CLEAN DEVELOPMENT MECHANISM
PROJECT DESIGN DOCUMENT FORM (CDM-SSC-PDD)
Version 03 - in effect as of: 22 December 2006

CONTENTS

Annexes

Appendixes

Revision history of this document

Version Number	Date	Description and reason of revision
01	21 January 2003	Initial adoption
02	8 July 2005	• The Board agreed to revise the CDM SSC PDD to reflect guidance and clarifications provided by the Board since version 01 of this document. • As a consequence, the guidelines for completing CDM SSC PDD have been revised accordingly to version 2. The latest version can be found at <http://cdm.unfccc.int/Reference/Documents>.
03	22 December 2006	• The Board agreed to revise the CDM project design document for small-scale activities (CDM-SSC-PDD), taking into account CDM-PDD and CDM-NM.

SECTION A. General description of small-scale project activity

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

>>

"Clean Energy to Grid"

Version 1.0

28/08/2007

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

>>

The project activity is a wind based power generation, the main purpose of the project activity is to generate electricity and export the same to the grid. The project activity utilizes renewable wind energy and this helps to mitigate the greenhouse gas effects. The project activity helps in offsetting the equivalent amount of electricity from the grid which would have been other wise generated from a conventional fossil fuel fired power plant.

The project activity comprises of seven number of 600 kW, two numbers of 500 kW WEGs which are installed in the southern states of India say Tamil Nadu and Karnataka respectively. The total installed capacity of the project activity is 5.2 MW.

View of the project participant on the contribution of the project activity to sustainable development:

Environmental

The project activity has adopted one of the effective and eco friendly approach, the environmental benefits due to this wind power project are listed below:

- The project activity helps to conserve our natural resources
- Reduces the dependences on non-renewable fuels
- The wind turbines life cycle impacts are relatively low and there are no long term environmental effects, such as hazardous waste disposal
- The project activity does not to lead to any noxious emissions

Socio-Economic:

Setting up a wind farm is a significant investment especially when it's in a rural area. The wind farm's not only helps in catering the regions energy demand but also contributes towards the development of the areas where it exists.

- Better Roads

- Tele- Communication facilities
- Local transportation in the project vicinity has improved
- Indirect socio-economic development

The project activity has created employment opportunities to the local people, during the project commissioning stage local people are used in construction activities and post commissioning of the project activity local people are employed as security guards.

A.3. Project participants:

>>

Name of Party involved ((host) indicates a host Party)	Private and/or public entity(ies) project participants (*) (as applicable)	Kindly indicate if the Party involved wishes to be considered as project participant (Yes/No)
India	M/s. Y.Mahabaleswarappa & Sons (Private Entity)	No

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

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

>>

A.4.1.1. Host Party(ies):

>>

India

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

>>

State: Tamil Nadu and Karnataka

District: Tirunelveli District of Tamil Nadu and Davanagere District of Karnataka

A.4.1.3. City/Town/Community etc:

>>

Town: Tirunelveli (Tamil Nadu) and Davanagere (Karnataka)

Village: Kasikuvaithan , Serndamangalam, Veeranam and Kumbaluru

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

>>

The project activity consists 9 WEGs with rated capacities of 500 kW and 600 kW (Vestas make) have been installed in two states which export the generated electricity to the southern regional grid.

The project sites are:

a) Kasikuvaithan, Serndamangalam and Veerananam villages of Tirunelveli district. The sites are well connected by roads. The nearest railway station for these sites is at Tirunelveli and nearest airport is at Madurai which is 100 kilometers away.

b) Site at Kumbaluru -The nearest railway station is Davanagere and the nearest airport is Hubli airport.

The geographical details of the sites are as follows

Tirunelveli: Is at latitude between 8° 8' and 9° 23' North latitude and 77° 09' and 77° 54'East longitude.

Davanagere: Is at latitude between 14° 5'51"North latitude and 75° 54'23"East longitude.

The project location details has been illustrated in Appendix 3 of this document

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

>>

Project Type: I- Renewable Energy Projects

Category: I.D. Renewable Electricity Generation for a Grid.

Technology: The project participants have installed WEGs of two different capacities. The technical description of each WEG is clearly listed below:

Salient Features of 600 kW WEG's

Sl.No	Particulars	Specifications
1.	Cut in wind speed	4 m/s
2.	Cut out wind speed	25 m/s
3.	Hub Height	50m to 65m
4.	Regulation	Pitch
5.	Gearbox Type	Planetary /Helical
6.	Gear ratio	1:58.2
7.	Rated power output	600 Kw
8.	Tower Type	Lattice
9.	Tower Height	48.1 m / 63.1m
10.	No of blades	3
11.	Rotor Diameter	47 m
12.	Brake system	Aerodynamic

Salient Features of 500 kW WEG's

Sl.No	Particulars	Specifications
1.	Cut in wind speed	4 m/s
2.	Cut out wind speed	25 m/s
3.	Hub Height	50m
4.	Regulation	Pitch
5.	Gearbox Type	Planetary /Helical
6.	Gear ratio	1:58.2
7.	Rated power output	500 kW
8.	Tower Type	Lattice
9.	Tower Height	48.1 m
10.	No of blades	3
11.	Rotor Diameter	47 m
12.	Brake system	Aerodynamic

