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

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SECTION A. General description of project activity

A.1 Title of the project activity:

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29.7 MW Wind Power project in Karnataka, India.
Version 02
January, 2008.

A.2. Description of the project activity:

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Accion Wind Energy Pvt. Ltd. (AWEPL) is an Indian Company and a 100% subsidiary of the Spanish Acciona group of companies, i.e. Acciona Energia Internacional, S.A. and Acciona, S.A. AWEPL is in the process of implementing a turnkey project being delivered by Vestas Wind Technology India Pvt. Ltd. of 18 Wind Turbines of 1.65 MW capacity each totaling 29.70MW spread over two locations in the State of Karnataka, located within a wind farm. The project activity involves the development and operation of wind based electricity generation facilities to be connected to the grid.

The individual sub-projects for this project activity are as follows:

S.No.	Owner	Project Capacity (MW)	Start Date[1]	Proposed Commercial Operation Date (COD)
1	Accion Wind Energy Pvt. Ltd. (AWEPL) (a 100% Subsidiary of Acciona Energia)	(Arasinagundi) 13.20 MW	27th April 2007	June, 2008
2	Same as above	(Anabaru) 16.50 MW	27th April 2007[2]	July, 2008

The objective of the project activity is to construct, own, operate and maintain wind power projects at two sites in close proximity within the district Davangere in the Indian state of Karnataka for providing renewable power to the Karnataka State electricity grid and reduce greenhouse gas emissions caused by reliance on fossil fuels. The project will lead to reduced greenhouse gas emissions as it will displace electricity from fossil fuel based electricity generating systems. The electricity generated from the project will be supplied to a common local sub-station at Hiremallaholle using underground internal electrical lines and local transmission lines. The aggregate 29.70 MW project activity comprises of 18 units of Vestas V82 make Wind Turbine Generators (WTGs), with each WTG having a capacity of 1,650kW. Vestas Wind Technology India Pvt. Ltd. will be the turbine supplier and also the operations and maintenance contractor for the first two years. The generated electricity will be supplied to the state grid (Distribution Company, or DISCOM) under long-term Power Purchase Agreement (PPA) for a period of

[1] It is the date of contract signature for turnkey implementation of the project

[2] The phase 2 activity was started with contract signature on 20th September, 2007

20 years, with a standard tariff of Rs.3.40 per kWh for the initial 10 years. The tariff from the eleventh year onwards will be decided by the KERC, and DISCOM can exercise its option to procure electricity at the KERC determined tariff. The purpose of the project is to harness renewable resources in the region, thereby displacing non-renewable natural resources to the extent of generation, ultimately leading to sustainable economic and environmental development. The project activity includes development, design, engineering, procurement, construction, operation and maintenance of wind energy based electric generating stations supplying electricity to the grid. The project activity will displace energy that is dispatched at the operating margin (largely thermal energy) and also delay any planned expansion of the Karnataka grid generation capacity by its equivalent size and thereby the Southern Regional Grid.

Project Activity's contribution to Sustainable Development:

The sustainable development indicators stipulated by the Government of India (Host Country) in the interim approval guidelines for CDM projects are as follows[3]:

- Social well being
- Economic well being
- Environmental well being
- Technological well being

The project activity assists in achieving the above components of sustainable development by-

- Substituting electricity generated using conventional fuel with wind energy based power
- Mitigating the emission of GHG (CO_2) as wind is a renewable source of energy
- Conserving coal and other non-renewable natural resource
- The project is in line with the policies of MNRE, India. It contributes its share towards achievement of the 11th Plan target of 10,000 MW renewable energy by 2012 set by MNRE.
- Increasing the share of renewable energy in the regional grid
- Reducing pollutants like SO_X, NO_X etc associated with other power plants
- Contributing towards reducing power shortage in the state of Karnataka
- Generate local employment in areas near the project activity
- Help to bridge India's energy deficit
- Contributing to the growth of Wind Energy sector in India
- Empowerment of the vulnerable sections of society dwelling near the project area

A.3. Project participants:

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Name of the Party involved	Private and/or Public entity	Kindly indicate if the Party

[3] http://cdmindia.nic.in/host_approval_criteria.htm

	Project Participants	involved wishes to be involved as project participants (Yes/No)
India (Host Country)	Accion Wind Energy Pvt. Ltd. (Project Promoter) – Private Entity	No

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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India

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

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Karnataka

A.4.1.3. City/Town/Community etc:

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Davangere district

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 sites are located at Villages Anabaru and Arasinagundi in the Jagalur Taluk in the district of Davangere, in the Indian state of Karnataka. Anabaru and Arasinagundi are approximately 35 kms. from Chitradurga town, and approximately 250 kms. from Bangalore, the capital city of Karnataka. The sites of Anabaru and Arasinagundi are located at a latitude and longitude of around 14°28' – 14º34’ N and 76°20' – 76º23’ E. They are at 700-810 meters from the mean sea level. These sites have been identified as ideally suited for wind power generation as per the micrositing studies and data analysis based on annual wind speed and frequency distribution, carried out by Vestas Wind Technology India Pvt. Ltd (VI). The feasibility of these sites for wind power production has been established by Vestas Wind Technology India Pvt. Ltd. The location of the project sites in the state map of Karnataka (India) is shown below:

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

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The project activity is considered under UNFCCC - CDM category “Zero emissions - grid-connected electricity generation from renewable sources” that generates electricity in excess of 60 GWhe per year (limit for small scale project). As per the scope of the project activity enlisted in the ‘list of sectoral scopes and related approved baseline and monitoring methodologies’ (version 04), the project activity may be principally 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 activity will employ state-of-art Horizontal axis wind turbines. The Wind Turbine Generators (WTGs) comprising the project activity will generate clean green power which will be exported to the grid through the receiving station of KPTCL (110/66 KV substation at Nayakanhatti). The pooling 33kV/66kV sub-station erected and commissioned in the leased land provided by KPTCL located within the premises of Hiremallahole Substation of KPTCL will be used as a common facility to evacuate the power generated at the Anabaru and Arasinagundi wind farms to Nayakanhatti. The project will house the metering, switchgear and other protection equipment along with underground cabling within the wind farms.

Traditionally in India, in any wind farm internal wind farm connections are usually done using overhead transmission lines with open transformers. However, in the above project going with Acciona’s global philosophy of environmental consciousness and safety precautions, for the first time in India Accion has gone ahead with underground cabling inside the wind farm, with unit substation sheltering transformers and switchgear. This underground cabling will be first of its kind for wind farms in India and will require special care and extra cost of approximately Rs.2 Million per MW in terms of installation, besides repair and maintenance as against the overhead transmission lines. The unit substation sheltering transformers and switchgear will cost another approximately Rs.2 Million per MW. Implementation of this concept in India will be developed and encouraged on the successful experience of AWEPL’s unique initiative. Pits

and earth removed will be restored post construction to bring back the site appearance as close to original as possible. Also, this is the first time an Indian entity has implemented a very sophisticated wind farm SCADA system with remote monitoring facility to have better control and bring in better efficiency in the wind farm monitoring and operation.

PPAs are intended to be signed with the Distribution Company (DISCOM) for a term of 10 years, extendable by another term of 10 years if the KERC determined tariff from the eleventh year onwards is acceptable to the DISCOM. The technology provider will provide operational training for the plant personnel, along with operation and maintenance service at least for the first two years of the project activity. WTGs are manufactured as per stringent European quality standards in accordance with Indian climatic conditions. All the WTGs are three bladed active stall regulated.

Salient features of WTG to be used in the project activity are:

- ISO 9001 Certificate for Design and Manufacture; ISO 9001:2000 for Installation & Commissioning and for Operation & Maintenance.
- Approved by Ministry for new and renewable energy (MNRE)
- Type certified by Det Norske Veritas, Denmark – World's most prestigious organization for Wind Turbine Certification.
- Suitable for India's harsh climatic conditions prevailing at remote locations.
- Improved Power factor
- Improved power curve for operation under low wind conditions
- Carefully devised electrical system to withstand erratic grid connections.
- Integrated Power transmission mechanism.
- High Performance Rotor blades.
- Dual speed asynchronous generator.
- Microprocessor based fully automatic control system with user friendly operation and central monitoring system.
- Quality, Safety and Health plan for construction, installation, commissioning and Operation & Maintenance.
- Microprocessor controlled high efficiency soft start.
- Active Yaw gear drives incorporating hydraulic yaw brakes.

Specifications of the individual WTGs are as follows-

Description	**Specifications**
Tower/Rotor Height	78 Meter
Rotor Diameter	82 Meter
Installed electrical output	1,650 kW
Annual generation of individual WTGs as per the guaranteed generation	There is no guaranteed generation – it is expected generation only. There is a 'power curve guarantee'. Expected generation to be in line with Financial Model.
Cut-in wind speed	3.5 m/s.
Rated wind speed	7.5 m/s.
Cut-out wind speed	20 m/s. (10 minute average)
Rotor swept area	5,281 sq. meters.
Rotational speed	14,4 rpm

Rotor material *Blades material*	Carbon fibre/epoxy/wood/glass
Regulation	Active Stall
Generator	1-speed, water cooled.
Rated output	1,650 kW
Rotational speed *at rated power*	1,012 rpm
Operating voltage	3 x 690 V
Frequency	50 Hz
Insulation class	F/B
Cooling system	Oil cooler/Radiator: Cooling capacity 37.5 kW Water cooler/Radiator: Cooling capacity 46.2 kW
Gear Box	1. Step planet, 2. Step helical
Manufacturer	Vestas
Gear ratio	1:70,2
Nominal load *Gearbox Mechanical power*	1,800 kW
Yaw Drive System	Planetary gear motor.
Yaw bearing	Ball bearing, internal gearing.
Aerodynamic brake	Hydraulic disc brake
Mechanical brake	Hydraulic disc brake
Control unit	SCADA

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

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Year (September - August)	**GHG abatement (t CO_2eq)**
2008 – 09	88,240.11
2009 – 10	88,240.11
2010 – 11	88,240.11
2011 – 12	88,240.11
2012 -13	88,240.11
2013 -14	88,240.11
2014-15	88,240.11
2015-16	88,240.11
2016-17	88,240.11
2017-18	88,240.11
Total Estimated reduction (tones of CO_2 e)	882,401.1
Total numbers of crediting years	10 Years
Annual average over the crediting period of estimated reduction (Tonnes of CO_2 e)	88,240.11

A.4.5. Public funding of the project activity:

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No Official Development Agency (ODA) funding will be used for the project activity. The total project cost is estimated at Rs.2,120 million, including financing cost. The project will be funded through equity infusion by the parent company Acciona Energia Internacional S.A. along with debt to be sourced from India, or abroad. This debt, however, will not be an ODA.

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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Title: "Consolidated baseline methodology for grid-connected electricity generation from renewable sources"

Reference: This is an UNFCCC consolidated baseline methodology ACM0002, version 06, Sectoral scope 01, 19 May, 2006.

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

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Among the methodologies approved by UNFCCC for grid-connected electricity generation from renewable sources based CDM project activities, ACM0002 has been chosen as the most suitable for this project activity. The project activity meets the applicability conditions of ACM0002, as demonstrated below –

Justification of the choice of the Methodology:

Sl. No.	The Methodology	Justification
1.	This methodology is applicable to grid-connected renewable power generation project activities that applies to electricity capacity additions from wind sources	The wind energy project contributes to electricity capacity addition of the Southern Regional Grid of India by generating at a Capacity Utilization Factor (CUF) of 36.47 % of an installed capacity of 29.7 MW
2.	This methodology is not applicable to project activities that involve switching from fossil fuels to renewable energy at the site of the project activity	There is no fossil fuel switching involved
3	The geographic and system boundaries for the relevant electricity grid can be clearly identified and information on the characteristics of the grid is available	The geographical boundary of the Southern Regional grid (to which the proposed project will be feeding) is identifiable, and sufficient information on the characteristics of the grid is available from the Central Electricity Authority, and other sources. The project activity will displace fossil fuel based electricity that would otherwise be provided by the operation and expansion of the Southern Regional grid of India.

