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:

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Title: Maharana Pratap Power Project in Rajasthan
Version: 1.0
Date of completion of PDD: 15 November 2006

A.2. Description of the project activity:

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Objective of the Project

The objective is development, design, engineering, procurement, finance, construction, operation and maintenance of Enercon Maharana Pratap Ltd. 100 MW wind power project ("Project") in the Indian state of Rajasthan to provide reliable, renewable power to the Rajasthan state electricity grid which is part of the Northern regional electricity grid. The Project will lead to reduced greenhouse gas emissions because it displaces electricity from fossil fuel based electricity generation plants.

Nature of Project

The Project harness renewable resources in the region, and thereby displacing non-renewable natural resources thereby ultimately leading to sustainable economic and environmental development. Enercon (India) Ltd ("Enercon" or "EIL") will be the equipment supplier and the operations and maintenance contractor for the Project. The generated electricity will be supplied to Rajasthan Rajya Vidyut Prasaran Nigam Ltd ("RRPVN")/ Jodhpur Electricity Distribution Company Ltd ("Jodhpur Discom") under a long-term power purchase agreement (PPA). The PPA is yet to be entered into. The Project will be owned by Enercon (India) Ltd and Enercon GmbH.

Contribution to sustainable development

The Project meets several sustainable development objectives including:

- contribution towards the policy objectives of Government of India and Government of Rajasthan of incremental capacity from renewable sources;
- contribution towards meeting the electricity deficit in Rajasthan;
- CO_2 abatement and reduction of greenhouse gas emissions through development of renewable technology;
- reducing the average emission intensity (SO_x, NO_x, PM, etc.), average effluent intensity and average solid waste intensity of power generation in the system;
- conserving natural resources including land, forests, minerals, water and ecosystems; and
- developing the local economy and create jobs and employment, particularly in rural areas, which is a priority concern for the Government of India;

A.3. Project participants:

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Name of Party involved ((host) indicates a host Party)	Private and/or public entity(ies) project participants (*) (as applicable)	Kindly indicate if the Party involved wishes to be considered as project participant (Yes/No)
Government of India (Host)	Enercon (India) Ltd	No
Government of Germany	KfW	No

The contact details of the entities are provided in Annex – 1.

A.4. Technical description of the project activity:

A.4.1. Location of the project activity:

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A.4.1.1. Host Party(ies):

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The host party to the project activity is the Government of India.

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

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The Project will be located in the State of Rajasthan that forms part of the Northern regional electricity grid of India.

A.4.1.3. City/Town/Community etc:

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The Project will be located at Phalodi village, in Jodhpur District of Rajasthan state in India.

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

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The project area extends between latitude 26º 55' & 27 º 01' North and longitude 72 º 29.5' & 72 º 37' East. The Project will be connected to 220/400 kV Surpura, Mandour RRVPN substation. The sites are located at a distance of 35 km from Phalodhi, Jodhpur by road. The nearest railway station is at Phalodhi. A location map is attached at Appendix – 1.

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

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The project activity is considered under CDM category zero-emissions **'grid-connected electricity generation from renewable sources'** that generates electricity in excess of 15 MW (limit for small scale project). Therefore as per the scope of the project activity enlisted in the 'list of sectoral scopes and related approved baseline and monitoring methodologies (version 02 Mar 05/07:23)', the project activity may principally be categorized in Scope Number 1, Sectoral Scope - Energy industries (renewable/ non-renewable sources).

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

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The Project involves 125 wind energy converters (WECs) of Enercon make (800 kW E-48) with internal electrical lines connecting the Project with local evacuation facility. The WECs generates 3-phase power at 400V, which is stepped up to 33 KV. The Project can operate in the frequency range of 47.5–51.5 Hz and in the voltage range of 400 V ± 12.5%. The other salient features of the state-of-art-technology are:

- Gearless Construction - Rotor & Generator Mounted on same shaft eliminating the Gearbox.
- Variable speed function – has the speed range of 18 to 33 RPM thereby ensuring optimum efficiency at all times.
- Variable Pitch functions ensuring maximum energy capture.
- Near Unity Power Factor at all times.
- Minimum drawl (less than 1% of kWh generated) of Reactive Power from the grid.
- No voltage peaks at any time.
- Operating range of the WEC with voltage fluctuation of -20 to +20%.
- Less Wear & Tear since the system eliminates mechanical brake, which are not needed due to low speed generator which runs at maximum speed of 33 rpm and uses Air Brakes.
- Three Independent Braking System.
- Generator achieving rated output at only 33 rpm.
- Incorporates lightning protection system, which includes blades.
- Starts Generation of power at wind speed of 3 m/s.

Enercon (India) Ltd has secured and facilitated the technology transfer for wind based renewable energy generation from Enercon GmbH, has established a manufacturing plant at Daman in India, where along with other components the "Synchronous Generators" using "Vacuum Impregnation" technology are manufactured.

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

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Crediting Period for the Project: fixed for 10 years

Years	Annual estimation of emission reductions in tonnes of CO2e
2008	178,258
2009	178,258
2010	178,258
2011	178,258
2012	178,258
2013	178,258
2014	178,258
2015	178,258
2016	178,258
2017	178,258

Years	Annual estimation of emission reductions in tonnes of CO2e
Total estimated reductions (tonnes of CO2e)	1,782,580
Total number of crediting years	10
Annual average over the crediting period of estimated reductions (tonnes of CO2e)	178,258

A.4.5. Public funding of the project activity:

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There is no ODA financing involved in the Project.

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:

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The approved consolidated baseline and monitoring methodology **ACM0002 Version 6.0** (19 May 2006) has been used. The titles of these baseline and monitoring methodologies are "Consolidated baseline methodology for grid-connected electricity generation from renewable sources" and "Consolidated monitoring methodology for grid-connected electricity generation from renewable sources.

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

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The Project is wind based renewable energy source, zero emission power project connected to the Rajasthan state grid, which forms part of the Northern regional electricity grid. The Project will displace fossil fuel based electricity generation that would have otherwise been provided by the operation and expansion of the fossil fuel based power plants in Northern regional electricity grid.

The approved consolidated baseline and monitoring methodology ACM0002 Version 6 is the choice of the baseline and monitoring methodology and it is applicable because:

- the Project is grid connected renewable power generation project activity
- the Project represents electricity capacity additions from wind sources
- the Project does not involve switching from fossil fuel to renewable energy at the site of project activity since the Project is green-field electricity generation capacities from wind sources at sites where there was no electricity generation source prior to the Project, and
- the geographical and system boundaries of the Northern electricity grid can be clearly identified and information on the characteristics of the grid is available.

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

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The project boundary encompasses the physical, geographical site of the Project sited at the Project location. It would include the wind turbine installations and sub-station up to the Metering Point.

According to ACM0002, for the baseline emission factor, the spatial extent of the project boundary includes the project site and all power plants connected physically to the electricity system that the CDM project power plant is connected to.

The Indian electricity system is divided into five regional grids, viz. Northern, Eastern, Western, Southern, and North-Eastern. Each grid covers several states. As the regional grids are interconnected, there is inter-state and inter-regional exchange. A small power exchange also takes place with neighbouring countries like Bhutan and Nepal.

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

Grid connected captive power plants have not been included because adequate detail of data (for example, fuel consumption) is not available. In addition, data on certain utility power plants was not available and these were excluded from the project electricity system. Even though data on individual renewable energy projects is not available, they have been included using appropriate assumptions.

	Source	Gas	Included?	Justification/ Explanation
Baseline	Electricity generation from power plants connected to the Northern Grid	CO_2	Included	Main emission source
		CH_4	Excluded	This source is not required to be estimated for wind energy projects under ACM0002
		N_2O	Excluded	This source is not required to be estimated for wind energy projects under ACM0002
Project Activity	Electricity generation from the Project	CO_2	Excluded	Wind energy generation does not have any direct GHG emissions.
		CH_4	Excluded	
		N_2O	Excluded	

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

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According to ACM0002, for project activities that do not modify or retrofit an existing electricity generation facility, the baseline scenario is the following:

Electricity delivered to the grid by the project would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources, as reflected in the combined margin (CM) calculations described below.

As the Project does not modify or retrofit an existing generation facility, the baseline scenario is the emissions generated by the operation of grid-connected power plants and by the addition of new generation sources. This is estimated using calculation of Combined Margin multiplied by electricity delivered to the grid by the Project.

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): >>

Step 0: Preliminary screening based on the starting date of the project activity

If project participants wish to have the crediting period starting prior to the registration of their project activity, they shall:

a) Provide evidence that the starting date of the CDM project activity falls between 1 January 2000 and the date of the registration of a first CDM project activity, bearing in mind that only CDM project activities submitted for registration before 31 December 2005 may claim for a crediting period starting before the date of registration.

b) Provide evidence that the incentive from the CDM was seriously considered in the decision to proceed with the project activity. This evidence shall be based on (preferably official, legal and/or other corporate) documentation that was available at, or prior to, the start of the project activity.

The Project start date will be later than the date of validation of the PDD and therefore, no evidence is required. Enercon entered into an Emission Reduction Purchase Agreement with a CER purchaser on 3rd May 2006 for purchase of emission reductions from the Project, which is prior to the start date of the Project.

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

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

1. Identify realistic and credible alternative(s) available to the project participants or similar project developers that provide outputs or services comparable with the proposed CDM project activity. These alternatives are to include:

- The proposed project activity not undertaken as a CDM project activity;
- All other plausible and credible alternatives to the project activity that deliver outputs and on services (e.g. electricity, heat or cement) with comparable quality, properties and application areas;
- If applicable, continuation of the current situation (no project activity or other alternatives undertaken).

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

(a) The Project is not undertaken as a CDM project activity.

(b) Setting up of comparable utility scale (100 MW) fossil fuel fired or hydro power projects that supply to the Rajasthan grid under a PPA.

(c) Continuation of the current situation where no project activity or any of the above Alternatives are undertaken would not be applicable as Rajasthan had energy (MU) shortages of 3.5% and peak (MW) shortages of 13.7% in 2005-06 (Source: Northern Region Power Sector Profile, July 2006, Ministry of Power).

