CLEAN DEVELOPMENT MECHANISM
PROJECT DESIGN DOCUMENT FORM (CDM-PDD)
Version 03 - in effect as of: 28 July 2006

CONTENTS

SECTION A. General description of project activity

A.1 Title of the project activity:

"40 MW Grid Connected Wind Power Project" by BP Energy India Private Limited in the Maharashtra, India
Version : 01
Date : 15 March 2006

A.2. Description of the project activity:

The proposed project activity involves capital investment for the construction, commissioning, and safe operation of a 40 MW wind farm to produce zero-carbon electric power in the district of Dhule, state of Maharashtra, India. The investment will be made, in its entirety, by BP plc through a wholly-owned domestic subsidiary (BP Energy India Private Limited). Construction of the project is scheduled to begin in the first quarter of 2007 and the commercial operation date of the project is expected to be 1 October 2007.

The investment will reduce GHG from India's power sector and help meet the growing demand for electricity in the region. More than seventy-five thousand tonnes of carbon dioxide will be avoided each year as a result of the project activity.

The project activity will entail the installation and long-term operation of 32 wind electric generators (WEGs), each one with a rated capacity of 1.25 MW. The generated power will be supplied to the high voltage electrical grid through a common sub-station owned by the Maharashtra State Electricity Distribution Company Ltd (MSEDCL). It is anticipated that the power will be sold under a power purchase agreement (PPA) to the MSEDCL, although at the time of writing a PPA has not yet been executed.

All 32 WEGs will be connected to a single sub-station and there will be one metering point. The technology and equipment supplier is Suzlon Energy Limited, India's leading wind turbine manufacturer. The operation and maintenance of the WEGs will be carried out by Suzlon Windfarm Services Limited.

The proposed CDM Project Activity addresses the following aspects of sustainable development:

Social well-being:
The project activity will have positive impacts on social well-being through direct and indirect employment in India. At a local level, both skilled and unskilled jobs will be created throughout the construction of the project and its ongoing operation and maintenance. At a national level, employment in turbine and balance of plant component manufacturing will be maintained. In addition, the project activity will require infrastructure investment in facilities such as roads and electrical transmission.

Economic well-being:

The project activity is the first significant investments by a foreign entity in India's wind power generation market. Successful implementation of the project will serve as a demonstration of the potential for foreign investment in India's wind power sector and may lead to more extensive foreign direct investment, helping to diversify the power generation mix in the region. The project activity will reduce the country's dependence on fossil fuels while narrowing the existing electricity supply gap in the State of Maharashtra.

Environmental well-being:
The project activity will generate electricity using a zero-carbon source of energy and will avoid the air quality impacts associated with fossil fuel combustion. Unlike both fossil-fuel and nuclear generation, wind energy does not require the use of water for cooling and therefore eliminates a strain on local freshwater resources. An environmental screening report has been carried out on behalf of the project sponsors by Environmental Resource Management (ERM) with the objective to assess potential environmental and social risk factors from the project and to propose options for managing these impacts. An internal recommendation to proceed with the project issued based upon the outcome from the environmental/social screening study and site visits conducted by BP staff responsible for health, safety, and environmental (HSE) issues.

A.3. Project participants:

Name of the Party involved (*) ((host) indicates a host Party)	*Private and/or public entity(ies) project participants (*) (as applicable)*	*Do the parties involved wish to be considered as project participant (Yes/No)*
Ministry of Environment and Forests (MoEF), Government of India	*BP Energy India Private Limited (the project investor; a 100% owned subsidiary of BP plc)* *BP Gas Marketing Limited (the purchaser of Certified Emissions Reductions; a 100% owned subsidiary of BP plc)*	*No*

A.4. Technical description of the project activity:

A.4.1. Location of the project activity:

A.4.1.1. Host Party(ies):

India

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

Maharashtra

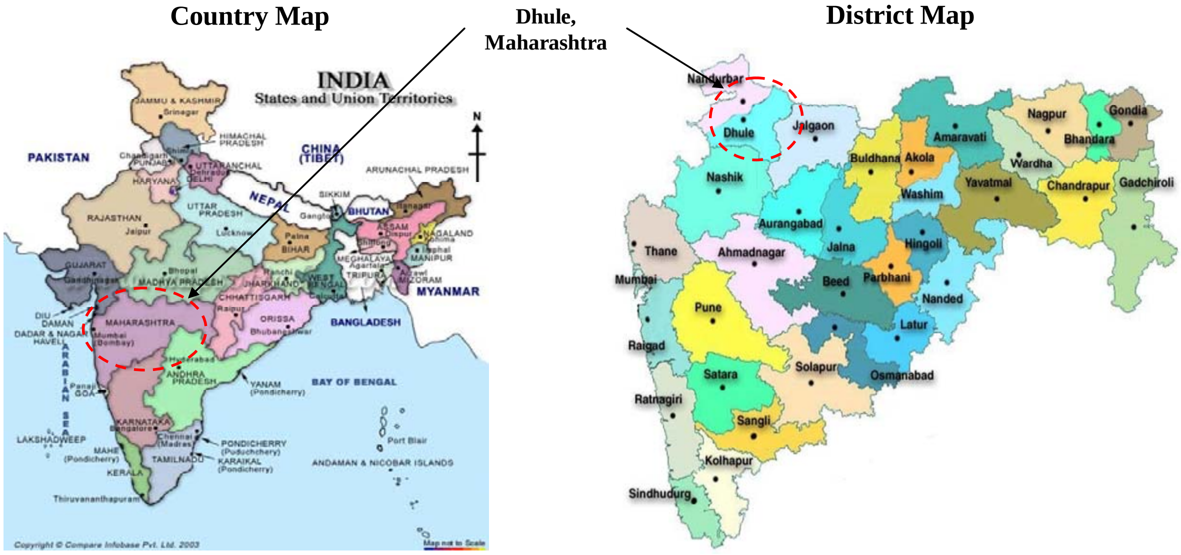
A.4.1.3. City/Town/Community etc:

Village : Brahmanvel
District : Dhule

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

The project activity is situated in the Brahmanvel village of the Dhule district in Maharashtra. The project is located between Latitudes 21° 12’ and 21° 14’ North and between Longitudes 74° 09’ and 74° 13’ East with an average elevation varying from 540 to 560 m above mean sea level.

Country Map **Dhule, Maharashtra** **District Map**



A.4.2. Category(ies) of project activity:

The project activity is considered under UNFCCC-CDM category “Zero emissions – grid connected electricity generation from renewable sources” that generates electricity in excess of 15 GWh per year. The project activity may be primarily categorised as follows:

Scope number : 1
Sectoral Scope : Energy Industries (renewable/non-renewable sources)

A.4.3. Technology to be employed by the project activity:

The project activity involves the installation of 32 WEGs manufactured by Suzlon Energy Ltd. Each WEG has a rated capacity of 1,250 kW. The WEGs have high-speed asynchronous generator with a multi-stage intelligent switching compensation system designed for high output efficiency.

The technical specifications of the 1,250 kW WEG is given below:

Technical Specifications

Description	Specifications
Tower/Rotor Height	74 m
Rotor Diameter	69.1 m
Installed electrical output	1250 kW
Annual generation of individual WEGs as per the guaranteed generation	2,468 MWh
Cut-in wind speed	3 m/s
Rated wind speed	12 m/s
Cut-out wind speed	20 m/s
Rotor swept area	3750 m2
Rotational speed	13.2/19.8
Rotor material	GRP
Regulation	Pitch
Generator	Asynchronous Generator,4/6 poles
Rated output	250/1,250 kW
Rotational speed	1,010/1,515 rpm
Operating voltage	690 V
Frequency	50 Hz
Protection	IP 56
Insulation class	H
Cooling system	Air-cooled
Gear Box	3 stage gear box, 1 planetary and 2 helical
Manufacturer	Winergy
Gear ratio	77.848
Nominal load	1390 kW
Type of cooling	Oil cooling system
Yaw Drive System	4 active electrical yaw motors
Yaw bearing	Polyamide slide bearing
Aerodynamic brake	3 times independent pitch regulation.
Mechanical brake	Spring powered disc brake, hydraulically released fail safe.
Control unit	Microprocessor controlled, indicating

Description	Specifications
	actual Operating conditions, UPS back up system
Design Standards	GL/IEC

A.4.4 Estimated amount of emission reductions over the chosen crediting period:

Years	*Annual Estimation of Emission Reductions (tonnes of CO_2 e)*
2007	*16,944*
2008	*69,749*
2009	*75,659*
2010	*75,659*
2011	*75,659*
2012	*75,659*
2013	*75,659*
2014	*75,659*
2015	*75,659*
2016	*75,659*
2017	*58,714*
Total Estimated Reductions *(tonnes of CO_2e)*	***750,679***
Total number of Crediting Years	*10*
Annual average over the crediting period of estimated reductions *(tonnes of CO_2e)*	*75,067*

Notes on Table A.4.4:
The quantity of tonnes of CO2 displaced during the first crediting year (2007) is based upon a presumption that the wind farm begins commercial operations on 1 October 2007 and therefore comprises 3 months of power generation.

The quantity of tonnes of CO2 displaced during the second crediting year (2008) is lower than the steady state level due to reduced wind farm availability (i.e. the ramp up period).