This baseline methodology shall be used in conjunction with the approved monitoring methodology ACM0002 ("Consolidated monitoring methodology for grid-connected electricity generation from renewable sources").

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

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For the baseline determination, project participants account CO_2 emissions from electricity generation in fossil fuel fired power that is displaced due to the project activity. 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.

Scenario	Source	Gas	Included?	Justification/Explanation
Baseline	Electricity generation in fossil fuel fired power that is dispatched due to the project activity	CO_2	Yes	Main emission source
		CH_4	No	Not identified in the baseline methodology
		N_2O	No	Not identified in the baseline methodology
Project activity	Electricity generation in the project activity	CO_2	No	Zero-emissions grid-connected electricity generation from renewable energy
		CH_4	No	Zero-emissions grid-connected electricity generation from renewable energy
		N_2O	No	Zero-emissions grid-connected electricity generation from renewable energy

Project site

The project activity boundary encompasses the physical and geographical site of the project activity site at the project location specified in Section A.4.1.4. This would include the wind turbine installation and the substations. The project activity evacuates the power to the Southern regional grid. Therefore, those power plants contributing to the Southern regional grid are taken in the connected (project) electricity system for calculation of baseline emission.

Connected electricity system

For the purpose of determining the Built Margin (BM) and Operating Margin (OM) emission factor, as per ACM0002, a (regional) connected electricity system is defined by the spatial extent of the power plants that can be dispatched without significant transmission constraints.

Indian power grid system is divided into five regions namely Northern, North Eastern, Eastern, Southern, and Western Regions. The Southern Region consists of Andhra Pradesh, Karnataka, Kerala, Tamilnadu, Pondicherry and Lakshadweep. Each state has its own power generation plants (State Government owned) managed by respective State Electricity Boards / Corporations.

The project activity is connected to the Karnataka state grid and the Southern Regional grid. The Southern Regional grid is the selected project electricity system because in large countries like India having layered dispatch systems, the state grid definition may be too narrow in many cases given significant electricity trade among states that might be affected directly or indirectly, by a CDM project activity.

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

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As per ACM0002, "The project activity is grid-connected electricity generation from renewable energy sources. There are a number of different sizes and sub-types of this project activity (Run-of-river hydro power plants; hydro power projects with existing reservoirs where the volume of the reservoir is not increased, **wind**, geothermal, solar sources, tidal, wave)."

According to the description in the approved baseline methodology ACM0002, for the 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) calculated described latter."

The project is connected to the Karnataka state grid an integrated part of the Southern Regional grid. So, Southern grid is considered as the "connected electricity system", which is defined as the "project boundary" of the proposed project. Therefore, being a project with the boundary of Southern Regional grid that does not modify or retrofit an existing electricity generation facility, the baseline scenario of the project can be identified as the following:

"Electricity delivered to the grid by the project that would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources within the Southern Regional grid, as reflected in the combined margin (CM) calculated described latter."

As prescribed in the methodology ACM0002, for the proposed project, the emission reductions will be the amount of electricity supplied to the grid multiplied by the grid emission co-efficient. Energy (electricity) generated by the wind turbines will be metered by AWEPL and KPTCL at the high voltage side of the step up transformers installed at the receiving station. The energy fed in to the grid will be used to calculate the emission reductions and is measured in terms of kWh.

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

The following potential alternatives are considered –

Alternative 1: **Implementation of the project activity not undertaken as a CDM project activity**
Alternative 2: **Implementation of a similar scale fossil fuel (diesel) based power plant**
Alternative 3: **Continuation of the current situation with no project activity**

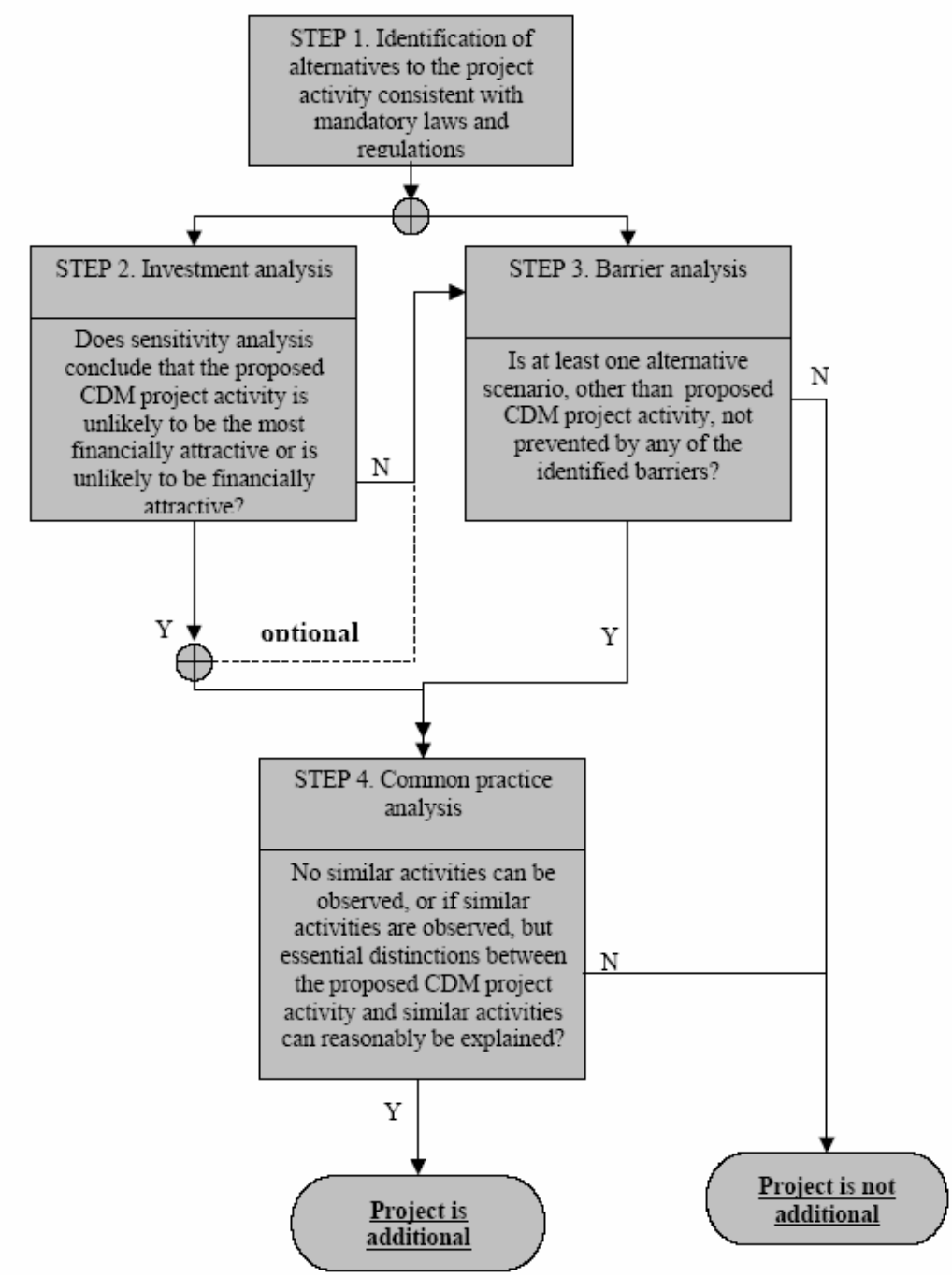
The alternatives are explained in detail in section B.5

B.5. Description of how the anthropogenic emissions of GHG by sources are reduced below those that would have occurred in the absence of the registered CDM project activity (assessment and demonstration of additionality) : >>

As per the decision 17/cp.7 Paragraph 43, a CDM project activity is additional if anthropogenic emissions of greenhouse gases by sources are reduced below those that would have occurred in the absence of the registered CDM project activity.

As per the selected methodology ACM0002, the project proponent is required to establish that the GHG reductions due to project activity are additional to those that would have occurred in absence of the project activity as per the 'Tool for the demonstration and assessment of additionality'.

The flowchart presented below provides a step-by-step approach to establishing additionality of the project activity as per the CDM consolidated tool for demonstration of additionality:


STEP 1. Identification of alternatives to the project activity consistent with mandatory laws and regulations
STEP 2. Investment analysis
Does sensitivity analysis conclude that the proposed CDM project activity is unlikely to be the most financially attractive or is unlikely to be financially attractive?
STEP 3. Barrier analysis
Is at least one alternative scenario, other than proposed CDM project activity, not prevented by any of the identified barriers?
N
N
Y
optional
Y
STEP 4. Common practice analysis
No similar activities can be observed, or if similar activities are observed, but essential distinctions between the proposed CDM project activity and similar activities can reasonably be explained?
N
Y
Project is additional
Project is not additional

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

Define realistic and credible alternatives to the project activity(s) that can be (part of) the baseline scenario through the following sub-steps:

In this step, AWEPL is required to define realistic and credible alternatives to the project activity that can be part of the baseline scenario through the following sub-steps:

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

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

AWEPL is required to 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.

The following alternatives are considered –

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

In this alternative, project activity is connected to the Southern regional grid and therefore it displaces an equivalent amount of electricity of the grid mix of the Southern regional grid.

Since the project activity has no project emissions this alternative would not generate carbon dioxide. AWEPL may implement the project activity to generate and sell power to the state grid. This alternative may be part of the baseline; however it is financially less attractive as compared to the standard returns of the similar kind of project activities. The investment analysis has been conducted as per Step 2: Investment analysis of the "Tool for the demonstration and assessment of additionality – Version 3".

.**Alternative 2: Implementation of a similar scale fossil fuel (diesel) based power plant**

Though, setting up of a comparable utility scale diesel fired power project that supplies power to the Southern regional grid is theoretically a possibility, AWEPL's primary business objective in promoting the project activity is to generate green power in the region, through wind energy which is consistent with Acciona Energia's global philosophy. It is clear that in the absence of the project activity, AWEPL would not have undertaken any fossil fuel fired power plant project. Hence this alternative cannot be part of the baseline for AWEPL. A hydro project, though renewable, would take too long to be implemented (around 4-5 years) and is therefore not a feasible alternative for AWEPL.

Alternative 3: No project activity, continuation of current situation

In this alternative, project activity is not implemented resulting in the continued current grid mix of the state grid i.e. the equivalent amount of energy would have been produced by the project grid electricity system through its currently running power plants and by new capacity additions. An equivalent amount

of carbon dioxide would be generated at the thermal power generation end predominantly by fossil fuel based power plants.

Outcome of Step 1a: The "no project activity" wherein the equivalent amount of energy would have been produced by the grid electricity system through its currently running power plants and by new capacity additions (which are mostly thermal) is the most plausible alternative as baseline option for the project. In India, the power off-takes from the power plants is decided based on power plant and T&D availability and not on merit order basis, thus in absence of the wind power project, it is difficult to justify that equivalent amount of units would have been generated by other alternative sources. Thus, suitable grid mix has been selected as baseline option and therefore for calculation of baseline emission.

Sub-step 1b: Consistency with mandatory laws and regulations

The alternative(s) shall be in compliance with all mandatory 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.).

If an alternative does not comply with all mandatory 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 noncompliance with those requirements is widespread in the country. If this cannot be shown, then eliminate the alternative from further consideration;

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

All the above alternatives are in compliance with all applicable legal and regulatory requirements.

The implementation of project activity is a voluntary initiative and it is not mandatory or a legal requirement. For power generation, the Electricity Act 2003 does not restrict or empower any authority to restrict the fuel choice, the applicable environmental regulations do not restrict the use of wind energy and there is no legal requirement on the choice of a particular technology.

