CLEAN DEVELOPMENT MECHANISM
SIMPLIFIED PROJECT DESIGN DOCUMENT
FOR SMALL-SCALE PROJECT ACTIVITIES (SSC-CDM-PDD)
Version 02

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>.

SECTION A. General description of the small-scale project activity

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

Bundled wind farm project Dhule, Maharashtra India

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

Description of the project activity

Wind energy in the state of Maharashtra India as of 31-12-2005 is at 654.6 MW installed capacity, and is steadily growing to meet the future power requirements in the state. Since wind generation is still comparatively new, long-term financial viability is important for the success of this project and will act as credence for the success of future and similar projects. Life span, operating cost, maintenance cost are additional concerning issues in this context. The project activity in this candidate CDM project, is conceived to include operational component of the windmill generators in the entity of recently commissioned power generation undertaking at two sites in Dhule district, Maharashtra. The installed capacity of 10 MW has been bundled together from two sites in Dhule district. The project activity would further highlight clean energy made available from these installed windmill turbines, and the allied benefits of providing the generated clean energy to the local grid, along with strengthening and promoting the economic activities in the project area.

This project will result in generating electrical energy through sustainable means to sell to the Western Region Grid of India, and to contribute to climate change mitigation efforts. In addition, aspects of capacity building and poverty eradication will be explored within the scope of sustainable development as project activity. Specifically, the following list of project activities would be undertaken.

1. Enhance financial success of starting an MW class wind turbines in regions most suitable for harnessing wind energy
2. Understand and promote success to run MW class turbines from the O&M cost point of view.
3. Contribute to the sustainable development of the region, socially, environmentally, and economically.
4. Opportunity to contribute towards capacity building, women in development, local and industry specific potential resulting in employment opportunities.

Details of each sub-project

Project ID	Project owners	Electricity Potential	Operational Date
A	Ghodawat Industries (India) Ltd	7.5MW	2 on 27th March 2006 1 on 29th March 2006 3 on 30th June 2006
B	Topaz Investments Pvt. Ltd	2.5MW	1 on 31st March 2006 1 on 30th June 2006

The aggregate 10 MW project activity comprise of total of 8 number of 1250 kW supplied by Suzlon Energy. 6 number of turbine installed at Ghodawat – Dhule site and 2 number of turbines installed at Topaz – Dhule site. The generated electricity is supplied to Western Region Grid.

The project activity meets the following sustainable development objectives, stipulated by Ministry of Environment and Forests, Govt. of India.

Contribution by Project Activity towards Sustainable Development

The project activity involves rural areas where wind energy is maximum and far away from urban activities. The wind power harnessing in a rural setting contributes to the sustainable development of the region through a profitable operation of the units and thereby creation of sustainable shareholder, economic, social and environmental value. The national goal in regards to sustainable development is towards increased share of renewable energy in the overall power generation profile through a focus on wind energy, increased rural incomes, reduced vulnerability and empowerment of a section of society otherwise deprived off opportunities available only to urban society.

1.0 Policy and Development

a) The wind power project is situated in rural area thereby creating employment opportunities in the rural areas in operation and maintenance of the Wind Turbine Generators. Creation of Employment opportunities in rural areas has long been recognized as a major concern for Sustainable development and to induce development preventing the mass exodus from rural to urban areas.

b) Currently, in India it is reported that there is 20% shortfall during peak demand. During the 10th Plan (2002-2007), Indian Government is targeting to increase overall contribution of wind energy to 10% (4055MW) of total capacity. This project activity is helping to achieve that goal.

c) The wind power project is located at several rural locations which are typically served by Fossil fuel , thereby contributing to reduction of Transmission and Distribution losses to some extent.

2.0 Socio-economic

a) The setting up of the Wind Energy Unit shall provide some amount of income security to Agricultural laborers in the regions creating opportunities for both men and women indirectly

b) Since agricultural laborers and marginal laborers are comprised primarily of persons from the vulnerable sections of society, this employment opportunity, though small, shall contribute to Empowerment of vulnerable sections.

c) It is expected that the wind power project shall result in widening of the skill base of the local Community. Several O&M work are proposed to be outsourced to local contractors and the local labor and workmen shall thus acquire new skills through job training and exposure to new skill base.

d) This exposure, together with an increased income potential in construction, operation and maintenance of an operating facility, shall result in capacity development of involved people especially in the initial phase of erection and construction..

A.3. Project participants:

Name of Party involved (*) ((host) indicates a host party)	Private and / or public entity (ies) Project participant (*) (as applicable)	Kindly indicate if the party involved wishes to be considered as project participant (Yes / No)
Government of India (Host country)	Ghodawat Industries (India) Ltd. Topaz Investments Pvt. Ltd.	Yes Yes

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

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

A.4.1.1. Host Party(ies):

Country India

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

State Maharashtra

A.4.1.3. City/Town/Community etc:

