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: Enercon Wind Farm (Hindustan) Ltd in Karnataka
Version: 4.0
Date of completion of PDD: 15/01/2008

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 Wind Farm (Hindustan) Ltd. 68.8 MW wind power project ("Project") in the Indian state of Karnataka to provide reliable, renewable power to the Karnataka state electricity grid which is part of the Southern 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 harnesses 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") will be the equipment supplier and the operations and maintenance contractor for the Project. The generated electricity will be supplied to Karnataka Power Transmission Company Ltd ("KPTCL")/ Bangalore Electricity Supply Company Ltd ("BESCOM") under a long-term power purchase agreement (PPA). The Project is 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 Karnataka of incremental capacity from renewable sources;
- contribution towards meeting the electricity deficit in Karnataka;
- 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

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 is located in the State of Karnataka that forms part of the Southern regional electricity grid of India.

A.4.1.3. City/Town/Community etc:

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The Project is located at Chikkabyaladakere, Kanubehalli, Elladakere and Arasinagundi villages in Chitradurga District and Dasudi, Nelenuru, Ganadu, Annenhalli , Siddapura villages in Tumkur district of Karnataka 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 13^{o} 31’ & 13^{o} 45’ North and longitude 76^{o} 30’ & 76^{o} 44’ East. The Project is connected to the KPTCL 220/66/11 kV substation at Hiriyur village. The site is located at a distance of 200 km from Bangalore by road. The nearest railway station is at Bangalore. A location map is attached at Appendix – 1.

The Project consist of 86 number of E-48 WECs of 800 kW each. The turbines are uniquely identified as EWFHL-01 to EWFHL-86.the details of the physical location are as follows:

S. No	District	Taluka	Village	No. Of WEC
1	Tumkur	Chikkanayakanahalli	Dasudi	20
		Chikkanayakanahalli	Nelenuru	5
		Chikkanayakanahalli	Ganadu	6
		Gubbi	Annenhalli	6

		Gubbi	Siddapura	9
2	Chitradurga	Hosadurga	Chikkabyaledakere	16
		Hosadurga	Kanubehalli	11
		Hosadurga	Arasinagundi	8
		Hosadurga	Elladakere	5
		Total		86

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 86 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	148,858
2009	148,858
2010	148,858
2011	148,858
2012	148,858
2013	148,858
2014	148,858
2015	148,858
2016	148,858
2017	148,858
Total estimated reductions (tonnes of CO2e)	1,488,580
Total number of crediting years	10
Annual average over the crediting period of estimated reductions (tonnes of CO2e)	148,858

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 Karnataka state grid, which forms part of the Southern 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 Southern 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 Southern 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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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 Projects. As the Projects are connected to the Southern regional electricity grid, the Southern grid is the "project electricity system".

Accordingly, the project boundary encompasses the physical extent of the southern regional electricity grid which includes the project site and all power plants connected physically to the electricity system.

	Source	Gas	Included?	Justification/ Explanation
Base	Electricity generation from	CO_2	Included	Main emission source

	power plants connected to the Southern Grid	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 Projects	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:

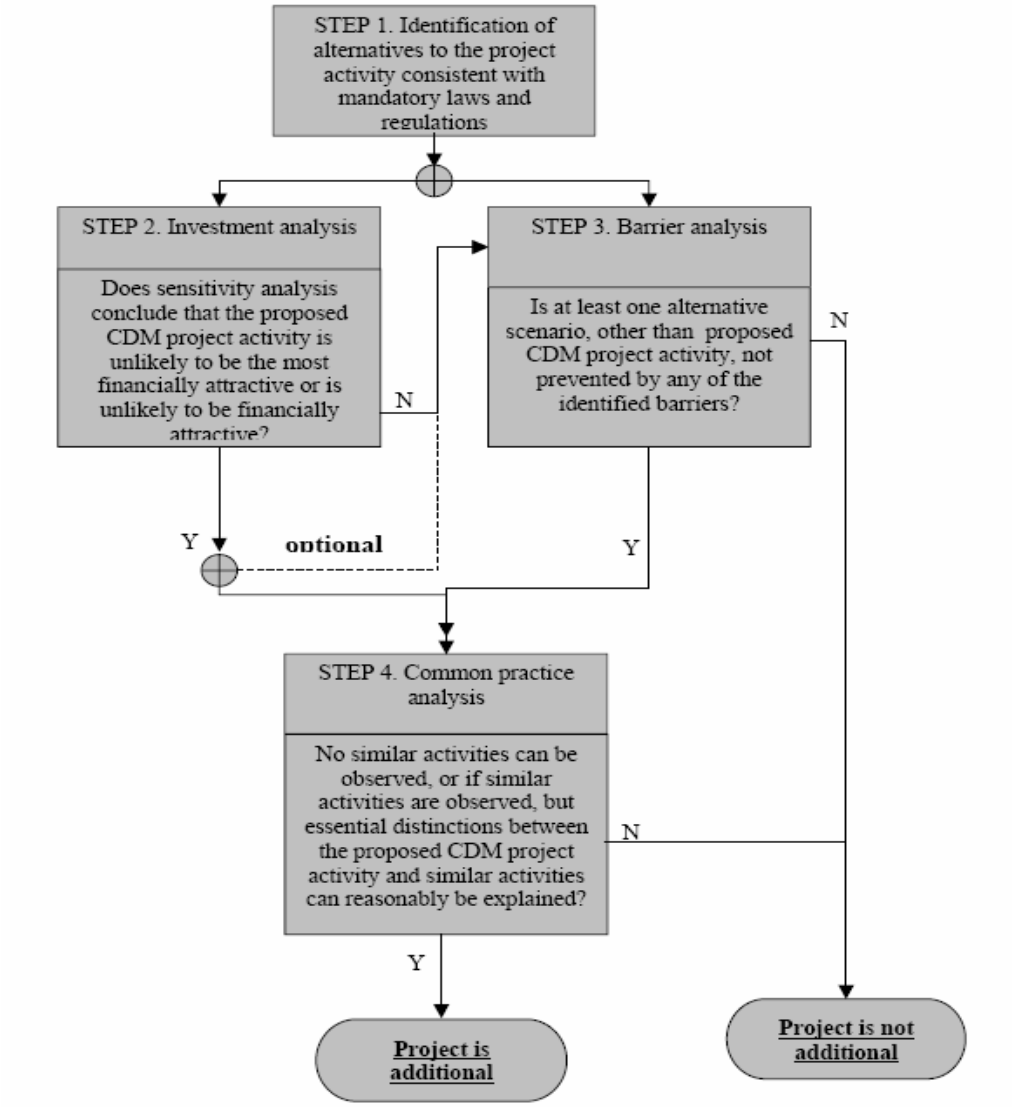
Electricity delivered to the grid by the project would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources, as reflected in the combined margin (CM) calculations described below.