Outcome of Step 1b: Thus, considering that all the alternatives are in line with the applicable legal and regulatory requirements, the "no project activity" i.e. continuation of current practise where in the equivalent amount of energy would have been produced by the project grid electricity system through its currently running power plants and by new capacity additions is the chosen baseline scenario which would have happened in the absence of the proposed project activity.

Step 2: Investment analysis

Determine whether the proposed project activity is economically or financially less attractive than at least one other alternative, identified in step 1, without the revenue from the sale of certified emission reductions (CERs).

AWEPL is required to determine whether the proposed project activity is economically or financially less attractive than at least one other alternative, identified in Step 1, without the revenue from the sale of certified emission reductions (CERs).

Sub-step 2a: Determine appropriate analysis method

As per the Tool for demonstration and assessment of additionality –Version 3, 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.

Hence, AWEPL has the option of using either Option II- Investment comparison analysis or Option III- Benchmark analysis (as per the Tool for demonstration and assessment of additionality –Version 3). AWEPL proposes to use **Option III – Benchmark analysis** because sufficient information is available for undertaking the same in the public domain. The Project IRR of the project activity serves as a benchmark to assess the financial attractiveness of the project activity. Option III assesses if the project's returns are sufficient for investors to make the initial investment and further bear the associated costs of successfully operating the project activity over the crediting period of the project. This being the first project of Acciona in India, an OECD risk premium value of 3% for India over prevailing interest rate is considered.

Sub-step 2b: Option III - Apply benchmark analysis

An investment analysis of the project activity was conducted by AWEPL with the Project IRR as the financial indicator (benchmark) vis-à-vis the local commercial lending rate.

As per AWEPL's independently certified analysis, the pre-tax Project IRR of 11.93% is barely above the average offered lending rate of 11.25% and does not provide any risk premium. This being the first project of Acciona in India, an OECD risk premium value of 3% over interest rate is considered (Current source: http://www.oecd.org/dataoecd/47/29/3782900.pdf). The residual value of project assets at the end of the 20-year lifetime is considered negligible and therefore not considered in arriving at the Project IRR of 11.93%. However, if considered it is unlikely to exceed 5% of the investment amount in any case, which makes a difference of less than 0.1% to the Project IRR over the 20 year term. The equity investor can in turn expect a reasonable Equity IRR based on the overall Project IRR only if there is an additional revenue stream in the form of CER revenue. Therefore, CER revenues have necessarily been considered for having an improved Project IRR for the equity investor to approve proposed project investment.

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

Capacity of Machines	1.65 MW/WEG
Number of machines	18
Project capacity	29.70 MW
Plant Load factor	36.47%
Insurance charges	INR 7.3 million
Operating expenses (e.g. as a % of capital cost)	~ 1% (for year 1 and 2) ~1.25% for 3rd year onwards)
% of escalation per annum of Operating cost	5 %
Tariff (for year 2008-17) – 10 Years	Rs.3.40/Kwh

Tariff after 2017	To be decided by KERC

Effective Income Tax rate	33.99%
Effective Minimum Alternate Tax	11.33%
100% Income Tax holiday	Under section 80IA of the Income Tax Act, 1961

Total Project Cost (including estimated financing expenses and interest during construction)	Rs.2,120 million
Means of Finance	70% Debt + 30% Equity
Own Source	Rs.636 million
Loan Funds	Rs.1,484 million

Term loan assumed	1 + 10 Years
Interest rate assumed	11.25%
Moratorium assumed	1 Year

The Project IRR of the project activity without considering CDM revenues is 11.93% and with CER revenue @ €9 per CER is 13.65% which barely meets the return criteria factoring the risk premium. The Project IRR has been calculated using Annex 35 - Guidance on the assessment of investment analysis approved at EB39 and taking the following assumptions under consideration:

1. Annual net export to the grid (except year 1 of the crediting period) – 94.88 million units
2. Power tariff – Rs.3.40 per unit.
3. Project IRR calculated over 20 years of the project activity
4. Section 80IA Tax benefits have been considered.
5. The project developer does not derive benefit in terms of tax shelter for profits in initial years from the 80% accelerated depreciation benefit available for wind power projects in India.

Therefore, considering the IRR, the CDM revenues are a key income stream for the project to achieve the benchmark for financial viability. It can be justifiably concluded that CDM revenue expected by the project activity through sale of the CERs is an important revenue stream.

Sub-step 2d: Sensitivity Analysis

A) Sensitivity to wind (or plant load factor)[4]

There is inherent variability in Wind power generation from year to year, caused by the cyclic non-systematic variations in the wind patterns. As a result, it is important to carry out the effect of varying PLF (with +/-10% change in generation) and project cost (+/-5%) on the Project IRR. Interest rate variation (+/- 75 bps) though considered as part of the analysis at the time of investment has no direct bearing. Project IRR is seen in co-relation with the likely average cost of locally borrowed funds @ 11.25% and a risk premium of 3% in addition. These parameters are considered for sensitivity as other

[4] Weighted average for Arasinagundi and Anabaru

parameters like tariff are certain. The sensitivity range of +/-5% on the **project cost** is based on it being a turn key fixed cost contract with Vestas for the 29.70 MW project. The additional cost on account of independent supervision, consulting, interest and financing expenses has been estimated and included. Therefore, a variation of >5% with other costs realistically considered on a fixed cost contract is highly unlikely. The sensitivity range of +/-10% on **PLF** is considered based on the extensive technical analysis done by Acciona itself, coupled with its global experience in project prospecting, analysis, execution, and operation of ~ 2 decades. The generation considered is quite high in comparison with similar wind energy projects. The revenue per kWh is itself linked to generation and a fixed tariff under a ten year Power Purchase Agreement (PPA) allowing no margin for variation. Therefore, >10% variation is not required to be considered necessary for AWEPL project for sensitivity.

A. Sensitivity to PLF (without considering CER Revenue)

PLF	Project IRR (%)	Assumptions
32.82% (-10% generation)	10.02	Interest rates are constant and project cost is constant
36.47%	11.93	Assumed generation.
40.12% (+10% generation)	13.75	Interest rates are constant and project cost is constant

B) Sensitivity to project cost

Project cost (million INR)	Project IRR (%)	Observations/comments
2,014 (-5%)	12.80	Interest rates are constant and PLF is constant
2,120	11.93	Considered
2,226 (+5%)	11.13	Interest rates are constant and PLF is constant

The results of the sensitivity analysis conducted confirm that the Project IRR of the project activity without CDM revenues by itself provides no or inadequate risk premium to Acciona, and therefore is lower than any benchmark for the project activity required by the investors, under circumstances which could bring about variations in the critical factors used for the IRR computations in Sub Step 2c.

The above analysis indicates that the project activity is financially not an attractive investment option and it is sensitive to minor variations in the critical assumptions. The CDM revenue the project activity is likely to obtain through sale of CERs is critical to sustain the operations of the project activity over its intended lifetime.

Outcome of Step 2:

It is concluded that the project activity is not the most financially attractive alternative.

Step 3: Barrier Analysis

AWEPL also wished to use the barrier analysis to show that the project activity is additional. In this step, AWEPL is required to determine whether the proposed project activity faces barriers that –

- *Prevent the implementation of this type of proposed project activity*
- *Do not prevent the implementation of at least one of the alternatives*

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

The project activity faces the following barriers:

Investment Barriers

The capital investment required for wind power plants is high when compared to conventional sources of power. The Government of India and state government of Karnataka have provided certain financial incentives for the development of wind power projects, a number of critical investment barriers remain. These include:

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

- ***The higher capital cost of wind farm plant and equipment*** makes wind power more expensive than traditional sources of electricity, and as a result this presents a barrier for investors to get into electricity generation market.

One of the main incentives offered by the Government of India to investors in wind power projects is:

- 80% accelerated depreciation on the written down value

The 29.7 MW wind farm investment is being made by Acciona Energia through a domestic corporate entity, Accion Wind Energy Private Limited (AWEPL). This corporate entity currently generates no profits to utilize the tax break offered to wind farm investors in India in the form of "accelerated depreciation". Therefore, AWEPL is presently unable to compete in economic terms with most of the wind energy projects as they utilize the depreciation benefit – as those projects are no set up as IPPs.

It acts as a barrier as competitors can benefit from this tax subsidy creating demand for wind energy assets, and thereby a demand supply mismatch resulting in higher price for the equipment and services available for wind power project development (land, approvals, planning, and studies), wind turbine supply or engineering, procurement and construction of the whole project. Though AWEPL is unable to utilize the depreciation, it has to bear the additional cost leading to higher project and maintenance cost based on the demand-supply gap in the market.

This barrier to competition is directly attributable to the restrictions on use of depreciation tax subsidies for tax shelter on profits from existing operations. As per the Indian Income Tax Act, 1961, the parent company and its subsidiary are considered two different entities and the possibility of transfer of the income tax or depreciation benefits between these two entities is not possible. In other words, the

depreciation benefit available to AWEPL cannot be utilized by Acciona Energia, which in any case is a foreign company.

In addition, the investment barriers for AWEPL are:

- Among the first IPP in Karnataka in the wind energy sector based on non recourse financing
- The only revenue stream for the project is sale of electricity. The other revenue stream envisaged is through sale of CERs. The project will utilize the tax holiday under Section 80IA of the Income Tax Act, 1961 but will remain taxable under Minimum Alternate Tax @ 11.33% per annum.

Technological Barriers

- First time underground cabling and unit substatation which covers transformers and switchgear to avoid visual impact of the medium voltage overhead lines within the wind farm as well as concern for the environment and hence the higher cost. This underground cabling will be first of its kind for wind farms in India and will require special care and extra cost of approximately Rs.2 Million per MW in terms of installation, besides repair and maintenance as against the overhead transmission lines. The unit substation sheltering transformers and switchgear will cost another approximately Rs.2 Million per MW. Implementation of this concept in India will be developed and encouraged on the successful experience of AWEPL's unique initiative. Pits and earth removed will be restored post construction to bring back the site appearance as close to original as possible.
- First time SCADA installation by Vestas India with the 1.65MW, for better monitoring and control of the wind farm.
- Lack of long term wind data that presents uncertainty in the year to year cash flow estimation – which is essential to ascertain the project viability
- The technological risks associated with WTGs are high due to the fact that the equipment is I imported and highly advanced.

Institutional barriers

- Lack of experience in Indian banks to undertake project finance for IPPs
- Uncertainty of wind generated electricity tariff (PPA) from the 11th to the 20th year posing higher risk for financial institutions lending to the project

Regulatory barrier

- Appellate tribunal order dated 14th May 2007 calling for competitive bidding for RE electricity tariff.
- The tariff structure for wind energy investment in India is a single-part tariff structure while utility-scale fossil fuel and hydro projects have a two-part tariff structure.

Outcome of sub-step 3a:

Barriers that may prevent one or more alternative scenarios to occur are identified.

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

As stated the above barriers are specifically hindering the implementation of wind farm projects including the proposed project activity. None of these barriers are applicable to any of the three other alternatives.