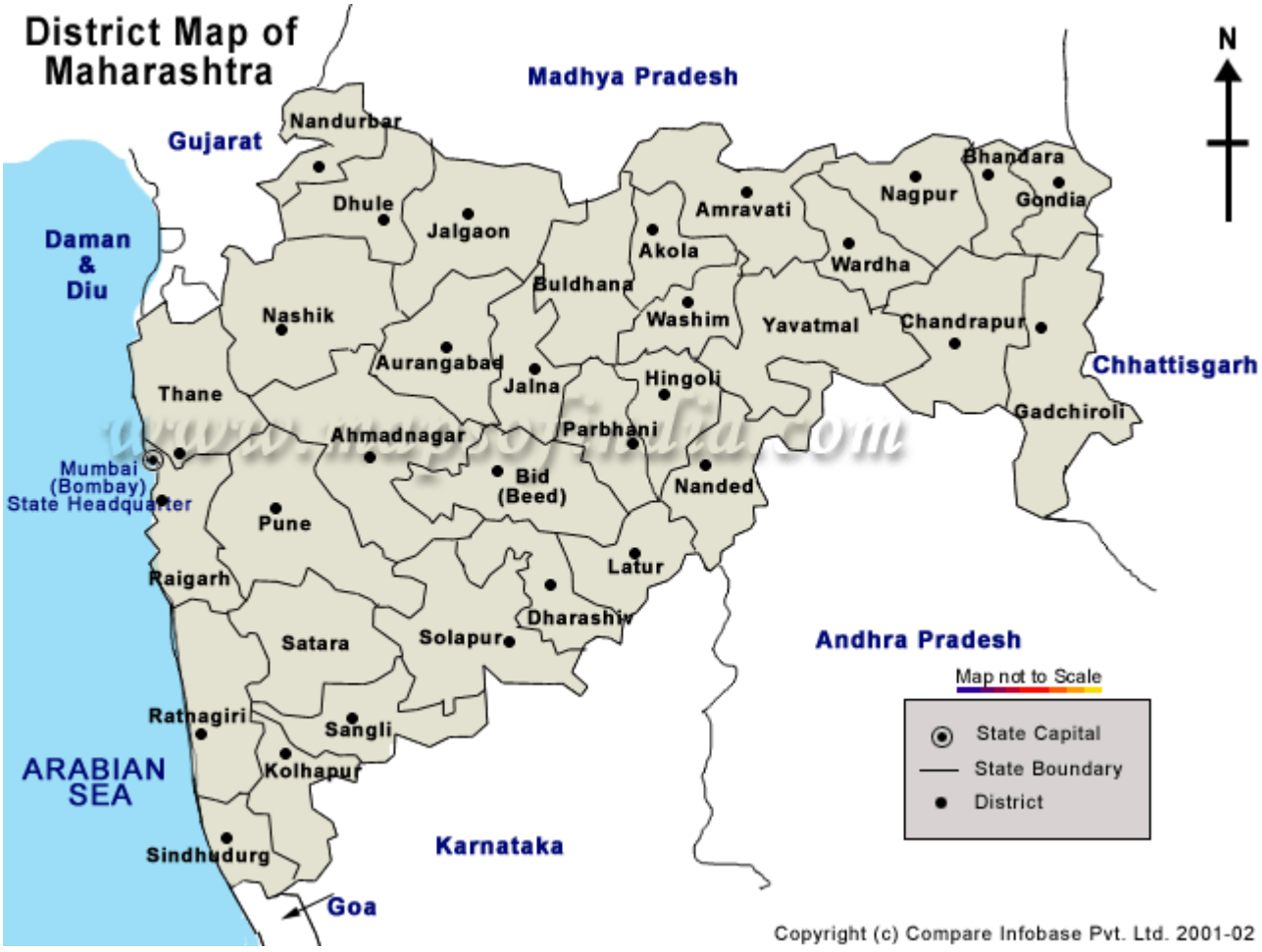
District: Dhule

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

The Locations of these two projects are as follows.

Project ID	Longitude	Latitude
A	**$74^0$60'59" E**	**$21^0$19'43'' N**
B	**$74^0$60'59" E**	**$21^0$19'43'' N**

Project A) Annual Mean Wind Speed of 21.22 km/h
Annual Mean Wind Power Density of 252 Watts/m2
Project B) Annual Mean Wind Speed of 30.30 km/h
Annual Mean Wind Power Density of 498 Watts/m2

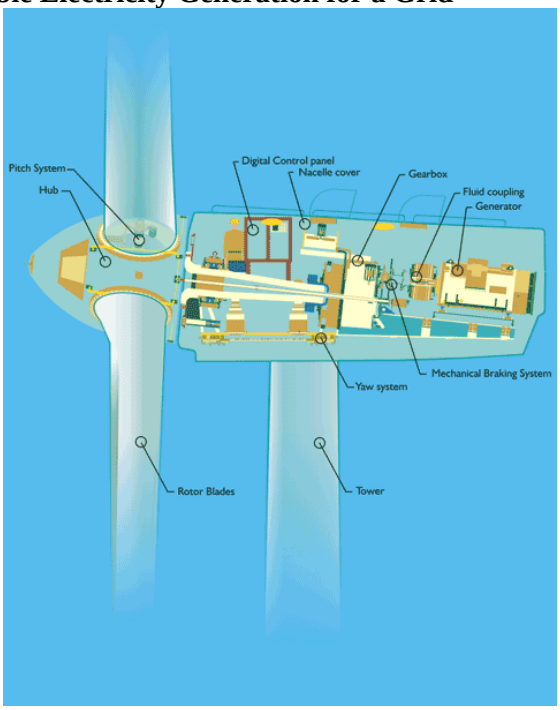


Map of District Dhule

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

The total capacity of these projects is 10 MW, which is less than the qualifying capacity of 15MW. These bundled projects are considered as a small scale CDM project activity. UNFCCC's simplified modalities and procedures are applied. The project activity will use the clean energy from wind potential to export generated electricity to the Western Region Network grid in Maharashtra. This project activity would specifically fall under the following type and category in small scale CDM modalities:

Type – I Renewable Energy Projects
Category I-D Renewable Electricity Generation for a Grid



The technology deployed coverts wind energy to electricity using a Suzlon Energy Wind Electric Generator of 1.25 MW capacity. The salient features of the technology are as follows:

Operating data:

1. Rotor Height:64 m
2. Hub Height: 65 m
3. Cut Speed: 3m/s
4. Rated speed 12 m/s
5. Cut over speed: 25 m/s
6. Survival speed: 67 m/s

Rotor:

1. Blade: 3 Blade Horizontal Axis

2. Swept area: 3217 m^2
3. Rotational speed 13.9 to 20.8 rpm
4. Regulation Pitch regulated

Generator:

1. Type: Asynchronous
2. Rated out put: 250 / 1250 kW
3. Rotational speed: 1006 / 1506 rpm
4. Frequency: 50 Hz

Braking System: Aerodynamic brake with blade pitching and mechanical brake feature of Hydraulic-fail-safe-disk braking system.

Control unit: Advance data collection, remote monitoring & control option, and micro process based high speed data communication with multilevel security and UPS backup.