The quantity of tonnes of CO2 displaced during the final crediting year (2017) is lower than the steady state level based on the presumption that the crediting period will end on 30 September 2017, which is ten calendar years from the commercial start date.

A.4.5. Public funding of the project activity:

No public funds will be utilized to implement the project activity. The investment funds required for the project will be raised by the project promoter using its internal resources.

SECTION B. Application of a baseline and monitoring methodology

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

Title: "Consolidated baseline methodology for grid-connected electricity generation from renewable sources (ACM0002)"
Version : 06
Date : 19 May 2006

B.2 Justification of the choice of the methodology and why it is applicable to the project activity:

The following table indicates the applicability of the methodology in the context of the present project activity.

	Conditions	Applicability
Criterion 1	Applies to electricity capacity additions from: ▪ Run-of-river hydro power plants; hydro power projects with existing reservoirs where the volume of the reservoir is not increased ▪ New hydro electric power projects with reservoirs having power densities (installed power generation capacity divided by the surface area at full reservoir level) greater than 4 W/m^2 ▪ **Wind sources** ▪ Geothermal sources ▪ Solar sources ▪ Wave and tidal sources	Project activity involves generation of electricity from wind sources with 40 MW capacity addition in the Western Grid
Criterion 2	This methodology is not applicable to project activities that involve switching from fossil fuels to renewable energy at the site of the project activity, since in this case the baseline may be the continued use of fossil fuels at the site	The project does not involve fuel-switching or fossil fuel use
Criterion 3	The geographic and system boundaries for the relevant electricity grid can be clearly identified and information on the characteristics of the grid is available	Project activity will be located in Maharashtra and as per the Indian electricity system; Maharashtra falls in the western regional grid. The "Western Grid" electricity system and

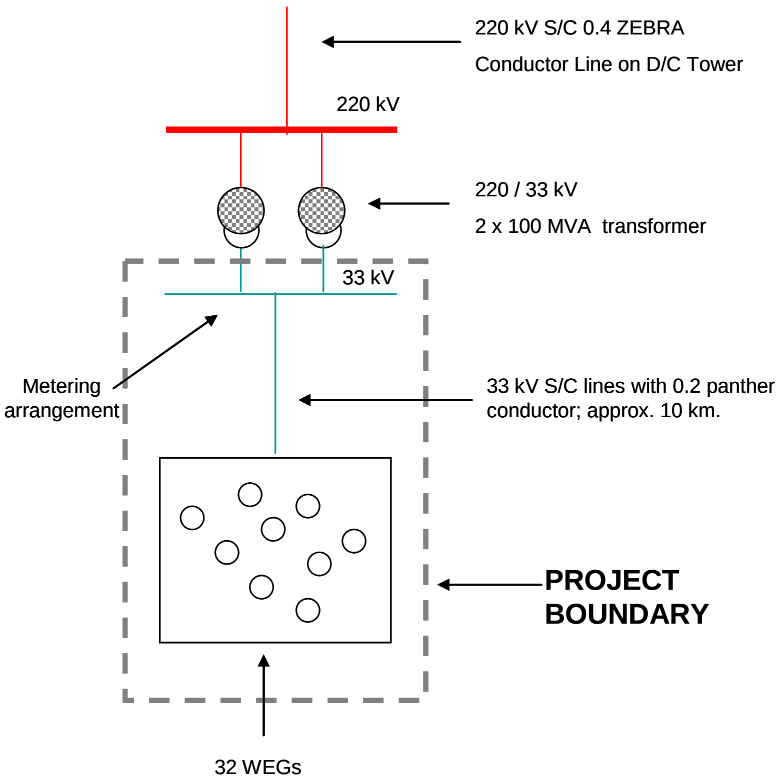
	Conditions	Applicability
		boundary is well defined. All the details pertaining to the same can be assessed through the Central Electricity Authority website. http://www.cea.nic.in/

B.3. Description of the sources and gases included in the project boundary

As per the approved methodology, ACM0002, *"the **spatial** extent of the project boundary includes the project site and all power plants connected physically to the electricity system that the CDM project power plant is connected to."*

In the context of the proposed project activity, the *"spatial extent of the project boundary"* would be the project site where all the 32 WEGs will be physically connected to a single substation that converts the voltage of the electricity and transfers it to the state-owned power transmission system.

Figure 1. Schematic of the Project Boundary



GHG emissions that can be characterized as occurring beyond the boundary of the project activity include those from other power plants connected to the high voltage transmission system. Those emissions do, however, comprise the baseline for the project activity. The details of all the power plants included in the project baseline can be found in Annex 3.[1]

B.4. Description of how the baseline scenario is identified and description of the identified baseline scenario:

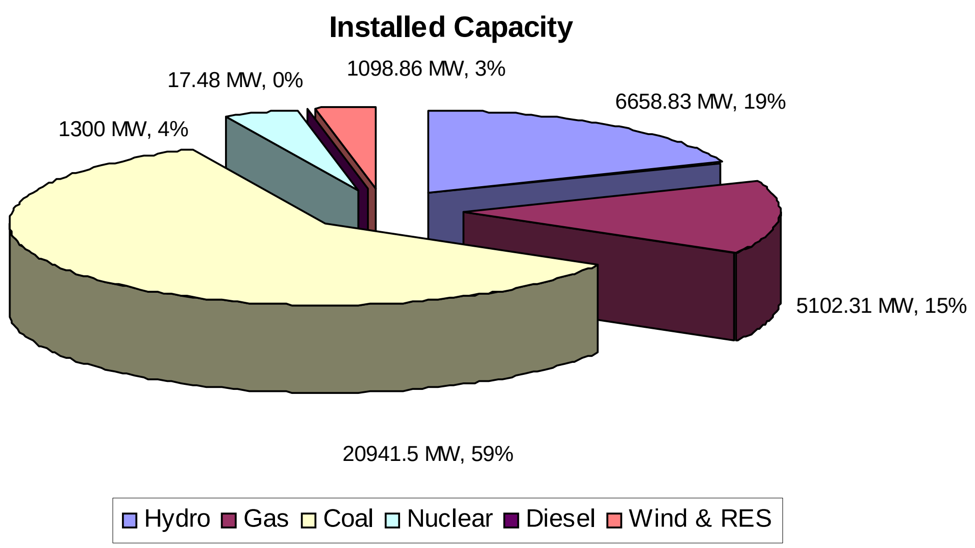
The proposed project will be located in the state of Maharashtra, which falls within the network of the Western Regional electricity system of the Indian electricity system. Generated power will be exported to the Western Regional Grid.

The Western Regional Grid is dominated by thermal sources. In the absence of the proposed project, the electricity delivered to the grid would have been generated by the operation of grid-connected, fossil-fuel based thermal power generation sources.

Grid System

The present installed capacity of the Western Regional Grid system is 35118.95 MW[2]. The break-down of the various sources constituting the total capacity is given below:

Figure 2. Installed Capacity Mix of the Western Regional Grid



Source: Western Region Annual Report 2005-2006

As described above, the prevailing form of power generation in the state of Maharashtra is coal-derived thermal energy. In the absence of the proposed project, power would be fed to the grid by existing and/or new coal-fired power stations, resulting in additional GHG emissions being sent to the atmosphere. The proposed project will displace power generation from the coal- and gas-

[1] Data drawn from a database published by the Central Electricity Authority of India.

[2] WREB Annual Report 2005-2006

fired power stations connected to the Western Region Grid. These power stations comprise the baseline for this project activity.

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 CDM project activity (assessment and demonstration of additionality):

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

The latest version (version 03) of the tool has been used in order to assess additionality and substantiate that the proposed project is not a business-as-usual scenario.

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

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

The following alternatives had been identified to the project activity:

Alternative 1: Implementation of the project activity not undertaken as a CDM project activity

In this alternative, the proposed project activity is implemented and connected to the Maharashtra State Grid, which is a part of the Western Regional Grid, and displaces an amount of electricity equivalent to the generation mix of the Western Grid. As wind power is a non-emitting energy resource, this project activity would not generate any GHG emissions.

Alternative 2: Investment in other renewable energy sources for power generation

The project proponent could have pursued the option of investment in other sources of renewable energy supplying to the grid, instead of wind power. In such a case there would have been fossil-fuel based electricity would have also been displaced in the Western Grid.

Alternative 3: No project activity-Continuation of the current scenario

The continuation of the current scenario would mean that the project activity would not be implemented with the result that the current mix of generation in the Western Region would remain unchanged. There would be no displacement of fossil-fuel based electricity to the grid. In other words, an equivalent amount of electricity would be generated by the power plants presently connected to the Western Grid. As these power plants are predominantly thermal, an increase in greenhouse emissions, especially CO_2, would result from this alternative.

Sub-step 1b: Enforcement of applicable laws and regulations

There are no legal and / or regulatory requirements that prevent the Alternatives from occurring.

Step 2. Investment Analysis

This step will demonstrate that the proposed project activity is economically or financially less attractive than the other alternatives, whereby the project activity does not earn revenue from the sales of certified emission reductions.

Sub-step 2a. Determine appropriate analysis method

The project proponent will seek to export the electricity generated from the project activity to the Maharashtra State Electricity Distribution Company Limited (MSEDCL) under a Power Purchase Agreement (PPA). The principal source of revenue for the project activity is the sale of electricity.