Step 4: Common practice analysis

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

The following table indicates the state wise wind power potential in India vis-à-vis the total capacity installed as on 31/03/2006:

Table 1: State wise wind power Potential and installed capacity

Sl. No.	State	Gross Potential (MW)	Technical Potential (MW)	Installed Capacity (MW)
1	Andhra Pradesh	8275	1920	121.1
2	Gujarat	9675	1780	337.9
3	Karnataka	6620	1180	584.3
4	Kerala	875	605	2.0
5	Madhya Pradesh	5500	845	40.25
6	Maharashtra	3650	3040	1001.15
7	Orissa	1700	780	2
8	Rajasthan	5400	910	358.06
9	Tamilnadu	3050	1880	2897.34
10	West Bengal	450	450	1.1
11	Other States	-	-	1.6
	Total	**45195**	**13390**	**5347**

- As on 31/03/2006, the total installed capacity of power generation in India through all power generation (coal, gas, nuclear, hydro and others) sources is 126031.27 MW (*Source: Indian Wind Power Directory, 2006*) whereas the installed capacity of wind power in India is 5347 MW. Thus only 4.2 % of the total installed capacity in India is through wind generation sources. Given that the gross potential for wind power in India is 45195 MW, the exploitation of the technology is very low.
- Karnataka, the eighth largest State in India, is situated on the western edge of the Deccan plateau. Karnataka is facing a temporary power crunch, and in order to tide over the immediate power shortage the state has considered setting up diesel power generating units and laying a gas grid along the coastline from Mumbai High, to utilize natural gas to generate power. The state has also identified 150 locations where mini and micro hydro-electric projects can be set up. Plans have been initiated to harness wind energy too (*Source: http://www.karnataka.com/industry/power*). In keeping with the policy of liberalization set in motion since 1991, private investment for generation of power through thermal stations, mini and micro hydro - electric schemes, diesel power generation, etc are welcomed by the state.

- As shown in the Table 1 above, wind based power projects are set up in only ten states in India. As per the Ministry of Non-Conventional Energy Sources (MNES), out of the gross wind power generation potential of 6620 MW in Karnataka, only 584.3 MW has been installed (March 31, 2006). This is a potential realization of just 8.8% and the grid penetration in Karnataka of as low as 7.5%. This is after 14 years of liberalization, wherein private sector participation was welcomed in the state.
- For year 2004-05, the total generation in Karnataka through all power sources (coal, gas, nuclear, hydro, wind and others) is 18,990 Million Unit (*Source: http://www.kerc.org/database/myweb4/default.htm*) whereas the total generation of wind power in Karnataka is 388 Million Unit. Thus only 2.04 % of the total generation in Karnataka is through wind generation sources. This indicates that wind energy is not a very common practice in Karnataka.
- Also, as of March 31, 2007, there are only 5 private wind farm project promoters with a total wind farm capacity of 20 MW or above in the state of Karnataka and exporting power to the KPTCL grid (KREDL) as per Table-2.
- All the project activities of Enercon, MSPL, Nuziveedu Seeds, Ramgad Minerals and Mining Pvt. Ltd and Hindustan Zinc Limited with an installed WTG's each of 600 KW or above have sought for CDM revenue.

Table 2: Private Wind farm Owners exporting power to the KPTCL Grid (20 MW or above) as of 20/12/2007

S. No.	Name of Project Developer	Total No. of WEG's	Capacity (KW)	Total (MW)	Has the proponent sought CDM revenue	Source
1	Enercon Wind farms	55 and 86	600 and 800	101.8	Yes	http://cdm.unfccc.int/Projects/Validation/DB/OXVWZAF5DIIKOJYLAKJC48EY8HWMFY/view.html http://cdm.unfccc.int/Projects/Validation/DB/4GSTDDCKD0IL1JLUKRI2ZNE1V7P55B/view.html
2	Nuziveedu Seeds Ltd.	5,18 and 6	750, 950, and 1500	27.65	Yes	http://cdm.unfccc.int/UserManagement/FileStorage/7MKGRE0K2J0D6O1WKHV6XTW67UCAD6
3	MSPL Limited	7, 17 and 83	750, 950 and 1250	125.15	Yes	http://cdm.unfccc.int/UserManagement/FileStorage/6TU55OXGCAEHNZQV27694ATC31SOM3
4	Hindustan Zinc Limited	43	800	34.4	Yes	http://cdm.unfccc.int/UserManagement/FileStorage/L5R9Y5U0YMIJ16D3YWJUK97I0XIMXJ

From the above table it is clear that there exists only 4 comparable wind farm projects in Karnataka and all have gone ahead only after considering benefits from CDM. Hence we can say that it is not a common practice in the region to install large scale wind farms in the region without consideration of CDM.

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

This has already been described in the sub step 4a above.

The registration of the proposed project activity as a CDM project would lead to annual flow of additional revenue to the project activity for a period of ten years thereby improving the returns from the project activity alleviating investment and regulatory policy risk to a certain extent. The successful registration also provides an incentive for other developers to invest in wind power projects. Additionally the project activity leads to reduction of greenhouse gases which would have been released in the absence of the proposed project activity by the operation of fossil fuel based plants in the grid. Also the project activity leads to diversification of regional grid supply making it more sustainable in the long term. Thus the CDM revenue acts as a risk mitigation tool in overcoming barriers and imparting viability to the AWEPL proposed project activity.

B.6. Emission reductions:

B.6.1. Explanation of methodological choices:

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Emission Reductions

The proposed project activity mainly reduces carbon dioxide through substitution of grid electricity generation with fossil fuel fired power plants by renewable electricity. The emission reduction ER_y by the project activity during a given year y is the difference between baseline emissions (BE_y), project emissions (PE_y) and emissions due to leakage (L_y), as follows:

$$\mathbf{ER_y = BE_y - PE_y - L_y}$$

For geothermal project activities and for new Hydro electric power projects with reservoirs, there are different choices to account emissions from the own project.

For wind energy projects $PE_y = 0$ and there is not leakage to this project so $L_y = 0$. Then $ER_y = BE_y$
The emission reductions are the baseline emissions.

The baseline emissions (BE_y in tCO_2) are the product of the baseline emissions factor (EF_y in tCO_2/MWh) times the electricity supplied by the project activity to the grid (EG_y in MWh).

$$\mathbf{BE_y = EF_y * EG_y}$$

The baseline emission factor (EF_y) is calculated as a combined margin (CM), consisting of the combination of operating margin (OM) and build margin (BM) factors according to the following three steps:

Step 1: **Calculating the Operating Margin emission factor ($EF_{OM,y}$)**

The consolidated methodology ACM0002 provides four options for calculating the operating margin, and guidance for how to choose which options for the corresponding project activity. The options are:

a) Simple OM, or

b) Simple adjusted OM, or
c) Dispatch Data Analysis OM, or
d) Average OM.

The methodology (ACM0002) relies on Dispatch data analysis as its first methodological choice, which requires hourly fuel consumption and power generation data for a set of plants falling within the top 10% of the system (grid) dispatch. To determine the set of plants it requires obtaining from national dispatch centre:

- the grid system dispatch order of operation for each power plant of the system and
- the amount of power (MWh) that is dispatched from all plants in the system during each hour that the project activity is operating

For the proposed project activity, the dispatch data analysis could not be used because of lack of availability of data for conducting such an analysis in the Indian context. The Southern regional grid (and all other regional grids in India) operates as loose power pool, in which the constituent states have full operational autonomy, and the state load dispatch centres (SLDCs) have the total responsibility for scheduling / dispatching their own generation, regulating the demand of their customers, scheduling their drawl from the Inter-State Generation Stations (ISGS) within their entitlement in the respective plant's available capability), arranging any bilateral interchanges, and regulating their net withdrawal from the regional grid. There is no merit order dispatch prepared by the Southern Regional Load Dispatch Centre - it merely collates the drawl schedule of the SLDCs, which are restricted to ISGSs only. Further, the hourly withdrawal schedule prepared by the SLDCs is not publicly available. Furthermore, hourly fuel consumption data for all generation sources is not available in public domain. In most cases, the thermal stations are paid the variable (fuel) charges based on normative station heat rate (efficiency) and not on actual efficiency. Some thermal stations may publish annual or monthly average station heat rate (efficiencies) but not hourly fuel consumed.

The choice of other options for calculating the operating margin emission factor depends on the generation of electricity from low cost/must run sources. In the context of the methodology low cost/must run resources typically include hydro, geothermal, wind, low cost biomass, nuclear and solar generation.

Table 8: Share of Low Cost / Must-Run (% of Net Generation) **Share of Must-Run (% of Net Generation)**

	2001-2002	2002-2003	2003-2004	2004-2005	2005-2006
North	25.7	26.1	28.1	26.8	28.1
East	13.4	7.5	10.3	10.5	7.2
South	25.5	18.3	16.2	21.6	27.0
West	8.5	8.2	9.1	8.8	12.0
North-East	42.1	45.8	41.8	55.4	52.7
India	18.9	16.3	17.1	18.0	20.1

Source: CO_2 Baseline Database for the Indian Power Sector – Central Electricity Authority (CEA)

Percentage of total grid generation by low cost/must run plants (on the basis of average of five most recent years) = 18.08 %

Thus the average emission rate method cannot be applied, as low cost/must run resources constitute less than 50% of total grid generation and detailed data to apply Simple adjusted OM is not available.

The **Simple Operating Margin** can be used for the proposed project activity because low-cost/must run resources constitute less than 50% of total generation.

The Simple OM can be calculated using either of the two following data vintages for years *y*:

- *(Ex-ante)* the full generation-weighted average for the most recent 3 years for which data are available at the time of PDD submission, if or,
- the year in which project generation occurs, if $EF_{OM,y}$ is updated based on *ex-post* monitoring.

The choice between *ex-ante* and *ex-post* vintage should be specified in the PDD, and cannot be changed during the crediting period.

This project will use the *ex-ante* alternative. This option does not call for updating *ex-post* every year, hence this part of the CO_2 emission factor will not require monitoring.

Simple OM: The simple OM emission factor ($EF_{OM,y}$) is calculated as the generation weighted average emissions per electricity unit (tCO_2/MWh) of all generating sources serving the system, not including low-operating cost and must-run power plants:

$$EF_{OM,simple,y} = \sum F_{i,j,y} \cdot COEF_{i,j} / \sum GEN_{j,y}$$

where $F_{i,j,y}$ is the amount of fuel *i* (in a mass or volume unit) consumed by relevant power sources *j* in year(s) *y*,
j refers to the power sources delivering electricity to the grid, not including low-operating cost and must-run power plants, and including imports to the grid.

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

$GEN_{j,y}$ is the electricity (MWh) delivered to the grid by source j. The CO_2 emission coefficient COEFi is obtained as:

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

where:
NCV_i 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 (2006 Revised IPCC Guidelines for default values),
$EF_{CO2,i}$ is the CO_2 emission factor per unit of energy of the fuel *i*.
The Simple OM emission factor ($EF_{OM,simple,y}$) is calculated separately for the most recent three years and an average value has been considered as the OM emission factor for the baseline ($EF_{OM,y}$).

Step 2: Calculation of the Build Margin Emission Factor $EF_{BM,Y}$

The Build Margin emission factor ($EF_{BM,y}$) is calculated as the generation weighted average emission factor (tCO_2/MWh) of a sample of power plants. The sample group *m* consists of either

- The five power plants that have been built most recently, or
- The power plants capacity additions in the electricity system that comprise 20% of the system generation (in MWh) and that have been built most recently.

From these two options the sample group that comprises the larger annual generation is to be chosen.

The calculation for Build Margin emission factor is furnished below:

$EF_{BM,y} = \sum F_{i,m,y} . COEF_{i,m} / \sum GEN_{m,y}$

Where $F_{i, m,y}$ = quantity of fuel *i* used in plant *m* (kt/yr) in year *y*
$COEF_{i, m}$ = carbon emissions factor for fuel *i* in plant *m* (tCO2/kt), taking into account the carbon content of the fuels by power sources and the percent oxidation of the fuel
$GEN_{m, y}$ = annual generation from plant *j* (MWh/yr) in year *y*

Calculations for the Build Margin emission factor $EF_{BM, y}$ has been done as *ex-ante* based on the most recent information available on plants already built for sample group m of regional grid at the time of PDD submission. The sample group m consists of the 20% of power plants supplying electricity to grid that have been built most recently, since it comprises of larger annual power generation. Further, none of the power plant capacity additions in the sample group have been registered as CDM project activities.