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

2. The alternative(s) shall be in compliance with all applicable legal and regulatory requirements, even if these laws and regulations have objectives other than GHG reductions, e.g. to mitigate local air pollution. This sub-step does not consider national and local policies that do not have legally-binding status.

3. If an alternative does not comply with all applicable legislation and regulations, then show that, based on an examination of current practice in the country or region in which the law or regulation applies, those applicable legal or regulatory requirements are systematically not enforced and that non-compliance with those requirements is widespread in the country. If this cannot be shown, then eliminate the alternative from further consideration.

4. If the proposed project activity is the only alternative amongst the ones considered by the project participants that is in compliance with all regulations with which there is general compliance, then the proposed CDM project activity is not additional.

There are no legal and regulatory requirements that prevent Alternatives (a) and (b) from occurring.

Proceed to Step 2 (Investment analysis) or Step 3 (Barrier analysis). (Project participants may also select to complete both steps 2 and 3.)

Step 2: Investment Analysis

Determine whether the proposed project activity is the economically or financially less attractive than other alternatives without the revenue from the sale of certified emission reductions (CERs). To conduct the investment analysis, use the following sub-steps:

Sub-step 2a. - Determine appropriate analysis method

1. Determine whether to apply simple cost analysis, investment comparison analysis or benchmark analysis (sub-step 2b). If the CDM project activity generates no financial or economic benefits other than CDM related income, then apply the simple cost analysis (Option I). Otherwise, use the investment comparison analysis (Option II) or the benchmark analysis (Option III).

Sub-step 2b. – Option I. Apply simple cost analysis

2. Document the costs associated with the CDM project activity and demonstrate that the activity produces no economic benefits other than CDM related income.

Sub-step 2b. – Option II. Apply investment comparison analysis

3. Identify the financial indicator, such as IRR, NPV, cost benefit ratio, or unit cost of service (e.g., levelized cost of electricity production in $/kWh or levelized cost of delivered heat in $/GJ) most suitable for the project type and decision-making context.

Sub-step 2b. – Option III. Apply benchmark analysis

4. Identify the financial indicator, such as IRR, NPV, cost benefit ratio, or unit cost of service (e.g., levelized cost of electricity production in $/kWh or levelized cost of delivered heat in $/GJ) most suitable for the project type and decision context.

Option I – Simple cost analysis is not applicable as the project activity sells electricity to the grid and obtains economic benefits in the form of electricity tariffs.

Enercon proposes to use **Option II – Investment comparison analysis** and the financial indicator that is identified is the post-tax return on equity or the equity IRR.

The post tax return on equity and equity IRR is used as the appropriate financial indicator because in the Indian power sector, a 14% post tax return on equity is an established benchmark for projects in public or private sector based on cost-plus regulations (Source: Central Electricity Regulatory Commission, Terms and Conditions of Tariff, Regulations 2004 dated 26 March 2004) for utility scale power plants (similar to Alternative (b)). Incentives, foreign exchange variations and efficiency in operations are in addition to this benchmark of 14%.

For determining the tariffs for wind power projects, the electricity regulatory commissions of the state of Rajasthan and Gujarat have considered the return on equity at 14% while the electricity regulatory commissions of the state of Madhya Pradesh, Maharashtra and Karnataka have considered the return on equity at 16%. (Source: RERC Order dated 29 September 2006).

There are some essential differences between the Project (whether implemented with or without CDM revenues) and the Alternatives identified in Sub-step 1(b) (utility scale fossil fuel and hydro projects). These should be taken into account while setting the appropriate level of equity IRR.

- The project activity tariff structure is a single-part tariff structure as compared to utility scale fossil fuel and hydro projects, which have two-part tariff structure. This implies that project activity carries a higher investment risk than the utility scale fossil fuel and hydro projects (Alternative (b)) where the investment recovery is decoupled from the level of actual generation achieved by the project due to variations in offtake.

  Thus, in case of the project activity, issues such as transmission unavailability, back-down of generation or part-load operations, which are beyond the control of the investors are likely to affect the project activity more severely and therefore the project activity investors would require higher rate of return to compensate them for these additional risks.

- In case of utility scale fossil fuel and hydro projects (Alternative (b)), these are by reference to cost-plus approach whereby the projects recover their full investment cost each year if they are able to reach specified level of plant availability. In case of the Project, it does not recover its full investment cost in the initial years as the tariffs are back-loaded. This increases the investment risks in the project activity compared to the alternatives.

Based on the above considerations, 16% post-tax equity IRR is considered to be the appropriate post-tax equity return. If the Project has a post-tax equity IRR of less than 16%, then it can be considered to be additional.

Sub-step 2c. Calculation and comparison of financial indicators (only applicable to options II and III):

5. Calculate the suitable financial indicator for the proposed CDM project activity and, in the case of Option II above, for the other alternatives. Include all relevant costs (including, for example, the

investment cost, the operations and maintenance costs), and revenues (excluding CER revenues, but including subsidies/fiscal incentives where applicable), and, as appropriate, non-market cost and benefits in the case of public investors.

6. Present the investment analysis in a transparent manner and provide all the relevant assumptions in the CDM-PDD, so that a reader can reproduce the analysis and obtain the same results. Clearly present critical techno-economic parameters and assumptions (such as capital costs, fuel prices, lifetimes, and discount rate or cost of capital). Justify and/or cite assumptions in a manner that can be validated by the DOE. In calculating the financial indicator, the project's risks can be included through the cash flow pattern, subject to project-specific expectations and assumptions (e.g. insurance premiums can be used in the calculation to reflect specific risk equivalents).

7. Assumptions and input data for the investment analysis shall not differ across the project activity and its alternatives, unless differences can be well substantiated.

8. Present in the CDM-PDD submitted for validation a clear comparison of the financial indicator for the proposed CDM activity and:

   (a) The alternatives, if Option II (investment comparison analysis) is used. If one of the other alternatives has the best indicator (e.g. highest IRR), then the CDM project activity can not be considered as the most financially attractive;

   (b) The financial benchmark, if Option III (benchmark analysis) is used. If the CDM project activity has a less favourable indicator (e.g. lower IRR) than the benchmark, then the CDM project activity cannot be considered as financially attractive.

The key assumptions used for calculating the benchmark (post-tax equity IRR) are set out below:

Capacity of Machines in kW	800
Number of Machines	125
Project Capacity in MW	100.00
Project Commissioning Date	1-Jan-08
Project Cost per MW (Rs. In Millions)	47.5

Operations	
Plant Load Factor - 1st to 5th year	22.00%
Plant Load Factor - 6th to 9th year	21.73%
Plant Load Factor - 10th to 13th year	21.45%
Plant Load Factor - 14th to 17th year	21.18%
Plant Load Factor - 18th to 20th year	20.90%
Insurance Charges @ % of capital cost	0.18%
Operation & Maintanance Cost base year @ % of capital cost	1.25%
% of escalation per annum on O & M Charges	5.0%

Tariff	
Base year Tariff (2005-06) - Rs./Kwh	3.25

Annual Escalation (Rs./kWh per Year)	0.06
Tariff applicable from 2014-15 onwards (Rs/kWh)	3.79

Project Cost	Rs Million
Land and Infrastructure, Generator & Electrical Equipments, Mechanical Equipments, Civil Works, Instrumentation & Control, Other Project Cost, Pre operative Expenses, etc.	
Total Project Cost	4,750

Means of Finance		Rs Million
Own Source	30%	1,425
Term Loan	70%	3,325
Total Source		4,750
Terms of Loan		
Interest Rate	9.00%	
Tenure	10	Years
Moratorium	6	Months

Income Tax Depreciation Rate (Written Down Value basis)	
on Wind Energy Generators	80%
On other Assets	10%
Book Depreciation Rate (Straight Line Method basis)	
On all assets	7.86%
Book Depreciation up to (% of asset value)	90%

Income Tax	
Income Tax rate	30%
Minimum Alternate Tax	10%
Surcharge	10%
Cess	2%

Working capital	
Receivables (no of days)	45
O & m expenses (no of days)	30
Working capital interest rate	12%

CER Revenues	
CER Price in US$	-
Exchange rate Rs./US$*	45.34

* RBI reference rate as of 15 November 2006

Crediting period starts	1-Jan-08
Length of Crediting period	10

Baseline Emission Factor for Northern Region (tCO2/GWh)	924.96

The equity IRR for the Project without CDM revenues is 10.9% and with CDM revenues is 14.1%.

Sub-step 2d. Sensitivity analysis (only applicable to options II and III):

9. Include a sensitivity analysis that shows whether the conclusion regarding the financial attractiveness is robust to reasonable variations in the critical assumptions. The investment analysis provides a valid argument in favor of additionality only if it consistently supports (for a realistic range of assumptions) the conclusion that the project activity is unlikely to be the most financially attractive (as per step 2c para 8a) or is unlikely to be financially attractive (as per step 2c para 8b).

Sensitivity analysis of the Equity IRR to the Plant Load Factor (the most critical assumption) has been carried out considering a plant load factor of 20% (plant load factor as observed in recent past for other Enercon projects) and 23.97% (highest plant load factor achieved according to RERC, in its Order dated 29 September 2006). Plant Load Factor is the key variable encompassing variation in wind profile, variation in off-take (including grid availability) including machine downtime. The post tax Equity IRRs at the stated PLFs are as follows:

	PLF at 20%	PLF at 23.97%
Post tax Equity IRR without CER revenues	8.0%	13.9%
Post tax Equity IRR with CER revenues	10.6%	17.4%

As can be seen from above, the Project is not the most financially attractive (as per step 2c para 8a) we proceed to Step 4 (Common practice analysis).

Step 4. Common practice analysis

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

1. Provide an analysis of any other activities implemented previously or currently underway that are similar to the proposed project activity. Projects are considered similar if they are in the same country/region and/or rely on a broadly similar technology, are of a similar scale, and take place in a comparable environment with respect to regulatory framework, investment climate, access to technology, access to financing, etc. Other CDM project activities are not to be included in this analysis. Provide quantitative information where relevant.