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): >>

The Project start date is prior to the date of validation of the PDD. Enercon and a CER purchaser had entered into an Emission Reduction Purchase Agreement dated 7 December 2005 for purchase of emission reductions from the Project, which is prior to the start date of the Project.

The latest additionality tool i.e. Tool for the demonstration and assessment of additionality version 3.0 approved by CDM Executive Board in its 29th meeting is used to demonstrate project additionality.



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 fossil fuel fired or hydro power projects that supply to the Karnataka 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 Karnataka had energy (MU) shortages of 0.7% and peak (MW) shortages of 9.8% in 2005-06 (Source: Southern Region Power Sector Profile, August 2006, Ministry of Power).

Outcome of step 1 a:

Alternatives a and b, as identified above are realistic and credible alternatives to the project activity.

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.

Outcome of step 1 b

Both alternative a and alternative b are in compliance with mandatory laws and regulations taking into account the enforcement in the region or country and EB decision on national and sectoral policies. Hence Alternative a and b as identified in the step 1 a are realistic and credible alternatives to the project activity.

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 III – Benchmark 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.

The foregoing discussion establishes that there is a relevant and publicly available benchmark of post-tax equity return in the regulatory domain. This benchmark return is used by KERC to set the electricity generation tariff from wind power projects in Karnataka. KERC set a single electricity generation tariff that is applicable to all the wind power generation projects (including the Project Activity) in the Tariff Order dated 18 January 2005. "In the matter of Determination of Tariff in respect of Renewable Sources of Energy"
(source: http://www.kerc.org/english/index.html).

Further, this tariff once fixed is applicable for all future wind power generation projects until a new tariff order replaces it.

In determining this tariff, as explained by KERC in the Tariff Order, it employs assumptions on the relevant parameters including capital cost, operating cost, plant load factor (or capacity utilisation factor), financing, taxation, etc. to arrive at the generation tariff that would cover the costs and provide the post-tax equity return. Thus, if a project is set up that has all the parameters exactly similar to those assumed by KERC in its Tariff Order, it will earn the benchmark post-tax equity return. However, if a project has parameters that are different than those assumed by KERC, its equity return will be different than the benchmark post-tax equity return and vice versa.

We provide an illustrative example of how this happens with the key parameter – capital cost per MW. As the tariff is established by KERC on a cost-plus basis, i.e., by relation to the capital cost, this is one of the key drivers of setting the tariff. During the public hearing process, various stakeholders suggested capital costs ranging from Rs. 42.5 million to Rs. 50.0 million and KERC chose Rs. 42.5 million as the reasonable capital cost to determine the tariff for all wind generation projects (refer to KERC Tariff Order).

However, the capital cost per MW of wind turbines in practice is far in excess of Rs. 42.5 million per MW. We provide examples below to show the capital cost per MW in Karnataka projects of different manufacturers and the proposed project activity.

UNFCCC Project ref. No	Title	Make	Cost per MW (Rs Million)
1082	7.85 bundled wind power project in Southern India	Suzlon	49.50
1308	3 MW wind power project at Chikasiddvanahalli, village Chitradurga district, Karnataka	NEG Micon	52.30
1259	Proposed project activity, Enercon Wind Farm (Hindustan) Ltd in Karnataka"	Enercon	47.4

The cost per MW value refers form the respective PDDs of the above-mentioned project uploaded at UNFCCC site.

In other words, if the project has parameters that are similar to the values assumed by KERC and a capital cost of Rs. 42.5 million per MW, using the tariff set by KERC, it would have earned the benchmark rate of return. It so happens that KERC has used extremely conservative assumptions in relation to the tariff parameters including the capital cost (without any provision of reviewing it to align it closer to the market) and therefore, the tariff set by KERC results in the Project Activity achieving equity IRR lower than the benchmark equity return.

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

1. 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.
2. 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).
3. Assumptions and input data for the investment analysis shall not differ across the project activity and its alternatives, unless differences can be well substantiated.
4. Present in the CDM-PDD submitted for validation a clear comparison of the financial indicator for the proposed CDM activity and:
5. 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;
6. 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	86
Project Capacity in MW	68.80
Project Commissioning Date	28-Dec-06
Project Cost per MW (Rs. In Millions)	47.4

Operations	

Plant Load Factor	26.5%
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 for 10 years - Rs./Kwh	3.40
Annual Escalation (Rs./kWh per Year)	0.00
Tariff applicable after 10 years (Rs/kWh)	Cost plus 16% return on equity

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	3,263

Means of Finance		Rs Million
Own Source	30%	979
Term Loan	70%	2,284
Total Source		3,263
Terms of Loan		
Interest Rate	8.50%	
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-Jul-07
Length of Crediting period	10

Baseline Emission Factor for Southern Region (tCO2/GWh)	932.04

The equity IRR for the Project (without CDM revenues) is 11.7 %.