Step 3. Calculation of Baseline Emission Factor EF_y

Calculate the baseline emission factor EF_y as the weighted average of the Operating Margin emission factor ($EF_{OM, y}$) and the Build Margin emission factor ($EF_{BM,y}$):

$$\mathbf{EF_y = w_{OM}\ EF_{OM,y} + w_{BM}\ .EF_{BM,y}}$$

Where the weights w_{OM} and w_{BM}, by default, are 50% (i.e., $w_{OM} = w_{BM} = 0.5$), and $EF_{OM,y}$ and $EF_{BM,y}$ are calculated as described in Steps 1 and 2 above and are expressed in tCO_2/MWh.

For wind and solar projects, the default weights are as follows: $w_{OM} = 0.75$ and $w_{BM} = 0.25$ (owing to their intermittent and non-dispatchable nature).

The Central Electricity Authority (CEA) has calculated the baseline emission factors for the various regional grids in India according to the formulas specified above. As this is the most authentic information available in the public domain. The baseline emission factor used in the calculation of baseline emissions for the proposed project activity is being referred from the same for transparency and conservativeness. Combined margins shown in the database are calculated based on equal weights (User Guide version 2 page 5), that's why we go for $EF_{OM,Y}$ and $EF_{BM,Y}$ data shown on the User's Guide for validation.

Project activity emissions According to the chosen baseline methodology ACM0002, for wind energy based renewable energy project activities, $PE_y = 0$.

Leakage According to ACM0002, the main emissions potentially giving rise to leakage in the context of electric sector projects are emissions arising due to activities such as power plant construction, fuel handling (extraction, processing, and transport), and land inundation (for hydroelectric projects). Project participants do not need to consider these emission sources as leakage in applying this methodology. Project activities using ACM0002 shall not claim any credit for the project on account of reducing these emissions below the level of the baseline scenario. Thus the leakage emissions are nil.

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

(Copy this table for each data and parameter)

Data / Parameter:	**$EF_{OM,y}$**
Data unit:	tCO_2/MWh
Description:	Operating Margin emission factor for Southern regional grid
Source of data used:	Referred from CO_2 Baseline Database for the Indian Power Sector prepared by Central Electricity Authority, Version 2.0.
Value applied:	1.004 tCO_2/MWh
Justification of the choice of data or description of measurement methods and procedures actually applied :	Calculated as per ACM0002 with 3 years vintage data and option of *ex-ante* calculation based on Simple Operating Margin Method. Computed once during PDD finalization (ex-ante).
Any comment:	Records to be archived from the start of the crediting period either on paper or in electronic media.

Data / Parameter:	**$EF_{BM,y}$**
Data unit:	tCO_2/MWh
Description:	Build Margin emission factor for Southern regional grid
Source of data used:	Referred from CO_2 Baseline Database for the Indian Power Sector prepared by Central Electricity Authority, Version 2.0.
Value applied:	0.711 tCO_2/MWh
Justification of the choice of data or description of measurement methods and procedures actually applied :	Calculated as per ACM0002 with 3 years vintage data and option of *ex-ante* calculation based on "20% of total generation approach". Computed once during PDD finalization (ex-ante).
Any comment:	Records to be archived from the start of the crediting period either on paper or in electronic media.

Data / Parameter:	**EF_y**
Data unit:	tCO_2/MWh
Description:	Combined Margin CO_2 emission factor for Southern regional grid
Source of data used:	Estimated figure based on 75% of OM and 25% of BM values, referred from

	CO_2 Baseline Database for the Indian Power Sector prepared by Central Electricity Authority, Version 2.0.
Value applied:	0.93 tCO_2/MWh
Justification of the choice of data or description of measurement methods and procedures actually applied :	Calculated as per ACM0002 with 3 years vintage data and option of *ex-ante* calculation based on 75% of OM and 25% of BM values approach". Computed once during PDD finalization (ex-ante).
Any comment:	Records to be archived from the start of the crediting period either on paper or in electronic media.

B.6.3 Ex-ante calculation of emission reductions:

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Installed Capacity (MW)	29.7
Number of WTGs	18
Capacity of individual WEG (MW)	1.65
PLF	36.47 %
Number of days of operation	365
Number of hours	8,760
Gross Generation of one WEG in an year (Million KWh)	5.27
Gross Generation from 18 WEG in an year (Million KWh)	94.88
Net Generation from the project (Million KWh)	94.88
Baseline emission factor Southern region grid (tCO_2/MWh)	0.93
Baseline emissions (tCO_2) (for 10 years)	882,401.1
Emission reductions (tCO_2) (for 10 years)	882,401.1

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

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Year (September to August)	**Baseline emissions (t CO_2eq)**	**Project emissions (tCO_2eq)**	**Leakage (tCO_2eq)**	**Emission reductions (tCO_2eq)**
2008 – 09	88,240.11	0	0	88,240.11
2009 – 10	88,240.11	0	0	88,240.11
2010 – 11	88,240.11	0	0	88,240.11
2011 – 12	88,240.11	0	0	88,240.11
2012- 13	88,240.11	0	0	88,240.11
2013 – 14	88,240.11	0	0	88,240.11
2014 – 15	88,240.11	0	0	88,240.11
2015 – 16	88,240.11	0	0	88,240.11
2016 – 17	88,240.11	0	0	88,240.11
2017 – 18	88,240.11	0	0	88,240.11
Total	882,401.1	**0**	**0**	882,401.1

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

B.7.1 Data and parameters monitored:	
(Copy this table for each data and parameter)	
Data / Parameter:	**EGy**
Data unit:	MWh
Description:	Net electricity supplied to DISCOM facility using KPTCL network.
Source of data to be used:	Joint energy meter reading available at project grid integration point and invoice to DISCOM.
Value of data applied for the purpose of calculating expected emission reductions in section B.5	94,882 MWh / annum
Description of measurement methods and procedures to be applied:	The provisions for metering will be as per the law applicable and implemented in practice to the wind farm in the state of Karnataka and the provisions of the power purchase agreement (PPA). Plant records and maintains the records of all the electricity supplied to the grid. Actually this is based on the joint energy meter readings signed by plant and DISCOM representatives which is normally termed as a Generation Note based on which the AWEPL will invoice. Data is archived electronically. Generation details will be kept two years beyond the crediting period.
QA/QC procedures to be applied:	Energy meters are calibrated at regular intervals as per the law applicable and implemented in practice to the wind farm in the state of Karnataka and/or as per the PPA signed and the calibration certificates for the same are maintained. The same will be followed throughout the crediting period.
Any comment:	This data can be cross verified with the invoices raised by AWEPL to DISCOM and payment received against the invoice. Auxiliary power supply will be required for operation of equipment like hydraulic motors and yaw system for which active power will be drawn from the grid. The metering of the drawn power will be done by the same trivector meter provided at the DISCOM end since it is an import export meter.

B.7.2 Description of the monitoring plan:

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The data will be monitored as per the monitoring information given in Annex 4.

As per the law applicable and implemented in practice, the delivered energy shall be metered by AWEPL and KPTCL at the high voltage side of the step up transformers installed at the receiving station. The energy metering equipment shall be electronic trivector meters, which is required for the project. The energy metering equipment shall be maintained in accordance with electricity standards and have the capability of recording half hourly and monthly readings, which in turn are produced to KPTCL. The energy meters installed would be capable of recording and storing the parameters for a minimum period of 35 days with digital output. The energy meter readings at the project sites and the receiving station

will be taken simultaneously and jointly by both the parties. The recorded metering data shall be downloaded through meter recording instrument.

At the conclusion of each energy meter reading, an appointed representative of AWEPL and KPTCL/DISCOM (with whom AWEPL has signed the PPA for the project) would sign a document indicating the number of kWh indicated by the meter and the frequency of metering will be as per the law applicable and implemented in practice to the wind farm in the State of Karnataka. Each energy meter shall be jointly inspected and sealed on behalf of AWEPL and KPTCL/DISCOM, in the presence of its authorized representatives and the frequency of inspection will be as per the law applicable and implemented in practice to the wind farm in the State of Karnataka. All the energy meters shall be tested for accuracy and the frequency of for the same will be as per the law applicable and implemented in practice to the wind farm in the State of Karnataka with reference to a "portable standard meter". As the instruments are calibrated and marked at regular intervals, the accuracy of measurement can be assured at all times.

Apart from the joint (KPTCL/DISCOM and AWEPL) main meter reading undertaken as per the law applicable and implemented in practice to the wind farm in the State of Karnataka, which is duly signed by the KPTCL/DISCOM representative together with a AWEPL representative, AWEPL will follow the provisions under the law applicable and implemented in practice to the wind farm in the State of Karnataka and PPA in case the primary measuring fails.

Frequency of monitoring
The project developer will install all metering and check metering facilities within the plant premises as well as in the grid substation where exported power is connected to the grid. The measurement will be recorded and monitored on a continuous basis by both KPTCL and the project developer.

Reliability
The amount of emission reduction units is proportional to the net energy export from the project. Thus the final export KWh meter reading is the final value from project side. All measurement devices will be of microprocessor based with best accuracy and will be procured from reputed manufacturers. Since the reliability of the monitoring system is governed by the accuracy of the measurement system and the quality of the equipment to produce the result, all power measuring instruments are calibrated at regular intervals for ensuring reliability of the system. All instruments carry tag plates, which indicate the date of calibration and the date of next calibration. Therefore the system ensures the final generation is highly reliable.

Registration and reporting

Registration and reporting shall be as per the CDM Manual

AWEPL has entered into Operation & Maintenance Agreement with the M/s Vestas Wind Technology India Pvt. Ltd. (Vestas) for carrying out the necessary maintenance of the project activity for the first two years of the designed life of the project during which the periodical checks on the procedures being followed will be carried out by AWEPL. Third years onwards, plant Operation & Maintenance may be taken care by AWEPL itself. Vestas (for the first two years) and AWEPL (third year onwards) responsibilities for the operation and maintenance of the project is as under:

1) Routine Maintenance Services

Routine Maintenance involves making available suitable manpower for operation and maintenance of the equipment and covers periodic preventive maintenance, cleaning and up keep of the equipment as necessary, including:

- Tower Torquing
- Blade Cleaning
- Nacelle Torquing and Cleaning
- Transformer Oil Filtration
- Control Panel & LT Panel Maintenance
- Site and Transformer Yard Maintenance

2) Security Services

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

3) Management Services

- Data logging in for power generation, grid availability, machine availability.
- Preparation and submission of performance report in agreed format and the frequency of reporting will be as per the law applicable and implemented in practice to the wind farm in the State of Karnataka.
- Taking monthly meter reading jointly of power generated at the Wind Farm and supplied to DISCOM and coordinate to obtain necessary power credit report/ certificate.

4) Technical Services

- Visual inspection of the WEG and all parts thereof.
- Technical Assistance including checking of various technical, safety and operational parameters of the Equipment, trouble shooting and relevant technical services.

The monitoring and verification procedure, training procedure and the responsibility matrix is detailed in the CDM Manual.

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

>>

Date of completion of baseline study – January 2008

Name of responsible person –

Winrock International India
788, Udyog Vihar
Phase-5
Gurgaon- 122001
India
wii@winrockindia.org
www.winrockindia.org

SECTION C. Duration of the project activity / crediting period

C.1 Duration of the project activity:

C.1.1. Starting date of the project activity:

>>

The Board of Directors approval for investment came on 18th April 2007, with the project activity beginning on 27th April 2007[5]

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 September, 2008 or the date of registration, whichever is earlier

C.2.2.2. Length:

>>

10 years

SECTION D. Environmental impacts

>>

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

>>

[5] The phase 2 activity was started with contract signature on 20th September, 2007 subsequent to the Board of Directors approval on 18th April 2007.

As per the Schedule 1 of Ministry of Environment and Forests (Government of India) notification dated January 27, 1994 and related latest notification dated, September 14, 2006 regarding requirement of Environment Impact Assessment (EIA) studies for a range of infrastructure projects, 38 categories of the proposed industry or project is required to undertake EIA studies. The details of these activities are available at: http://envfor.nic.in/divisions/iass/notif/eia.htm.