Sub-step 4b. Discuss any similar options that are occurring:

2. If similar activities are widely observed and commonly carried out, it calls into question the claim that the proposed project activity is financially unattractive (as contended in Step 2) or faces barriers (as contended in Step 3). Therefore, if similar activities are identified above, then it is necessary to demonstrate why the existence of these activities does not contradict the claim that the proposed project activity is financially unattractive or subject to barriers. This can be done by comparing the proposed project activity to the other similar activities, and pointing out and explaining essential distinctions between them that explain why the similar activities enjoyed certain benefits that rendered it financially attractive (e.g., subsidies or other financial flows) or did not face the barriers to which the proposed project activity is subject.
3. Essential distinctions may include a serious change in circumstances under which the proposed CDM project activity will be implemented when compared to circumstances under which similar projects where carried out. For example, new barriers may have arisen, or promotional policies may have ended, leading to a situation in which the proposed CDM project activity would not be implemented without the incentive provided by the CDM. The change must be fundamental and verifiable.

We analyze the extent to which wind energy projects have diffused in the electricity sector in Rajasthan. In 2005 – 06, electricity generation from wind sources was 417 GWh which is expected to increase to 512 GWh in 2006 – 07. This works out to 1.35% of total generation available to the state of Rajasthan in 2005 – 06 and 1.66% of total expected generation available to the state of Rajasthan in 2006 – 07. Clearly, electricity generation from wind is not a common practice in Rajasthan.

We analyze the wind energy projects in Rajasthan that have come under different policy regimes and in different years. Briefly, the various policies have progressively decreased the electricity tariffs payable by the offtaker (RRVPN/Discoms) and have progressively passed on burden of providing or paying for transmission facilities. Below is the electricity tariff payable under different policies:

Electricity tariff (Rs/kWh)	1999-00	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08
1999 Policy	2.89	3.03	3.18	3.34	3.51	3.69	3.87	4.06	4.27
2000 Policy		3.03	3.18	3.34	3.51	3.68	3.87	4.06	4.26
2003 Policy					3.32	3.39	3.45	3.52	3.59
2004 Policy (Original)						2.91	2.96	3.01	3.06
2004 Policy (Amended)							3.25	3.31	3.37

Out of the 279 MW installed up to 31 March 2005, the wind power projects under various policies of Government of Rajasthan are set out below:
Policy 1999 (effective 11th March 1999): 4.25 MW
Policy 2000 (effective 4th Feb 2000): 82.23 MW
Policy 2003 (effective 30th April 2003): 174.29 MW
Policy 2004 (effective 25th October 2004): 18.85 MW

Currently, there are 134.71 MW of wind projects in Rajasthan (at various stages) that are in the CDM pipeline (on the cdm.unfccc.int website) out of 279 MW and more projects are expected to come into the CDM pipeline.

With the revision of Policy 2004 (effective February 2006), the capacity additions during the three years are expected to be around 297 MW:
2005–06: 74 MW
2006-07: 36 MW

2007-08: 187 MW

Out of the 297 MW that is estimated to be installed up to 2008, this Project constitutes 100 MW. Enercon is further developing a 60 MW wind power project and another 24.8 MW as CDM project activities under the 2004 policy (amended). It is expected that other wind power projects during this period will be undertaken as CDM projects.

Clearly, wind power project development in Rajasthan is insignificant when compared to the power sector of Rajasthan. Further, wind power project development is substantially dependent on CDM mechanism and thus is not common practice.

Sub-steps 4a and 4b are satisfied.

Step 5. Impact of CDM registration

Explain how the approval and registration of the project activity as a CDM activity, and the attendant benefits and incentives derived from the project activity, will alleviate the economic and financial hurdles (Step 2) or other identified barriers (Step 3) and thus enable the project activity to be undertaken.

Registering the project activity as a CDM activity provides a significant amount of revenue, improving the project's cash flow and improving the equity IRR by 3.2%. The revenues from sale of the Certified Emission Reductions would enhance the viability of the project and would partially offset the risks associated with the possible changes in policy, wind regime, project implementation risks (time and cost overruns), etc. Further, CER revenues will be high quality cash flows coming from creditworthy parties and denominated in foreign currency. The CDM revenues will attract new players to wind investments in Rajasthan, as they provide compensation for the regulatory and project risks implicit in the wind power projects.

B.6. Emission reductions:

B.6.1. Explanation of methodological choices:

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According to the approved baseline methodology ACM0002, the emission reductions ***ERy*** by the project activity during a given year "*y*[1]" is

ERy = BEy – PEy – Ly……..(1)

where *EGy* is the electricity supplied to the grid, *EFy* is the CO_2 emission factor of the grid and Ly is the amount of emissions leakage resulting from the project activity.

Baseline Emissions for the amount of electricity supplied by project activity, *BEy* is calculated as

BEy = EGy * EFy ……..(2)

[1] Throughout the document, the suffix *y* denotes that such parameter is a function of the year y, thus to be monitored at least annually.

where *EGy* is the electricity supplied to the grid, *EFy* is the CO_2 emission factor of the grid as calculated below.

The emission factor *EFy* of the grid is represented as a combination of the Operating Margin (OM) and the Build Margin (BM). Considering the emission factors for these two margins as $EF_{OM,y}$ and $EF_{BM,y}$, then the *EFy* is given by:

$$EFy = w_{OM} * EF_{OM,y} + w_{BM} * EF_{BM,y} \quad \text{.....(2)}$$

with respective weight factors w_{OM} and w_{BM} (where $w_{OM} + w_{BM} = 1$).

The Operating Margin emission factor

As per ACM0002, dispatch data analysis should be the first methodological choice. However, this option is not selected because the information required to calculate OM based on dispatch data is not available in the public domain for the Northern electricity regional grid.

The Simple Operating Margin approach has been used to calculate the Operating Margin emission factor applicable in this case. As per ACM 0002 the Simple OM method can only be used where low cost must run resources constitute less than 50% of grid generation based on average of the five most recent years. The generation profile of the Northern grid in the last five years is as follows:

Generation in GWh	**2004-05**	**2003-04**	**2002-03**	**2001-02**	**2000-01**
Low cost/must run sources					
Hydro	36,128	38,279	30,335	29,129	29,020
Wind	332	15	25	19	6
Nuclear	7,503	7,380	8,800	8,158	6,669
Other sources					
Coal	106,156	103,232	100,362	96,882	92,417
Diesel	-	-	-	24	-
Gas	19,991	18,758	17,262	17,634	16,863
Total Generation	**170,109**	**167,663**	**156,785**	**151,845**	**144,975**
Low cost/must run sources	43,962	45,674	39,160	37,305	35,695
Low cost/must run sources	26%	27%	25%	25%	25%

Source: Table 3.4 of CEA General Review 2004-05, 2003-04, 2002-03, 2001-02, 2000-01

From the available information it is clear that low cost/must run sources account for less than 50% of the total generation in the Northern grid in the last five years. Hence the Simple OM method has been used to calculate the Operating Margin Emission factor applicable.

Simple OM Method: *The Simple OM emission factor* $EF_{OM,y}$ is calculated as the generation-weighted average emissions per electricity unit generated (tCO_2/MWh) for all sources serving the Northern regional grid, excluding zero- or low-operating cost power plants (hydro, wind and nuclear), using the following equation:

$$EF_{OM,y} = [\sum_{i,j} Fi,j,y * COEFi,j] / [\sum_j GENj,y] \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (3)$$

where *Fi,j,y* and *COEFi,j* are the fuel consumption and associated carbon coefficient of the fossil fuel *i* consumed by power plant *j* in the grid in year(s) *y*. *GENj,y* is the electricity generation by power plant *j* connected to the grid excluding zero- or low-operating cost sources in year(s) *y*.

As per ACM0002, the OM emission factor can be calculated using *ex ante* generation-weighted average of the most recent 3 years for which data is available or using *ex post* generation data in the year in which the project generation occurs. The OM emission factor is calculated using *ex ante* generation-weighted average of the most recent 3 years and hence does not require yearly monitoring of the OM emission factor.

For the purpose of determining the emission factor(s) for net electricity imports from a connected electricity system within India, the following option has been used "(c) the average emission rate of the exporting grid, if and only if net imports do not exceed 20% of total generation in the project electricity system". This has been done because the net imports to the Northern Grid from the connected electricity system (Western, Eastern, North - Eastern and Southern regional electricity grids) do not exceed 20% and it is not appropriate to use emissions of specific plants as it is not possible to identify specific plants from which these imports take place.

The CO_2 emission coefficient $COEF_{i,j}$ is obtained as:

$$COEF_{i,j} = NCV_{i,j} * EFCO_{2,i} * OXID_i \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (4)$$

where:

$NCV_{i,j}$ is the net calorific value (energy content) per mass or volume unit of a fuel *i*,

$OXID_i$ is the oxidation factor of the fuel,

$EFCO_{2,i}$ is the CO2 emission factor per unit of energy of the fuel i.

Build Margin Emission Factor

The Build Margin emission factor *EF_BMy* (tCO_2/GWh) 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 the most recent 20% of the generating units built (summation is over such plants specified by k):

$$EF_{BM,y} = [\sum_i F_{i,m,y} * COEFi] / [\sum_k GEN_{k,m,y}] \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (5)$$

The summation over *i* and *k* is for the fuels and electricity generation of the plants in sample *m* mentioned above.

The choice of method for the sample plant is the most recent 20% of the generating units built as this represents a significantly larger set of plants for a large regional electricity grid have a large number of power plants connected to it and is therefore appropriate. The calculation of the net generation for 5 most

recent built and for the most recent 20% of the generation units built is shown in the calculation of Build Margin in Annex – 3.

The Build Margin is calculated on *ex ante* based on the most recent information available on power plants already built for sample group *m* at the time of the PDD preparation.

Combined Margin Emission Factor

As already mentioned, baseline emission factor (EFy) of the grid is calculated as a combined margin (CM), calculated as the weighted average of the operating margin (OM) and build margin (BM) factor. In case of wind power projects default weights of 0.75 for EF_{OM} and 0.25 for EF_{BM} are applicable as per ACM0002. No alternate weights are proposed.