A.4.3. Brief explanation of how the anthropogenic emissions of anthropogenic greenhouse gas (GHGs) by sources are to be reduced by the proposed small-scale project activity, including why the emission reductions would not occur in the absence of the proposed small-scale project activity, taking into account national and/or sectoral policies and circumstances:

This small-scale project activity is to generate electricity using wind based generators. The electricity produced is then supplied into the western grid system. Since wind based generators produce zero emissions, this will result in the displacement of the more traditional fossil fuel based thermal power stations comprising coal, diesel, furnace oil and gas, as thermal power stations contributes 75% of power to the grid.

The installed capacity of Western Region Power Generation as of 31-12-2005

Sl. No	Region	Hydo	Thermal				Nuclear	RES	Total
			Coal	Gas	DSL	Total			
1	Northern	11070.79	17382.50	3213.19	14.99	20610.68	1180.00	920.46	33781.93
2	Western	6476.33	20914.50	5074.72	17.48	26006.70	1300.00	1084.71	34867.74
3	Southern	11026.39	15992.50	3201.20	939.32	20133.02	830.00	3829.52	35818.93
4	Eastern	2466.52	13813.58	190.00	17.20	14020.78	0.00	193.40	16680.70
5	N. Eastern	1095.02	330.00	750.50	142.74	1223.24	0.00	124.81	2443.07
6	Island	0.00	0.00	0.00	70.02	70.02	0.00	5.42	75.44
7	**All India**	**32135.05**	**68433.08**	**12429.61**	**1201.75**	**82064.44**	**3310.00**	**6158.32**	**123667.81**

This project activity will contribute to the reduction of 14,533 CO2e, over a ten year period. This reduction is the result of displacement of fossil fuel fired power plants that would otherwise have delivered the electricity to Western Region Grid in the absence of the project activity.

A.4.3.1 Estimated amount of emission reductions over the chosen crediting period:

Year	Annual Emission Reduction (tCO2e)		
	Project A	Project B	Total
2006	6,799	2,250	9,048
2007	10,900	3,633	14,533
2008	10,900	3,633	14,533
2009	10,900	3,633	14,533
2010	10,900	3,633	14,533
2011	10,900	3,633	14,533
2012	10,900	3,633	14,533
2013	10,900	3,633	14,533
2014	10,900	3,633	14,533
2015	10,900	3,633	14,533
September 2016	4,101	1,384	5,485
Total for a crediting period of 10 Year	108,996	36,332	145,328
Annual average estimated reduction of CO2e over the crediting period (tonne of CO2e)			Project A 10,900 Project B 3,633 Total 14,533

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

No Public funds were used in this Project.

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

The project activity is not a de-bundled component of a large project activity as there is no registered small scale project activity or application to register another project activity ;

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

SECTION B. Application of a baseline methodology:

B.1. Title and reference of the approved baseline methodology applied to the small-scale project activity:

Project Type: I Renewable energy project
Project Category: I D Renewable electricity generation for a grid
Reference: Appendix B of the simplified M&P for small scale CDM project activities (UNFCCC, I.D / Version 8: Scope 1 Effective from 03, March 2006)
Approved baseline methodology: AMS-I.D. : Grid connected renewable electricity generation

B.2 Project category applicable to the small-scale project activity:

The project activity is for renewable power generation, connected into Western region grid system. The western region grid is fed by generating plants using fossil fuels such as coal, natural gas, diesel and non-fossil fuel such as hydro, nuclear, and RES (SHP, BG, BP U&I, and wind energy). Reference is made to "Indicative simplified baseline and monitoring methodologies for selected small-scale CDM project activity categories" I.D./Version 08 Scope 1 dated 03 March 2006. The following option has been selected for calculating the baseline for a Type I D project.

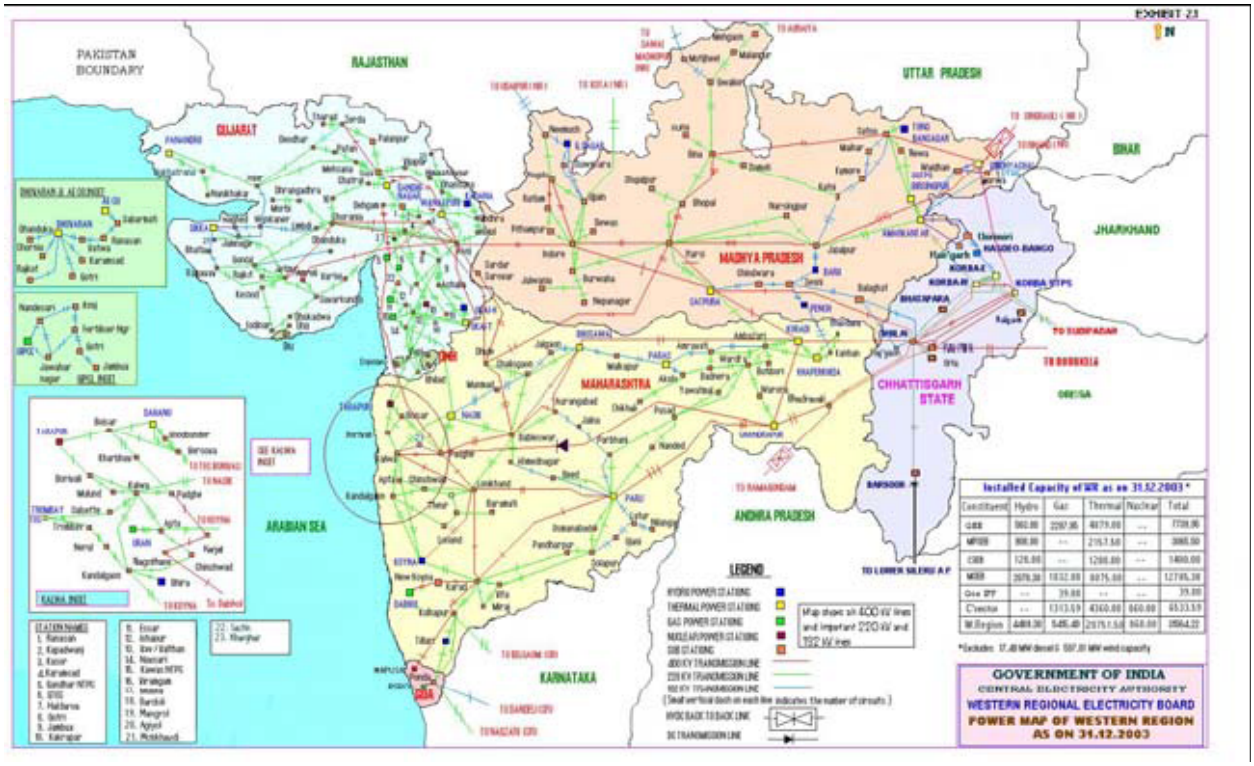
a. The "approximate operating margin" is the weighted average emissions (in kg CO2equ/kWh) of all generating sources serving the system, excluding hydro, geothermal, wind, low-cost biomass, nuclear and solar generation;