The proposed project doesn't fall under the list of activities requiring EIA as it will not involve any negative environmental impacts, as the WTGs installation for generation of power use wind (cleanest possible source of renewable energy). Wind power is one of the cleanest sources of renewable energy, with no associated emissions and waste products. In India, wind power projects do not require an EIA**.**

Though this project activity does not fall under the purview of Environmental Impact Assessment notification of the Ministry of Environment and Forests – Government of India (GOI), due consideration has been given by AWEPL to environmental aspects. The project will obtain all necessary project clearances from the State and Central Governments for the project. There are no transboundary impacts from the project. The details of clearances obtained / to be obtained by Vestas for Accion are as follows:

Clearance, Procedure, Concerned Authority	ARA.	ANA.
Government of Karnataka Order (GoK) Approval (GO)	√	√
GoK agreement to establish the Project	√	√
Land lease with Ministry of Environment and Forest	√	×
Power Evacuation Approval from KPTCL	√	√
Transfer of GO in Accion's name	√	√
Transfer land lease in Accion's name	√	×
Power Purchase Agreement (PPA)	×	×

√ - Obtained; × - Pending

The proposed project activity has no significant impact on the environment. However, certain foreseen impacts due to the project activity are described below:

Construction Phase:

Impact on Land use
The land on which the project activity takes place is barren and unfertile. Prior to the project activity the land had no beneficial use. AWEPL has brought the land for a worthwhile application and obtained necessary approvals for installation of windmills. No dislocation of people is involved in the course of the project activity.

Impact on Soil use
The minor quantity of solid/liquid discharge, likely to be generated during the construction phase has no noticeable impact on soil use and the project proponent has made arrangements to dispose them in an environmentally acceptable manner.

Impact on Air Environment

Wind Power plants are known to contribute to zero atmospheric pollution as no fuel combustion is involved during any stage of the operation. The source of emission that is anticipated is likely due to the exhaust released due to the running of the heavy motor vehicles, during the movement of the construction material, which shall be properly maintained to minimize the air pollution. The dust so generated during haulage shall be minimized by sprinkling water.

Impact on noise environment
Personal protective equipments are provided to workers involved in the construction activity to mitigate the effects of noise pollution, but they are no impact on ambient noise level.
The emissions involved in the construction of the wind power plant and the gridlines are negligible as a percentage of the total power generated. Taking into consideration the project life cycle, the magnitude of the impacts during the construction phase is negligible and exists for a temporary period of time till the end of construction phase. Therefore, it would not effect the environment considerably.

Operation and Maintenance Phase:
AWEPL maintains highest level of safety standards. Systematic and scientific maintenance of all equipments has been undertaken to ensure the best safety standards.

Impact on Land use
The project site is a barren land and unproductive area with no application and habitat. There are no migratory birds/endangered species in the region of project activity. Therefore no harm on the ecological environment is envisaged.

Impact on Noise Environment
Noise is generated due to the movement of rotor blades. It has no direct effect on the population, as the area is less populated and noise generated will be attenuated by ambient conditions. Vestas has obtained necessary certification from DNV for conformity with environment and safety management system as per relevant ISO requirements. Though noise is generated during the operation of wind turbine generators, considering the overall impact of the project in reducing GHGs, creation of employment etc., the same can be considered as negligible.

Socio-Economic Impacts
There is no inconvenience to the local community due to the transmission lines. The locals have benefited economically through land sales. The project activity helps the upliftment of skilled and unskilled manpower in the region. The project will be providing employment opportunities not only during the construction phase, but also during its operational lifetime. The project activity improves employment rate and livelihood of local populace in the vicinity of the project. Moreover, the project generates eco-friendly, GHG free power which contributes to sustainable development of the region.

The net impact under environmental pollution category would be positive as all necessary abatement measures would be adopted and periodically monitored. The project activity does not have any major adverse impacts on environment during its construction or operational phase. The human interest parameters would show positive impacts due to increased job opportunities at the facility as well as other ancillary units coming up.

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:

>>

As the project is environment friendly in nature, hence, there is no significant environmental impact due to this project.

SECTION E. Stakeholders' comments

>>

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

>>

The stakeholders for the project activity were identified by the team of AWEPL and Vestas Wind Technology India Pvt. Ltd. staff and the stakeholders were duly informed of the consultation meeting. The team of AWEPL and Vestas Wind Technology India Pvt. Ltd. visited both the villages and extended the invitation to join the consultation meeting. In addition, a press release on "Announcement for Initial CDM Stakeholder Consultation Meeting" was made on 28th July 2007 in 'Vijaya Karnataka', Chitradurga edition. The same is attached as Appendix A.

A wide range of stakeholders were identified for the stakeholder meeting, including employees of the plant, contractors at site, Government officials and local villagers at the wind plant site.

The stakeholders identified for the project were:

- Local villagers and representatives of village governing body
- Supplier of WEG
- Karnataka Renewable Energy Development Limited
- Karnataka Power Transmission Corporation Limited (KPTCL)
- DISCOM
- Staff of Vestas Wind Technology India Pvt. Ltd.

Accordingly, the initial CDM stakeholder consultation meeting was held at 11:00 hours on 3rd August 2007 at Arasinagundi wind farm site to discuss stakeholder concerns on proposed project activity and the Clean Development Mechanism (CDM) initiatives by AWEPL. Before this, an informal stakeholder consultation was done by Vestas in April 2007.

This stakeholder meeting involved:

a) Welcome address to the Stakeholders by Mr. Prashanth Vittal P, AWEPL
b) Inaugural address by Sri Manjunath, A.E.E, BESCOM
c) Introduction of project by Mr. Prashanth Vittal P, AWEPL
d) Special address by Smt. Suvarnamma, Gram Panchayat President, Thoranagatte
e) Stakeholder comments were invited at the consultation meeting.
f) The stakeholders were provided clarifications on the issues raised as above to their satisfaction
g) Summation of the concerns expressed by the stakeholder groups & commitments to address the concerns by AWEPL

The agenda of the meeting was fixed as follows:

a) Welcome Address
b) Inaugural Address
c) Introduction of the project

d) Special Address
e) Queries and responses from the proponent and the stakeholders
f) Vote of thanks

The details of the stakeholders present with signature are attached as Appendix B. The photographs of the consultation meeting are attached as Appendix C. The minutes of the stakeholder meeting is attached as Appendix D.

E.2. Summary of the comments received:

>>

A brief introduction about the project activity was given to the stakeholders and their doubts and concerns were clarified by the AWEPL representatives. The comments can be summarized as positive.

The A.E.E. BESCOM and Panchayat president and local people expressed satisfaction due to the project activity since the project activity has created / will create local employment opportunities, lead to increase in land values for the nearby villagers that will positively help in improving standard of life as well as socio-economic conditions of the villages.

During the stakeholder consultation meeting, individual stakeholders were consulted by AWEPL representatives to comment on the proposed project activity. The comments from the stakeholders are summarized and separately attached as Appendix E. The summary clearly indicates that all the stakeholders agree that the project activity has helped / will help to improve the socio-economic environment of the local area.

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

>>

Considering the comments made by the stakeholders, no negative impacts due to the project activity had been identified. However, the only issue some of them had mentioned is about the roads being damaged during the implementation of the project activity. This is minor compared to the benefits from the project activity.

Annex 1

CONTACT INFORMATION ON PARTICIPANTS IN THE PROJECT ACTIVITY

Organization:	Accion Wind Energy Pvt. Ltd.
Street/P.O.Box:	C1-001, Tower C, The Millennia
Building:	No. 1& 2, Murphy Road, Ulsoor
City:	Bangalore
State/Region:	Karnataka
Postfix/ZIP:	560008
Country:	India
Telephone:	+91-80-41557102
FAX:	+91-80-41557110
E-Mail:	rsapra@acciona.com
URL:	
Represented by:	
Title:	Chief Finance Officer
Salutation:	Mr.
Last Name:	Sapra
Middle Name:	Krishanlal
First Name:	Rajnish
Department:	Finance
Mobile:	+91-9980947870
Direct FAX:	+91-80-41557102
Direct tel:	+91-80-41557110
Personal E-Mail:	rsapra@acciona.com

Annex 2

INFORMATION REGARDING PUBLIC FUNDING

No public funding is sought.

Annex 3

BASELINE INFORMATION

The Central Electricity Authority (CEA) under the Ministry of Power, Government of India, has estimated the Combined Margin emission factor as per ACM 0002 for the Southern grid, the details of which are available on the following website.
http://www.cea.nic.in/planning/c%20and%20e/Government%20of%20India%20website.htm

The procedures and formulas used for estimation of the baseline factor and the assumptions made have also been detailed in there. The results are briefly detailed as follows:

CENTRAL ELECTRICITY AUTHORITY: CO2 BASELINE DATABASE

VERSION	**2.0**
DATE	**21 June 2007**
BASELINE METHODOLOGY	**ACM0002 / Ver 06**

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

	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06
North	0.98	0.98	1.00	0.99	0.97	0.99
East	1.22	1.22	1.20	1.23	1.20	1.16
South	1.02	1.00	1.01	1.00	1.00	1.01
West	0.98	1.01	0.98	0.99	1.01	0.99
North-East	0.73	0.71	0.74	0.74	0.71	0.70
India	1.02	1.02	1.02	1.03	1.03	1.02

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

	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06
North					0.53	0.60
East					0.90	0.97
South					0.71	0.71
West					0.77	0.63
North-East					0.15	0.15
India					0.70	0.68

As per ACM002, the **Operating Margin** is calculated as follows-

As explained in Section B, The Simple OM is chosen to calculate Operating margin which is calculated as the full generation-weighted average for the most recent 3 years for which data are available at the time of PDD submission

Thus,

$EF_{OM,y}$= (1.00+1.00+1.01)/3= 1.003

As per ACM002, for wind and solar projects, the default weights are as follows: wOM = 0.75 and wBM = 0.25 (owing to their intermittent and non-dispatchable nature).

EFy= $wOM.EF_{OM,y}$ + $wBM.EF_{BM,y}$

= 0.75*1.003+0.25*0.71

= 0.93 t CO_2/MWh

Annex 4

MONITORING INFORMATION

The points given below detail the monitoring plan

The general conditions set out for metering, recording, meter readings, meter inspections, Test & Checking and communication are as per the law applicable and implemented in practice to the wind farm in the State of Karnataka and / or standard PPA (power purchase agreement) with DISCOM.

Metering: The Delivered Energy is metered by the DISCOM and AWEPL at the high voltage side of the grid integration point at the Project Site.

Metering Equipment: Metering equipment is electronic trivector meter, which is required for the Project. KPTCL approved energy meter is installed by AWEPL and maintained in accordance with the prevailing electricity standards, which also involved calibrating the same at regular prescribed intervals under the supervision of KPTCL and/or DISCOM. The meter has the capability of recording hourly and monthly readings.

Meter Readings: The monthly meter reading is taken jointly by DISCOM and AWEPL and the frequency of metering will be as per the law applicable and implemented in practice to the wind farm in the State of Karnataka. At the conclusion of each meter reading an appointed representative of the DISCOM and AWEPL sign a document indicating the number of Kilowatt-hours indicated by the meter.

Meter Test Checking: The energy meter is tested for accuracy at regular intervals as mandated by prevalent law applicable and implemented in practice to the wind farms in the State of Karnataka, and conducted by KPTCL/DISCOM with reference to a "portable standard meter". All the meters are tested for accuracy with reference to a portable standard meter. The portable standard meter is owned by KPTCL/DISCOM; however, AWEPL will have no control over KPTCL/DISCOM or other government agencies to perform such checks in accordance with any stipulated schedule. The meters shall be deemed to be working satisfactorily if the errors are within specifications for meters. The consumption registered by the trivector meter on the KPTCL/DISCOM end at the evacuation sub-station alone will hold good for the purpose of metering electricity supplied to the grid.