Using the above mentioned formulas for calculation of operating margin and build margin emission factors and their respective weights for calculation of combined margin emission factor, the baseline carbon emission factor (CM) is 924.96 tCO2e/GWh or 0.92496 tCO2e/MWh.

Project Emissions:

The project activity uses wind power to generate electricity and hence the emissions from the project activity are taken as nil.

PEy = 0

Leakage:

Emissions Leakage on account of the project activity is ignored in accordance with ACM0002.

Ly = 0

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

>>

Data / Parameter:	**Net Calorific Value of Coal, Furnace Oil, HSD, Light Oil, LSHS, Lignite**
Data unit:	Terra Joules per 10^3 tons
Description:	The Net Calorific Value has been used for calculating the emission coefficients of fuels.
Source of data used:	Data published in Table 1.3 of Central Electricity Authority (CEA) General Review of Power Sector for 2004-05, 2003-04 and 2002-03 has been used for all fuels except for HSD. Calorific value of HSD is taken from data published by CEA on petroleum fuels used by GT and Diesel power plants in India in 2003-04.
Value applied:	

	2002-03	2003-04	2004-05
Coal	17.46	15.99	15.72
Furnace oil	44.91	43.40	43.68
Light oil	40.86	42.65	43.00
LSHS/HHS/HSD	44.06	43.13	43.64
Lignite	11.25	11.46	11.40

	HSD | 42.71 | 42.71 | 42.71
Justification of the choice of data or description of measurement methods and procedures actually applied :	As per ACM0002, wherever available, country specific Net Calorific Values should be used for calculation. Accordingly the Net Calorific Value data published by the Central Electricity Authority, Ministry of Power, Govt. of India has been used. HSD Calorific values are not published in the CEA General Review, hence the value as per CEA data on petroleum fuels used by GT and Diesel power plants in India in 2003-04 was used. This publication is only available for 2003-04 hence the 2003-04 Calorific value has been used for all three years i.e. 2002-03, 2003-04 and 2004-05.
Any comment:	

Data / Parameter:	**Net Calorific Value of Naphtha, Natural Gas**			
Data unit:	Terra Joules per M.cum			
Description:	The Net Calorific Value has been used for calculating the emission coefficients of Naphtha and Natural Gas.			
Source of data used:	Data published by CEA on petroleum fuels used by GT and Diesel power plants in India in 2003-04.			
Value applied:		2002-03	2003-04	2004-05
	Natural Gas	34.12	34.12	34.12
	Naphtha	46.89	46.89	46.89
Justification of the choice of data or description of measurement methods and procedures actually applied :	HSD Calorific values are not published in the CEA General Review, hence the value as per CEA data on petroleum fuels used by GT and Diesel power plants in India in 2003-04 was used. This publication is only available for 2003-04 hence the 2003-04 Calorific value has been used for all three years i.e. 2002-03, 2003-04 and 2004-05.			
Any comment:				

Data / Parameter:	**Carbon Emission Factor**	
Data unit:	Tonnes Carbon per Terra Joule	
Description:	Carbon Emission Factor has been used for calculating the emission coefficients of different fuel types	
Source of data used:	In case of Coal and Lignite, Carbon Emission Factor as per India's first National Communication to the UNFCCC has been used. For all other fuels, default values as per table 1-4 of Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories: Workbook has been used.	
Value applied:	Coal	26.13
	Furnace oil	21.10
	Light oil	20.00
	LSHS/HHS/HSD	20.20
	Lignite	28.95
	Natural Gas	15.30
	Naphtha	20.00
	HSD	20.20
Justification of the choice of data or description of measurement methods	As per ACM0002, wherever available, country specific values of Carbon Emission Factors should be used for calculation. Accordingly the Emission Factors data as per India's first National Communication to UNFCCC has been used in case of Coal and	

and procedures actually applied :	Lignite. Country specific Emission Factors for other fuel types are not available. Hence default values as per the IPCC Guidelines have been used.
Any comment:	

Data / Parameter:	**Oxidation Factor**
Data unit:	Fraction of Carbon oxidised
Description:	Oxidation Factor has been used for calculating the emission coefficients of different fuel types
Source of data used:	Default values obtained from Table 1-6 of Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories: Workbook
Value applied:	Coal 0.98 Furnace oil 0.99 Light oil 0.99 LSHS/HHS 0.99 Lignite 0.98 Natural Gas 1.00 Naphtha 0.99 HSD 0.99
Justification of the choice of data or description of measurement methods and procedures actually applied :	Only IPCC default values are available.
Any comment:	

Data / Parameter:	**Fuel Density**
Data unit:	Kgs per Ltr or Kgs per Cu.m
Description:	Fuel density of various fuels has been used for calculating the emissions of the respective fuel types
Source of data used:	
Value applied:	**Fuel** / **Density (kg/Lt)** Coal 1.00 Furnace oil 0.93 Light oil 0.83 LSHS 0.83 Lignite 1.00 Natural Gas 1.00 HSD 0.83 Naphtha 0.76
Justification of the choice of data or description of measurement methods and procedures actually applied :	Only IPCC default values are available

Any comment:	

Data / Parameter:	**Fuel consumption by Northern grid generating sources in 2004-05, 2003-04 and 2002-03**
Data unit:	'000'MT, KL, M Cu M
Description:	Fuel consumption by generating sources have been used to calculate the total emissions from electricity generation in the Northern grid during 2004-05, 2003-04 and 2002-03
Source of data used:	Table 6.1 CEA General Review of Power Sector 2004-05, 2003-04 and 2002-03
Value applied:	

Fuel	**Units**	**2002-03**	**2003-04**	**2004-05**
Steam stations				
Coal	'000' MT	68,594	70,085	72,943
Furnace oil	KL	57,666	43,377	26,071
Light oil	KL	60,211	254,855	94,208
LSHS/HHS	KL	32,761	2,377	3,126
Lignite	'000' MT	-	-	-
Gas Stations				
Natural Gas	M Cu M	3,953	3,808	4,058
HSD	KL	401,257	240,593	275,047
Naphtha	KL	-	188,981	243,961

Justification of the choice of data or description of measurement methods and procedures actually applied :	The data source, i.e. Central Electricity Authority is a Government of India organisation, which is mandated to publish such information under section 73 (i) and 73(j) of the Indian Electricity Act 2003.
Any comment:	

Data / Parameter:	**Imports from other regional grids into the Northern grid in 2002-03, 2003-04 and 2004-05**
Data unit:	GWh
Description:	Electricity imports from other regional grids are used as an input into the calculation of operating margin.
Source of data used:	Table 5.8 of CEA General Review of Power Sector for 2002-03, 2003-04 and 2004-05
Value applied:	

Net generation in GWh	2004-05	2003-04	2002-03
Western Region	374	175	43
Eastern Region	3,043	125	827
Southern Region	120		
North-eastern Region	172		

Justification of the choice of data or description of measurement methods and procedures actually	The data source, i.e. Central Electricity Authority is a Government of India organisation, which is mandated to publish such information under section 73 (i) and 73(j) of the Indian Electricity Act 2003.

applied :	
Any comment:	

Data / Parameter:	**Average emission rate of regional grids in 2002-03, 2003-04 and 2004-05**
Data unit:	tCO2e/GWh
Description:	Average emission rate of regional grids is used for calculating the emissions related to import of electricity from other regional grids into the Northern grid, which is used as an input for calculation of operating margin.
Source of data used:	Fuel Consumption: Table 6.1, CEA General Review for 2004-05, 2003-04 and 2002-03 Gross Electricity Generation: Table 3.4, CEA General Review for 2004-05, 2003-04 and 2002-03 Net Electricity Generation: Table 5.5, CEA General Review for 2004-05, 2003-04 and 2002-03
Value applied:	Refer Annex – 3
Justification of the choice of data or description of measurement methods and procedures actually applied :	The data source, i.e. Central Electricity Authority is a Government of India organisation, which is mandated to publish such information under section 73 (i) and 73(j) of the Indian Electricity Act 2003.
Any comment:	

Data / Parameter:	**Net electricity generation by fossil fuel fired power plants in the Northern grid in 2002-03, 2003-04 and 2004-05**
Data unit:	GWh
Description:	Net electricity generation by fossil fuel fired power plants in the Northern grid has been used to calculate the average emission intensity of electricity generated in the Northern grid. This data is used as an input in the Operating margin emission factor calculation.
Source of data used:	Table 3.4 of CEA General Review of Power Sector for 2002-03, 2003-04 and 2004-05
Value applied:	
Justification of the choice of data or description of measurement methods and procedures actually applied :	The data source, i.e. Central Electricity Authority is a Government of India organisation, which is mandated to publish such information under section 73 (i) and 73(j) of the Indian Electricity Act 2003.
Any comment:	

Net generation in GWh	**Steam**	**Gas**
2004-05	96,404	19,516
2003-04	94,041	18,328
2002-03	91,523	16,852

Data / Parameter:	**Sample group of power plants added to the Northern grid in recent times,**
Data unit:	MW, GWh
Description:	The sample group of new additions to the Northern grid comprising 20% of the grid's net generation during 2004-05 have been used for calculating the build margin emission factor
Source of data used:	Table 2.8 of CEA General Review of Power Sector for 2004-05, 2003-04,2002-

	03,2001-02,2000-01,1999-00,1998-99,1997-98,1996-97 and 1995-96
Value applied:	Refer Annex – 3
Justification of the choice of data or description of measurement methods and procedures actually applied :	The data source, i.e. Central Electricity Authority is a Government of India organisation, which is mandated to publish such information under section 73 (i) and 73(j) of the Indian Electricity Act 2003.
Any comment:	