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

5. 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 18% and 22% (10% variation from the CUF considered by MERC for tariff determination in its Order dated 24 November 2003. 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:

Sensitivity	PLF at 23%	PLF at 28%
Post tax Equity IRR without CER revenues	7.0%	13.9%

Outcome of step 2

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:

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

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.
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 Karnataka. In 2004 – 05, wind electricity generation was 485.57 GWh and the total electricity availability at bus-bar in the state of Karnataka was 33523.92 GWh (Source: CEA General Review 2006). This works out to 1.45%, showing that wind energy power generation is insignificant as compared to other power project generation sources in Karnataka.

Installed capacity of wind energy generation sources stood at 276 MW as of 31 March 2005 (Source: CEA General Review 2006). There are approximately 201 MW wind energy projects that are currently in the CDM pipeline (UNFCCC website) and more are expected to follow.

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

Outcome of step 4

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

Sub-steps 4a and 4b are satisfied and therefore the project activity is additional.

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: *BEy* is baseline emissions
PEy is project activity emissions 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)

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 Southern electricity regional grid.

The Simple Operating Margin approach is appropriate 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 Southern 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	24,951	16,943	18,288	26,260	29,902
Wind & Renewables	3,256	1,865	1,607	1,456	1,262
Nuclear	4,408	4,700	4,390	5,244	4,331
Other sources					

[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.

Coal	99,010	98,435	92,053	84,032	83,292
Diesel	2,434	3,295	4,379	4,155	2,868
Gas	12,428	14,214	13,950	10,331	7,132
Total Generation	**146,487**	**139,451**	**134,667**	**131,478**	**128,787**
Low cost/must run sources	32,615	23,508	24,285	32,960	35,496
Low cost/must run sources	22%	17%	18%	25%	28%

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 Southern grid in the last five years. Hence the Simple OM method is appropriate to calculate the Operating Margin Emission factor applicable.

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):

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

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 having a large number of power plants connected to it and is therefore appropriate.

The Central Electricity Authority, Ministry of Power, Government of India has published a database of Carbon Dioxide Emission from the power sector in India based on detailed authenticated information obtained from all operating power stations in the country. This database i.e. The CO2 Baseline Database provides information about the Operating Margin and Build Margin Emission Factors of all the regional electricity grids in India. The Operating Margin in the CEA database is calculated ex ante using the Simple OM approach and the Build Margin is calculated ex ante based on 20% most recent capacity additions in the grid based on net generation as described in ACM0002. We have, therefore, used the Operating Margin and Build Margin data published in the CEA database, for calculating the Baseline Emission Factor.

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 values for operating margin and build margin emission factors provided in the CEA database and their respective weights for calculation of combined margin emission factor, the baseline carbon emission factor (CM) is 932.04 tCO2e/GWh or 0.93204 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:	$EF_{OM,y}$
Data unit:	tCO2e/MWh
Description:	Operating Margin Emission Factor of Southern Regional Electricity Grid
Source of data used:	"CO2 Baseline Database for Indian Power Sector" published by the Central Electricity Authority, Ministry of Power, Government of India. The "CO2 Baseline Database for Indian Power Sector" is available at www.cea.nic.in
Value applied:	2002 – 03: 0.9970 2003 – 04: 1.0094 2004 – 05: 1.0038
Justification of the choice of data or description of measurement methods and procedures actually applied :	Operating Margin Emission Factor has been calculated by the Central Electricity Authority using the simple OM approach in accordance with ACM0002.

Data / Parameter:	$EF_{BM,y}$
Data unit:	tCO2e/MWh
Description:	Build Margin Emission Factor of Southern Regional Electricity Grid
Source of data used:	"CO2 Baseline Database for Indian Power Sector" published by the Central Electricity Authority, Ministry of Power, Government of India. The "CO2 Baseline Database for Indian Power Sector" is available at www.cea.nic.in
Value applied:	2004 – 05: 0.718

Justification of the choice of data or description of measurement methods and procedures actually applied :	Build Margin Emission Factor has been calculated by the Central Electricity Authority in accordance with ACM0002.

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)
= 932.04 tCO2e/GWh

Annual electricity supplied to the grid by the Project
= 68.8 MW (Capacity) x 26.5% (PLF) x 8760 (hours) / 1000 GWh
= 159.712 GWh

Annual baseline emissions
= 932.04 tCO2e/GWh x 159.712 GWh
= 148,858 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	148,858	0	148,858
2009	0	148,858	0	148,858
2010	0	148,858	0	148,858
2011	0	148,858	0	148,858
2012	0	148,858	0	148,858
2013	0	148,858	0	148,858
2014	0	148,858	0	148,858
2015	0	148,858	0	148,858
2016	0	148,858	0	148,858
2017	0	148,858	0	148,858
Total (tonnes of CO2e)	0	1,488,580	0	1,488,580

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 KPTCL/BESCOM.
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 = 68.8 MW (Capacity) x 26.5% (PLF) x 8760 (hours) MWh = 159,712 MWh
Description of measurement methods and procedures to be applied:	Metering system for the project activity consists of one main and one check meter. Both the meters are **two-way trivector meters capable of recording import and export of electricity** and provide output in the form of net electricity supplied to the grid. The procedures for metering and meter reading will be as per the provisions of the power purchase agreement. 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 KPTCL/BESCOM pursuant to the provisions of the power purchase agreement. Refer Annex – 4 for an illustration of the provisions for QA/QC procedures.
Any comment:	The data (electricity supplied to the grid) will be archived on electronic media as well as on paper. The archive will be kept for the period up to two years after the completion of the crediting period or the last issuance of CERs for the project activity whichever occurs later.