A.4.3 Estimated amount of emission reductions over the chosen crediting period:

>>

Year	Estimate of GHG abatement (in tCO2e)
2008-09	9,874
2009-10	9,874
2010-11	9,874
2011-12	9,874
2012-13	9,874
2013-14	9,874
2014-15	9,874
2015-16	9,874
2016-17	9,874
2017-18	9,874
Total estimated reductions (tonnes of CO2 e)	**98,470**
Total number of crediting years	**Ten**
Annual average of the estimated reductions over the crediting period (tCO2 e)	**98,740**

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

>>

The project participant has not availed any Public Funding from any Annex 1 countries.

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

1. Debundling is defined as the fragmentation of a large project activity into smaller parts. A small-scale project activity that is part of a large project activity is not eligible to use the simplified modalities and procedures for small-scale CDM project activities. The full project activity or any component of the full project activity shall follow the regular CDM modalities and procedures.

2. A proposed small-scale project activity shall be deemed to be a debundled component of a large project activity if there is a registered small-scale CDM project activity or an application to register another small-scale CDM project activity:

- With the same project participants;

- In the same project category and technology/measure; and
- Registered within the previous 2 years; and
- Whose project boundary is within 1 km of the project boundary of the proposed small-scale activity at the closest point.

3. If a proposed small-scale project activity is deemed to be a debundled component in accordance with paragraph 2 above, but total size of such an activity combined with the previous registered small-scale CDM project activity does not exceed the limits for small-scale CDM project activities as set in paragraph6 (c) of the decision 17/CP.7, the project activity can qualify to use simplified modalities and procedures for small-scale CDM project activities.

SECTION B. Application of a baseline and monitoring methodology

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

>>

Title: "AMS I.D. Grid connected renewable electricity generation", Version 12, EB 33

Reference: http://cdm.unfccc.int/methodologies/SSCmethodologies/approved.html.

B.2 Justification of the choice of the project category:

>>

The project activity falls under the following CDM project category:

Type I (Renewable Energy Projects) Category D (Grid connected renewable electricity generation)

Classification	Justification
Type I – Renewable Energy projects	The project activity involves generation of electricity using the wind energy, which is a renewable source.
Category 'D' – Grid connected renewable electricity generation	The project activity supplies the generated electricity to the Tamil Nadu Electricity Board (TNEB) grid & Mangalore Electricity Supply Company Limited (MESCOM).

As per Appendix B of the simplified modalities and procedures for small-scale project activities, the project activity is eligible to use the baseline calculation provided in methodology AMS I.D. The applicability to the methodology is described below:

AMS I.D Applicability conditions	Project applicability
This category comprises renewable energy generation units, such as photovoltaic's, hydro, tidal/wave, wind, geothermal, and renewable biomass, that supply electricity to and/or displace electricity from an electricity distribution system that is or would have been supplied by at least one fossil fuel fired generating unit.	The project activity involves wind energy generating units that supply electricity to the southern regional electricity distribution system of India that is supplied by a number of fossil fuel fired units. Hence applicability condition is satisfied.
If the unit added has both renewable and non-	The project has only renewable components with a

renewable components (e.g. a wind/diesel unit), the eligibility limit of 15MW for a small-scale CDM project activity applies only to the renewable component.	capacity of 5.2 MW (is lower than 15MW eligibility limit). Hence applicability condition satisfied.
For project activities adding renewable energy capacity, to qualify as a small scale CDM project activity, the aggregate installed capacity after adding the new units should be lower than 15 MW.	The project activity is the installation of new renewable energy capacity where currently no power generation occurs. The aggregate capacity of these units is 5.2 MW which is lower than the threshold limit of 15 MW.
Project activities that seek to retrofit or modify an existing facility for renewable energy generation are included in this category.	Not Applicable

Eligibility as a small-scale CDM project activity:

The table below demonstrates, following the "Simplified modalities and procedures for small-scale project activities" and its recent revisions, the eligibility of the project activity as a small-scale project activity and confirms that it will remain under the small-scale limits over the crediting period.

Criteria	Eligibility
For Type I: Demonstrate that the capacity of the project activity will not exceed 15 MW.	The project activity involves 9 WEGs of capacity 500 kW & 600 kW. The sum of maximum rated capacity of all the WEGs is 5.2 MW (Within the 15 MW threshold).

Baseline for projects under Methodology I.D has been detailed in paragraph 9 described in Annex B of the simplified modalities and procedures for small-scale CDM project activities. It states that the baseline is the kWh produced by the renewable generating unit multiplied by an emission coefficient (measured in kg CO_2 / kWh) calculated in a transparent manner as:

(a) The average of the "approximate operating margin" and "build margin", where:

i) The "approximate operating margin" is the weighted average emissions (in kg CO_2 e/kWh) of all generating sources serving the system, excluding hydro, geothermal, wind, low cost biomass, nuclear and solar generation.

ii) The "build margin" is the weighted average emissions (in kg CO_2 e/kWh) of recent capacity additions to the system, based on the most recent information available on

plants already built for sample group *m* at the time of PDD submission. The sample group *m* consists of either the five power plants that have been built most recently or the power plant capacity additions in the electricity system that compromise 20% of the system generation (in MWh) and that have been built most recently. Project participants should use from these two options that sample group that comprises the large annual generation. Power plant capacity additions registered as CDM project activities should be excluded from the sample group *m*. If 20% falls on part capacity of a plant, that plant is included in the calculation.