b. The "build margin" is the weighted average emissions (in kg CO2equ/kWh) of recent capacity additions to the system, based on the most recent information available on plants already built for sample group m at the time of PDD submission.

Grid system of the proposed project activity:

In India, electricity network is divided into regional grids such as northern, western, southern, eastern and north-eastern. The state of Maharashtra is in Western Region grid. The Western Region grid is managed by Western Region Electricity Board (WREB) consisting of five states (Maharashtra, Madhya Pradesh, Chhattisgarh, Gujarat and Goa) and 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 causing dynamic variance between states due to inter-state power transactions.

Map of the Western Region Grid



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.

B.3. 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:

Technology / Measure for AMS-I.D	Measure of the project activity
This category comprises renewable energy generation units, such as photovoltaic, hydro, tidal/wave, wind, geothermal, and renewable biomass, that supply electricity to and/or displace electricity from an electricity distribution system that is or would have been supplied by at least one fossil fuel fired generating unit	The project activity uses wind energy, which is a renewable energy generation unit. The generated energy is supplied to Western Region grid which is being supplied using fossil fuels such as coal, natural gas, diesel and non-fossil fuel such as hydro, nuclear, and RES (SHP, BG, BP U&I, and wind energy).
If the unit added has both renewable and non-renewable components (e.g. a wind/diesel unit),	The unit added has only renewable component, which is wind energy. The capacity of the

the eligibility limit of 15MW for a small-scale CDM project activity applies only to the renewable component. If the unit added co-fires fossil fuel, the capacity of the entire unit shall not exceed the limit of 15MW.	project activity is 10 MW only.

It is evident from the above table that the project activity meets all the applicable conditions of the approved small scale methodology AMS-I.D Category I.D – Grid connected renewable electricity generation as specified in "Indicative simplified baseline and monitoring methodologies for selected small-scale CDM project activity categories" I.D./Version 08 Scope 1 dated 03 March 2006

Justification for additionality of the Project

UNFCCC simplified modalities require to prove additionality of the project activity by identifying at least one barrier among the following from the list in the attachment A to Appendix B of the UNFCCC simplified modalities. At least one barrier shall be identified as a barrier, due to which the project would not have occurred anyway.

1. Investment Barrier:
   The total investment made by Ghodawat Industries and Topaz Investment on these project A and B in the proposed project activity is about Cad$ 11,882,485.03 at 7.5% discount rate over the period of 10 years, with a equity / debt ratio of about 50:50. The equity has been arranged through Ghodawat and Topaz, through their available resources. The debt has been arranged through financial institution. The project activity was undertaken with an aim to repay the debt, meet the operation expenses in running the WTG to generate the power to be wheeled to the western regional grid, additionally create a source of income base to invest on alternate fuel and clean energy projects. The total capital cost and 10 years O&M cost is Cad$ 11,882,485.03. The cost per MW is about CAD$ 1.2 million, which is considered high as compared to other renewable energy projects. The WTG has a load factor of about 20 – 22%, which further brings down the attraction to invest on this project activity, resulting in reduced present worth value of the project activity. The net present worth of the project activity considering the power tariff through power purchase plan between state electricity board MSEB and Ghodawat (Project A) and Topaz (Project B) works out to be CAD$ 1,858,587.83 at 7.5% discount rates, during the span of 10 years for total investment worth of CAD$ 13,741,072.86. This is considered very small compared to other energy generation projects investment. This low net-present-worth value is a high deterrent, compared to the opportunity for return-on-investment from other power generation projects is higher. Thus, an investment barrier exists for this project activity.

2. Regulatory Risk:
   Reference has been made in the following discussion, to the following paper "Approach paper for introduction of Renewable Purchase specification' RPS within Maharashtra". The tariff determination process follows the following regulatory process.

   As per Section 61 of EA 2003 in
   the matter of Tariff Regulations, Appropriate Commission is required to specify the

terms and conditions for the determination of Tariff, in accordance with the provisions of the Act. Further, as per sub-section (h) of Section 61 of EA 2003, while specifying the terms and conditions for tariff, the Commission shall be guided by promotional aspect as regards renewable energy sources.

The national tariff policy stipulates that it will take some time before non-conventional technologies can compete with conventional sources in terms of cost of electricity. Therefore, procurement by distribution companies shall be done at preferential tariffs for RE, determined by the Appropriate Commission. From the above From the above, it is clear that promotional aspect for renewable is not only limited to 'tariff' related to matters but also need to address various associated issues that influences growth /harnessing of renewable energy such as purchase obligation as percentage of consumption by all.