Data / Parameter:	**Gross electricity generation during 2004-05 by power plants considered for Build margin calculations.**
Data unit:	GWh
Description:	Gross generation by the sample group of power plants has been used to arrive at the net electricity supply by these power plants to the Northern grid.
Source of data used:	– Hydro Generation data obtained from CEA Performance Review of Hydro Power Stations 2004-05 – Steam Generation data obtained from Section 2, CEA Thermal Performance Review 2004-05 – Gas Generation data obtained from Section 10, CEA Thermal Performance Review 2004-05 – Nuclear Generation data obtained from Nuclear Power Corporation of India's website http://www.npcil.nic.in/raps.asp – Wind generation data is obtained from Table 3.4, CEA General Review 2004-05
Value applied:	Refer Annex – 3
Justification of the choice of data or description of measurement methods and procedures actually applied :	The data source, i.e. Central Electricity Authority is a Government of India organisation, which is mandated to publish such information under section 73 (i) and 73(j) of the Indian Electricity Act 2003. Many power generating stations in India house multiple generating units (both in case of Hydro and Thermal) and in many cases unit wise generation data is not published. Therefore some times it is not possible to determine the actual amount of electricity generated by a new unit that was added in recent times. In such cases pro-rata generation, depending on capacity, has been used. Plant wise generation for Nuclear power units is not available in the CEA publication. Generation data reported for the Rajasthan Atomic Power station for 2004-05 on the website of Nuclear Power Corporation of India Limited, http://www.npcil.nic.in/raps.asp, has been used. Similarly unit wise generation data of wind installations is also not available in the public domain. In case of the northern region build margin sample plants, the earliest plant i.e. GHTP Bhatinda-2 was commissioned on 18 October 1998, whereas the earliest wind installation of northern region was commissioned in 1999-00 in Rajasthan. Rajasthan is the only state in the northern region that has wind power installations. Therefore electricity generation for all wind power projects in Rajasthan for 2004-05 has been considered for build margin calculations.
Any comment:	

Data / Parameter:	**Auxiliary consumption during 2004-05 by power plants considered for Build margin calculations.**
Data unit:	GWh

Description:	Auxiliary consumption by the sample group of power plants has been used to arrive at the net electricity supply by these power plants to the Northern grid.
Source of data used:	– Auxiliary consumption for Hydro units is considered at 0.5% as per CERC norms applicable to Surface hydro electric power generating stations with static excitation system. – Auxiliary consumption for Steam units taken from Section 11, CEA Thermal Performance Review 2004-05 – For Gas plants, the state average auxiliary consumption of Gas Power plants as per Table 5.5 CEA General Review 2004-05 has been used in the absence of plant specific auxiliary consumption data. – Auxiliary Consumption for Nuclear Power Plants taken as the: State average for the respective generation type from Table 5.5 CEA General Review 2004-05
Value applied:	Refer Annex – 3
Justification of the choice of data or description of measurement methods and procedures actually applied :	The data source, i.e. Central Electricity Authority is a Government of India organisation, which is mandated to publish such information under section 73 (i) and 73(j) of the Indian Electricity Act 2003. Actual auxiliary consumption of Hydro power units is not available in the CEA publications. Hence the auxiliary consumption norms set by Central Electricity Regulatory Commission for determination of tariff for Hydro units has been used. Nuclear power in India is generated by the Government owned Nuclear Power Corporation of India Limited. Therefore the entire nuclear power generation pertains to NPCL alone. Hence the state average auxiliary consumption for Nuclear power actually refers to the auxiliary consumption rate achieved by the NPCL plant. In case of Gas plants, plant wise data is not available. Hence the state averages (for the respective fuel type) of auxiliary consumption have been applied. Auxiliary consumption of wind considered as "Nil" as wind power generation does not involve any auxiliary consumption. This is conservative.
Any comment:	

Data / Parameter:	**Average Emission Factor for Gas plants**
Data unit:	tCO2/GWh
Description:	The Average emission factor for Gas plants is used as in input for calculation of build margin emission factor
Source of data used:	CERC for tariff Regulations dated 24 March 2004
Value applied:	

	Gas Combined Cycle (Advanced class machines)
Gross Heat Rate (Kcal/KWh)	1,850
Auxiliary Consumption	3.0%
Net Heat Rate	1,907
Net Calorific value of fuel (Kcal/SCM)	8,150
Net Calorific value of fuel (TJ/'000' Tons)	34.12
Specific Fuel Consumption (SCM/KWh)	0.23
Carbon emission factor	15.30

	Oxidation factor tCO2/'000' tons	0.995 1,905	
	Emission Coefficient (tCO2e/GWh)	**445.73**	
Justification of the choice of data or description of measurement methods and procedures actually applied :	In the absence of any plant specific gas consumption information, the operating norms set by CERC, for tariff determination of Gas power plants, has been considered for arriving at the applicable emission rates for gas plants included in the build margin calculations.		
Any comment:			

Data / Parameter:	**Average Emission Factor for Coal plants**
Data unit:	tCO2/GWh
Description:	The Average emission factor for Coal plants is used as in input for calculation of build margin emission factor.
Source of data used:	CEA Thermal Performance Review 2004-05
Value applied:	

Coal/lignite fired stations	Coal consumption	Installed Capacity	Gross generation	Auxiliary consumption	Net Generation	Emission Coefficient (tCO2/ 1000 tonnes of fuel)	Specific emissions (tCO2e/MWh)
	Million Tonnes	MW	GWh	%	GWh		
Northern Region							
Rihand	4,768	1,000	7,988	7.93%	7,355	1,476	957
Suratgarh	5,920	1,250	9,362	9.22%	8,499	1,476	1,028
Kota	5,213	1,045	7,749	9.62%	7,004	1,476	1,099
Unchahar	4,604	840	6,781	8.57%	6,200	1,476	1,096
Bhatinda	1,995	420	3,309	9.23%	3,004	1,476	980
Panipat	4,447	860	5,326	10.34%	4,775	1,476	1,375

Justification of the choice of data or description of measurement methods and procedures actually applied :	The data source, i.e. Central Electricity Authority is a Government of India organisation, which is mandated to publish such information under section 73 (i) and 73(j) of the Indian Electricity Act 2003.
Any comment:	

B.6.3 Ex-ante calculation of emission reductions:

>>

Ex-ante calculation of emission reductions is equal to ex-ante calculation of baseline emissions as project emissions and leakage are nil.

Baseline emission factor (combined margin)
= 924.96 tCO2e/GWh

Annual electricity supplied to the grid by the Project
= 100 MW (Capacity) x 22% (PLF) x 8760 (hours) / 1000 GWh
= 192.70 GWh

Annual baseline emissions
= 924.96 tCO2e/GWh x 192.70 GWh
= 178,258 tCO2e

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

>>

Year	Estimation of project activity emissions (tonnes of CO2e)	Estimation of baseline emissions (tonnes of CO2e)	Estimation of leakage (tonnes of CO2e)	Estimation of overall emission reductions (tonnes of CO2e)
2008	0	178,258	0	178,258
2009	0	178,258	0	178,258
2010	0	178,258	0	178,258
2011	0	178,258	0	178,258
2012	0	178,258	0	178,258
2013	0	178,258	0	178,258
2014	0	178,258	0	178,258
2015	0	178,258	0	178,258
2016	0	178,258	0	178,258
2017	0	178,258	0	178,258
Total (tonnes of CO2e)	0	1,782,580	0	1,782,580

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

B.7.1 Data and parameters monitored:

Data / Parameter:	**EGy**
Data unit:	MWh (Mega-watt hour)
Description:	Net electricity supplied to the grid by the Project
Source of data to be used:	Electricity supplied to the grid as per the tariff invoices raised on RRVPNL/Jodhpur Discom.
Value of data applied for the purpose of calculating expected emission reductions in section B.5	Annual electricity supplied to the grid by the Project = 100 MW (Capacity) x 22% (PLF) x 8760 (hours) = 192,700 MWh
Description of measurement methods	Net electricity supplied to grid will be measured by main meters (export and import). The procedures for metering and meter reading will be as per the

and procedures to be applied:	provisions of the power purchase agreement to be entered into and the Metering Code of Rajasthan. Refer Annex – 4 for an illustration of the provisions for measurement methods.
QA/QC procedures to be applied:	QA/QC procedures will be as implemented by RRVPN/Jodhpur Discom pursuant to the provisions of the power purchase agreement to be entered into and the Metering Code of Rajasthan. Refer Annex – 4 for an illustration of the provisions for QA/QC procedures.
Any comment:	

B.7.2 Description of the monitoring plan:

>>

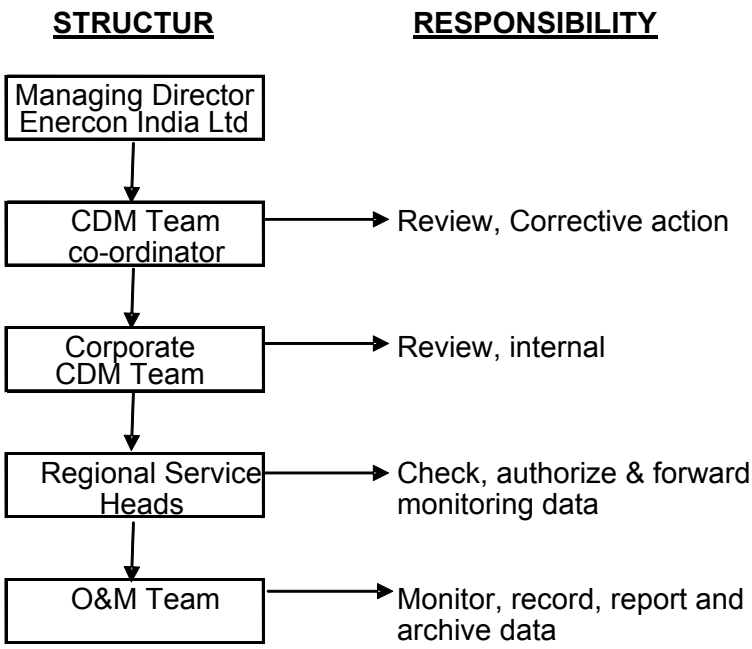
Approved monitoring methodology ACM0002 / Version 06 Sectoral Scope: 1, "Consolidated monitoring methodology for zero-emissions grid-connected electricity generation from renewable sources", by CDM - Meth Panel is proposed to be used to monitor the emission reductions.