B.7.2 Description of the monitoring plan:

>>

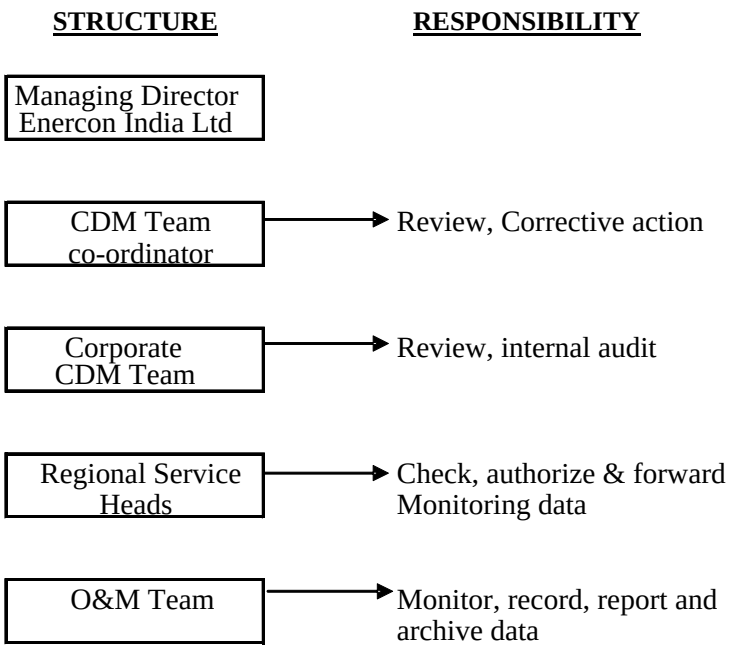
Approved monitoring methodology ACM0002 / Version 06 Sectoral Scope: 1, "Consolidated monitoring methodology for zero-emissions grid-connected electricity generation from renewable sources", by CDM - Meth Panel is proposed to be used to monitor the emission reductions.

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)

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Date of completion: 06/03/2007

Name of responsible person/entity:
PricewaterhouseCoopers Private Limited (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:

>>

10/03/2006 being the 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:

>>
15/10/2007, being the date on which the Project is expected to be Registered.

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 socio-economic 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 physiochemical characteristics of bore wells. The ph level of water was found to be under the specified limits.

The study area represents part of Chitradurga and Tumkur district. The terrain comprises hilly areas, which are sparingly populated, the hills are generally covered with shrubs and grass, and trees are not found on the hilltops. Moreover the project area doesn't fall under any protected land for wildlife and it has no adverse ecological impacts on the surroundings, flora and fauna found in the vicinity of the project area. The wind-farms do not affect the path of migratory birds.

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 local 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

>>

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

>>

The comments from local stakeholders were invited through two local stakeholder meetings both conducted on 2 September 2006 at Arashinagundi Village, Hiriyur in Chitradurga District and Bukkapatna Village, Sira Taluk in Tumkur District. The two locations are approximately 30 kms apart and the stakeholder consultations were done on the same day. Two advertisements in a local newspaper were placed in Vijaya Karnataka on 19 August 2006 inviting the local stakeholders for the meetings.

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 1.

E.2. Summary of the comments received:

>>

The queries/comments from local villagers in Chitradurga district included:

- Comment that there is a significant impact on the economic and social life in and around Chitradurga villages due to the wind power projects. Further, there are no rainfall shortages due to wind mills.
- Query on afforestation work carried out by Enercon
- Query on impact on ground water
- Query on generation capacity of wind mills
- Query on scope of purchasing wind mills by the public
- Query on revenue land being used wherever electrical overhead lines pass

The local villagers responded to the questions queries made by Enercon in Chitradurga district included:

- No noise pollution as the projects are located in hilltops and away from villages
- No water draining, soil erosion due to wind mills
- No problem with cattle grazing in the hills
- Better food production due to better quality of electricity and less load shedding
- No deforestation except while road formation and installation of machines
- No damage or accidents during construction or erection

The queries/comments from local villagers in Tumkur district included:

- A village leader (Mr Santosh) demanded some basic facilities to nearby villages. Another (Mr. Virupaksha) commented that there is no loss of forestry but instead, theft of wood has decreased due to project activity.
- Query on wind mill affecting cloud formation thereby causing drought.

The local villagers responded to the questions queries made by Enercon in Tumkur district included:

- No noise pollution so far. Once project is operational, they would come to know but they believe there would be no noise pollution.
- There is little damage due to water inflow and proper check dam is to be constructed.
- There are no minerals found in the hill areas and therefore no loss of minerals due to the wind projects.
- No problem in animal grazing. The road due to project construction activity helps farmers graze animals easily
- Believe that better food production due to better quality of electricity and less load shedding but will come to know only after commissioning of project
- No deforestation has taken place due to wind mills

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:

In Chitradurga district

- Enercon is carrying out afforestation work in all the hills where the wind turbines are installed.
- There is no impact on ground water due to wind mills.
- Generation capacity of wind mills is 800 kW.
- It is possible to purchase wind mills. In Maharashtra, farmers association has purchased one wind machine.
- Revenue land is not being used wherever electrical overhead lines pass. Access to the land is required only for line inspection in case of a fault.

In Tumkur district

- Enercon will ensure that check dams are constructed as required and no water/soil would enter the fields

Annex 1

CONTACT INFORMATION ON PARTICIPANTS IN THE PROJECT ACTIVITY

Organization:	Enercon (India) Limited
Street/P.O.Box:	A-9, Veera Industrial Estate, Veera Desai Road, Andheri (West)
Building:	Enercon Towers
City:	Mumbai
State/Region:	Maharashtra
Postfix/ZIP:	400 053
Country:	India
Telephone:	+91-22-5522 7794
FAX:	+91-22-5692 1175
E-Mail:	a.raghavan@enerconindia.net
URL:	
Represented by:	
Title:	Associate Vice President
Salutation:	Mr.
Last Name:	Raghavan
Middle Name:	
First Name:	A
Department:	Corporate
Mobile:	+91-9820045724
Direct FAX:	+91-22-5692 1175
Direct tel:	+91-22-6692 4848 extn. 7169
Personal E-Mail:	a.raghavan@enerconindia.net

Annex 2

INFORMATION REGARDING PUBLIC FUNDING

The Project activity does not involve any ODA financing.