Methodology ACM0002 offers three possible options to perform the investment analysis. Option I, based on a simple cost analysis, would not be an appropriate analysis method given that the project activity generates other income not related to CDM. Among the other two options, investment comparison analysis (Option II) and benchmark analysis (Option III), the promoter has adopted the benchmark analysis wherein the post-tax internal rate of return (IRR) for the project cash flows serves as the parameter for deciding the financial attractiveness of the project.

Sub-step 2b. Apply benchmark analysis (Option-III)

The project promoter conducted a detailed investment analysis of the project activity before the investment was sanctioned. The post-tax internal rate of return on the investment was used as a primary indicator of investment attractiveness. IRR is a widely accepted financial metric used by many corporations and financial institutions for investment decision-making.

BP does not currently maintain a specific cost of capital for prospective investments in the Indian power sector. The “hurdle rates” for proposed project investments are determined on a case-by-case basis, taking into account the risk of individual project cash flows. The risk of project cash flows are in turn dependent upon a comprehensive evaluation of prevailing economic, technological, political and market risk factors.

The expected IRR of the project activity has been compared to a benchmark of 14%, which is the post tax return on equity (ROE) benchmark for projects in public or private sector in India, as established by the Central Electricity Regulatory Commission on its “Terms and Conditions of Tariff Regulations” of March 26, 2004.

Sub-step 2c. Calculation and comparison of financial indicators

The post-tax IRR of the project activity without considering the CDM revenues is 10.14 %. The IRR has been calculated over a 25 year investment horizon, which corresponds to the useful life of the WEGs. This base case IRR is significantly lower than the domestic benchmark ROE.

The base case IRR for the project activity has been calculated based on the following input assumptions:

No.	***Parameter***	***Value***
	Technical Details	
1.	*Capacity of WEGs (kW)*	*1,250*
2.	*Number of WEGs*	*32*
3.	*Project Capacity (MW)*	*40*
4.	*Gross Capacity Utilisation Factor*	*27.85%*
5.	*Gross Generation in kWh (excluding park effect)*	*97,600,000*
	Financial Details	
6.	*Cost of WEGs (INRm)*	*1,876.45*
7.	*Civil Works & Grid Connection Costs (INRm)*	*155.5*
8.	*Gross CAPEX (INRm)*	*2,032*
9.	*Escalation on O&M*	*5%*
10.	*Tariff (INR/ kWh)*	*3.50*
11.	*Yearly Escalation in tariff (INR/kWh)*	*0.15*
12.	*Corporate Tax*	*33.7%*
13.	*Minimum Alternate Tax*	*11.2%*

The consideration of the CDM revenues ($10/CER for 10 years) improves the post tax internal rate of return to 10.97 %. The IRR uplift from CDM is depressed by an assumption made by BP on the advice of in-country advisors that 25% of the CER revenues may need to returned to the MSEDCL, despite the fact that it has played no role in realizing CDM accreditation for the project.

In summary, the financial return on the project activity approaches the benchmark rate if it attains CDM revenue through the sale of emission reductions, but does not surpass it.

Sub-step 2d. Sensitivity analysis

A sensitivity analysis has been carried out on the IRR to analyse the robustness of the financial attractiveness of the project activity with and without the CDM revenues. The effect of a variation of +/- 5% in the value of the Annual Gross Electricity Production has been carried out and the results are as follows:

Parameter	***Variation***	***IRR with CDM revenue***	***IRR without CDM revenue***
	+ 5%	*11.82%*	*10.95%*

Annual gross electricity production	*97.6 GWh (Estimated)*	*10.97%*	*10.14%*
	-5%	*10.09%*	*9.29%*

Additionally, sensitivities on the price of CERs have been conducted to test their effect on IRR. The results of varying the CER price by +/- $5/CER on the base case annual gross electricity production of 97.6 GWh are presented below:

Parameter	***Variation***	***IRR with CDM revenue***
	15 $/CER	*11.40%*
CER price	*10 $/CER*	*10.97%*
	5 $/CER	*10.54%*

Note: IRR with CDM revenue projections are calculated net of a 25% deduction in realized CER income

The sensitivity analysis shows that even with a higher annual gross production of electricity and a higher CER price, the project would not supersede the benchmark ROE of 14%. However, it also shows that the CDM revenue provides a financial stimulus to the project that makes the investment case more attractive.

BP's decision to approve the investment with a project IRR that is less than the benchmark ROE reflects the strategic importance of the Indian market to BP. It also recognizes that the benchmark ROE is not perfectly comparable to the project IRR due to BP's relatively low corporate debt-to-equity ratio. While project financing could have been pursued in an attempt to improve ROE, such an option was determined to be financially sub-optimal due to the high rates of interest and restrictive terms on non-recourse loans in India's wind power market.

Step 3. Barrier Analysis

Sub-step 3a: Identify barriers that would prevent the implementation of type of the proposed project activity:

Sub-step 3b: Show that the identified barriers would not prevent the implementation of at least one of the alternatives (except the proposed project activity):

Investment Barriers:

The capital investment required for wind power plants is high when compared to conventional sources of power. While the State of Maharashtra and the Government of India have provided certain financial incentives for the development of wind power projects, a number of critical investment barriers remain. A variety of investment barriers applicable to this project have been well documented in successful CDM applications by other project sponsors. These include:

- ***The tariff structure for wind energy investment*** in India is a single-part tariff structure while utility-scale fossil fuel and hydro projects have a two-part tariff structure. These fossil-fuel and hydro projects carry less investment risk than the project activity because the two-part tariff structure allows for investment recovery to be partially secured. Moreover, in the case of fossil-fuel and hydro projects, the cost-plus approach is used wherein the projects recover their entire investment cost if they are able to achieve a specified level of plant availability.

- ***The higher capital cost of wind farm plant and equipment*** makes wind power more expensive than traditional sources of electricity. Despite the lack of a variable fuel cost, wind power remains more expensive its fossil fuel alternatives. The following table shows a generic comparison between the per unit generation cost for different sources of power, which shows that the cost associated with wind power is higher than for power from fossil fuels.

Per unit cost of generation[3]

No.	*Source*	*Power generation cost (INR/kWh)*
1	*Coal*	*2.72*
2	*Fuel oil*	*3.25*
3	*Wind energy*	*4.42*

In addition to the institutional investment barriers outlined above, the ***rules concerning foreign direct investment (FDI) in India's wind power*** market pose additional investment barriers that are specific to the project sponsors. The Government of India offers two forms of tax subsidy to investors in wind power projects. These are:

- 80% accelerated first year depreciation
- 10 year tax holiday

The 40 MW wind farm investment is being made by BP through a domestic corporate entity, BP Energy India Private Limited. Neither this domestic corporate entity - nor any other domestic corporate entity that is wholly owned by BP - currently generates sufficient income to fully utilize the tax advantages offered to wind farm investors in India. Therefore, like most foreign

[3] Nagda Hills – a registered PDD

energy companies seeking to invest in India's wind power market, BP is presently unable to compete in economic terms with domestic players. This barrier to competition is directly attributable to the restrictions on eligibility for tax subsidies, as promoted by the Government.

As per the Indian Income Tax Act, 1961, the parent company and its subsidiary are considered two different entities and the possibility of transfer of the income tax benefits between these two entities is not explicitly authorized. In other words, the depreciation benefit available to BP Energy India Private Limited cannot be transferred to BP plc. As a result, the subsidy can not be utilised.

BP Energy India Private Limited was incorporated on 6 June 2005. The most recent full year audited accounts show a loss of Rs. 2.25 crores, which is approximately $504,000. A copy of the most recent audited balance sheet for BP Energy India Private Limited has been provided to the Designated Operational Entity (DOE) for the project.

The economic loss associated with the project sponsor's inability to utilise these tax benefits is significant. The post-tax cash flows to a firm with sufficient tax capacity (i.e. existing in-country taxable income) to absorb the accelerated depreciation and tax holiday have been computed. The net present value (NPV) of those post-tax cash flows has then been compared to the NPV post-tax cash flows to a multinational investor (such as BP) that is unable to fully utilize those fiscal support mechanisms. All cash flows have been discounted at an assumed ten percent (10%) cost of capital.

The difference between the "Foreign Investor" NPV and the "Domestic Investor" NPV is shown in the table below and is equivalent to the net economic loss to BP on a 40 MW wind farm investment.

Scenario	*NPV ($m)*
Foreign Investor *Limited benefit from existing fiscal support mechanisms.*	*$3.24*
Domestic Investor *Full benefit from existing fiscal support mechanisms.*	*$10.53*
Difference	*($7.29)*

Note: the calculations assume that depreciation for tax purposes in Scenario 1 is calculated using the declining balance method. In this scenario, a minimal level of tax relief remains available to the foreign investor due to the ability to "carry forward" net operating losses into the subsequent tax year.

As the project proponent is not eligible to fully utilise the income tax depreciation benefit and the tax holidays available for the Indian promoters, the CDM provides an important investment incentive, which partially mitigates the economic barrier to competition described in the paragraphs above.