The project activity would displace an equivalent amount of electricity that would have been drawn from the grid. Since the electricity is routed through TNEB & MESCOM which form the part of the southern regional grid, the emission factor for southern regional grid as been adopted for the calculation of emission reductions.

Since the displaced electricity generation is the element that are likely to affect both the operating margin in the short term run and the build margin in the long run, electricity baselines should reflect a combination of these effects. Therefore:

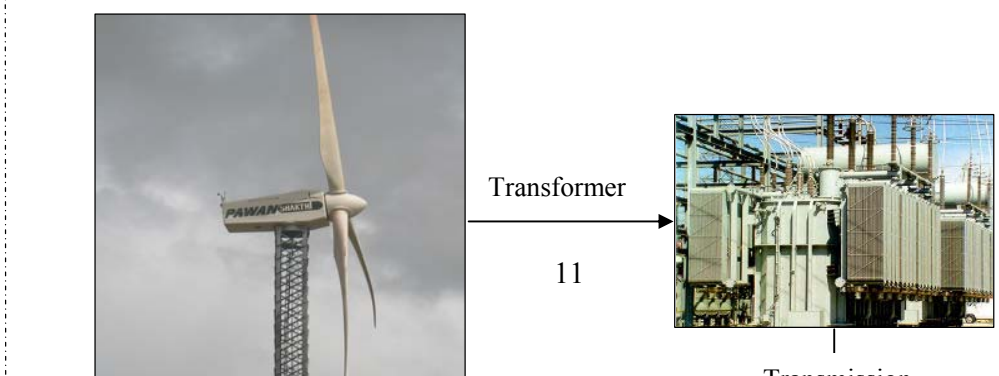
"Combined Margin Emission Factor" has been adopted for calculating emission reductions for this project activity.

B.3. Description of the project boundary:

>>

As mentioned under paragraph four of Type I.D. of the simplified modalities and procedures for small-scale CDM project activities, project boundary encompasses the physical, geographical site of the renewable generation source. For the project activity the project boundary is WEG to the point of electricity supply to the grid interconnection point where the Project participant has full control. The interconnection of the project activity is to the southern regional grid.

Thus, project boundary covers wind electric generator and other accessory equipments.Flow chart and project boundary are indicated in the following diagram.



B.4. Description of baseline and its development:

>>

As per the methodology (AMS I.D) specified for this project category in Appendix B to simplified modalities and procedures, "The baseline is the kWh produced by the renewable generating unit multiplied by an emission coefficient calculated in a transparent and conservative manner".

Whereas the kWh produced by the WEGs can be monitored directly through energy meters, the methodology AMS.I.D prescribes the calculation of emission factor as per ACM0002. The method "combined margin (CM), consisting of the combination of operating margin (OM) and build margin (BM) according to the procedures prescribed in the approved methodology ACM0002" has been used in this document to calculate the emission factor. The operating margin and build margin values for calculation of combined margin are adopted from the latest Central Electricity Authority (CEA)'s CO_2 database. Refer section B.6.1 and Annex III for details.

The project activity displaces electricity from the southern regional grid which is part of the southern regional grid. In the absence of this CDM project activity, equivalent quantity of electricity would be generated from the southern regional grid. Hence for the calculation of baseline emission factor, all generating sources connected to the southern regional grid of India have been considered as per ACM0002. Therefore the baseline for the project activity would be the product of kWh generated by the WEGs and the emission factor of the southern regional grid.

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 small-scale CDM project activity:

Referring to attachment A to appendix B document of "indicative simplified baseline and monitoring methodologies for selected small scale CDM project activity categories", project participants are required to provide a qualitative explanation to show that the project activity would not have occurred anyway, **atleast one** of the listed elements should be identified in concrete terms to show that the activity is either beyond the regulatory and policy requirement or improves compliance to the requirement by removing barrier(s); The guidance provided as per tool for the demonstration and assessment of additionality (Version 03). The step wise approach to demonstrate and assess additionatlity includes:

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

Step 2: *Investment Analysis*

Step 3: *Barrier Analysis*

Step 4: *Common Practice Analysis*

a) Investment barrier

b) Technological barrier

c) Barrier due to prevailing practice

As per the tool for the demonstration and assessment of additionality (Version 03)

1. Investment Analysis Method:

The project participant's core area of business is Iron Ore Mining and has an experience of over 3 decades. Venturing into in to a new area of business is always a risk for any organisation with out knowing the integrities involved in that business. The project participant does not have any first hand experience in Wind Based Power Generation. The project participant's decision to go ahead with this venture primarily depended upon rate of return. Rate of Return is one of the vital factor for any decision maker /organisation to go ahead with any project or any major investment.