Annex 3

BASELINE INFORMATION

The Operating Margin data for the most recent three years and the Build Margin data for the Southern Region Electricity Grid as published in the CEA database are as follows:

Simple Operating Margin

	tCO2e/GWh
Simple Operating Margin - 2002-03	997.02
Simple Operating Margin - 2003-04	1,009.37
Simple Operating Margin - 2004-05	1,003.76
Average Operating Margin of last three years	1,003.38

Build Margin

	tCO2e/GWh
Build Margin- 2004-05	717.99

Combined Margin calculations

	Weights	**tCO2e/GWh**
Operating Margin	0.75	1003.38
Build Margin	0.25	717.99
Combined Margin		**932.04**

Detailed information on calculation of Operating Margin Emission Factor and Build Margin Emission Factor is available at www.cea.nic.in.

Annex 4

MONITORING INFORMATION

- **Metering:** Electricity supplied to the grid is metered by the Parties (KPTCL, Enercon and the Project) at the high voltage side of the step up transformer installed at the Project Site.

- **Metering Equipment:** Metering system for the project activity consists of one main and one check meter. Both the meters are **two-way Trivector meters capable of recording import and export of electricity** and provide output in the form of net electricity supplied to the grid. The main meter is installed and owned by the Project, whereas check meters are owned by KPTCL. The metering equipment is maintained in accordance with electricity standards prevalent in Karnataka. The meters installed are capable of recording and storing half hourly readings of all the electrical parameters for a minimum period of 35 days with digital output.

- **Meter Readings:** The Net electricity supplied to the grid is recorded by taking a Joint Meter Reading (JMR) in the presence of Officials from off-taking Utility and Enercon India Limited. The Joint meter reading contains the value of energy imported and exported and the net export to the grid during the recording period. This Joint meter reading is certified by the Executive engineer of the utility and by Enercon Officials. These certified readings are then used by the Discom officials to prepare the tariff invoices. Thus the sole monitoring parameter for the project activity is the net electricity supplied to the grid as mentioned in the JMR, which will be crosschecked with the value mentioned in the invoices.

- **Inspection of Energy Meters:** All main and check energy meters (export and import) and all associated instruments, transformers installed at the Project are of 0.2% accuracy class. Each meter is jointly inspected and sealed on behalf of the Parties and is not to be interfered with by either Party except in the presence of the other Party or its accredited representatives.

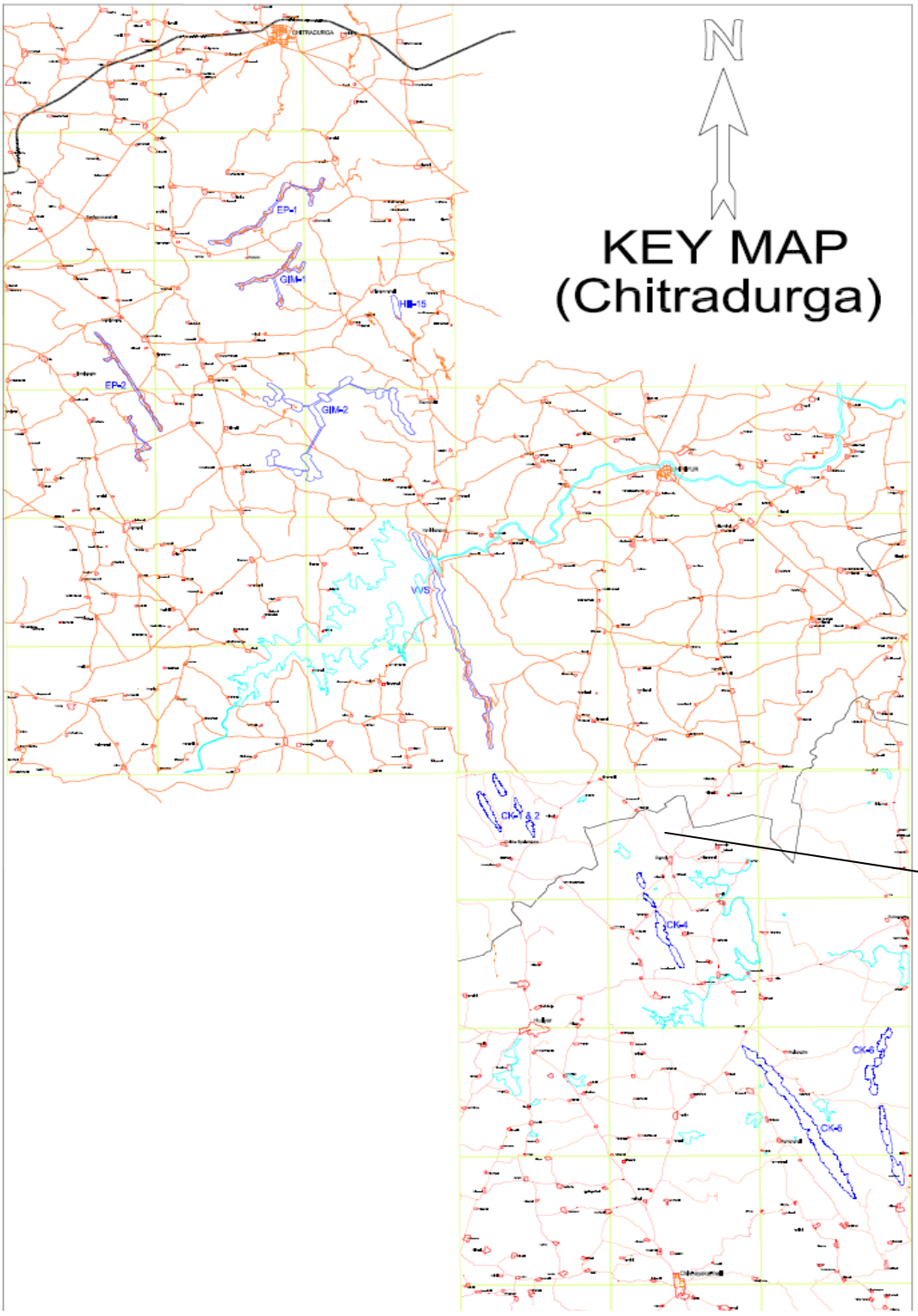
- **Meter Test Checking:** All main and check meters are tested for accuracy with reference to a portable standard meter. The portable standard meter is owned by KPTCL. The main and check meters shall be deemed to be working satisfactorily if the errors are within specifications for meters of 0.2 accuracy class. The consumption registered by the main meters alone will hold good for the purpose of metering electricity supplied to the grid as long as the error in the main meters is within the permissible limits.