Technological Barriers:

The project proponent has currently two operational wind farms in Europe and has recently initiated a significant new project construction program in the United States. This program will entail the investment of more than $800 million in U.S. wind projects by 2008.

While the proponent is well versed with the technical attributes of Western European and North American wind markets, India poses unique challenges and technological barriers to investment. Those challenges primarily relate to the lack of reliable and long term wind data, and to the reliability of the electrical transmission network (hereafter referred to as “the grid”).

While the project proponent could continue to invest in markets where these technological barriers are not present, those activities would not contribute to the sustainable development of a non Annex I country, nor contribute to the displacement of the fossil fuel power generation from India’s Western Regional Electricity Grid.

Applying best practices gained from previous wind power investments, the project proponent has commissioned specialized technical consultants to undertake risk analyses on its behalf. The results from those assessments can be summarised as follows:

1. ***Grid Reliability Study:*** An independent assessment of the capacity of the local electricity grid to incorporate a new 40 MW wind farm has been made by Mott MacDonald, a leading international engineering consulting firm. Their report identified the need for installation of additional equipment at the 33 kV substation to achieve the correct power factor and for reinforcement of a 220 kV line (beyond the project boundary) to adequately maintain voltage regulation. While the project sponsors have budgeted for a limited number of instances when the grid may be unavailable to evacuate power to the high voltage transmission system, the need for additional investment in the local electricity grid poses a risk of more frequent outages. Should grid outage become more frequent than expected (currently estimated as reducing the base case IRR by 0.61%), the project sponsors will suffer additional economic losses. This is due to the fact that there is no compensation to wind power generators in Maharashtra in event that power can not be evacuated from the 33kV substation.

2. ***Wind Resource Study:*** An independent assessment of the wind resource available at the site has been made by Garrad Hassan and Partners Ltd., a leading international wind resource assessment agency. Their report provided forecasts for the P50 and P90 wind speeds that could be expected at hub height (74 meters.). The conclusions of the wind resource study were subject to greater than average uncertainty due to the lack of reliable sources of meteorological data in the vicinity. The authors note that “in the assessment of the wind regime at a potential wind farm site, it is generally necessary to correlate data recorded on the site with data recorded from a nearby long-term reference meteorological station.” The analysis of the prevailing wind regime was made solely upon the basis on 4.1 years of data from anemometers on site and without the benefit of long-term reference data. Ten years or more of reference data is typically available for wind farm developments in Annex 1 countries. The lack of long-term reference data introduces a

greater degree of risk that the data obtained from site monitoring will prove to be an inaccurate sample of the long term wind resource.

The high degree of uncertainty associated with the long-term availability of the high voltage grid and the higher than normal potential for error in the wind resource predictions act to reduce the overall risk-adjusted profitability of the project activity. CER revenues would provide additional return to the project and thereby compensate the project proponent for some of the additional risk it faces due to technological barriers.

Regulatory Barriers:

The uncertainty in the tariff policy has been a major barrier for the project promoters. Private sector investment in wind power in Maharashtra saw a sudden spurt during 2001-02 and then the installations dropped rapidly. The reason for the same was the implementation of certain incentives introduced by the State government like the Sales Tax Benefit. However, it was only available up to March 2003, after which it had been withdrawn. The annual installed capacity pattern itself clearly indicates the slump in growth shortly after that.

The National Tariff Policy clearly states:

"The benefits of reduced tariff after the assets have been fully depreciated should remain available to the consumers"[4]

This essentially implies that the term of the Power Purchase Agreement (PPA) should be equal to the economic lifetime of the project. As per the current Maharashtra Electricity Regulatory Commission (MERC) order for wind projects, the allowed duration for a PPA is only 13 years, which roughly approximates the discounted payback period for the project.

The lack of a guaranteed price beyond year 13 introduces significant market risk into the project economics. As there is no long-term policy framework in the State of Maharashtra which provides a reliable indicator of the value of wind power to the State Electricity Board after year 13 of the project, the long term revenues for the project (up to the end of the useful life of the asset) are subject to considerable uncertainty.

Furthermore, despite considerable progress in reform of India's power sector subsequent to the 2003 Electricity Act, the country's state electricity boards (including the MSEDCL) remain loss-making entities that can not currently be described as "investment-grade" counterparties. The barrier posed by the significant levels of credit risk that would be borne by the project proponents in making a capital investment in return for a commercial commitment to purchase wind power from a non-investment grade entity is a product of the regulatory structure of India's power market.

Barriers due to prevailing practice:

Foreign Direct Investment (FDI) in India's renewable power sector has, to date, been quite limited. While multinational wind turbine manufacturers such as Vestas and Enercon have

[4] National Tariff Policy – Section 5.3.c

invested in manufacturing/assembly facilities, investment in wind power generation projects by foreign entities is not common practice.

If investments made by foreign manufacturers for on-site captive generation (<10MW) are excluded, this project would be the first investment by a foreign energy company in India’s wind power market. The project sponsors hope that successful implementation of this 40 MW project will provide an important precedent for deep and continuing investment by BP and other multinational energy companies in India’s alternative energy sector.

Summary – Step 3. Barrier Analysis

In summary, all the above mentioned barriers (investment, technological, and regulatory) are applicable to the project activity (i.e. Alternative 1) and obstruct the implementation of the project activity. However, the barriers mentioned do not apply to the other two alternatives.

Step 4. Common Practice Analysis

The wind power installations in India increased during 1999-2000 with the introduction of the 100% sales tax relief incentive by the State Government. Soon after its introduction, however, the incentive was made performance-based (i.e. incentives made commensurate with capacity factors). In March 2003, this incentive was withdrawn and subsequently the annual installed capacity dropped rapidly.

While there have been fluctuations over time in political support for wind power, the project sponsors are confident that a stable investment climate now exists in Maharashtra for new wind power projects. However, unlike most wind projects installed to date in Maharashtra, this project is unique because:

- it represents a Foreign Direct Investment in the wind sector, and;
- the project proponent does not have an entity in India with the capacity absorb the fiscal subsidies enjoyed by domestic investors.

Thus, the project is dependent upon a power purchase agreement with the MSEDCL and revenue from the CDM for viability.

Step 5. Impact of CDM Registration

The revenue generated from the sale of Certified Emission Reductions (CERs) would be a major source of support for the project to sustain and mitigate the investment risks faced by sponsor.

The successful implementation of the project will encourage BP and other potential foreign investors to work proactively with state and national governments as well as investment partners (e.g. turbine suppliers) to collaboratively overcome the barriers to large-scale investment in

India's wind power sector. CDM registration for this project will make a significant contribution towards establishing a powerful business model in the area of grid connected wind power that may be replicated more widely and at greater scale.

B.6. Emission reductions:

The power generated by the project activity will be supplied to the grid, which will directly displace the equivalent amount of power fed to the grid, which is dominated by fossil fuel source. Hence the resultant wind power, supplied to the grid, will avoid the fossil fuels used for power generation and will avoid the corresponding amount of GHG emissions, mainly CO_2, associated with fossil fuel based power in the grid.

The emissions reductions claimed from the project will be the amount of electricity fed to the western grid multiplied by the western grid emission co-efficient, calculated as prescribed in the applied baseline methodology. The emission co-efficient is calculated based on a combined margin (CM), consisting of the combination of an operating margin (OM) and a build margin (BM), according to the procedures prescribed in the approved methodology ACM0002.

B.6.1. Explanation of methodological choices:

As prescribed in the methodology, the emission reductions will be the amount of electricity supplied to the grid multiplied by the grid emission co-efficient.

Energy (electricity) generated by the wind turbines will be metered directly, both at the source (power plant site) and at the point of discharge (grid). The energy fed in to the grid will be used to calculate the emission reductions and is measured in terms of kWh.

Estimation of the emission reductions due the project activity = amount of electricity supplied to the grid multiplied by the grid emission co-efficient.

$ER = \sum_n E_{WEG} * E\ Coeff_{grid}$

$\sum_n E_{WEG}$ = Amount of electricity supplied to the grid

$E\ Coeff_{grid}$ = Grid emission co-efficient

Grid emission co-efficient = Combined margin of the western grid calculated as given below:

$E\ Coeff_{grid} = w_{OM} * EF\_OM_y + w_{BM} * EF\_BM_y$

Where

EF_OM_y = emission factor of Operating Margin

EF_BM_y = emission factor of Build Margin

w_{OM} = weight factors of Operating Margin

w_{BM} = weight factors of Build Margin with respective weight factors w_{OM} and w_{BM} (where $w_{OM} + w_{BM} = 1$), for wind and solar projects by default, are as follows: $w_{OM} = 0.75$ and $w_{BM} = 0.25$ (owing to their intermittent and non-dispatchable nature).

The Operating and the Built Margin emission factors for calculating the Combined margin emission factor has been referred to from the ***"Baseline Carbon Dioxide Emission Database Version 1.1"***[5] ***(dated: December 21, 2006)*** developed by the Central Electricity Authority (CEA) of India and is a publicly available document. The national database uses the value of the weight factors w_{OM} and w_{BM} as 0.05 each. Therefore, the combined margin emission factor considering $w_{OM} = w_{BM} = 0.5$ for the Western Regional Grid is 0.89 tCO_2/MWh. However, for the present case the emission factor is 0.95 tCO_2/MWh.