The major components on which the Financial Analysis or Investment Analysis was carried out are

a) Electricity generated annually

b) Rate at which each unit is sold to the electricity board

A financial analysis was carried out to determine the feasibility of the wind based power project. The analysis was carried out on the basis assuming that the WEGs would be generating electricity at 80% of the manufacturer guaranteed.

Sl No.	WEG Capacity	No. of WEGs	Location	IRR Without CDM	Bench Mark RoI
1	500 kW	2	TN	8.52	16%
2	600 kW	2	KAR	15.76	
3	600 kW	2	TN	7.46	
4	600 kW	3	TN	7.66	
Total	**5.2 MW**	**9**		**9.85**	

The results obtained were not so encouraging for the project participant to go ahead with the project activity.

This was a setback and major barrier for the project participant, since the implementation of project would not prove to be sustainable in long term basis.

The project participant was aware of the potential benefits associated with Clean Development Mechanism. The project participant decided to include the CDM benefits into the financial analysis. The results obtained post inclusion of CDM benefits was encouraging for the project participant.

IRR Summary of Y M & Sons

Sl No.	WEG Capacity	No. of WEGs	Location	IRR Without CDM	IRR With CDM	Bench Mark RoI
1	500 kW	2	TN	8.52	10.71	16%
2	600 kW	2	KAR	15.76	18.54	
3	600 kW	2	TN	7.46	10.62	
4	600 kW	3	TN	7.66	9.46	
Total	**5.2 MW**	**9**		**9.85**	**12.33**	

2. Technological Barriers:

The major setback for the project participants is the utilisation of the generated electricity from the WEGs. The power evacuation facility is a major concern for the project participant. This proves to be barrier for the project participant since, he cannot realize the revenue for the generated electricity. The cash inflow of the project activity is affected and if the same trend continues the project activity may not prove to be financially viable for the project participant.

3. Other Barriers:

Uncertainties

Any organisation/management would primarily rely on any known results or any proven track records before starting a new venture or business or making any decisions on any investments. The project participant was relatively new and experience in the field of wind based power generation was nil. The primary disadvantage of wind energy is its intermittence, wind doesn't blow consistently or even all the time. The project participant has installed two of his WEGs at Davanagere – Karnataka which is a ***'Virgin Site'***. Any project participant would be hesitant to invest when such a situation arises, but still the promoter has taken the risk and has gone ahead and installed the WEGs. The project participants were one among first promoters to go ahead and install the WEGs at the project location.

4.Policy related barriers:

The tariff rates offered varies from state to state the comparison between different states is as follows:

Sl No	States	Tariff Rate in Rs./kWh	Escalation Period
1	Tamil Nadu	2.7	No Escalation
2	Andhra Pradesh	3.37	No Escalation
3	Karnataka	3.4	No Escalation

When compared to other two states which fall under the southern regional grid the tariff rate offered by Tamil Nadu state proves to be lower. The project participant has installed majority of WEGs in Tamil Nadu. The installation of WEGs in other states would have proven to be profitable to the project participant.

Summary:

The lack of economic attractiveness coupled with other barriers proved as significant barriers to the project participant. The consideration of prospective carbon revenues improved the rate of return and economic viability of the project activity on long term basis and has motivated the project participant in implementing the project activity. The impacts of CDM registration include, access to CDM revenues, institutional capacity building etc. Registering the project activity as a CDM activity provides revenue as one of the annual cash flows, expected after the registration. The financial viability of the Y M & Sons project activity would improve with CDM revenues.

B.6. Emission reductions:

B.6.1. Explanation of methodologsgical choices:

>>

The methodology AMS I.D states "the baseline is the kWh produced by the renewable generating unit multiplied by an emission coefficient measured in (kg CO_2e/kWh) calculated in a transparent and conservative manner".

Calculation of baseline emissions (BE_y):

$BE_y = (EG_y \times BEF_y)$

Where,

BE_y Baseline emissions in year represented in tCO_2e

EG_y	Baseline energy generation, which is equal to the electricity generated by all the WEGs constituting the project activity represented in MWh[1] per year. This parameter is monitored continuously.
BEF_y	Emission co-efficient calculated as per AMS I.D and represented in tCO_2e/MWh

Calculation of emission co-efficient (EF_y):

As described in Section B.2, the southern regional grid is considered as the baseline reference grid for the project activity and the method *"combined margin (CM), consisting of the combination of operating margin (OM) and build margin (BM) according to the procedures prescribed in the approved methodology ACM0002."* as prescribed by AMS I.D has been adopted to calculate the baseline emission factor.