Following table indicates RE potential and installed generation capacity of various types of RE sources excluding solar energy as on 31st December 2005 within Maharashtra.(as on 31-Dec-2005) – Source MEDA

Sr. No.	**Types of RE Sources**	**Potential of RE in Maharashtra (MW)**	**Achievement in MW (installed)**
01	Wind	3650	703.00
02	Small Hydro	599.47	206.33
03	Co-generation	1250	73.5
04	Biomass	781	14
05	MSW & Liquid Waste	287	0
06	Industrial Waste	350	6.13
	Total	6917.47	1002.96

In this context, the current allowance for windmill energy in regulatory framework regime:

Wind Power

- Order dated 24th November in the matter of Case no. 17(3), 3, 4 & 5 of 2002 for procurement of wind energy and wheeling for third part sale and / or self use.
- The Tariff rate has been determined for various categories of wind energy projects classified as Group-I, Group-II and Group-III.
- New wind power capacity (Group-III) to be permitted for sale to Utilities shall not be more than 750 MW during the balance period of 4 years of the 10th Plan Period ending 31st March 2007.
- The Commission shall review the tariff rate and the tariff structure for wind power projects after 31st March, 2007 or on addition of 750 MW of additional wind capacity after 1st April, 2003, whichever is earlier.

Three factors contributing to the regulatory risks are:

1. Agricultural subsidy being practiced by the regulatory framework in India to promote agricultural sector, with a possible influence on the market pricing of electricity and specifically wind energy and therefore possible tariff change affecting the Power Purchase Plan it might have.

2. The likelihood of changes in future to sector allowance currently targeted to be 750 MW during the balance period of 4 years of the 10th Plan Period ending 31st March 2007.

3. The future risks associated with tariff rates during the review by commission on 31 March, 2007 or when 750MW wind energy power exceeded

Subsidies, in the form of huge tax concessions and preferential tariff given to wind power projects in Maharashtra, has provided incentives to the investors to take up the risk. However, from future stand point, changes to pricing and tariff due to changes in sector allowances, subsidies provided to other sectors such agriculture and the inability to sustain the provision of incentives for wind energy project from tax concessions and preferential tariff, there is an impending barrier beyond 31 March 2007 for wind energy projects by MERC (Maharashtra Electricity Regulatory Commission).

3. Technological Barrier:
In the advent of MW class of 1.25MW implementation in India recently, it has gaining acceptance among investors. However, there is an inherent risk associated with WEGs in producing power dependent on wind availability. Coupled with it, the recently inducted MW class WEGs has not established a consistent and proven performance pose a technological barrier, in comparison to technological comfort provided by other conventional energy projects.

4. Barrier due to prevailing practice:

Sl. No	**Region**	**Hydo**	**Thermal**				**Nuclear**	**RES**	**Total**
			Coal	**Gas**	**DSL**	**Total**			
1	Northern	11070.79	17382.50	3213.19	14.99	20610.68	1180.00	920.46	33781.93
2	Western	6476.33	20914.50	5074.72	17.48	26006.70	1300.00	1084.71	34867.74
3	Southern	11026.39	15992.50	3201.20	939.32	20133.02	830.00	3829.52	35818.93
4	Eastern	2466.52	13813.58	190.00	17.20	14020.78	0.00	193.40	16680.70
5	N. Eastern	1095.02	330.00	750.50	142.74	1223.24	0.00	124.81	2443.07
6	Island	0.00	0.00	0.00	70.02	70.02	0.00	5.42	75.44
7	**All India**	**32135.05**	**68433.08**	**12429.61**	**1201.75**	**82064.44**	**3310.00**	**6158.32**	**123667.81**

@ Renewable Energy Sources (RES) includes SHP, BG, BP, U&I, and Wind Energy from Executive summary report from CEA: http://www.cea.nic.in/power_sec_reports/Executive_Summary/2005_12/6.pdf

It is evident from the above table that the share of installed capacity of wind energy under Renewable Energy Source (RES) is very decimal for Western Region and in India largely. Hence wind energy is not a prevailing practice in India.

Impact of CDM registration

Registering the project activity as CDM project upon approval would provide additional revenue to the project activity improving the cash flow. The financial impact on the project activity due to additional CER revenue would be positive, improving the success rate of the project. It has been estimated that the net present worth (NPV) would be CAD 3,602,523.83 instead of CAD 1,858,587.83 with out CER revenue. The CER revenue is almost doubling the present worth value of the project, over 10 year span with a discount rate of 7.5%.
The Project proponents were well aware of the impacts of CDM registration when the decision was made to go ahead with the project. Suzlon Energy always highlights the extra revenue that can be received from Carbon Credits Trade while showing the potential in wind power electricity.

B.4. Description of how the definition of the project boundary related to the baseline methodology selected is applied to the small-scale project activity:

The simplified modalities and procedures for small-scale CDM project activities defines project boundary encompasses the physical geographical site of the renewable generation source. In the case of India, the perspective planning, monitoring of implementation of power project is the responsibility of Ministry of Power, Government of India. At the state level, the state utilities or state boards (SEBs) are responsible for supply, transmission, and distribution of power. Since the CDM project would be supplying to the regional grid it is preferred to take the regional grid as the project boundary than the state boundary. It also minimizes the effect of inter state power transactions, which are dynamic and widely varying. The project activity evacuates the power to the Western Region Grid. Therefore all the power plants contributing electricity to the Western Grid are considered for the purpose of base line estimation.

B.5. Details of the baseline and its development:

The base line calculations are carried out hereunder:

A.) The weighted average of emissions (in kg CO2 equ / kWh) of the current generation mix in Western Region for Thermal power plants.

States	Name of station - No of Units installed Capacity	Installed Capacity MW	Design Heat Rate kcal / kwh	2003-2004 Operating Heat Rate kcal / kwh	2004-2005 Generation (MU)	Operating Heat Rate kcal / kwh
	Wester Region					
1	**GUJARAT**					
	Sikka RPL 2*120	240	2389	2837	1408	3026
	Kutch Lignite 2*70 +1*75	215	2745	3555	769	3867
	Wanakbori - 7*210	1470	2344	2513	10883	2539
	GandhinagarTPS2*120+3*210	870	2336	2536	4979	2542
	Ukai---2*120+2*200+1*210	850	2403	2675	5063	2681