Operating Margin Emission Factor (EF_OM_y)

The Operating Margin Emission Factor (EF_OM_y) is based on the Simple Operating Margin and is calculated as the generation weighted-average emissions per electricity unit (tCO_2/MWh) of all generating sources serving the system, not including low-operating cost and must-run power plants:

$$EF\_OM_y = \frac{\sum_{i,j} F_{i,j,y} . COEF_{i,j}}{\sum_{j} GEN_{j,y}}$$

Where,

$F_{i,j,y}$ = amount of fuel *i* (in a mass or volume unit) consumed by relevant power sources *j* in year(s) *y*

$COEF_{i,j,y}$ = is the CO_2 emission coefficient of fuel *i* (tCO_2/mass or volume unit of the fuel_), taking into account the carbon content of the fuels used by relevant power sources *j* and the percent oxidation of the fuel in year(s) *y*

$GEN_{j,y}$ = is the electricity (MWh) delivered to the grid by source *j*.

The CO_2 emission coefficient $COEF_i$ is obtained as:

$$COEF_i = NCV_i . EF_{CO2,i} . OXID_i$$

Where,

NCV_i = net calorific value (energy content) per mass or volume unit of a fuel *i*

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

$OXID_i$ = oxidation factor of the fuel

$EF_{CO2,i}$ = CO_2 emission factor per unit of energy of the fuel *i*

Build Margin emission factor (EF_{BM})

The Build Margin emission factor *EF_BMy* is given as the generation-weighted average emission factor of the selected representative set of recent power plants, represented by the 5 most recent plants or by the most recent 20% of the generating units built (summation is over such plants specified by *k*):

$$EF\_BM_y = \frac{\sum_i F_{i,y} * COEF_i}{\sum_k GEN_{k,y}}$$

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

Data / Parameter:	$\sum_n E_{WEG}$
Data unit:	MWh
Description:	Amount of electricity supplied to the grid
Source of data used:	Net quantity of annual power generation from the project activity (sum of power generated from all WEGs)
Value applied:	79,641
Justification of the choice of data or description of measurement methods and procedures actually applied :	Data will be monitored in two ends; at source at the WTG controller meter and in MSEDCL 33 KVsub station at delivery point by MSEDCL metering equipment. $\sum_n E_{WEG}$ is based on MSEDCL data.
Any comment:	Data will be monitored by, electronic energy meter integrated with the WEGs at the source and electronic energy meter fitted in the transmission line at delivery point maintained by MSEDCL. The metering equipment consisting of Main and Check Meters are identical in make, technical standards and of 0.5 % accuracy class and calibration and comply with the requirements of Electricity Rules. The meters installed at the Metering Point with four quadrant, three phase, four wire, provision for on line reading and time slots as required. The metering equipment are duly approved, tested and sealed by the MSEDCL

Data / Parameter:	Grid Emission factor *(Operating Margin)*
Data unit:	tCO_2/MWh
Description:	Emission factor of Regional grid, Western Grid
Source of data used:	Central Electricity Authority data, www.cea.nic.in
Value applied:	1.01
Justification of the choice of data or	Emission Factor is estimated and officially published by Central Electricity Authority, Government of India.

description of measurement methods and procedures actually applied :	
Any comment:	Simple Operating Margin is used, by including Imports

Data / Parameter:	Grid Emission factor *(Build Margin)*
Data unit:	tCO_2/MWh
Description:	Emission factor of Regional grid, Western Grid
Source of data used:	Central Electricity Authority data, www.cea.nic.in
Value applied:	0.77
Justification of the choice of data or description of measurement methods and procedures actually applied :	Emission Factor is estimated and officially published by Central Electricity Authority, Government of India.
Any comment:	Value is calculated based on ex-ante data and the data does not call for reworking every year

Data / Parameter:	Grid Emission factor *(Combined Margin)*
Data unit:	tCO_2/MWh
Description:	Emission factor of Regional grid (Western Grid)
Source of data used:	Central Electricity Authority data, www.cea.nic.in
Value applied:	0.95
Justification of the choice of data or description of measurement methods and procedures actually applied :	Emission Factor is estimated and officially published by Central Electricity Authority, Government of India.
Any comment:	Value is calculated based on ex-ante data and the data does not call for reworking every year

Data / Parameter:	**Emission factor**
Data unit:	$kgCO_2/kWh$
Description:	Emission factor of Regional grid (Western Grid)
Source of data used:	Central Electricity Authority data, www.cea.nic.in
Value applied:	0.95
Justification of the choice of data or description of measurement methods and procedures actually applied :	The Baseline Emission Factor has been estimated by the Central Electricity Authority of India.
Any comment:	

B.6.3 Ex-ante calculation of emission reductions:

Emission by Source

Wind power generation creates no point source pollution. Thus, there will be no air emissions from the source as a result of this project activity.

Leakage

Leakage will be zero and is not applicable to calculation of the emission reductions

Baseline Emissions

The emission reduction per annum is calculated based on the annual total power exported to the grid from all 32 WEGs multiplied with grid emission co-efficient.

$ER_y = \sum_n E_{WEG} * E\ Coeff_{grid}$

$\sum_n E_{WEG}$ = Amount of electricity supplied to the grid

$E\ Coeff_{grid}$ = Grid Emission co-efficient

Grid Emission co-efficient is calculated based on the combined margin, of western grid and is calculated as given below

$E\ Coeff_{grid} = w_{OM} * EF\_OM_y + w_{BM} * EF\_BM_y$

Where

EF_OM_y = emission factor of Operating Margin (Simple Operating Margin)

EF_BM_y = emission factor of Build Margin

w_{OM} = weight factors of Operating Margin

w_{BM} = weight factors of Build Margin

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

Net Power Output		**Emission Reductions**
Year	**MWh**	**t CO_2**
2007	17,836	16,944
2008	73,420	69,749
2009	79,642	75,659
2010	79,642	75,659
2011	79,642	75,659
2012	79,642	75,659

Net Power Output		Emission Reductions
2013	79,642	75,659
2014	79,642	75,659
2015	79,642	75,659
2016	79,642	75,659
2017	61,805	58,714
Total estimated reductions (tones of CO_2)		**750,679**
Total number of crediting years		10
Annual average over the crediting period of estimated reductions (tons of CO_2)		75,067

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

B.7.1 Data and parameters monitored:

Data / Parameter:	**Electricity generated**
Data unit:	MWh
Description:	Electricity supplied to the western grid by the project.
Source of data to be used:	The data will be projected based on the operations of the wind turbines over the crediting period.
Value of data applied for the purpose of calculating expected emission reductions in section B.5	79,642
Description of measurement methods and procedures to be applied:	Data will be recorded by, electronic energy meter integrated with the WEGs at the source and electronic energy meter fitted in the transmission line at delivery point maintained by MSEDCL. The metering equipment consisting of Main and Check Meters are identical in make, technical standards and of 0.5 % accuracy class and calibration and comply with the requirements of Electricity Rules. The meters installed at the Metering Point are four quadrant, three phase, and four wire, with provision for on-line reading and time slots as required. The metering equipment are duly approved, tested and sealed by the MSEDCL
QA/QC procedures to be applied:	Periodic QA/ QC audits are planned to ensure consistency of data. Metering equipment at dilevery point are calibrated by MSEDCL annually . WTG controller meters are calibrated by SWSL annually . These data will be directly used for calculation of emission reductions. Sales record to the grid and other records are used to ensure the consistency.
Any comment:	

B.7.2 Description of the monitoring plan:

As per the applied methodology ACM0002, Version 6, the following parameters are required to be monitored during the implementation of project activity and to be reported for the emission reductions calculation:

a. Electricity generation from the proposed project activity which is supplied to the grid.

The project requires no monitoring for leakage and electricity generated from the WEGs will be the only parameter to be monitored.

The generated electricity from the project will be exported to the Maharashtra State Grid, which is a part of the Western Regional Grid. Throughout the CDM crediting period and beyond, the electricity generated from the project will be monitored by both the project proponent and the state utility, Maharashtra Electricity Distribution Company Limited (MSEDCL).

The project promoter has hired the services of Suzlon Windfarm Services Limited (SWSL) for the Operation and Maintenance of the wind farm under a contract. Two BP asset managers – one technical and one commercial - will represent the project promoter and will be directly responsible for the long-term monitoring of asset performance.

Metering

The power generated shall be recorded at a 33 KV substation owned by MSEDCL. The metering equipment consisting of Main and Check Meters are identical in their make and technical features. The Main and Check Meters are of 0.5 % accuracy class and comply with the requirements of local electricity regulations. The meters installed at the Metering Point are four quadrant, three phase, and four wire, with provision for on-line reading and time slots as required. The metering equipments are duly approved, tested, and sealed by the MSEDCL.

The procedures for testing and reading of the metering equipment are summarized in the paragraphs below. MSEDCL refers to the state utility, Maharashtra Electricity Distribution Company Limited, while the Company refers to Suzlon Windfarm Services Limited, acting in its contractual capacity on behalf of the project proponents

Testing of the Metering Equipment

1. The Main and Check Meters are tested for accuracy with a portable standard meter by the MSEDCL'S Testing Division.

2. The MSEDCL shall carry out the calibration, periodical testing, sealing and maintenance of meters in the presence of the authorized representative(s) of the Company and the representative(s) of the Company shall sign on the result thereof.