Net energy export: Auxiliary power supply will be required for operation of equipment like hydraulic motors and yaw system for which active power will be drawn from the grid. The metering of the drawn power will be done by the same trivector meter provided at the DISCOM end since it is an import export meter.

- -

Appendix A

PRESS RELEASE OF INVITATION TO INITIAL STAKE HOLDERS MEETING ON AUGUST 3RD 2007 IN VIJAYA KARNATAKA – CHITRADURGA EDITION, DATED JULY 28, 2007

ಪ್ರಕಟಣೆ

ಸಿ ಡಿ ಎಂ ಮುಂದಾಳುಗಳ ಸಮಾಲೋಚನಾ ಸಭೆ

ಆಕ್ಸಿಯಾನ್ ವಿಂಡ್ ಎನರ್ಜಿ ಪ್ರೈ. ಲಿಮಿಟೆಡ್ ಸಂಸ್ಥೆಯು,

29.7 ಮೆಗಾವ್ಯಾಟ್ ವಿಂಡ್ ಎನರ್ಜಿ ಯೋಜನೆಗೆ ಸಂಬಂಧಿಸಿದಂತೆ ಮುಂದಾಳುಗಳ ಸಮಾಲೋಚನಾ ಸಭೆಗೆ ಸರ್ವರನ್ನೂ ಆಹ್ವಾನಿಸಿದೆ. ತಾವುಗಳು ಸಭೆಗೆ ಹಾಜರಾಗಿ ತಮ್ಮ ಅಭಿಪ್ರಾಯ ಹಾಗೂ ಅಮೂಲ್ಯ ಸಲಹೆಗಳನ್ನು ನೀಡಬೇಕೆಂದು ಕೋರಲಾಗಿದೆ.

ಸ್ಥಳ: ಸರ್ವೆ ನಂ.33, ಅರಸಿನಗುಂಡಿ ಗ್ರಾಮ,
ಜಗಳೂರು ತಾಲ್ಲೂಕು, ದಾವಣಗೆರೆ ಜಿಲ್ಲೆ, ಕರ್ನಾಟಕ
ದಿನಾಂಕ : 03.08.2007 ಸಮಯ: ಬೆಳಿಗ್ಗೆ 11-00 ಗಂಟೆಗೆ

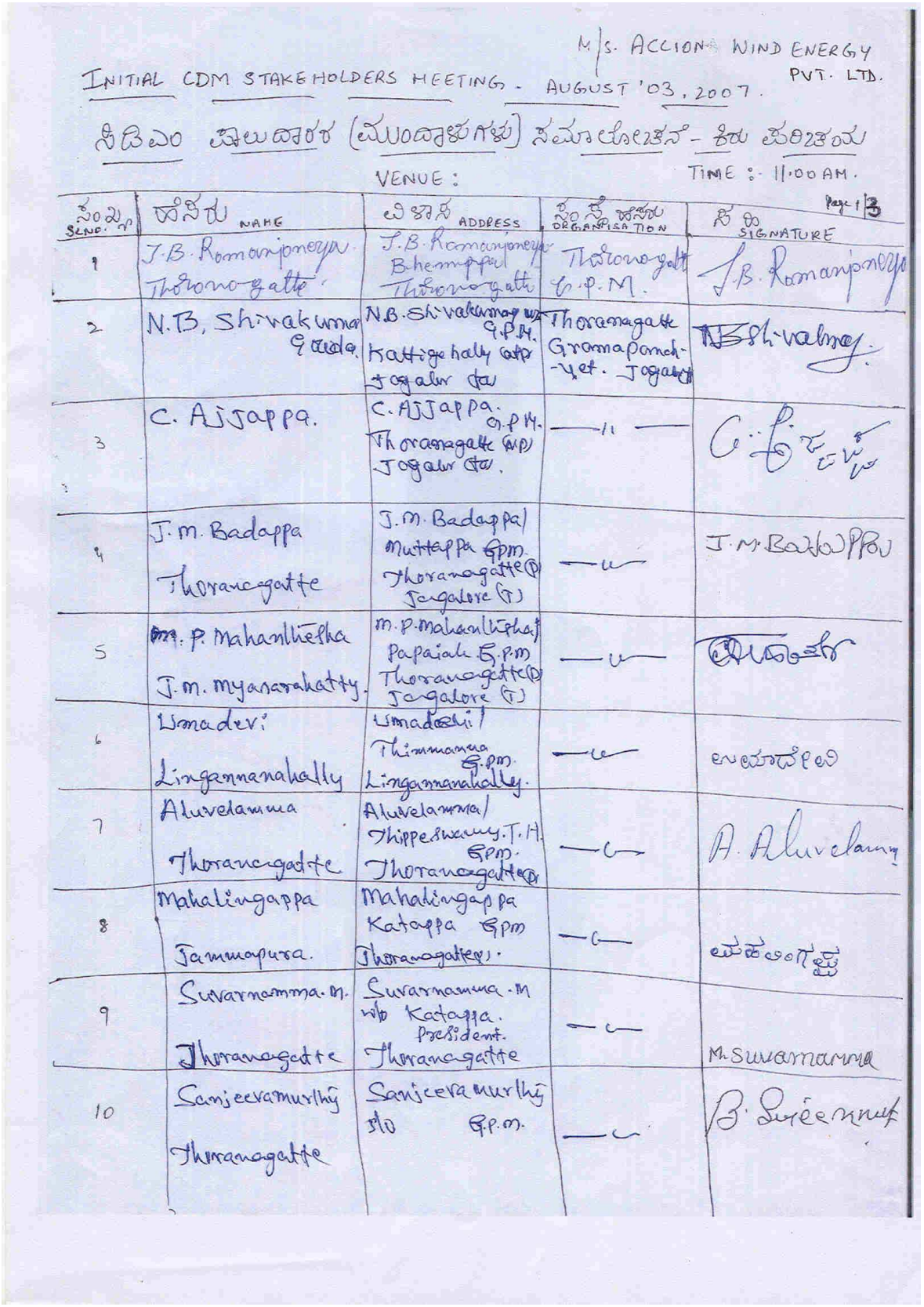
ಹೆಚ್ಚಿನ ವಿವರಗಳಿಗೆ ಸಂಪರ್ಕಿಸಿ : ಶ್ರೀ ರಜನೀಶ್ ಸಪ್ರಾ
113, ರೇಜುಸ್ ಮಿಲೇನಿಯ ಟವರ್-ಬಿ, 1-2 ಮರ್ಫಿ ರಸ್ತೆ,
ಅಲಸೂರು, ಬೆಂಗಳೂರು - 08. ಫೋನ್: (080) 40224127

English translation of the above notice

NOTICE
CDM Stakeholders Meeting
Accion Wind Energy Pvt. Ltd.

All are welcome to attend the 29.70 MW wind power project stakeholder meeting and give your opinions and views on the same.

Venue: Survey No.33, Arasinagundi, Jagalur Taluk, Davangere, Karnataka
Date: 03.08.2007 Time: 11 a.m.
For more details contact: Mr. Rajnish Sapra, 113, Regus Millenia Tower B, 1&2 Murphy Road, Ulsoor, Bangalore 560008. Telephone: (080) 40224127



M/s. ACCIONA WIND ENERGY PVT. LTD.

INITIAL CDM STAKEHOLDERS MEETING - AUGUST '03, 2007.

ಸಿಡಿಎಂ ಪಾಲುದಾರರ (ಮುಂದಾಳುಗಳು) ಸಮಾಲೋಚನೆ - ಕಿರು ಪರಿಚಯ

VENUE :

TIME :- 11.00 AM.

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ಸಂಖ್ಯೆ SLNO.	ಹೆಸರು NAME	ವಿಳಾಸ ADDRESS	ಸಂಸ್ಥೆ ಹೆಸರು ORGANISATION	ಸಹಿ SIGNATURE
1	J.B. Romanjoneya. Thoranagatte.	J.B. Romanjoneya B.hemmpal Thoranagatte	Thoranagatte G.P.M.	J.B. Romanjoneya
2	N.B, Shivakumar Gowda.	N.B. Shivakumaraiah G.P.M. Kattigehally Post Jagalur (Tq)	Thoranagatte Gramapanch-yet. Jagalur	N.B Shivakumar.
3	C. AJjappa.	C. AJJappa. G.P.M. Thoranagatte (Vill) Jagalur (Tq).	—11—	C. AJJappa
4	J.m. Badappa Thoranagatte	J.M. Badappa/ Muttappa GPM. Thoranagatte (V) Jagalore (T)	—11—	J.M. Badappa
5	M.P. Mahanthesha J.m. myanarahatty.	M.P. Mahanthesha/ Papaiah G.P.M Thoranagatte (V) Jagalore (T)	—11—	
6	Umadevi Linganmanahally	Umadevi/ Thimmanna G.P.M. Linganmanahally.	—11—	
7	Aluvelamma Thoranagatte	Aluvelamma/ Thippeswamy. T.H. GPM. Thoranagatte (V)	—11—	A. Aluvelamma
8	Mahalingappa Jammapura.	Mahalingappa Kataggpa GPM Thoranagatte (V).	—11—	
9	Suvarnamma.M. Thoranagatte	Suvarnamma.M w/o Kataggpa. President. Thoranagatte	—11—	M. Suvarnamma
10	Sanjeevamurthy Thoranagatte	Sanjeevamurthy S/o G.P.M.	—11—	B. Sreenivas