As prescribed by ACM0002, combined margin emission factor of the grid is calculated as follows:

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

Where,

w_{OM}	Weight of the operating margin emission factor (0.75 for wind power projects as per ACM0002, Ref: Version 06, 19th May, 2006 Pg No. 10)
$EF_{OM,\,y}$	Operating margin emission factor calculated as per ACM0002
w_{BM}	Weight of the build margin emission factor (0.25 for wind power projects as per ACM0002, Ref: Version 06, 19th May, 2006 Pg No. 10)
$EF_{BM,y}$	Build margin emission factor calculated as per ACM0002
BEF_y	Combined margin baseline emission factor of the grid

Operating margin (OM):

ACM0002 provides four options for calculating OM. Option (a) "Simple OM" has been adopted here and the formula for calculating same is described below:

$$EF_{OM,y} = \sum_{i,j} F_{i,j,y}\, x\, COEF_{i,j} / \sum_{j} GEN_{j,y}$$

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*

[1] Though the methodology prescribes representation in kWh, for ease of calculations, MWh has been used

j	Refers to the power sources delivering electricity to the grid, excluding low-operating cost and must-run power plants, and including imports from 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 $COEF_i$ is obtained as:

$$COEF_i = NCV_{i,}\, x\, EF_{CO2} xOXIDi$$

For calculations, local values of NCV_i and $EFCO_{2i}$ have been used. The *ex-ante* data vintage of 3-year average, based on the most recent statistics available at the time of PDD submission has been used for the calculation.

Build Margin:

The build margin is calculated as the weighted average emissions of recent capacity additions to the reference grid, based on the most recent information available on plants already built for sample group *m* at the time of PDD submission. The PDD has adopted *ex-ante* option for build margin calculation.

$$EF_{BM,y} = \sum_{i,m} F_{i,m,y}\, x\, COEF_{i,m} / \sum_{j} GEN_{m,y}$$

where,

$F_{i,m,y}$, $COEF_{i,m}$ and $GEN_{m,y}$ - Are analogous to the variables described for the OM method above for plants *m*.

The sample group *m* consists of,

- 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.

Further, power plant capacity additions registered as CDM project activities have been excluded from the sample group *m* of South India Regional grid mix.

Emission Reductions (ER_y):

The emission reductions from the project activity are equal to the baseline emissions minus project emissions and Leakage. Since the project activity generates electricity from wind, which is a zero emission source, there are no associated project emissions. As per AMS I.D, leakage need not be

considered since there is no transfer of energy generating equipment from another activity or transfer of existing equipment to another activity.

Therefore, emission reductions from the project activity directly equal the baseline emissions.

$\mathbf{ER_y = BE_y}$

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

Data / Parameter:	EF_y
Data unit:	tCO_2/MWh
Description:	CO_2 emission factor of Southern Regional Grid (SRG)
Source of data used:	CO_2 baseline database for Indian Power Sector provided by the Central Electricity Authority (CEA)
Value applied:	0.93
Justification of the choice of data or description of measurement methods and procedures actually applied :	Calculated from data provided by the CEA in the CO_2 baseline database for Indian Power Sector
Any comment:	Calculated as weighted average of OM and BM emission factor

Data / Parameter:	$EF_{OM,y}$
Data unit:	tCO_2/MWh
Description:	CO_2 operating margin emission factor for the Southern Regional Grid (SRG)
Source of data used:	CO_2 baseline database for Indian Power Sector provided by the Central Electricity Authority (CEA)
Value applied:	1.01
Justification of the choice of data or description of measurement methods and procedures actually applied :	This is the CO_2 operating margin emission factor for the Southern Regional Grid (SRG) as provided by the CEA.
Any comment:	

Data / Parameter:	$EF_{BM,y}$
Data unit:	tCO_2/MWh
Description:	CO_2 build margin emission factor for the Southern Regional Grid (SRG)
Source of data used:	CO_2 baseline database for Indian Power Sector provided by the Central Electricity Authority (CEA)
Value applied:	0.71
Justification of the choice of data or description of measurement methods and procedures actually applied :	This is the CO_2 build margin emission factor for the Southern Regional Grid (SRG) as provided by the CEA.
Any comment:	

B.6.3 Ex-ante calculation of emission reductions:

>>

Ex-ante calculation of emission reductions (ER_y):

As per formula described in Section B.6.1, following

$ER_y = BE_y = (EG_y \times EF_y)$

$ER_y = (EG_y \times EF_y)$

ER_y = 10561 x 0.93 = 9,874 tCO_2e/yr

Ex-ante Estimation of Energy Generation (EGy):

Energy generation per year has been considered as 80% of the estimated generation data for each WEG provided by the equipment suppliers.

Sum of estimated generation for all WEGs = 12674 MWh/yr

EG_y = 12,674 x 80% = 10,561 MWh/yr

Ex-ante determination of baseline emission factor (BEFy):

As per formula described in section B.6.1 above,

BEF_y = Combined margin emission factor = $w_{OM}.EF_{OM,\,y} + w_{BM}.EF_{BM\,,\,y}$

BEFy = 0.75*1.01 + 0.25*0.71 = 0.93 tCO_2e/yr

Simple Operating Margin (OM) values for three years and Build Margin (BM) values have been directly taken from CEA database. Refer Annex 3 for details.