3. The frequency of meter testing will be annual. All the meters will be tested only at the Metering Point. The MSEDCL will promptly provide a copy of the test reports to the Company.

4. If during testing, both the Main and Check Meter are found within the permissible limits of error i.e. 0.5%, the energy computation will be as per the Main Meter. If during test, any of the Main Meters is found to be within the permissible limits of error but the corresponding Check Meter is beyond the permissible limit, the energy computation will be as per the Main Meter. The Check Meter would then be re-calibrated immediately.

5. If during the tests, the Main Meter is found to be beyond permissible limits of error, but the corresponding Check Meter is found to be within the permissible limits of error, then the energy computation for the month to-date shall be in accordance with Check Meter. The Main Meter would then be re-calibrated immediately and the energy for the period thereafter is as per the calibrated Main Meter.

6. If during any of the monthly meter readings, the variation between the Main Meter and the Check Meter is more than 0.5%, then all the meters shall be retested and calibrated immediately by MSEDCL. The correction required as per result of the testing will be applied to the generation and consumption of energy for the period from last meter reading to the time of such test checks. Energy for the periods thereafter is in accordance with the calibrated Main Meter.

Reading of Joint Metering Equipment

1. The meter readings at the Metering Point is undertaken jointly by the representatives of the MSEDCL and the authorized representative of the Company on the 1st day of every month for the preceding month. The meter readings are jointly certified by both representatives of the MSEDCL and the Company.

2. The joint meter reading will be furnished by MSEDCL's Jurisdictional Officer to the Office of Superintending Engineer for further processing. A final judgment of the total units received for sale of Wind Energy to MSEDCL will be made by the Superintending Engineer on the basis of the joint meter readings.

3. The Joint Meter Reading taken at the common evacuation system will be supported by meter readings of Individual WEGs using such common evacuation system. Based on this data, the power generated from individual power plants will be certified by MSEDCL.

WEG Controller meters

Controller meters will be installed at WEG and shall be calibrated annually. These meters shall be monitored by SCADA real time monitoring. In event of any error in these meters alarm will be generated and recorded in SCADA. The SWSL O&M team will take immediate corrective action to rectify the fault. Such faults will be reported immediately to the BP representative followed by a detailed report of corrective actions. If required, a joint- investigation will be carried out.

The project proponent has undertaken an operation and maintenance agreement with the supplier of the WEGs for a period of 5 years, renewable for a maximum period of 20 years. The performance of the WEGs, safety in operation and scheduled/ breakdown maintenance is to be organised by the service provider. Therefore, the responsibility of the operation of the project lies with the service provider.

As per the established procedures of Suzlon, the monitoring personnel receive extensive training at the Suzlon Manufacturing facility at Daman before being appointed at the site to look after the operations. The various activities to be carried out by the Operation and Maintenance team as per the agreement with the project promoter are as follows:

1. ***Routine Maintenance Services***
   Routine maintenance services involve the operation and maintenance of the equipment along with periodic preventive maintenance, cleaning and upkeep of the equipments.

2. ***Security Services***
   This service includes watch and ward and security of the wind farm and the equipments.

3. ***Management Services***
   Suzlon Windfarm Services Limited is an ISO certified company and apart from the maintenance of the wind farm their services also include the following:

   a) Data logging in for power generation, grid availability and machine availability.
   b) Preparation and submission of monthly performance report in the agreed format.
   c) Taking monthly meter reading, jointly with SEB, of power generated at the wind farm and supplied to SEB Grid for the purpose of co-ordination and to obtain necessary power credit report/certificate

4. ***Technical Services***
   The technical assistance includes checking of various technical, safety and operational parameters of the equipments, trouble shooting and relevant technical services.

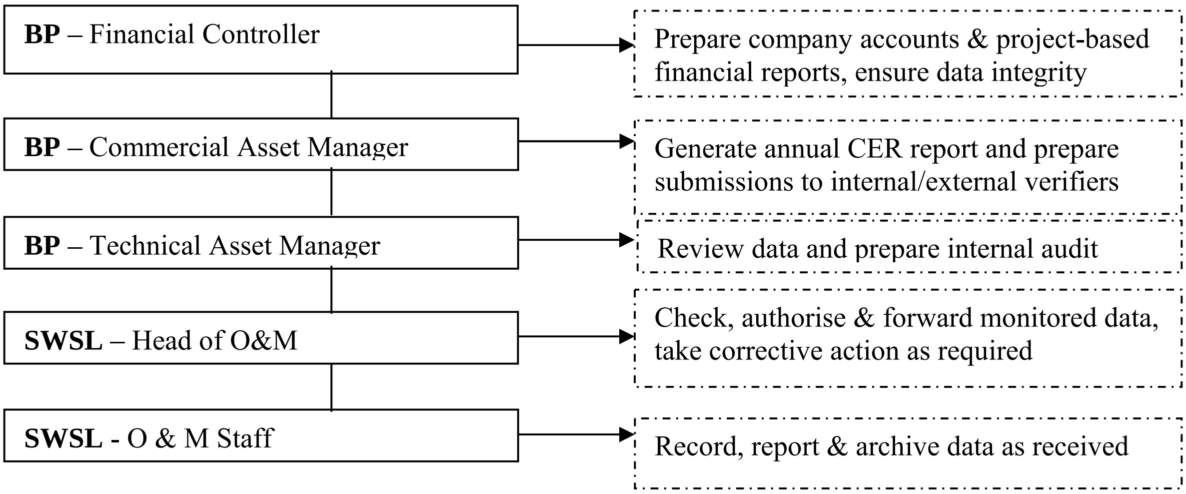
The operation and maintenance team consists of Senior Engineers, Engineers and Technicians who will record the readings and prepare daily generation reports of all the WEGs. The primary recording of the electricity fed to the state utility grid will be carried out jointly at the incoming feeder of the state electricity utility.

The joint measurement will be carried out once in a month in the presence of both parties (the developers' representative and the officials of the state power utility), and the records will be signed by the officials from the project proponent and MSEDCL. This generation record will form the basis of payment by the MSEDCL to the project proponent. Such records will be maintained and would be made available on demand throughout the crediting period of the project.

As part of the dual metering system (to ensure accuracy), and as part of the secondary monitoring, each WEG is equipped with an integrated electronic meter. These meters will be connected to the Central Monitoring System (CMS) for the wind farm through a wireless radio frequency network.

A snapshot of the generation on the last day of the month will be kept as a record both in electronic as well as in printed form.

The organisational structure as proposed by the project promoter for overall reporting of CER generation data is as follows:



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

Date of completion of the baseline study : 04/10/2006
Name of the entity : Asia Carbon Emission Management India Pvt. Ltd.

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:

The expected commercial operation date of the 40 MW wind farm is 30/09/2007.

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

25 years.

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

C.2.1. Renewable crediting period

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

N/A

C.2.1.2. Length of the first crediting period:

N/A

C.2.2. Fixed crediting period:

C.2.2.1. Starting date:

30/09/07.

C.2.2.2. Length:

10 years.

SECTION D. Environmental impacts

>>

D.1. Documentation on the analysis of the environmental impacts, including trans-boundary impacts:

The Ministry of Environment and Forests (MoEF), Government of India made notification on September 14, 2006[6] regarding the requirement of Environment Impact Assessment (EIA) studies for a range of infrastructure projects. The notification states that any project developer in India needs to file an application to the Ministry of Environment and Forests (including a public hearing and an EIA) in the event that the proposed industry or project is identified in a predefined list. Thirty-eight categories of activities are required to undertake an Environment Impact Assessment (EIA). Wind farms are not included in this list and are therefore exempted from conducting an EIA.

However, the project promoter has voluntarily undertaken an environmental and social risk assessment at the project site. The study considered the potential impacts upon the environment and the local community that may result from the project activity. The key observations from the study are summarised below:

[6] http://envfor.nic.in/legis/eia/so1533.pdf

- The setting up of each WEG will require a land area of approximately 1.5 ha (including land required for substation and unpaved connecting road). It is expected that the project as a whole will have an impact on a wider land area over the lifetime of the project.

- The project area will require a change in land use over 30-50 ha within the Nadurbar forest range, which is largely comprised of degraded vegetation.

- The impact from the project on the fauna is expected to be moderate in nature, considering the degraded nature of the forest resource within the project area.

- Impact on soil erosion and contamination is considered to be minor to moderate over the entire cycle of the project.

- Additional noise can be expected through construction and operation of the wind farm, which may be heard by local fauna and people in the surrounding villages.

- Mitigation measures included in the design of the WEGs will moderate the impact of ambient noise once the wind farm is operational.

- The only settlements that are expected to be directly impacted by the project are the ones of Chadvel and Mogarpara (Village Pangan). The project will not have any land acquisition impact as it is located within a reserve forest area. Thus, it is expected there will be no displacement of people related from the construction of the project.

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:

In their totality, the environmental impacts from the project activity were not considered to be significant as to outweigh the greenhouse gas reduction and sustainable development benefits of the project.

SECTION E. Stakeholders' comments

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

A local stakeholder consultation meeting was convened in order to invite comments from the people residing nearby the proposed project activity. The meeting was announced to the general public by posting of written notices at the village school and site offices as well as verbal communications to site workers.