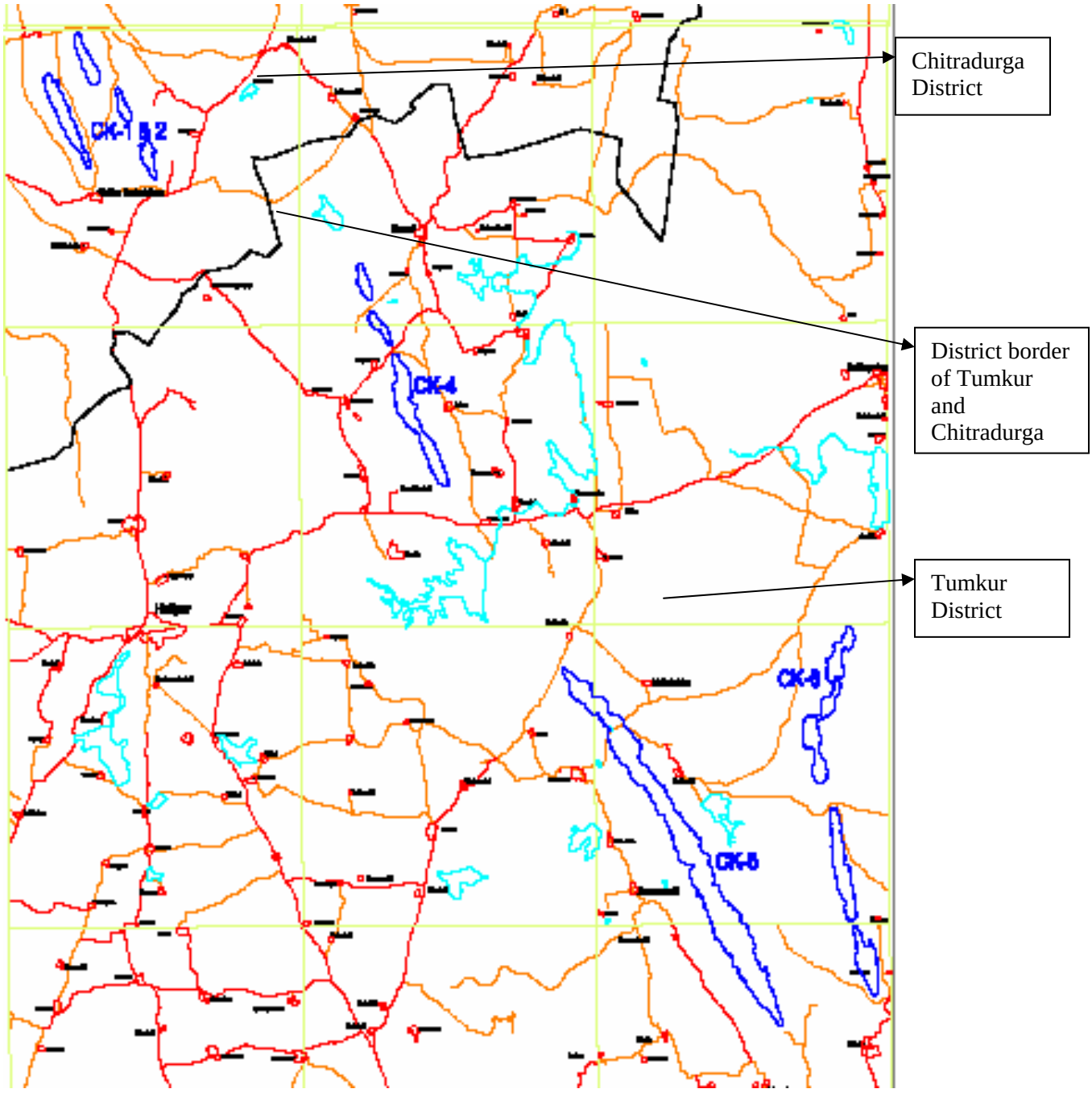
  If during the meter test checking,
  - the main meter is found to be within the permissible limit of error and the corresponding check meter is beyond the permissible limits, then the meter reading will be as per the main meter as usual. The check meter shall, however, be calibrated immediately.
  - the main meter is found to be beyond permissible limits of error, but the corresponding check meter is found to be within permissible of error, then the meter reading for the month up to the date and time of such test shall be as per the check meter. There will be a revision in the meter reading for the period from the previous calibration test up to the current test based on the readings of the check meter. The main meter shall be calibrated immediately

and meter reading for the period thereafter till the next monthly meter reading shall be as per the calibrated main meter.

- both the main meters and the corresponding check meters are found to be beyond the permissible limits of error, both the main meters shall be immediately calibrated and the correction applied to the reading registered by the main meter to arrive the correct reading of energy supplied for metering electricity supplied to the grid for the period from the last month's meter reading up to the current test. Meter reading for the period thereafter till the next monthly reading shall be as per the calibrated main meter.
- If during any of the monthly meter readings, the variation between the main meter and the check meter is more than the permissible limit for meters of 0.2% accuracy class, all the meters shall be re-tested and calibrated immediately.