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

>>

Sl No.	Crediting Period	Baseline Emission Factor ($kgCO_2/kWh$)	Baseline Emissions (tCO2)	Project Emissions (tCO2)	Emission Reductions (tCO2)
1.	2007-08	0.935	9,874	0	9,874
2.	2008-09	0.935	9,874	0	9,874
3.	2009-10	0.935	9,874	0	9,874
4.	2010-11	0.935	9,874	0	9,874
5.	2011-12	0.935	9,874	0	9,874
6.	2012-13	0.935	9,874	0	9,874
7.	2013-14	0.935	9,874	0	9,874
8.	2014-15	0.935	9,874	0	9,874
9.	2015-16	0.935	9,874	0	9,874
10.	2016-17	0.935	9,874	0	9,874
		Total	**98,740**		**98,740**

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

Data / Parameter:	EG_y
Data unit:	MWh/yr
Description:	Net electricity supplied to the facility. This data is quantitative.
Source of data to be used:	Energy meter readings and electricity board bills from TNEB & MESCOM's
Value of data applied for the purpose of calculating expected emission reductions in section B.5	10,561

Description of measurement methods and procedures to be applied:	100% of the data is to be monitored and measured. The Electricity Board's meter readings will be used for calculation of emission reductions. The Electricity Board's bills and generation data will be archived electronically in CD's and also in paper.
QA/QC procedures to be applied:	This data (Electricity Board meter readings) will be used for the calculation of project electricity generation. Hence QA/QC procedures will be applied.
Any comment:	

B.7.2 Description of the monitoring plan:

>>

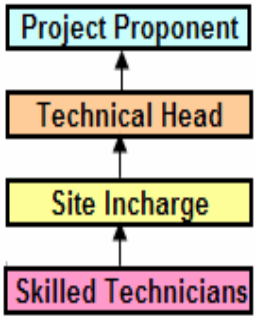
The project participant has a special CDM team which takes care of operation and maintenance work. The team comprises of technicians who are well trained and equipped to carry out the work. The work would mainly comprise of

a) Compilation of daily readings from individual WEGs on daily (24 Hr) basis

b) Regular monitoring of WEGs for smooth functioning.

c) Assure regular maintenance of individual WEGs

The readings are compiled daily and documented in the log books. The readings in the form of daily report are sent to the project participant and monthly generation reports are also submitted to the project participant. The operation and maintenance team's company is an ISO 9001:2000 / Quality Management Systems (QMS) certified company and as a part of their quality compliance necessary preventive and corrective actions are carried out and annual audits are carried out as per QMS requirements.



Organisational Structure

B.8 Date of completion of the application of the baseline and monitoring methodology and the

name of the responsible person(s)/entity(ies)

>>

Date of completion baseline: 28/08/2007

Mr. Y.Satish, (Partner)

M/s. Y.Mahabaleswarappa & Sons

Sindigi Cloth Market, Car Street,

Bellary – 583101, Karnataka.

India

Project participant is the entity determining the baseline as mentioned in the Annex I of this document.

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:

>>
04/07/2005

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

>>
The project participant has not opted for renewable crediting period.

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

>>
Not Applicable

C.2.1.2. Length of the first crediting period:

>>
Not Applicable

C.2.2. Fixed crediting period:

>>
10 years 0 month 0 days

C.2.2.1. Starting date:

>>
01/10/2007 or upon Registration with UNFCCC. The Project participant affirms that they would not start the crediting period before actual registration happens.

C.2.2.2. Length:

>>
10 years 0 months

SECTION D. Environmental impacts

>>

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

>>

Wind based power projects does not fall under the purview of Environmental Impact Assessment Notification of Ministry of Environment and Forest (MoEF), Government of India (GoI) dated 27/01/1994 and the latest amendment dated 14/09/2006.

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:

>>

The environmental impacts due this project activity are nil or negligible since:

The wind based electricity generation does not involve any operation which may lead to air pollution hence, air pollution is *Nil.*

The project activity does not involve any wet processes which may lead to contamination of water hence, water contamination or soil degradation is *Nil.*

SECTION E. Stakeholders' comments

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

>>

The local population in the vicinity of the project activity comprises mainly of farmers and rural population, who are the major stakeholders in the project activity. The other stakeholders are the party off-taking power from the project activity as well as other parties involved in the construction, operation of the project activity. The project participant had transmitted the information to the relevant stakeholders to obtain the necessary clearances. The stakeholders identified for the project are listed below:

- Elected body of representatives administering the local area (Village Panchayat)
- Local Residents
- Tamil Nadu Electricity Board
- Consultants
- Equipment suppliers

All the stakeholders were invited for a discussion on the project activity and the date and venue were informed to them through formal invitations. The stakeholder consultation meetings were conducted on 09/06/2007 at Courtalam, Tenkasi Taluk and on 11/06/2007 at Kumbarulu village, Davan1ghere. The meeting was attended by all the stakeholders. The equipments and technology used in the project activity, prospective benefits of GHG reduction and contribution to sustainable development were appraised by the project participant to the stakeholders through a presentation in English and in the regional languages - Tamil and Kannada respectively. The stakeholder feedback forms are available and will be made available to the Designated Operational Entity (DOE) at the time of Validation.