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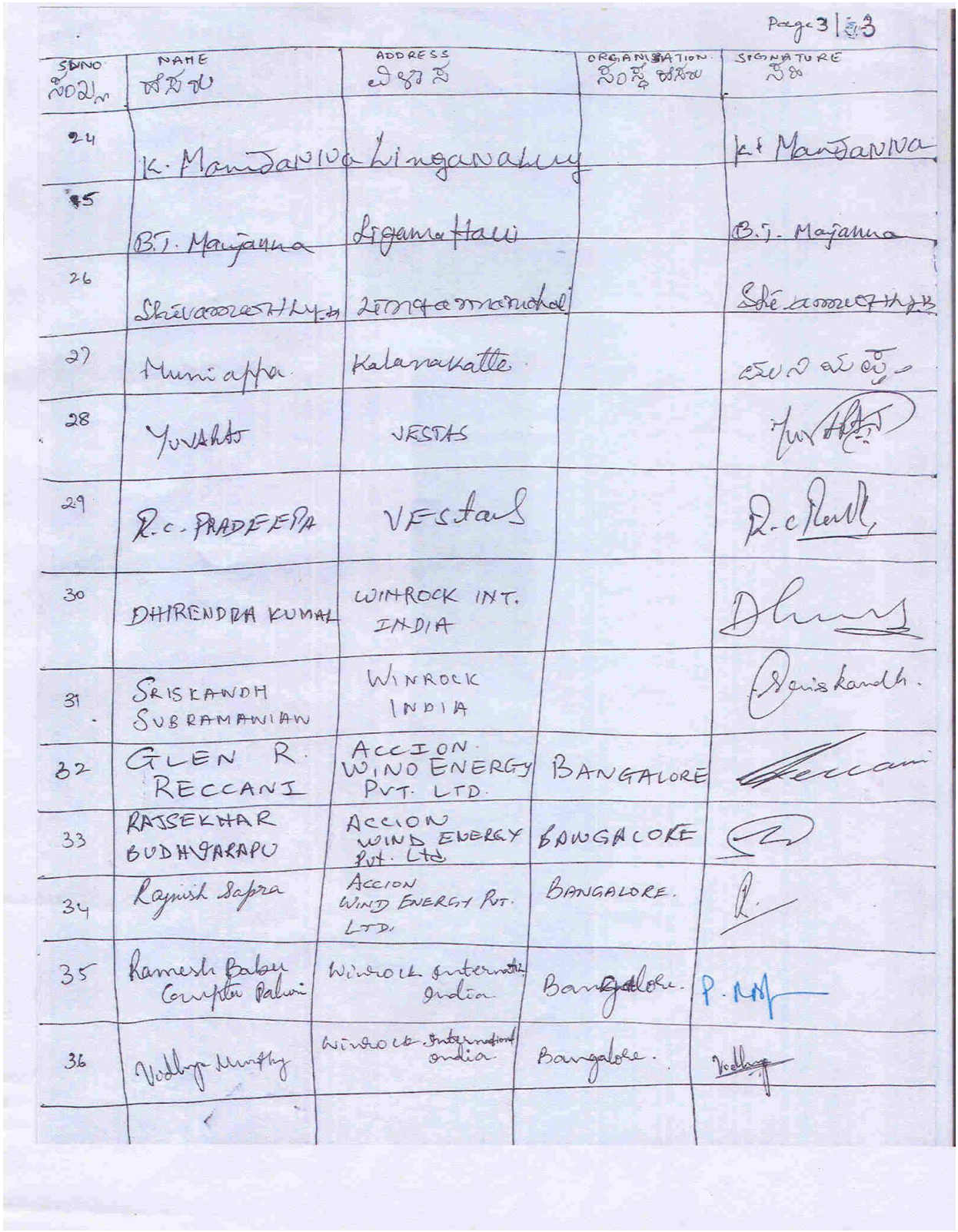
SL NO. ಸಂಖ್ಯೆ	NAME ಹೆಸರು	ADDRESS ವಿಳಾಸ	ORGANISATION ಸಂಸ್ಥೆ ಹೆಸರು	SIGNATURE ಸಹಿ
11	T. Aravind Kumar	7/3 Basement Hotel Naveen Regency NH4 By Pass Road Chitradurga	VESTAS	T.A
12	Prashanth Vittal P		Acciona	[illegible]
13	G.S Prabhakar	Banashree marketing agency NEW Bus stand Jagalur 577528		[illegible]
14	G. Manjunath	A.E.E. of Bescom Jagalur	AEE of Bescom Jagalur	[illegible]
15	G.S. Swamy	G.S. Swamy Anabur Jagalur (T)		Swamy
16	G.V. Mallana Gowda	G.V. Mallana Gowda Anabur Jagalur		G.V. Mallana Gowda
17	Jogappa [illegible]	[illegible]		[illegible]
18	M. Karibasappa	M. Karibasappa Anabur Jagalur		M. Karibasappa
19	P. Thippeswamy. Ex president And Member G. Panchayat Banannalgatte			[illegible]
20	M. Thippeswamy [illegible]	M. Thippeswamy [illegible] Anabur		M. Thippeswamy
21	B.M. [illegible] Brishabendra			B.M. [illegible]
22	Durgappa [illegible]			[illegible]
23	B. Marigudappa [illegible]		—	B. Marigudappa



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Sl No ಸಂಖ್ಯೆ	NAME ಹೆಸರು	ADDRESS ವಿಳಾಸ	ORGANISATION ಸಂಸ್ಥೆ ಹೆಸರು	SIGNATURE ಸಹಿ
24	K. Manjanna	Lingavahally		K. Manjanna
25	B.J. Manjanna	Ligamahalli		B.J. Manjanna
26	Shivakumarswamy	Lingadamandal		Shivakumarswamy
27	Munivappa	Kalamakatte		ಮುನಿವಪ್ಪ
28	Yuvaraj	VESTAS		
29	R.C. PRADEEPA	VESTAS		R.C. Pradeepa
30	DHIRENDRA KUMAR	WINROCK INT. INDIA		Dhirendra
31	SRISKANDH SUBRAMANIAN	WINROCK INDIA		Sriskandh.
32	GLEN R. RECCANI	ACCION WIND ENERGY PVT. LTD.	BANGALORE	Reccani
33	RAJSEKHAR BUDHAVARAPU	ACCION WIND ENERGY Pvt. Ltd	BANGALORE	
34	Rajnish Sapra	ACCION WIND ENERGY PVT. LTD.	BANGALORE.	R.
35	Ramesh Babu Computer Palani	Winrock International India	Bangalore.	P. M
36	Vadhya Murthy	Winrock International India	Bangalore.	Vadhya

Appendix C


INITIAL STAKEHOLDERS MEETING
UNDER
CLEAN DEVELOPMENT MECHANISM (CDM)
FRIDAY, 3 AUGUST 2007
ACCION WIND ENERGY PVT. LTD.
FOR ARASINAGUNDI AND ANASARU, KARNATAKA
LOCATION : ARASINAGUNDI
03.08.2007 07:31


03.08.2007 07:32

APPENDIX - D

Minutes of the Initial Stake Holders' Consultation Meeting

The Workshop started with the welcome address by **Mr. Prashanth Vittal** from **M/s. Accion Wind Energy Pvt. Ltd.** He explained the purpose of the meeting and requested the members present to give suggestions / comments / remarks about the project.

Sri Manjunath, Assistant Executive Engineer (A.E.E) of BESCOM in his address briefed about the present power scenario of India and Karnataka in particular. He also pointed out the benefits of wind energy which included no pollution, no heat, no submergence like hydel plants, no adverse environmental impacts, no transmission and distribution losses due to being nearer to the point of consumption, etc.

He also emphasized on creation of employment opportunity at the regional level through the proposed project activity, revenue improvement in the distribution companies etc. He stressed upon requirement of such plants and augmentation of capacity addition through such plants. He also requested that the village people should co-operate with the proposed project.

Smt. Suvarnamma, Gram Panchayat President, Thoranagatte in her special address expressed that such units will enhance the employment and business opportunities and make available electricity.

Mr. Thippeswamy, **Anabaru Gram Panchayat Member** said the economic conditions of the villages are improving through such projects, and as these units generate no pollution during operation, more and more such units should be added up in the region.

Mr. J. B. Ramanjaneya, Thoranagatte Gram Panchayat Member expressed that although wind mills gives 100% benefits and no negative impact, however, AWEPL should also contribute towards social responsibility towards improvement or development of hospital, temples, roads (damaged due to construction activity), schools etc. In addition he suggested that local villages should get free electricity.

The meeting was concluded with vote of thanks from Mr. Prashanth Vittal.

******

Appendix E

Summary of Stakeholder Comments

Sl. No.	Participants name	Category	Employment opportunities increased?	Whether land values are increased?	Infrastructure facilities are developed?	Whether you have learnt or exposed to new technology	Whether you are facing any type of pollution (Air/Water/ Sound) problems due to the project	Whether the electricity facilities are improved	Whether your local area is improved
1.	J.B. Ramanjoneya	Public	YBM	S	YV	Y	N	Y	YMV
2.	N.B. Shivakumar Gouda	Public	YBM	S	YV	Y	N	Y	YMV
3.	C. Ajjappa	Public	YBM	S	YV	Y	N	Y	YMS
4.	J.M. Badappa	Public	YBM	Y	YV	Y	N	Y	YMVS
5.	M.P. Mahanthesha	Public	YBM	Y	YV	Y	N	Y	YMVS
6.	J.M. Myanarahatty	Public	YBM	Y	YV	Y	N	N	N
7.	Aluvelamma	Public	YBM	Y	YV	Y	N	Y	YMVS
8.	Mahalingappa	Public	YBM	Y	YM	Y	N	Y	YMVS
9.	Suvarnamma M.	Gram Panchayat President Thoronagatta	YBM	Y	YV	Y	N	N	YMVS
10.	Sanjeevamurthy	Gram Panchayat President Thoronagatta	YBM	Y	YV	Y	N	Y	YMVS
11.	T. Anand Kumar	Contractor (VESTAS)	YBV	Y	YV	Y	N	Y	YMV

12.	Prashanth Vittal P.	AWEPL	YBV	Y	YVMM	Y	N	Y	YMS
13.	G.S. Prabhakar	Public	YSV	Y	YVMN	Y	N	Y	YMS
14.	G. Manjunath	Govt.	YBM	Y	YV	Y	N	Y	YMSV
15.	G.S. Swamy	Public	YBM	Y	YV	Y	N	Y	YMSV
16.	G.V. Mallane Gouda	Public	YBM	Y	YVVV	Y	N	Y	YMSV
17.	Jogappa	Public	YBM	Y	YVMN	Y	N	Y	YMSV
18.	M. Kaibasappu	Public	YBM	Y	YV	Y	N	Y	YMSV
19.	P. Thippeswamy	Public	YBM	Y	YV	Y	N	Y	YMSV
20	M. Thippeswamy	Public	YBM	Y	YV	Y	N	Y	YMSV
21.	B.M. Brishabendra	Public	YBM	Y	YV	Y	N	Y	YMSV
22.	Durgappa	Public	YBM	Y	YV	Y	N	Y	YMSV
23.	B. Marigudappa	Public	YBM	Y	YV	Y	N	Y	YMSV
24.	K. Manijanna	Public	YBM	Y	YV	Y	N	Y	YMSV
25.	B.T. Manjanna	Public	YBM	Y	YV	Y	N	Y	YMSV
26.	Shivamurthy	Public	YBM	Y	YV	Y	N	Y	YMSV
27.	Muniappa	Public	YBM	Y	YV	Y	N	Y	YMSV
28.	Yuvaraj	Contractor (VESTAS)	YSV	Y	YV	Y	N	Y	YMSV

29.	R.C. Pradeepa	Contractor (VESTAS)	YSV	Y	YV	Y	N	Y	YMSV
30.	Dhirendra Kumar	Consultant	YBV	Y	YV	Y	N	Y	YMSV
31.	Sriskandh Subramanian	Consultant	YBV	Y	YV	Y	N	Y	YMSV
32.	Glen R. Reccani	AWEPL	YBM	Y	YV	Y	N	Y	YMSV
33.	Rajsekhar Budhvarapu	AWEPL	YBM	Y	YV	Y	N	Y	YMSV
34.	Rajnish Sapra	AWEPL	YBM	Y	YV	Y	N	Y	YMSV
35.	Ramesh Babu Guptha Paluri	Consultant	YBM	Y	YV	Y	N	Y	YMSV
36.	Vidhya Murthy	Consultant	YBM	Y	YV	Y	N	Y	YMSV

Y = Yes, N = No, B = Both Skilled & Unskilled Labours, V = Visible, M = Marginal, S = Slightly increased

APPENDIX - F

ABBREVIATIONS AND REFERENCES

AWEPL – Accion Wind Energy Private Limited
BM – Build margin
CDM – Clean Development Mechanism
CEA – Central Electricity Authority
CER – Certified Emission Reduction
CM – Combined Margin
COD – Commercial operation date
CO2 – Carbon dioxide
CUF – Capacity Utilization Factor
DISCOM – Distribution company
EB – Executive Board
GHG = Greenhouse gas
INR – Indian Rupees
IPP –
IRR – Internal Rate of Return
ISGS – Inter state Generation stations
ISO – International Standards Organization
kW – KiloWatt
KERC – Karnataka Electricity Regulatory Commission
KPCB – Karnataka Pollution Control Board
KPTCL – Karnataka Power Transmission Corporation limited
KREDL – Karnataka renewable energy development agency
M&V – Monitoring and Verification
MNRE – Ministry for New and Renewable Energy
MW – Megawatt
NO_X – Nitrogen oxides
ODA – Official Development Assistance
OM – Operating Margin
PLF – Plant Load Factor
PPA – Power Purchase Agreement
RE – Renewable Energy
Rpm – Rotations per minute
ROE – Return on Equity
SCADA
SLDC – Southern Regional Load Dispatch Centres
SO_X- Sulphur oxides
UNFCCC - United Nations Framework Convention on Climate Change
WEG – Wind Electric Generators
WTG – Wind Turbine Generators

APPENDIX - G

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