This approved monitoring methodology requires monitoring of the following:

- Electricity generation from the project activity; and
- Operating margin emission factor and build margin emission factor of the grid, where *ex post* determination of grid emission factor has been chosen

Since the baseline methodology is based on ex ante determination of the baseline, the monitoring of operating margin emission factor and build margin emission factor is not required.

The sole parameter for monitoring is the electricity supplied to the grid. The Project is operated and managed by Enercon (India) Ltd. The operational and management structure implemented by Enercon 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: 15/11/2006

Name of responsible person/entity:
PricewaterhouseCoopers (not a Project Participant)

SECTION C. Duration of the project activity / crediting period

C.1 Duration of the project activity:

C.1.1. Starting date of the project activity:

>>

01/01/2007, being the expected date of placement of purchase order for the wind energy generators.

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

>>

20 years

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

C.2.1. Renewable crediting period

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:

>>

01/01/2008, being the expected date of commissioning of the entire Project.

C.2.2.2. Length:

>>

10 years

SECTION D. Environmental impacts

>>

D.1. Documentation on the analysis of the environmental impacts, including transboundary impacts:

>>

Enercon appointed Aditya Environmental Services Private Limited to conduct rapid environmental impact assessment study to assess the impact of the project on the local environment.

Environmental Impact Assessment (EIA) of this project is not an essential regulatory requirement, as it is not covered under the categories as described in EIA Notification of 1994 or the Amended Notification of 2006. However, Enercon conducted the EIA to study impacts on the environment resulting from the project activity.

The EIA study included identification, prediction and evaluation of potential impacts of the CDM activities on air, water, noise, land, biological and socioeconomic environment within the study area. The ambient air concentrations of Suspended Particulate Matter, Respirable Particulate Matter, Oxides of Nitrogen, Sulphur dioxide and Carbon Monoxide were monitored and were found under limits as specified by CPCB. The noise levels were observed through out the study period and were found to be in the permissible range. Water quality monitoring studies were carried out for determination of physico-chemical characteristics of bore wells. The ph level of water was found to be under the specified limits.

The study area represents part of Jodhpur district. The terrain is rough comprising sandy or stony wasteland & is very sparsely populated. The windfarm is located in the mist of the Indian 'Thar' Desert and does not come in the path of the migratory birds. There is no wild life or forestland near the project sites.

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:

>>

EIA demonstrated that there is no major impact on the environment due to the installation and operation of the windmills. The desert ecology is not likely to get impacted by this type of project activity. The local population confirmed that there is no noise or dust nuisance due to windmills. The EIA also ruled out any adverse impacts due to the project activity.

SECTION E. Stakeholders' comments

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

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The comments from local stakeholders were invited through a local stakeholder meeting conducted at Phalodhi, Jodhpur on 19 September 2006. A local newspaper advertisement was placed in *Rajasthan Patrica* on 5th September 2006 inviting the local stakeholders for the meeting.

The local stakeholder consultation meeting had representatives from the nearby villages, representatives of Enercon and representative of Aditya Environmental Services (consultant to Enercon). The minutes of the meeting are set out in Appendix 2.

E.2. Summary of the comments received:

>>

The comments from local villagers included:

- The nature of benefits that local stakeholders will get
- Impact on the grazing of local cattle
- Impact on any migratory patterns of birds or fauna
- Addressing safety issues by Enercon

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

>>

Enercon provided the following responses in relation to the comments received from the local stakeholders:

- The benefits to the local stakeholders will be through employment opportunities provided by the project in terms of small shops and construction workers.
- The project does not affect the grazing by the cattle. Enercon does not use any kind for boundary wall to protect their machines and hence the accessibility of cattle to areas for grazing and drinking water is not affected.
- The Project does not fall under migratory patterns of the birds.
- Enercon has appropriate protocols are in place to take care of all the safety issues.

The local stakeholders were satisfied with the explanations provided during the meeting.

Annex 1

CONTACT INFORMATION ON PARTICIPANTS IN THE PROJECT ACTIVITY

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Annex 2

INFORMATION REGARDING PUBLIC FUNDING

Annex 3

BASELINE INFORMATION

Emission Coefficients

2004-2005

Type of FUEL	Net Calorific Value (TJ/ 10^3 tonnes or TJ/Mcum)	Carbon Emission Factor (t C/ TJ)	Fraction of Carbon Oxidised Oxidation Factor	Emission Coefficient (tCO2/ 10^3 tonnes or tCO2/Mcum)
Steam stations				
Coal	15.72	26.13	0.98	1,476
Furnace oil	43.68	21.10	0.99	3,346
Light oil	43.00	20.00	0.99	3,122
LSHS/HHS/HSD	43.64	20.20	0.99	3,200
GAS	34.12	15.30	1.00	1,905
Lignite	11.40	28.95	0.98	1,186
Gas Stations				
Natural Gas	34.12	15.30	1.00	1,905
HSD	42.71	20.20	0.99	3,131
Naphtha	46.89	20.00	0.99	3,404
Diesel Stations				
LSHS	43.64	20.20	0.99	3,200
Diesel	43.00	20.20	0.99	3,153

2003-2004

Type of FUEL	Net Calorific Value (TJ/ 10^3 tonnes or TJ/Mcum)	Carbon Emission Factor (t C/ TJ)	Fraction of Carbon Oxidised Oxidation Factor	Emission Coefficient (tCO2/ 10^3 tonnes or tCO2/Mcum)
Steam stations				
Coal	15.99	26.13	0.98	1,502
Furnace oil	43.40	21.10	0.99	3,324
Light oil	42.65	20.00	0.99	3,096
LSHS/HHS/HSD	43.13	20.20	0.99	3,163
GAS	34.12	15.30	1.00	1,905
Lignite	11.46	28.95	0.98	1,192
Gas Stations				
Natural Gas	34.12	15.30	1.00	1,905
HSD	42.71	20.20	0.99	3,131
Naphtha	46.89	20.00	0.99	3,404
Diesel Stations				
LSHS	43.13	20.20	0.99	3,163
Diesel	42.65	20.20	0.99	3,127

2002-2003

Type of FUEL	Net Calorific Value (TJ/ 10^3 tonnes or TJ/Mcum)	Carbon Emission Factor (t C/ TJ)	Fraction of Carbon Oxidised Oxidation Factor	Emission Coefficient (tCO2/ 10^3 tonnes or tCO2/Mcum)
Steam stations				
Coal	17.46	26.13	0.98	1,640
Furnace oil	44.91	21.10	0.99	3,440
Light oil	40.86	20.00	0.99	2,967
LSHS/HHS/HSD	44.06	20.20	0.99	3,231
GAS	34.12	15.30	1.00	1,905
Lignite	11.25	28.95	0.98	1,170
Gas Stations				
Natural Gas	34.12	15.30	1.00	1,905
HSD	42.71	20.20	0.99	3,131
Naphtha	46.89	20.00	0.99	3,404
Diesel Stations				
LSHS	44.06	20.20	0.99	3,231
Diesel	40.86	20.20	0.99	2,996

Operating Margin for Northern Region

Fuel	Units	2004-05		2003-04		2002-03	
		Fuel consumption	Emissions (tCO2)	Fuel consumption	Emissions (tCO2)	Fuel consumption	Emissions (tCO2)
Steam stations							
Coal	'000' MT	72,943	107,674,458	70,085	105,246,478	68,594	112,472,267
Furnace oil	KL	26,071	81,119	43,377	134,086	57,666	184,464
Light oil	KL	94,208	243,211	254,855	652,561	60,211	147,724
LSHS/HHS/HSD	KL	3,126	8,272	2,377	6,217	32,761	87,535
GAS	MT	-	-	-	-	-	-
Lignite	'000' MT	-	-	-	-	-	-
Gas Stations							
Natural Gas	M Cu M	4,058	7,729,258	3,808	7,253,084	3,953	7,529,265
HSD	KL	275,047	712,283	240,593	623,059	401,257	1,039,127
Naphtha	KL	243,961	631,206	188,981	488,955	-	-
Diesel Stations							
LSHS	KL	-	-	-	-	-	-
Diesel	KL	-	-	-	-	-	-
Grid imports	**Units**	**Electricity import**	**Emissions (tCO2)**	**Electricity import**	**Emissions (tCO2)**	**Electricity import**	**Emissions (tCO2)**
From region							
Western Region	GWh	374	345,000	175	164,242	43	51,472
Eastern Region	GWh	3,043	3,375,957	125	144,143	827	1,050,177
Southern Region	GWh	120	97,941				
North-eastern Region	GWh	172	55,058				
Total emissions		3,709	120,953,763		114,712,824		122,562,031

Net electricity generation	Units	2004-05	2003-04	2002-03
Steam stations	GWh	96,404	94,041	91,523
Gas stations	GWh	19,516	18,328	16,852
Diesel stations	GWh			
Grid imports	GWh	3,709	301	870
Total	GWh	119,630	112,669	109,245

	Units	2004-05	2003-04	2002-03
Operating Margin	tCO2/GWh	1,011.07	1,018.14	1,121.90

Average Emission Rate of Western Grid

Fuel	Units	2004-05		2003-04		2002-03	
		Cons	Emissions (tCO2)	Cons	Emissions (tCO2)	Cons	Emissions (tCO2)
Steam stations							
Coal	'000' MT	94,123	138,939,213	89,075	133,763,716	91,350	149,784,844
Furnace oil	KL	1,066,231	3,317,529	1,187,213	3,669,883	135,786	434,357
Light oil	KL	10,028	25,889	10,685	27,359	46,383	113,798
LSHS/HHS/HSD	KL	574,238	1,519,604	423,797	1,108,473	2,006,346	5,360,834
GAS	MT	39,012	74,306	33,884	64,539	204,166	388,874
Lignite	'000' MT	2,609	3,095,348	2,560	3,051,709	19,311	22,591,188
Gas Stations							
Natural Gas	M Cu M	4,667	8,889,218	3,721	7,087,375	3,505	6,675,961
HSD	KL	1,625	4,208	2,767	7,166	697,009	1,805,029
Naphtha	KL	776,908	2,010,111	1,082,436	2,800,610	426,280	1,102,924
Diesel Stations							
LSHS	KL	-	-		-	-	-
Diesel	KL	-	-		-	-	-
Total			**157,875,426**		**151,580,830**		**188,257,809**
Net Grid Generations	GWh		**171,027**		**161,528**		**158,333**
Average Emission Rate	tCO2e/GWh		**923.10**		**938.42**		**1,189.00**