E.2. Summary of the comments received:

>>

The consultation process was taken up in a good note by the stakeholders, which was very clearly visible during the interaction session. The stakeholders wanted clarifications pertaining to the environmental and social well being, which were attended and appropriate clarifications were given. The stakeholders appreciated project participant's for being instrumental in implementing the project activity and no negative comments were put forth by the stake holders. Further they have encouraged the project participant for similar future projects.

CDM – Executive Board

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

>>

Important clauses mentioned in the project document/clearances such as regulatory clearances etc. were considered while preparing the CDM project activity development document.

All responses received through the stakeholder consultation process were positive and encouraging. There were no negative comments received from any of the stake holders and hence no corrective action was to be made. The list of attendees and their documented responses are available with the Project participant and will be made available to the validator.

As per UNFCCC requirement, the Project Design Document will be published at the validator's web site for public comments.

Annex 1

CONTACT INFORMATION ON PARTICIPANTS IN THE PROJECT ACTIVITY

Organization:	M/s.Y.Mahabaleswarappa & Sons
Street/P.O.Box:	Sindhigi Cloth Market, Car Street
Building:	
City:	Bellary
State/Region:	Karnataka State
Postfix/ZIP:	583101
Country:	India
Telephone:	+918392-270311
FAX:	+918392-273602
E-Mail:	satishyechreddy@yahoo.com
URL:	--------
Represented by:	
Title:	
Salutation:	Mr.
Last Name:	Reddy
Middle Name:	Y
First Name:	Satish
Department:	
Mobile:	+91-99807-65807
Direct FAX:	+918392-273602
Direct tel:	+918392-270311
Personal E-Mail:	---------

Annex 2

INFORMATION REGARDING PUBLIC FUNDING

No public funding as a part of project financing from parties included in Annex I of the convention is involved in this project activity.

Annex 3

BASELINE INFORMATION

CENTRAL ELECTRICITY AUTHORITY: CO2 BASELINE DATABASE						
VERSION			**2.0**			
DATE			**21 June 2007**			
BASELINE METHODOLOGY			**ACM0002 / Ver 06**			
EMISSION FACTORS						
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

Annex 4

MONITORING INFORMATION

Parameters to be monitored and detailed monitoring procedures:

Net energy generation and export to the grid (MWh)	
Monitoring methods and procedures	This data will be measured continuously in the Project participant (PP)'s energy meters located at individual WEGs and also in the Electricity Board energy meters located at individual WEGs. The Technicians of the CDM team will record the generation data from the PP's meters on a daily basis in log books. The reading from TNEB and MESCOMs meter will be recorded every month by TNEB personnel in the presence of site Engineer. All power transmission infrastructures downstream of the TNEB and MESCOM meter are part of the southern regional grid and therefore for the calculation of emission reductions, monthly meter readings shall be considered.
QA/QC procedures	The monthly TNEB and MESCOM meter reading would be cross-checked with the PP's meter data by the Site Engineer. In case the deviation in TNEB's or MESCOM recorded data is beyond the allowable limits for energy meters, the PP would request TNEB/MESCOM to calibrate/rectify the meter at the earliest. For the period of error, data would be adjusted as described under "Data uncertainties and adjustments".
Reporting	The Site Engineers (SE) will review the PP's energy meter log books on a daily basis and record the data in computer. On a daily basis, a compilation of the energy data from each WEG would be uploaded on the O&M Contractor's website. This website data would be accessible by the project - Wind at the respective project participant's administration office. The project participant receives a monthly report from the operation & maintenance team which includes TNEB's and MESCOM monthly report, the EB's monthly statement is used for cross-checking purposes.
Data archiving	The monthly reports would be documented by the Project participant.
Data uncertainties	For this parameter, data uncertainties are likely during the following scenarios: • During error in meter

and adjustments	• When meter is dismantled for O&M or calibration • When data is not recorded or records are lost Error in the meter will be usually identified during cross-checking the monthly energy reports. If an error is found in the TNEB/MESCOM meter, the data recorded by the PP's meter minus average transformer losses would be calculated and used for emission reduction determination for the error period. When the PP's meter is dismantled for O&M or Calibration, the reading recorded by the TNEB/MESCOM meter for that period would be noted and adjusted with the PP meter reading. The emission reductions would be calculated based on TNEB's/MESCOM's monthly generation report.

- - - - -

Appendix 1

LIST OF ABBREVIATIONS

AMS	Approved Small-Scale Methodology
BEF	Baseline Emission Factor
CER	Certified Emission Reductions
CEA	Central Electricity Authority
CDM	Clean Development Mechanism
CM	Combined Margin
EIA	Environmental Impact Assessment
EB	Executive Board of the United Nations Framework Convention on Climate Change
GHG	Greenhouse Gas
HCA	Host Country Approval
IPP	Independent Power Producer
IREDA	Indian Renewable Energy Development Agency
INR	Indian Rupees
IPCC	Inter Governmental Panel on Climate Change
IRR	Internal Rate of Return
ISO	International Standards Organisation
kWh	Kilowatt hour
MESCOM	Mangalore Electricity Supply Company Limited
MW	Mega watt
MWh	Megawatt hour
MoEF	Ministry of Environment and Forests
MNES	Ministry of New and Renewable Energy
OM	Operating Margin
PPA	Power Purchase Agreement
PCN	Project Concept Note
PDD	Project Design Document
tCO_2e	Tonnes of carbon dioxide equivalent
TNEB	Tamil Nadu Electricity Board
UNFCCC	United Nations Framework Convention on Climate Change
WEG's	Wind Electric Generators