Appendix 1 – Location Map




Chitradurga District
District border of Tumkur and Chitradurga
Tumkur District
CK-1 & 2
CK-4
CK-5
CK-6

Appendix 2 – Minutes of stakeholder consultation meeting

Public Consultation Meeting for Wind Farm Projects as Clean Development Mechanism Projects at sites – CK 1&2, Gim Sites and VVS, Chitradurga District, Karnataka State.

Venue: Enercon (India) Limited, CK 1 & 2 Site, Arashinagundi Village, Hiriyur, Chitradurga Dist.

Date: 02nd September 2006, 10 am – 12 pm

Members from the Villages:

1. Sri. Thimmanna
2. Sri. Kanumappa
3. Sri. Rajappa
   And 19 participants from the village.

Members from Enercon (India) Ltd., Chitradurga

1. Mr. C.B.Poonacha
2. Mr. Sajith
3. Mr. Fathahulla
4. Mr. Naveen Kumar
5. Mr. Ravidhara

Members from Enercon(India) Ltd., Mumbai

1. Mr. Vivek Sen
2. Mr. Neeraj Gupta

Members from Aditya Environmental Services Pvt. Ltd.

1. **Mr. Gurmeet Singh**

Agenda of the Meeting:

1. Welcome Address and Introduction
2. Project Profile, CDM, Environmental and social issues
3. Description about Wind Energy Conversion.
4. Suggestions and Opinions
5. Queries and Responses from the Stakeholders and Co. Authorities respectively.
6. Vote of Thanks.

1. **Welcome Address:** In the Welcome Address, Mr. C.B.Poonacha has briefed about the purpose of this Public Meeting, how Wind Mills and Wind Energy are occupied major role in generating power thereby rural population is benefited. Further he was pointing out how the benefits of employment opportunities, economical growth taken place in the areas. And also he has quoted examples of various social and religious activities taken up in the villages, for ex. construction of temples, roads through villages etc.

   Then Mr. C.B.Poonacha invited Mr. Thimmanna, Village Panchayat leader to preside over the meeting and conducts the further proceedings. And also he has invited village leaders viz. Mr. Kanumappa and Mr. Rajappa on the dias.

2. Project Profile:

Mr. Md. Fathahulla: Mr. Md. Fathahulla has described about the Wind Mills and how the Wind Power is generated, why it is called Green Energy and our project is emission free and it is pollution free energy when compared with Thermal power. He reiterated that in Thermal Power, carbon would be emitted into the air, which causes air pollution. He said that the public would not have any bad impact by the Wind Mills. When asked by the villagers about the clouds running away due to running of Wind Mills and thereby causing deficiency in rainfall, Mr. Fathahulla has cleared the doubts of the stakeholders by convincing them about the height of the clouds and the height of the Wind Mill Erector. He said we are conducting aforestation and drainage work to eradicate the soil erosion from the hills. He also informed that the co-operation by the villagers required for successful completion and service of Wind Mills.

Mr. Ravidhara: Mr. Ravidhara has described to the villagers how the power is converted from Wind to Electricity and how the generators are running and generate electricity power. And also he has specified where the generated power will be transmitted and at what rate. He has told about the safety measures taken in our Wind Erectors and automatic stoppage of m/c with more rpm in order to avoid any untoward incidence.

3. President's Address:

a) Sri. Thimmanna who has presided over the meeting has informed the villagers about how Wind Mills are helped our Villagers and Farmers, benefits to the unemployed one. And we have benefited more from wind mills rather loss of any kind. He also strongly quoted that "The economic and social life has changed due to wind mills in and around Chitradurga Villages. He extended fullest cooperation for development of such activities and also stated that lack of rainfall in the region is not due to Wind Mills. Since last two years we had plenty of rainfall. He also pledged that the cooperation from our villagers is there in future also and sought the same from Enercon.
b) Sri. Kanumappa has accepted that the temple work is been completed by Enercon only and praised about the social and religious activities by Enercon. Eco friendly project like wind power should come up in all villages which will not harm any environmental balancing, he specified.
c) Sri. Rajappa, who has told that there was no rainfall shortage due to Wind Mills.

Questionnaire:

a) By the Stakeholders:

i) Are you conducting afforestation work in the hills where the plants are removed?

Ans: Yes, We are doing afforestation work in all the hills where M/cs are installed.

ii) Are there any chances of drying up Ground Water?

Ans: No, Wind Mills do not use any ground water for its process.

iii) What is the generation capacity of the Machine?

Ans: 800 KW per hour.

iv) Is there any scope of purchasing machine by the public?

Ans: Yes, In Maharashtra farmers association has purchased one machine.

v) There is a rumour that revenue land is used wherever the electrical line passes through? Is it true?

Ans: No, Only line inspection will be done.

b) By the Company:

i) Is there any Noise Pollution by running the Wind Mills?

Ans: So far no idea. But as it is in hilltops and away from villages such nuisance may not happen.

ii) Is there any water draining, soil erosion due to Wind Mills?

Ans: No, such incidence not occurred.

iii) Is there any problem for animals grazing in the hills?

Ans: No, Cattle are grazing in hill areas as usual.

iv) How Wind Mills helped in improvement of Crops?

Ans: By increase in voltage capacity and less load shedding results in increase in food grain production.

v) Have you observed any deforestation problem?

Ans: No, Except while forming the roads and installing the machines, there found no deforestation is taken place.

vi) During construction or erection any damages or accidents occurred?

Ans: Absolutely not. The Project work is taken up very smoothly and run with more safety standards.

For further queries the representatives from ENERCON put forward to the participants that they could raise any queries within a week and the same can be submitted at ENERCON Office, Bangalore as the address mentioned in the Paper Notification on 19th Aug. 2006.

Vote of Thanks: **Mr. Naveen Kumar** thanked the village leaders and villagers who have set aside their work and shown interest and eagerness to know about the Wind Mills. He also sought cooperation from all the corners for successful operation of windmills thereby achieving the National Target of self-sufficiency in Power Sector.