Average Emission Rate of Eastern Grid

Fuel	Units	2004-05		2003-04		2002-03	
		Cons	Emissions (tCO2)	Cons	Emissions (tCO2)	Cons	Emissions (tCO2)
Steam stations							
Coal	'000' MT	58,372	86,165,546	53,212	79,908,334	45,146	74,025,031
Furnace oil	KL	54,976	171,055	78,230	241,823	52,510	167,971
Light oil	KL	121,186	312,858	170,917	437,636	98,608	241,928
LSHS/HHS/HSD	KL	-	-	-	-	-	-
GAS	MT	-	-	-	-	-	-
Lignite	'000' MT	-	-	-	-	-	-
Gas Stations							
Natural Gas	M Cu M	-	-	-	-	-	-
HSD	KL	-	-	2,596	6,723	3,423	8,864
Naphtha	KL	-	-	-	-	-	-
Diesel Stations							
LSHS	KL	219	580	-	-	-	-
Diesel	KL	29,880	77,911	38,881	100,551	14,847	36,790
Total			**86,727,950**		**80,695,067**		**74,480,585**
Net Grid Generations	GWh		**78,164**		**70,253**		**58,652**
Average Emission Rate	tCO2e/GWh		**1,109.57**		**1,148.64**		**1,269.86**

Average Emission Rate of North – Eastern Grid

Fuel	Units	2004-05		2003-04		2002-03	
		Cons	Emissions (tCO2)	Cons	Emissions (tCO2)	Cons	Emissions (tCO2)
Steam stations							
Coal	'000' MT						
Furnace oil	KL						
Light oil	KL						
LSHS/HHS/HSD	KL						
GAS	MT						
Lignite	'000' MT						
Gas Stations							
Natural Gas	M Cu M	1,309	2,493,248	1,246	2,373,252	930	1,771,368
HSD	KL						
Naphtha	KL						
Diesel Stations							
LSHS	KL						
Diesel	KL	353	920	3,431	8,873	4,948	12,261
Total			**2,494,168**		**2,382,125**		**1,783,629**
Net Grid Generations	GWh		**7,814**		**6,569**		**5,308**
Average Emission Rate	tCO2e/GWh		**319.20**		**362.63**		**336.05**

Average Emission Rate of Southern Grid

Fuel	Units	2004-05		2003-04		2002-03	
		Cons	Emissions (tCO2)	Cons	Emissions (tCO2)	Cons	Emissions (tCO2)
Steam stations							
Coal	000MT	53,144	78,448,259	52,985	79,567,449	65,997	108,214,016
Furnace oil	KL	45,848	142,654	56,498	174,645	115,914	370,790
Light oil	KL	24,330	62,811	33,031	84,577	8,407	20,626
LSHS/HHS/HSD	KL	2,612	6,912	5,310	13,889	6,093	16,280
GAS	KL		-				
Lignite	000MT	22,121	26,244,612	20,755	24,741,489	17,738	20,750,996
Gas Stations							
Natural Gas	M Cu M	2,203	4,196,046	2,010	3,828,440	3,130	5,961,700
HSD	KL	81,254	210,422	226,981	587,808	275,122	712,478
Naphtha	KL	289,451	748,903	719,694	1,862,080	485,496	1,256,134
Diesel Stations							
LSHS	KL	465,220	1,231,110	647,451	1,693,457	-	-
Diesel	KL	63,039	164,371	14,903	38,541	865,938	2,145,766
Total			**111,456,100**		**112,592,373**		**139,448,786**
Net Grid Generations	GWh		**137,025**		**129,865**		**125,830**
Average Emission Rate	tCO2e/GWh		**813.40**		**867.00**		**1,108.23**

Build Margin Emission Factor for Northern Grid

Name of the plant	State	Date of addition	Gross Gen	Aux Cons	Net supply to grid	Emission factor (tCO2/GWh)	Total tCO2
			GWh	%	GWh	(for 2004-05)	
Hydro							
Nathpa Jhakri HEP - 1	Himachal	31-Mar-04	852	0.50%	847		
Nathpa Jhakri HEP - 2	Himachal	9-Mar-04	852	0.50%	847		
Chamera HEP II - 3	Himachal	26-Feb-04	449	0.50%	447		
Nathpa Jhakri HEP - 3	Himachal	13-Feb-04	852	0.50%	847		
Nathpa Jhakri HEP - 4	Himachal	22-Jan-04	852	0.50%	847		
Chamera HEP II - 2	Himachal	5-Dec-03	449	0.50%	447		
Nathpa Jhakri HEP - 5	Himachal	23-Nov-03	852	0.50%	847		
Chamera HEP II - 1	Himachal	4-Nov-03	449	0.50%	447		
Nathpa Jhakri HEP - 6	Himachal	20-Sep-03	852	0.50%	847		
Baspa -II - 3	Himachal	27-May-03	398	0.50%	396		
Baspa -II - 2	Himachal	8-Feb-03	398	0.50%	396		
Baspa -II - 1	Himachal	24-Jan-03	398	0.50%	396		
Upper Sindh II - 2	JK	29-Mar-02	49	0.50%	49		
Sewa III - 3	JK	19-Mar-02	3	0.50%	3		
Sewa III - 1	JK	18-Mar-02	3	0.50%	3		
Sewa III - 2	JK	18-Mar-02	3	0.50%	3		
Upper Sindh II - 1	JK	11-Sep-01	49	0.50%	49		
Malana - 2	Himachal	9-Jul-01	134	0.50%	133		
Malana - 1	Himachal	5-Jul-01	134	0.50%	133		
Ghanvi - 1	Himachal	7-Dec-00	37	0.50%	37		
Ranjait Sagar - 3	Punjab	11-Oct-00	286	0.50%	285		
Ranjait Sagar - 4	Punjab	16-Sep-00	286	0.50%	285		
Ranjait Sagar - 2	Punjab	20-Aug-00	286	0.50%	285		
Ranjait Sagar - 1	Punjab	12-Aug-00	286	0.50%	285		
Chenani III - 1	JK	31-Jul-00	6	0.50%	6		
Chenani III - 2	JK	31-Jul-00	6	0.50%	6		
Chenani III - 3	JK	31-Jul-00	6	0.50%	6		
Ghanvi - 2	Himachal	30-Jul-00	37	0.50%	37		
Upper Sind II - 3	JK	5-Jan-00	49	0.50%	49		
Steam							
Kota TPS IV - 6	Rajasthan	30-Jul-03	1,470	9.62%	1,329	1,099	1,459,784
Suratgarh III - 5	Rajasthan	30-Jun-03	1,955	9.22%	1,775	1,028	1,824,857
Suratgarh TPS - 4	Rajasthan	25-Mar-02	1,951	9.22%	1,771	1,028	1,821,124
Suratgarh TPS - 3	Rajasthan	29-Oct-01	1,876	9.22%	1,703	1,028	1,751,116
Panipat TPS St IV - 6	Haryana	31-Mar-01	1,482	10.34%	1,329	1,375	1,826,599
Suratgarh - 2	Rajsthan	28-Mar-00	1,704	9.22%	1,547	1,028	1,590,566
Unchahar TPP - 4	UP	22-Oct-99	1,748	8.57%	1,598	1,096	1,751,911
Unchahar TPP - 3	UP	27-Jan-99	1,690	8.57%	1,545	1,096	1,693,781

Name of the plant	State	Date of addition	Gross Gen	Aux Cons	Net supply to grid	Emission factor (tCO2/GWh)	Total tCO2
			GWh	%	GWh	(for 2004-05)	
GHTP Bhatinda - 2	Punjab	16-Oct-98	1,536	11.24%	1,363	980	1,336,723
Wind							
All wind power projects in the region	Rajasthan	31-Mar-05	332	0.00%	332		
Gas							
Pragati CCGT - 3	Delhi	31-Jan-03	936	2.34%	914	446	407,293
Pragati CCGT - 2	Delhi	9-Nov-02	808	2.34%	789	446	351,509
Ramgarh CCGT Stg II - 2	Rajasthan	24-Aug-02	120	7.21%	111	446	49,447
Ramgarh CCGT Stg II - 1	Rajasthan	7-Aug-02	119	7.21%	110	446	49,054
Pragati CCGT - 1	Delhi	15-Mar-02	808	2.34%	789	446	351,509
Faridabad CCGT	Haryana	31-Jul-00	1,059	2.28%	1,035	446	461,205
Faridabad CCGT - 2	Haryana	18-Oct-99	1,052	2.28%	1,028	446	458,002
Faridabad CCGT - 1	Haryana	28-Jun-99	1,052	2.28%	1,028	446	458,002
Nuclear							
Rajasthan Atomic PP - 4	Rajasthan	23-Dec-00	1,649	10.50%	1,476		
Rajasthan APS - 3	Rajasthan	10-Mar-00	1,470	10.50%	1,316		
Total			**34,125**		**32,150**		**17,642,481**

Test of Build Margin Sampling

Net Generation from five most recent plants	3,836	GWh
	Net	
Total Net Electricity Generation for NR grid (2004-05)	**158,836**	GWh
Total Net Electricity Generation from power plants added to the system	**32,150**	GWh
of the total grid generation	**20.24%**	

Therefore the power plants as per table above have been considered in Build Margin calculations

		tCO2/GWh
Build Margin	**548.76**	

Combined Margin for Northern Grid

		Northern Grid (tCO2e/GWh)
Simple Operating Margin - 2002-03		1,122
Simple Operating Margin - 2003-04		1,018
Simple Operating Margin - 2004-05		1,011
Average Operating Margin of last three years		1,050

		Northern Grid (tCO2e/GWh)
Build Margin		549

Combined Margin for Wind Power Plants		**Northern Grid (tCO2e/GWh)**
	Weights	
Operating Margin	0.75	1,050
Build Margin	0.25	549
Combined Margin		924.96

Annex 4

MONITORING INFORMATION

- The electricity supplied to the grid will be metered at the 220/400 kV level at the RRVPN substation at Surpura, Mandour. Representatives of RRVPN/Jodhpur Discom and Enercon will jointly take the main meter reading and sign the meter reading on the first day of every month. Simultaneously, the joint meter reading at the 220/400 kV level of the backup metering system at Surpura, Mandour substation will also be taken by representatives of RRVPN/Jodhpur Discom and Enercon.