Appendix 2

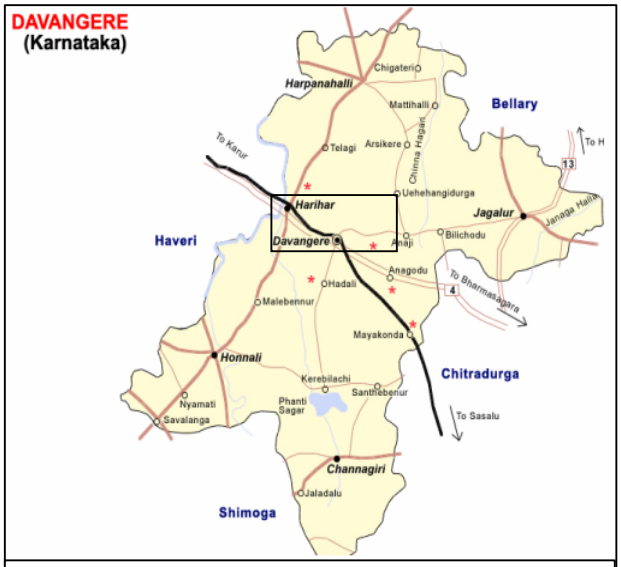
REFERENCES

- Website of United Nations Framework Convention on Climate Change (UNFCCC), http://unfccc.int
- UNFCCC document: Clean Development Mechanism, Simplified Project Design Document Form, for Small-Scale Project Activities (SSC-CDM-PDD), Version 03
- UNFCCC CDM Approved Small-Scale Methodology AMS-I.D/Version 09
- www.windpowerindia.com
- www.mapsofindia.com
- Source of Map: http://tnmaps.tn.nic.in/district.php?dcode=12
- Source of Map: http://www.nellai.tn.nic.in/general.html
- Source of Map: http://www.indianngos.com/districts/coimbatore_about.htm
- Ministry of Non-Conventional Energy Sources, Government of India: http://mnes.nic.in
- Environmental Impact Assessment: http://envfor.nic.in/legis/eia/so-60(e).html
- Tamil Nadu Electricity Regulatory Commission, http://tnerc.tn.nic.in/orders/TRANSMISSION%20CHARGES%20TP1-Final.pdf
- http://tnerc.tn.nic.in/orders/nces%20order%20-approved%20order%20host%20copy.pdf
- http://www.terienvis.nic.in/windenergy.pdf
- Central Electricity Authority, 2005-06 Annual Report
- Central Electricity Authority, CDM CO_2 Baseline Database, http://www.cea.nic.in/planning/c%20and%20e/Government%20of%20India%20website.htm

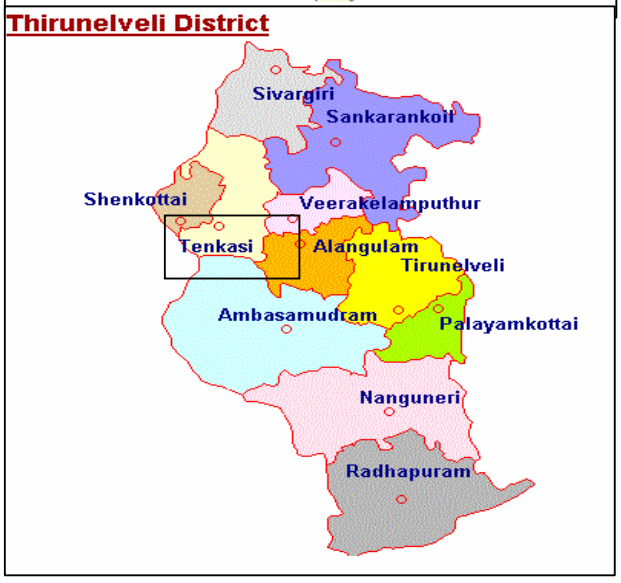
Appendix 3

Location details

Capacity (kW)	Nos	District	Village	Revenue Survey No	HT Service Connection No
600	1	Davanagere	Kumbaluru	37,40	-
600	1	Davanagere	Kumbaluru	5.75	-
500	1	Tirunelveli	Kasikuvaithan	38/1	1464
500	1	Tirunelveli	Kasikuvaithan	38/4	1396
600	1	Tirunelveli	Serndamangalam	623/5,6	2040
600	1	Tirunelveli	Serndamangalam	693/6 (Part) & 699/3A(Part) & 4(Part)	2041
600	1	Tirunelveli	Serndamangalam		2179
600	1	Tirunelveli	Serndamangalam		2180
600	1	Tirunelveli	Serndamangalam	622/1, 624/4 & 629/16	2181



1. Davangere district



2. Tenkasi district