Public Consultation Meeting for Wind Farm Projects as Clean Development Mechanism Projects at site – CK 4 & 6, Tumkur District, Karnataka State.

Venue: Enercon (India) Limited, CK 4 Site, near Bukkapatna Village, Sira Taluk, Tumkur Dist.

Date: 02nd September 2006, 2 pm – 4 pm

Members from the Villages:

1. Sri. R.H. Veeranna
2. Sri. Rangaswamy
3. Sri. Virupaksha
   And 26 participants from the village.

Members from Enercon (India) Ltd., Chitradurga

1. Mr. C.B.Poonacha
2. Mr. Sajith
3. Mr. Fathahulla
4. Mr. Naveen Kumar
5. Mr. Ashok M.G.

Members from Enercon(India) Ltd., Mumbai

1. Mr. Vivek Sen
2. Mr. Neeraj Gupta

Members from Aditya Environmental Services Pvt. Ltd.

1. **Mr. Gurmeet Singh**

Agenda of the Meeting:

1. Welcome Address and Introduction
2. Project Profile, CDM, Environmental and social issues
3. Description about Wind Energy Conversion.
4. Suggestions and Opinions
5. Queries and Responses from the Stakeholders and Co. Authorities respectively.
6. Vote of Thanks.

1. **Welcome Address**: Mr. C.B. Poonacha in the welcome address has explained about the purpose of this Public Meeting, Wind Mills contribution in the generation of electricity in India. He also stated about the rural employment generation due to this wind mills erected in rural areas and how the improvement took place in voltage increase and uninterrupted supply of electricity to the farmers pump sets in the villages. This resulting in improvement of economic status of the society in village areas. He also noted how the contribution by the villagers helped us in establishing the wind farms in their villages and sought cooperation and coordination in the same manner in future to give better service and generate more power.

   Inspite of above Mr. C.B.Poonacha described about some social work taken up in villages viz. road development, temple construction repairs etc.

2. **Project Profile:**

   Mr. Md. Fathahulla: Mr. Fathahulla explained about the power generating sources available in our country. He made a note that how the Thermal Power is polluting the

environment and non-conventional energy sources like wind power is eco friendly and producing green power. What is the difference between the conventional and non-conventional energies, how it contributes to the national requirement etc. were the points made clear to the stakeholders by Mr. Fathahulla.

Mr. Ashok Kumar M.G.: Mr. Ashok Kumar has described how the wind energy will be converted into electrical energy, how it would be transmitted to the Power grids through Sub-stations etc. He also explained about the resources of Wind Mill is wind which is abundant in nature and it is God given gift and is not exhausting. After installation of Wind Mills single-phase problem is almost solved in the villages, he expressed.

3. Address by Village Leaders:

Mr. Rangaswamy: Mr. Rangaswamy remembered that initially there was an awareness problem among the villagers with regard to the Wind Mills. But after understanding the realty, we gave our fullest co-operation for establishing this project. Our cooperation will continue in the same way, he ensured. He also expressed his happiness that such Wind Power energy will enhance the social and economic growth of our village.

Mr. Santosh: Mr. Santosh has demanded some basic facilities to their nearby village.

Mr. Virupaksha : Mr. Virupaksha informed that, due to the Wind Mill project, we have not lost any forestry instead the no. of theft of wood is reduced since the windmill project is going on which is safeguarding forestland.

4. President's Address:

Mr. R.H. Veeranna: Sri . R. H. Veeranna who has presided over the meeting has opined that Wind Mills are building strong base in Power sector. "Wind mills are creating revolution in the generation and supply of electricity. This benefits all the farmers. Even Govt. is helping by implementing such power sectors. Due to the establishment of Wind Mills in large quantity, we found development of villages. Further the wastelands in the hilly terrain, which are not useful for any activities is best, utilized by Wind Farms for generating electricity power. This is a great job. By spending crores of rupees, you are providing electricity to villages, towns and our nation. The company also takes up so many social works. You all have put so many efforts in establishing wind energy sectors, which has given good result. Please continue such type of national development activities" Sri Veeranna explained. He further clears the doubts of villagers that there is no harm and pollution in any manner by running the Wind Mills. Please leave up the rumour about the same, he told.

5. Questionnaire:

a) By the Stakeholders:

i) There is a rumour that by running wind mill, clouds are running away from the area and thereby causing drought situation.

Ans: No, the rumour is false. The clouds are in very much height and our machines are only 55-60 Meters height. Hence there is no chance of rainy clouds affected by running windmills.

b) By the Company:

i) Is there any Noise Pollution by running Wind Mills?
Ans: We do not know so far. Once start running the machine we would come to know. But we heard that such noise pollution might not happen.

ii) Any damages to the farmland due to water flow from the hilltops?
Ans: Little damage is taken place due to water inflow. Proper check dam is to be constructed. Company representatives have promised that the check dams will be constructed and not allowing the water and soil entering into the fields.

iii) Any type of loss of minerals occurred due to Wind Project?
Ans: No. Such Minerals are not found in the hill areas.

iv) Is there any problem for animals grazing in the hills?
Ans: No, since the road is there, it is helped the farmers to graze their animals easily.

v) How Wind mills helped in improvement of Crops?
Ans: After running the machine only we can assess. But definitely there will be an improvement since we get uninterrupted power supply to our pump sets causing increase in food crops.

vi) Any damages to the Forest by establishing Wind Mills?
Ans: There is no damage of forestland seen. It is happened only due to fire and not due to erection of Wind Mills.

For further queries, the representatives from ENERCON put forward to the participants that they could raise any queries within a week and the same can be submitted at ENERCON Office, Bangalore as the address mentioned in the Paper Notification on 19th Aug. 2006.

Vote of Thanks: **Mr. Naveen Kumar** offered special thanks to the village leaders and villagers who have set aside their work and shown interest and eagerness to attend the meeting and know about the Wind Mills. He also sought cooperation from all the villagers for successful operation of windmills thereby achieving the National Target of self-sufficiency in Power Sector.

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