2	**CHATTISGARH**					
	Korba East (III) 2*120	240	2369	3007	901	2918
	Hasdeo Korba West (I) 2*210 (Unit:1&2)	420	2439	2894	2035	2695
	Hasdeo Korba West (II) 2*210 (Unit:3&4)	420	2398	2827	2723	2674
3	**MADHYA PRADESH**					
	Satpura(Ph-II)--1*200+1*210	410	2394	2996	2626	3035
	Satpura(Ph-III)--2*210	420	2370	2892	2934	2901
	Birsingpur (II) 2*210	420	2293	2806	3027	2885
	Amarkantak (Ph-II)-- 2*120	240	2350	3807	921	3977
4	**MAHARASHTRA**					
	K'kheda- 4*210	840	2254	2516	6289	2641
	Koradi 4*120 + 1*200 +2*210	1100	2399	2890	6444	2952
	Paras 1*62.5	62.5	2686	3107	393	3343
	Parli 2*30 +3*210	690	2424	2657	4895	2649
	Chandrapur--4*210+3*500	2340	2278	2385	15924	2600
	Nasik 2*140+3*210	910	2348	2551	5694	2582
	Bhusawal TPS---1*62.5+2*210	482.5	2406	2562	3291	2670
	Total					
	Total (WESTERN REGION)	**12640**	**2357**	**2637**	**81198**	**2712**

*****CEA - Performance Review of Thermal Power Stations 2004-05 PAGE No.13.1*

Estimation of emissions based on heat rate using the following formula.

Emissions (kg/ kWh) = heat rate (kcal/ kWh) × emission factor (kg/kg) / Calorific value (kcal/kg)

Total CO2 emissions from power plant in a year are estimated from net annual generation.

Plant emission (ton) = net emissions (kg/kWh) x net generation / 1000

Total generation from thermal only is calculated as follows:

Baseline (thermal only) (kg/kWh) = total regional emissions (kg) / total net generation (thermal) (kWh)

Total regional emission (ton) = Σ plant emissions (ton)

Year / Baseline	2001-2002	02-03	03-04	04-05	05-06	06-07	07-08	08-09	09-10	10-11	11-12
Western - Thermal kg/kWh	1.021	0.992	0.993	0.993	0.995	1.002	0.959	0.959	0.959	0.959	0.962

**Baseline for different regions in India by CEA Page 28*

B.)The baseline is calculated using the combined margin approach.

Combined Margin

The baseline methodology suggests that the project activity will have an effect on both operating margin (i.e. the present power generation sources of the grid, weighted according to the actual participation in the regional grid mix) and the build margin (i.e. weighted average emissions of recent capacity additions) of the selected grid and the baseline emission factor would therefore incorporate an average of both these elements.

Operating Margin

The existing power plants using hydro, wind, geothermal, low-cost biomass, nuclear and solar have been excluded. The following table lists the generation details of power using the remaining fuel types, along with capacity of each plant, design heat rate of fuel type used, along with operating heat rate for 2003-2004 and 2004-2005. The table finally includes the generated power in MU.

Considering data available for thermal power plants from annual reports by CEA, the operating margin emission factor has been calculated in section E as follows:

Year / Baseline	2002-2003	2003-04	2004-05
$EF_{om,y}$ in kg/kWh	0.955	0.923	0.922

The average Operating Margin EFom (average of the above three values) = 0.933 kg CO2equ / kWh.

Build Margin

The project activity will have some effect on the Build Margin (BM) of the western regional electricity grid. The baseline factor as per the Build Margin takes into consideration the delay effect on the future projects and assumes that the past trend will continue in the future. As per the baseline methodology, the baseline factor for Build Margin is calculated as the weighted average emissions of recent capacity additions to the system, defined as the greater (in MWh) of most recent 20% of plants built or the 5 most recent plants. In case of western regional electricity grid capacity additions (in MWh) of most recent 20 % of the existing plants are greater than that of 5 most recent plants. The thermal efficiencies of coal and gas based plants for calculating build margin has been assumed same as that for calculating operating margin. The formulae and calculations are presented in Section-E.

Carbon Emission Factor of grid as per BM is 0.653 kg CO_2equ/kWh electricity generation.

Net Carbon Emission Factor of Western Region Grid by combined margin average of EF_{om} + EF_{bm}

EF = 0.793 kg CO2 equ. / kWh.

SECTION C. Duration of the project activity / Crediting period:

C.1. Duration of the small-scale project activity:

C.1.1. Starting date of the small-scale project activity:

The Projects have 2 different Start dates according to the schedule of completing the construction of the windmills at the site.

We have 4 Windmills totaling 6 MW Commissioning by 1st April 2006 and 4 Windmills of 6 MW commissioning by 1st July 2006.

Project ID	Project Owner	Electricity Potential	Commissioning Date
A	Ghodawat Industries (India) Ltd	4.75MW	3 on 1st April 2006
A	Ghodawat Industries (India) Ltd	1.25MW	1 on 1st July 2006
B	Topaz Investments Pvt. Ltd	1.25MW	1 on 1st April 2006
B	Topaz Investments Pvt. Ltd	1.25MW	1 on 1st July 2006

C.1.2. Expected operational lifetime of the small-scale project activity:

20 years

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

Fixed Crediting Period

C.2.1. Renewable crediting period:

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

C.2.1.2. Length of the first crediting period:

C.2.2. Fixed crediting period:

C.2.2.1. Starting date:

1st April 2006

C.2.2.2. Length:

10 years

SECTION D. Application of a monitoring methodology and plan:

D.1. Name and reference of approved monitoring methodology applied to the small-scale project activity:

This Project will be monitored under the Section 13 of the simplified modalities & procedures for small-scale CDM-project activities under Category ID – *Grid connected renewable electricity generation*.

