind Energy Limited	1	P-2	0.35 MW	0.35	25/03/2001	S.No 223/1/1, Village Vankusavade, Taluka-Patan, Dist-Satara