The meeting was held on 10 March 2007 at the Suzlon Energy's Dhule site office for approximately 2 hours. The meeting was attended by 17 people, of which were 5 residents of the neighboring village. The remainder were resident site workers. The meeting was chaired by

Rajesh Zoldeo (BP Senior Asset Manager) and supported by Mr. Santonu Kashyap and Mr. R. Mohanakrishnan, both employed as CDM consultants by the project promoter.

The meeting participants were provided with an overview of the project activity and the project promoter's views of the environmental and economic benefits associated with its implementation. Participants were also informed about wind power technology and its role in the reduction of the greenhouse gases, a principal cause of climate change. Mr. Zoldeo provided a translation of the lecture in the local Marathi tongue to make it more understandable to the attendees.

A specially designed questionnaire was circulated among the participants in order to receive their comments on a issues related to the proposed project activity. A copy of the questionnaire has been attached as Appendix B. The comments received from the questionnaire have been summarized in Appendix C.

E.2. Summary of the comments received:

In general, the participants were very positive about implementation of the project activity. Employment generation was repeatedly mentioned as the major source of benefit. Overall, there were three areas of potential benefits commonly identified by attendees:

- Employment generation, in particular the skilled and unskilled labor required for construction and operation of the project
- Improvement in infrastructure as a result of roads and communication facilities required for access to the site
- Escalation in the land values of the neighboring areas

During the meeting, participants described two areas of major concern:

- Impact on ground water resources in the neighboring areas due to the proposed project activity
- Impact on the soil and the water resources of the area due to the electrical earthing of the WEGs

A stakeholder from the neighboring village mentioned that there were previously serious concerns about the installation of the WEGs in their area and made specific reference to protests in Maharashtra during 2002; these were fuelled by perceptions that WEGs were affecting the rainfall pattern of the area. The same villager said that these concerns were no longer present due to the fact that while wind turbines had become more prevalent over the past years, rainfall had returned to normal levels.

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

A more thorough explanation of wind turbine technology was provided to demonstrate that the operation of wind turbines do not consume water nor in any way interfere with local hydrological resources. The villagers were also informed about the importance of electrical earthing for any electrical installation (even for modern electrified houses) and that it would in no way have any impact on ground water availability.

No additional impacts from the project activity were identified during the discussion and it was concluded that no additional measures would need to be undertaken to address comments received during the meeting. The project team will work with the site operator to provide a communication channel for any community concerns that may arise going forward.

Annex 1

CONTACT INFORMATION ON PARTICIPANTS IN THE PROJECT ACTIVITY

Organization:	BP Energy India Private Limited
Street/P.O.Box:	Mahakali Caves Road, Andheri (East)
Building:	Technopolis Knowledge Park
City:	Mumbai
State/Region:	Maharastra
Postfix/ZIP:	400 093
Country:	India
Telephone:	022-66984100
FAX:	022-66984101
E-Mail:	shantanu.bagchi@bp.com
URL:	n/a
Represented by:	n/a
Title:	Director
Salutation:	Mr.
Last Name:	Bagchi
Middle Name:	
First Name:	Shantanu
Department:	Wind Energy
Mobile:	+91 98202 39783
Direct FAX:	n/a
Direct tel:	+91 22569 84240
Personal E-Mail:	Shantanu.bagchi@bp.com

Organization:	BP Gas Marketing Limited
Street/P.O.Box:	Chertsey Road
Building:	Sunbury Office Park
City:	Sunbury on Thames
State/Region:	Middlesex
Postfix/ZIP:	TW16 7BP
Country:	United Kingdom
Telephone:	0207 948 4000
FAX:	0207 948 5000
E-Mail:	arran.kitson@bp.com
URL:	n/a
Represented by:	n/a
Title:	Emissions Originator
Salutation:	Mr
Last Name:	Kitson
Middle Name:	
First Name:	Arran

Department:	Integrated Supply & Trading
Mobile:	+44 (0) 7796 993 519
FAX:	+44 (0) 20 7948 7848
Direct tel:	+44 (0) 20 7948 5534
Personal E-Mail:	arran.kitson@bp.com

Annex 2

INFORMATION REGARDING PUBLIC FUNDING

No public funding is involved in the project activity

Annex 3
Baseline Information

CENTRAL ELECTRICITY AUTHORITY: CO2 BASELINE DATABASE

VERSION	**1.1**
DATE	**21 Dec 2006**
BASELINE METHODOLOGY	**ACM0002 / Ver 06**

EMISSION FACTORS

Weighted Average Emission Rate (tCO2/MWh) (excl. Imports)

	2000-01	2001-02	2002-03	2003-04	2004-05
North	0.72	0.73	0.74	0.71	0.71
East	1.09	1.06	1.11	1.10	1.08
South	0.73	0.75	0.82	0.85	0.79
West	0.90	0.92	0.90	0.90	0.92
North-East	0.39	0.38	0.37	0.36	0.30
India	0.82	0.83	0.85	0.85	0.84

Weighted Average Emission Rate (tCO2/MWh) (incl. Imports)

	2000-01	2001-02	2002-03	2003-04	2004-05
North	0.72	0.73	0.74	0.71	0.72
East	1.09	1.03	1.09	1.08	1.05
South	0.74	0.75	0.82	0.85	0.79
West	0.90	0.92	0.90	0.90	0.92
North-East	0.39	0.38	0.37	0.36	0.46
India	0.82	0.83	0.85	0.85	0.84

Simple Operating Margin (tCO2/MWh) (excl. Imports)

	2000-01	2001-02	2002-03	2003-04	2004-05
North	0.98	0.98	1.00	0.99	0.97
East	1.22	1.22	1.20	1.23	1.20
South	1.02	1.00	1.00	1.01	1.00
West	0.98	1.01	0.98	0.99	1.01
North-East	0.67	0.66	0.68	0.62	0.66
India	1.02	1.02	1.02	1.03	1.03

Simple Operating Margin (tCO2/MWh) (incl. Imports)

	2000-01	2001-02	2002-03	2003-04	2004-05
North	0.98	0.98	1.00	0.99	0.98
East	1.22	1.19	1.17	1.20	1.17
South	1.03	1.00	1.00	1.01	1.00
West	0.98	1.01	0.98	0.99	1.01
North-East	0.67	0.66	0.68	0.62	0.81
India	1.01	1.02	1.01	1.02	1.02

Build Margin (tCO2/MWh) (excl. Imports)

	2000-01	2001-02	2002-03	2003-04	2004-05

Build Margin (tCO2/MWh) (not adjusted for imports)

	2000-01	2001-02	2002-03	2003-04	2004-05

North	0.53
East	0.90
South	0.72
West	0.78
North-East	0.10
India	0.70

North	0.53
East	0.90
South	0.72
West	0.78
North-East	0.10
India	0.70

Combined Margin (tCO2/MWh) (excl. Imports)

	2000-01	2001-02	2002-03	2003-04	2004-05
North	0.76	0.76	0.77	0.76	0.75
East	1.06	1.06	1.05	1.07	1.05
South	0.87	0.86	0.86	0.86	0.86
West	0.88	0.89	0.88	0.88	0.90
North-East	0.39	0.38	0.39	0.36	0.38
India	0.86	0.86	0.86	0.86	0.86

Combined Margin in tCO2/MWh (incl. Imports)

	2000-01	2001-02	2002-03	2003-04	2004-05
North	0.76	0.76	0.77	0.76	0.75
East	1.06	1.05	1.04	1.05	1.04
South	0.87	0.86	0.86	0.86	0.86
West	0.88	0.89	0.88	0.88	0.89
North-East	0.39	0.38	0.39	0.36	0.45
India	0.86	0.86	0.86	0.86	0.86

GENERATION DATA

Gross Generation Total (GWh)

	2000-01	2001-02	2002-03	2003-04	2004-05
North	144,292	151,185	155,385	165,735	168,438
East	58,936	64,048	66,257	75,374	85,776
South	128,983	131,902	136,916	138,299	144,086
West	162,329	165,805	177,399	172,682	183,955
North-East	5,314	5,292	5,811	5,880	7,904
India	499,854	518,231	541,766	557,970	590,158

Net Generation Total (GWh)

	2000-01	2001-02	2002-03	2003-04	2004-05
North	135,230	141,415	144,741	155,043	157,290
East	53,350	58,097	59,841	68,428	77,968
South	121,144	123,612	127,780	128,165	134,691

EMISSION DATA

Absolute Emissions Total (tCO2)

	2000-01	2001-02	2002-03	2003-04	2004-05
North	97,863,848	102,743,113	106,777,065	109,980,786	112,199,697
East	58,025,890	61,436,757	66,595,529	75,515,998	83,956,860
South	88,728,956	92,484,478	104,180,940	108,406,007	105,960,087
West	135,147,507	141,597,621	148,313,340	144,127,175	157,781,065
North-East	2,009,681	1,976,535	2,090,087	2,088,985	2,294,430
India	381,775,882	400,238,503	427,956,961	440,118,951	462,192,140

Absolute Emissions OM (tCO2)