D.2. Justification of the choice of the methodology and why it is applicable to the small-scale project activity:

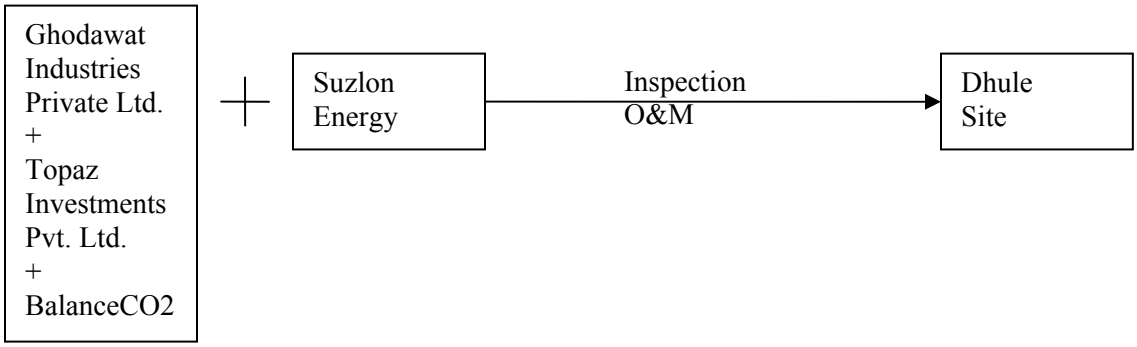
The Project here is generating electricity using Wind Power and hence it is using a Renewable source. This makes the applicable methodology as ID and the monitoring will be performed using the procedure mentioned in the document 'Simplified Modalities and Procedures for Small-Scale CDM project activities'

D.3 Data to be monitored:								
ID Number	**Data Variable**	**Data Unit**	**Measured(m), calculated (c) or estimated (e)**	**Recording Frequency**	**Proportion of Data to be recorded**	**How will the data be archived?**	**How long is the archived data to be kept?**	**Comment**
E_{Gen}	*Electricity*	*KWh*	*Measured (m)*	*Continuous*	*100%*	*Electronic*	*2 years from the crediting period (12 years)*	*Monthly MSEB certificates provided for generation of electricity will be used for calculation of the emissions.*

D.4. Qualitative explanation of how quality control (QC) and quality assurance (QA) procedures are undertaken:

ID Number	Data Monitored	Uncertainty level of Data (High/Medium/Low)	Explain why QA/QC procedures are or are not being planned
Q_1	Electricity Generation	Low	The data will be used for calculation of the Electricity Generated. The electricity generated represents the effective displacement of Carbon dioxide from the Atmosphere.

D.5. Please describe briefly the operational and management structure that the project participant(s) will implement in order to monitor emission reductions and any leakage effects generated by the project activity:



Ghodawat Industries has signed a long term Operation and Maintenance contract with Suzlon Energy Ltd. The contract requires Suzlon Energy to maintain optimum functionality of the Windmills at all times. Suzlon Energy will also replace any worn out parts in the windmills. This agreement provides the most optimum operation of the windmills resulting in maximum extraction of energy from the wind patterns at the site.

As a part of this contract Suzlon Energy has site engineers with supporting personnel who regularly visit the site for inspection and maintenance of the windmills. Ghodawat Industries Private Ltd. and Topaz Investments Pvt. Ltd. also has its own personnel visiting the site occasionally to inspect and supervise any maintenance operations on the windmills.

D.6. Name of person/entity determining the monitoring methodology:

BalanceCO2 Ltd.
99 Prairie Dunes Place,
Concord, ON L4K 2E4
Canada.

SECTION E.: Estimation of GHG emissions by sources:

E.1. Formulae used:

Since approved small scale methodology AMS I.D does not indicate formula to calculate the GHG emission reduction by source, no specific formula is used. Since the project activity is a wind energy project, GHG emission by source is not applicable.

E.1.1 Selected formulae as provided in appendix B:

No formula is applicable, since the project activity generating power using wind energy does not entail causing anthropogenic GHG emission within the project boundary.

E.1.2 Description of formulae when not provided in appendix B:

No formula is applicable, since the project activity generating power using wind energy does not entail causing anthropogenic GHG emission within the project boundary

E.1.2.1 Describe the formulae used to estimate anthropogenic emissions by sources of GHGs due to the project activity within the project boundary:

No formula is applicable, since the project activity generating power using wind energy does not entail causing anthropogenic GHG emission within the project boundary

E.1.2.2 Describe the formulae used to estimate leakage due to the project activity, where required, for the applicable project category in appendix B of the simplified modalities and procedures for small-scale CDM project activities

As per category I.D of Appendix B of the simplified M&P for small scale CDM project activities (UNFCCC, I.D / Version 8: Scope 1 Effective from 03, March 2006), there are no leakage issues associated with this project activity where new WTG are installed.

E.1.2.3 The sum of E.1.2.1 and E.1.2.2 represents the small-scale project activity emissions:

Year	Project emissions (tCO2e)		
	Project emissions E.1.2.1	Project emissions E.1.2.2	Total
2006	0	0	0
2007	0	0	0
2008	0	0	0
2009	0	0	0
2010	0	0	0

2011	0	0	0
2012	0	0	0
2013	0	0	0
2014	0	0	0
2015	0	0	0
2016	0	0	0
Total	0		

E.1.2.4 Describe the formulae used to estimate the anthropogenic emissions by sources of GHGs in the baseline using the baseline methodology for the applicable project category in appendix B of the simplified modalities and procedures for small-scale CDM project activities:

As per paragraph 7 of Type I.D. described in Appendix B of the simplified modalities and procedures for small-scale CDM project activities, the baseline is the kWh produced by the renewable generating unit multiplied by an emission coefficient (measured in kg CO_2 equ/ kWh). Western Region Grid is considered for baseline analysis and calculation of anthropogenic emissions by fossil fuels during power generation. The baseline value is estimated through the average of the approximate operating margin and built margin of Western Region Grid. Formula used for estimation of the anthropogenic emissions by sources of greenhouse gases of the baseline is as under.

Emission Reduction by project activity

$ER = (TP_{exp} \times EF) – PE - EL$

Where,

ER - Emission reduction per year by project activity (tonnes CO_2 eq/year)
TP_{exp} - Total power exported to grid per year in MWh
EF - Baseline emission factor (kg CO_2/kWh)
PE - Project emissions [= 0]
EL - Emission due to leakage [=0]

Western Regional grid is considered for baseline analysis and calculation of anthropogenic emissions by fossil fuels during power generation. As mentioned already, in the Western Region generation mix, coal, gas and diesel based power projects are responsible for GHG emissions.