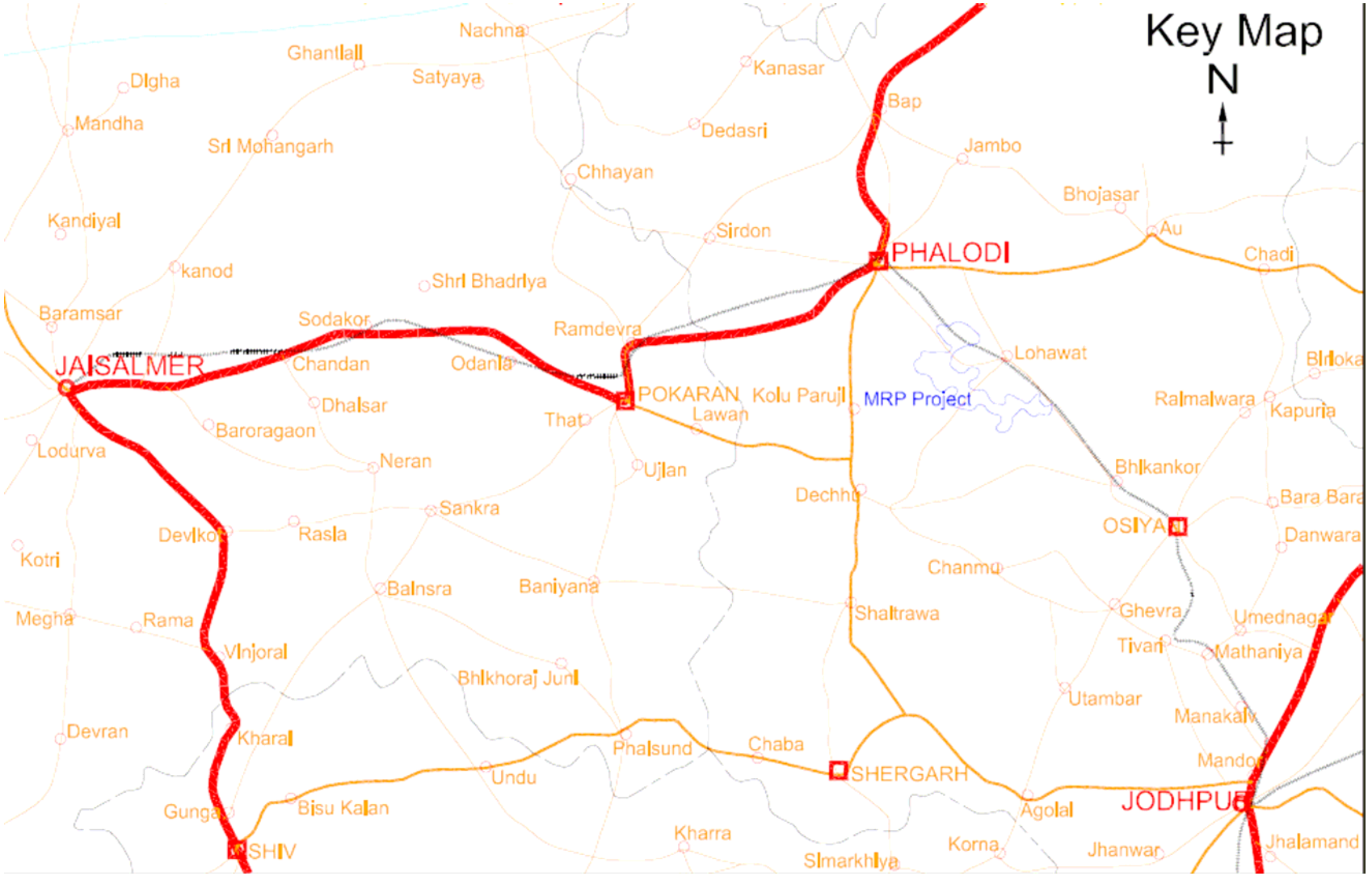
- The meters will jointly inspected/ tested once in a year as per the terms of the PPA. Joint inspection and testing will also be carried out as and when difference in monthly meter readings exceeds the sum of maximum error as per accuracy class of main and back up meters.

- In case the meters are found to operate outside the permissible limits, the meters will be either replaced immediately or calibrated. Error correction will be applied to the meter reading. Whenever a main meter goes defective, the consumption recorded by the backup meter will be referred. The details of the malfunctioning along with date and time and snaps shot parameters along with load survey will be retrieved from the main meter. The exact nature of the malfunctioning will be determined after analyzing the data so retrieved and the consumption recorded by the main meter will be assessed accordingly.

- If main as well as back up metering system becomes defective, the assessment of energy consumption for the outage period will be done from the backup meters by the concerned parties as mutually agreed or at the level of Metering Committee set up under the Metering Code.

- The main and the backup metering systems will be sealed in presence of representatives of Enercon and RRVPN/Jodhpur Discom.

Appendix 1 – Location Map



Appendix 2 – Minutes of stakeholder consultation meeting

	Public Consultation Meeting of Wind Energy Projects fort Clean Development Mechanism Project of Enercon (India) Limited. situated at Phalodhi in Jodhpur, Rajasthan **Jaisalmer, District Rajasthan, India** **MINUTES OF THE MEETING**
	Venue: Welcome Hotel, Phalodhi, Jodhpur | Date: 19 Sep 2006
	The people participated are the following:
	Representatives:
	Representatives from the Village: Shri. D.K.Joshi Shri. Mohan Singh The list of all other people from the villages is annexed. **Enercon (India) Limited:** Mr. Anupam Mathur Mr. Rajendra Vyas Mr. Rakesh Chhangani Mr. Neeraj Gupta **Aditya Environmental Services Pvt. Ltd.** Mr. Gurmeet Singh
	Mr. Anupam Mathur invited Shri.D.K. Joshi to chair the meeting. The agenda of the meeting is fixed as follows: • Welcome • Description of the project details • Queries and responses from the proponent and the stakeholders • Vote of thanks **WELCOME ADDRESS** Mr.Anupam Mathur, from Enercon India Limited welcomed all the people who came to take part in the meeting. There were more than 20 people from all the villages that fall in the vicinity of the project site. **Description of the Project Details.** The present stakeholder consultation is for proposed 100 MW of Enercon Wind Farm (Maharana Pratap) coming up at Phalodhi, Jodhpur, Rajasthan. The 100 MW of capacity will include 125 machines of 800 KW (Enercon make E-48). The Knowledge of the wind farm was communicated to the local people in the local language. The wind farm projects falls in the category of the renewable energy. The meaning of the renewable energy was explained. The sites where the projects are located have no commercial activity and is a waste land. The best use of land will be made through the project which otherwise is barren. Improved

	supply of electricity to the grid, and employment opportunities to local people. He explained function and advantages of the windmill to the people. The comparison between the wind farm projects and other alternatives is drawn in order to convey the advantages that wind power possess over other alternatives. The wind farm produces the clean and green energy and do not account for any kind of pollution, as might be the case with other alternatives. The energy for the wind power is derived from the kinetic energy of the wind and hence do not produce any kind of waste, as may be the case with the other alternatives. In addition several other support services augmented by Enercon to local people in terms of transportation, mid –day meals to school children, renovation of Temedarai temple etc. as its social community initiatives. **SHRI. D.K. JOSHI** The chairperson of the meeting briefed the advantages of the wind farm. The project will provide the employment opportunities to the local people as the result of which may result in increase of the income of local people as is the case of Jaisalmer where the Enercon India Limited Projects has provided the employment opportunities to the local people. He also praised Enercon India Limited for their decision to invest in district of Jodhpur. **Mr. Rajindra Vyas** The villagers in this part of the state are very backward but the times are changing with coming up of the wind farm projects of the Enercon India Limited. The project has provided the employment opportunities to the people. Security, drivers and labour people are selected among the local villagers. The reference to the projects of Enercon India Limited in Jaisalmer was drawn to explain the advantages and the opportunities that the local people have gained as the result of the project. The project will employ the local people for the construction work and security. The people who are educated may also be given better opportunities depending upon their talent. **Mr. Gurmeet Singh**, Aditya Environmental Services briefed the environmental benefits of wind power generation as compared to that of thermal power generation based on coal. Similarly, a briefing on GHG and its role in global warming / increasing temperatures on the earth was given. The benefits in terms of pollution free environment and safeguard to human health were also communicated to the stakeholders while comparing coal-based generation to wind based generation. The Government of Rajasthan is also encouraging the development of renewable energy. Summary on Kyoto Protocol and CDM were made available.

	The concerns, suggestions, opinions of the stakeholders have been specially invited. The participants expressed the queries as given below. The representatives from ENERCON clarified them as given below.	
	Queries	**Responses**
1.	What are the benefits of the wind power projects that stakeholders shall observe?	The project will provide the people with the employment opportunities. The project shall give jobs and economic opportunities in terms of small shops and construction workers.
2.	Will the project affect the grazing of local cattle?	No, the project do not affect the grazing by the cattle. Enercon India Limited does not use any

		kind for boundary wall to protect their machines and hence the accessibility of cattle to areas for grazing and drinking water is not affected.
3.	Will the project affect any migratory patterns of birds or fauna?	The project does not fall under migratory patterns of the birds.
4.	Do Enercon take care of safety issues?	The Enercon India Limited takes care about the safety issues. Appropriate protocols are in place to take care of all the safety issues.

Vote of thanks

Mr. Rakesh Chhangani thanked all the people for sparing their time for this meeting and requested them to continue their support towards the projects of Enercon India Limited. The representatives of the villages and also the local population represented their happiness towards Enercon India Limited.