	2000-01	2001-02	2002-03	2003-04	2004-05
North	97,863,848	102,743,113	106,777,065	109,980,786	112,199,697
East	58,025,890	61,436,757	66,595,529	75,515,998	83,956,860
South	88,728,956	92,484,478	104,180,940	108,406,007	105,960,087

West	150,412	153,125	164,448	159,780	170,726
North-East	5,185	5,169	5,669	5,758	7,776
India	465,321	481,417	502,480	517,174	548,451

West	135,147,507	141,597,621	148,313,340	144,127,175	157,781,065
North-East	2,009,681	1,976,535	2,090,087	2,088,985	2,294,430
India	381,775,882	400,238,503	427,956,961	440,118,951	462,192,140

20% of Net Generation (GWh)

	2000-01	2001-02	2002-03	2003-04	2004-05
North	27,046	28,283	28,948	31,009	31,458
East	10,670	11,619	11,968	13,686	15,594
South	24,229	24,722	25,556	25,633	26,938
West	30,082	30,625	32,890	31,956	34,145
North-East	1,037	1,034	1,134	1,152	1,555
India	93,064	96,283	100,496	103,435	109,690

Absolute Emissions BM (tCO2)

	2000-01	2001-02	2002-03	2003-04	2004-05
North					17,108,583
East					14,303,611
South					19,525,581
West					26,881,491
North-East					206,514
India					78,025,780

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

	2000-01	2001-02	2002-03	2003-04	2004-05
North	25.9%	25.7%	26.1%	28.1%	26.8%
East	10.8%	13.4%	7.5%	10.3%	10.5%
South	28.1%	25.5%	18.3%	16.2%	21.6%
West	8.2%	8.5%	8.2%	9.1%	8.8%
North-East	42.3%	42.1%	45.8%	41.8%	55.4%
India	19.2%	18.9%	16.3%	17.1%	18.0%

Net Generation in Operating Margin (GWh)

	2000-01	2001-02	2002-03	2003-04	2004-05
North	100,189	105,076	106,940	111,449	115,151
East	47,570	50,308	55,377	61,378	69,746
South	87,100	92,085	104,441	107,396	105,584
West	138,071	140,173	150,889	145,264	155,731
North-East	2,992	2,995	3,071	3,350	3,469
India	375,923	390,638	420,718	428,838	449,681

Net Generation in Build Margin (GWh)

	2000-01	2001-02	2002-03	2003-04	2004-

IMPORT DATA

Net Imports (GWh) - Net exporting grids are set to zero

	2000-01	2001-02	2002-03	2003-04	2004-05
North	0	0	0	0	3,616
East	489	555	357	1,689	0
South	1,162	1,357	518	0	0
West	321	0	797	962	285
North-East	0	0	0	0	2,099

Share of Net Imports (% of Net Generation)

	2000-01	2001-02	2002-03	2003-04	2004-05

	05
North	32,067
East	15,818
South	27,195
West	34,587
North-East	2,052
India	111,718

North	0.0%	0.0%	0.0%	0.0%	2.3%
East	0.9%	1.0%	0.6%	2.5%	0.0%
South	1.0%	1.1%	0.4%	0.0%	0.0%
West	0.2%	0.0%	0.5%	0.6%	0.2%
North-East	0.0%	0.0%	0.0%	0.0%	27.0%

20% of Gross Generation (GWh)

	2000-01	2001-02	2002-03	2003-04	2004-05
North	28,858	30,237	31,077	33,147	33,688
East	11,787	12,810	13,251	15,075	17,155
South	25,797	26,380	27,383	27,660	28,817
West	32,466	33,161	35,480	34,536	36,791
North-East	1,063	1,058	1,162	1,176	1,581
India	99,971	103,646	108,353	111,594	118,032

Gross Generation in Build Margin (GWh)

	2000-01	2001-02	2002-03	2003-04	2004-05
North					34,034
East					17,239
South					29,052
West					36,831
North-East					2,067
India					119,222

** Note: The combined margin emission factor for the Western Grid as per this database is 0.89 tCO_2 / MWh; assuming $w_{OM} = w_{BM} = 0.5$. However, for wind and solar projects ACM0002 allows the usage of $w_{OM} = 0.75$ and $w_{BM} = 0.25$ for calculating the combined margin emission factor. Using the same the emission factor for the western grid has been calculated to be 0.95 tCO_2 / MWh.

This page left intentionally blank

Annex 4

MONITORING INFORMATION

Please refer to Section B.7.2

Appendix A

Evidence of CDM Incentive

Please see attached PDF documents

1) *“BP_CDM May 2006 Memo.pdf”*
2) *“BP_CDM October 2006 Memo.pdf”*

Appendix B

Stakeholders Meeting Questionnaire

Project	: 40 MW Grid Connected Wind Power Project – BP Energy India Private Limited
Location	: Chadvel Village, Dhule District
Date	: 10.03.2007
Participant Name	:
Age	:
Sex	:
Address	:
Category	:

1. Whether employment opportunities will increase due to the project activity?

   (a). Yes (b). No

   If Yes means then,

   Employment opportunities will be given to,

   (a). Skilled labour (b). Unskilled labour (c). Both Skilled & Unskilled labours

   Employment generation : Visible / Marginal / No

   Improvement in Income level to local people : Visible / Marginal / No

2. Whether land values will increase?

   (a).Yes (b). No

3. Whether Infrastructure facilities will develop due to the project activity?

   (a).Yes (b). No (c). Expected

   If Yes means,

Transport facility : Visible / Marginal / No

Education facility : Visible / Marginal / No

Health facility : Visible / Marginal / No

Any other (Please specify) : …………………………………………….......

4. Whether you have learnt or exposed to new technology?

(a).Yes (b). No

5. Whether you will face any type of pollution (Air / Water / Sound) problems due to the project?

(a).Yes (b). No

If Yes means what type of problem?
…………………………………………………………………………………………

6. Whether the electricity facilities will be improved?

(a).Yes (b). No (c). Expected

7. Whether your local area will improve due to the project?

(a).Yes (b). No (c). Expected

If Yes means,

Improvement in Standard of Living : Visible / Marginal /No

Land and Agriculture Development : Visible / Marginal / No

Industrial Development in the Project Area : Visible / Marginal / No

Social Upliftment of Women : Visible / Marginal / No

Other Comments if any:

Signature of the Participant

Date:

Appendix C

Summary of Stakeholder Comments

No.	Participants name	Occupation	Whether employment opportunities will increase due to the project activity?	Whether land values will increase?	Whether Infrastructure facilities will develop due to the project activity?	Whether you have learnt or exposed to new technology?	Whether you will face any type of pollution (Air / Water / Sound) problems due to the project?	Whether the electricity facilities will be improved?	Whether your local area will improve due to the project?
1.	Pavin Thakur	Operator SWSL	YBVV	Y	YVMV	Y	N	Y	YVMVN
2.	Gangedhar Rama Ahire	Engineer SWSL	YSVV	Y	YVVV	Y	N	Y	YVVVV
3.	Deepak Tugnawat	Engineer SWSL	YBVV	Y	YVMV	Y	N	Y	YVMVM
4.	Mohan Sonawane	Jr. Engineer SWSL	YBVV	Y	YVVV	Y	N	Y	YVVVM
5.	Gulabrao Tulshiram Shewale	Teacher Chadwel Z.P.School	YBVV	Y	YVVV	Y	N	N	YVNVV
6.	Shanray Sonawane	Engineer SWSL	YBVV	Y	YVMV	Y	N	N	YVVVN
7.	Ritesh Batsa	Asst. Manager Suzlon	YBVV	Y	YVMV	Y	N	Y	YVMVV
8.	Move Eknath Rupsing	Jr.Operator MSEDCL	YBVV	Y	YVVV	Y	N	E	YVVMV
9.	Rajesh Desai	Engineer Suzlon	YBVV	Y	YVVV	Y	N	Y	YVVMV
10.	Suraj Balu Wagh	Jr.Engineer	YBVV	Y	YVMV	Y	N	N	YVVVV

11.	*Akhilesh Bahadhur*	*Suzlon Day Manager Suzlon-OA*	*YBVV*	*Y*	*YVVV*	*Y*	*N*	*Y*	*YVVVV*
12.	*Bangale Manish*	*Asst.Manager QA*	*YBMM*	*Y*	*YMMM*	*Y*	*N*	*Y*	*EMMMM*
13.	*Yogesh Shinde*	*Villager*	*YBVV*	*Y*	*YVVV*	*Y*	*N*	*Y*	*YVMVV*
14.	*Sanjay Muralidhar Chowry*	*Villager*	*YBVV*	*Y*	*YMMM*	*Y*	*N*	*Y*	*YVVVM*
15.	*Subhash Nimba Patil*	*Villager*	*YBVV*	*Y*	*YVMM*	*Y*	*N*	*E*	*YVVVM*
16.	*Naresh Mere*	*Villager*	*YBVV*	*Y*	*YVVV*	*Y*	*N*	*N*	*YVVV*
17.	*Rakesh Mere*	*Villager*	*YBVV*	*Y*	*YVVV*	*Y*	*N*	*N*	*YVVV*

Y = Yes, N = No, E = Expected, S = Skilled labor, U = Unskilled labor, B = Both skilled & unskilled labours, V = Visible, M = Marginal

- - - - -