Estimation of baseline emission factor

The baseline emission factor as per option (a) mentioned in Para 7 of the latest version AMS I.D dated 3 March 2006 stated hereunder:

The average of the approximate operating margin and the build margin (combined margin approach). The average of the "approximate operating margin" and the "build margin", where:

i)The "approximate operating margin" is the weighted average emission (in $kgCO_2eq/kWh$) of all generating sources serving the system, excluding hydro, geothermal, wind, low cost biomass, nuclear and solar generation;

ii) The "build margin" is the weighted average emissions (in $kgCO_2eq/kWh$) of recent capacity additions to the system which capacity additions are defined as the greater (in MWh) of most recent 20 % of existing plants or the 5 most recent plants;

Formula used for estimation of the anthropogenic emissions by sources of greenhouse gases of the baseline is as under.

Baseline Power generation

$P_{wlc} = P_{tot} - P_{lrc}$

Where,

P_{wlc} - Power generation by all sources, excluding hydro, biomass and nuclear.

P_{tot} - Power generation by all sources of grid mix.

P_{lrc} - Power generation by hydro, nuclear, biomass projects

Sector wise baseline Power generation

$$\mathbf{P_{fuel} = (P_f \ / \ P_{wlc}) * 100}$$

$\mathbf{P_{fuel}}$ - Share in % of power by each fuel (coal, Gas and diesel out of total power generation excluding P_{lrc}

$\mathbf{P_f}$ - Power generated by fuel used. (in GWh)

Calculation of Operating Margin emission factor

$$\mathbf{EF_{OM}} = \sum \mathbf{P_{fuel}} \ \mathbf{X} \ \mathbf{EF_{fuel}}$$

Where,

$\mathbf{EF_{OM}}$ Operating margin emission factor of baseline (kg/kWh)

$\mathbf{EF_{fuel}}$ Emission factor (actual or IPCC) for each fuel type considered (e.g. coal, gas, etc.).

Calculation of Build Margin emission factor for each source of baseline generation mix

$\mathbf{EF_{BM}}$ = weighted average of emission by recent 20% capacity additions.

Where,

$$EF_{BM}\ (kg/kWh) = \{ \Sigma\ [\ P'_{fuel}\ X\ EF'_{fuel}\ ] / \Sigma\ P'_{fuel} \}$$

Combined Margin Factor

$EF_B = (EF_{OM} + EF_{BM\ r}) / 2$ (in kg/kWh)

Year	Project - A		Project - B		Project A & B	
	Units	Emissions	Units	Emissions	Units	Emissions
2006	8,605,800	6,799	2,847,600	2,250	11,453,400	9,048
2007	13,797,000	10,900	4,599,000	3,633	18,396,000	14,533
2008	13,797,000	10,900	4,599,000	3,633	18,396,000	14,533
2009	13,797,000	10,900	4,599,000	3,633	18,396,000	14,533
2010	13,797,000	10,900	4,599,000	3,633	18,396,000	14,533
2011	13,797,000	10,900	4,599,000	3,633	18,396,000	14,533
2012	13,797,000	10,900	4,599,000	3,633	18,396,000	14,533
2013	13,797,000	10,900	4,599,000	3,633	18,396,000	14,533
2014	13,797,000	10,900	4,599,000	3,633	18,396,000	14,533
2015	13,797,000	10,900	4,599,000	3,633	18,396,000	14,533
2016	5,191,200	4,101	1,751,400	1,384	6,942,600	5,485
Total	137,970,000	108,996	45,990,000	36,332		
Total A & B	**183,960,000 units**		**145,328 tones of CO2 equ. emission**			

E.1.2.5 Difference between E.1.2.4 and E.1.2.3 represents the emission reductions due to the project activity during a given period:

E.1.2.3 represents emission due to project activity is equal to zero in this case.

E.2 Table providing values obtained when applying formulae above:

Year	Baseline Emissions for Project A and B bundled (tCO_2)
2006	9,048
2007	14,533
2008	14,533
2009	14,533
2010	14,533
2011	14,533
2012	14,533
2013	14,533
2014	14,533
2015	14,533
2016	5,485
Total	**145,328**

SECTION F.: Environmental impacts:

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

The host Party, i.e. Ministry of Environment and Forest, Government of India, does not require Environmental Impact Assessment EIA of windmill projects.
Environment Impact Notification S.O.60(E) Dated 27/01/1994 and amendment notice EO Dated 04/07/2005, 32 sectors covered under Schedule 1 with project cost of more than Rs 50,000 are required to conduct EIA. However Windmill Projects are not covered under Schedule 1 and thus EIA is not required.

SECTION G. Stakeholders' comments:

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

Meeting with the Local Community: Since the project site is at a remote location the stakeholders from the nearby villages were invited. The residents of the surrounding areas did not have any adverse comments about the activity. People have appreciated the local employment growth resulting from the activities being performed at the site. The activity has also resulted in increased infrastructure being setup in these remote parts of Maharashtra.

G.2. Summary of the comments received:

There were no adverse comments from stakeholders.

Summary of comments received:

- People were appreciative of the new employment opportunities now created because of the project activities.
- The local infrastructure like Roads to the sites has helped in upbringing the facilities in the remote parts of India.
- The Power generated from these windmills helps the Western Grid and India as a result achieve fulfillment of the demand of electricity in a cleaner form.

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

There were no adverse comments received for the activities performed under these Projects. Thus there were no actions taken in addition to the regular project activity.

Annex 1

CONTACT INFORMATION ON PARTICIPANTS IN THE PROJECT ACTIVITY

Organization	Ghodawat Industries (India) Ltd.
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Fax	+91 (2322) 2552059
Email	sanjay555@sancharnet.in
URL	
Represented By	
Name	MR. SANJAY GHODAWAT
Title	President

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State/Region	Karnataka
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Fax	
Email	
URL	
Represented By	
Name	MR. Yogesh Datar
Title	President

Annex 2

INFORMATION REGARDING PUBLIC FUNDING

No Public funds were used in this project activity