CLEAN DEVELOPMENT MECHANISM
PROJECT DESIGN DOCUMENT FORM (CDM-SSC-PDD)
Version 01

CONTENTS

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:

Title : 13.65 MW Captive Wind Energy Project in Tirunelveli
Version : 02
Date : 13/03/2008

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

Energy is a major input for overall socio-economic development for developing countries. Power generation from wind energy has emerged as one of the most successful programmes in the renewable energy sector, and has started making meaningful contributions to the overall power requirements in India.

This project activity has 15 WEGs of various capacities installed in Tirunelveli district of Tamil Nadu, India. There are 4 * 600 kW, 6 * 750 kW, 3* 1250 kW and 2 * 1500 kW WEGs constituting the entire bundle of 13.65 MW. The project activity is an initiative of Loyal Textile Mills Limited and its sister concern Shri Chintamani Textile Mills Private Limited hereinafter referred as LTML and CTML respectively. The generated power will be banked and wheeled through the state grid for captive consumption in Loyal Textile Mills and its group companies Loyal Super Fabrics, Valli Textile Mills and its sister concern Shri Chintamani Textile Mills thereby reducing the dependence on the use of power generated from fossil fuels in these plants. In this bundled project, LTML is the main promoter and will act as the focal point for VER related activities. The project activity aims to claim the already generated VERs upto the date of verification by the DOE. From this project activity till 31st December 2007, the approximate electricity generation recorded is 5,90,02,574 kWh and VER generated is 47,202.

The main purpose of the project activity is to generate electrical energy through sustainable means using wind power resources, to bank and wheel through the Southern Regional Grid for captive consumption and thereby contributing to climate change mitigation efforts

Social well-being:

The project is located in the rural areas of Tirunelveli districts of Tamil Nadu and implementation of the project activity has contributed positively towards the 'Sustainable Development' in this region.

- Employment opportunities have increased marginally for both skilled and unskilled labours in the surrounding areas due to the implementation of the project. The increased income level has improved the living standards of the people. Local people in the surrounding villages have been employed for civil and mechanical works during the implementation of the project and permanent employment for some local people was given by O&M contractors (Enercon, Suzlon, etc.) for operation and maintenance of the wind farm.

- Electricity facilities are improved comparatively and expected to improve further in future due to the upcoming installations in the villages. Due to implementation of the project activity, certain developments have occurred in the surrounding area and the stakeholders admitted that the

project activity has contributed towards the improvement of the socio economic conditions of the local area to some extent.

- Other infrastructural and communication facilities in the area have also improved considerably due to the project.

Economic well-being:

- The project activity also enhances the national economy, although in a small way, by reducing the import of fossil fuels for power generation.

Environmental well-being:

- Wind power generation is a zero-emission activity and there is no addition of emissions into the atmosphere. Moreover, it reduces the pressure on the fossil fuels for power generation and consequently reducing the emission of greenhouse gases into the atmosphere.

Technological well-being

- Increased interest in Wind energy projects will further push innovations efforts by technology providers to develop more efficient and better machinery in future.
- The technology is well proven and safe.

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 (Host Country)	Loyal Textile Mills Ltd. (Private entity)	No

(*) In accordance with the CDM modalities and procedures, at the time of making the CDM-PDD public at the stage of validation, a Party involved may or may not have provided its approval. At the time of requesting registration, the approval by the Party(ies) involved is required.

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.:

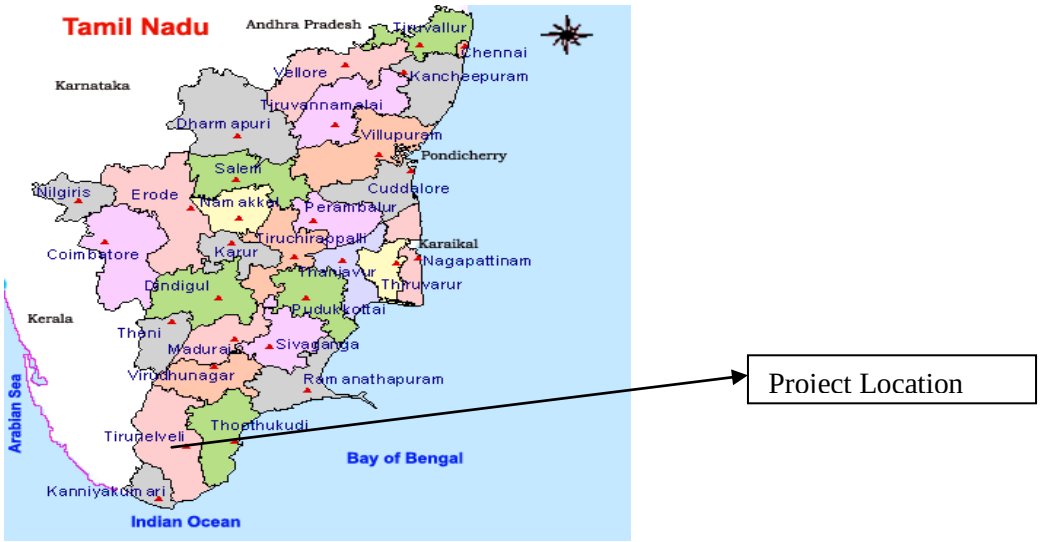
Tamil Nadu

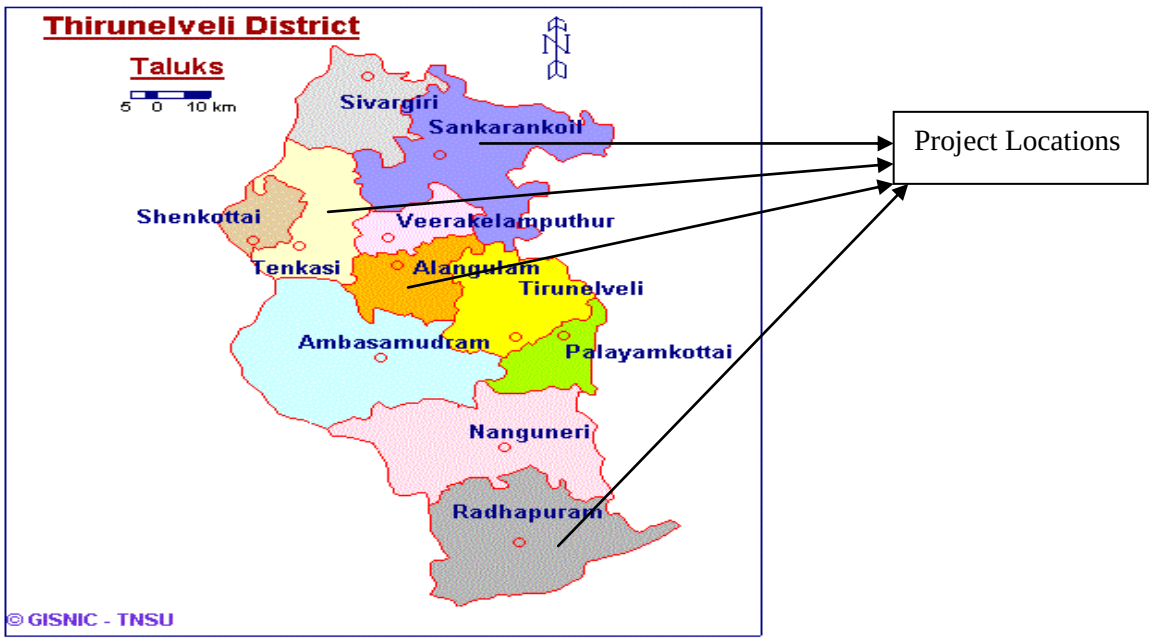
A.4.1.3. City/Town/Community etc:

No. of WEGs	Village	Taluk	District	Latitude	Longitude
2	Pattakuruchi	Tenkasi	Tirunelveli	8.58^{0}N	77.23^{0}E
2	Pulliyur	Tenkasi	Tirunelveli	8.57^{0}N	77.16^{0}E
2	Ayakudi	Tenkasi	Tirunelveli	8.97^{0}N	77.3^{0}E
2	Panagudi	Radhapuram	Tirunelveli	8.19^{0}N	77.34^{0}E
2	Dhanakarkulam	Radhapuram	Tirunelveli	8.16^{0}N	77.38^{0}E
2	Veerakeralampudur	Alangulam	Tirunelveli	8.89^{0}N	77.5^{0}E
1	Melillandaikulam	Sankarankovil	Tirunelveli	9.10^{0}N	77.32^{0}E
2	Kasthurirengapuram	Radhapuram	Tirunelveli	8.16^{0}N	77.42^{0}E

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

The project is spread in eight villages in Tirunelveli district, Tamil Nadu, in Southern India.





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

Type and Category:
Since the capacity of the proposed project is only 13.65 MW, which is less than the maximum qualifying capacity of 15 MW, the project activity has been considered as a small scale VER project activity and UNFCCC indicative simplified modalities and procedures are applied. According to small scale CDM modalities the project activity falls under:

Sectoral Scope 1 : Energy Industries (renewable/non-renewable sources)
Type-I : Renewable Energy Projects
Category I-D : Grid Connected renewable electricity generation
Project category : 1. Renewable Energy (**Wind**, PV, solar thermal, biomass, liquid biofuels, geothermal, run-of- river hydro) as per VCS 01

A wind turbine is a machine for converting the kinetic energy in wind into mechanical energy. If the mechanical energy is used directly by machinery, such as a pump or grinding stones, the machine is usually called a windmill. If the mechanical energy is then converted to electricity, the machine is called a wind generator.

The project activity involves the erection, commissioning and operation of 15 numbers of various capacity Wind Electric Generators (WEGs) of various makes, all connected to the local evacuation facilities at the respective sites to deliver the generated power. The technology to be employed converts wind energy to electricity using Wind Electric Generators manufactured by NEG Micon, Enercon(India) Limited and Suzlon Energy Ltd. All the technology suppliers are ISO-14001 certified companies. Moreover, the responsibility of the Operation and Maintenance of the WEGs lie with the respective technology suppliers. Therefore, the maintenance and calibration of monitoring equipments has been followed as per the ISO-14001 standards.

The Technical details of various WEGs are given below:

Particulars		**NEG Micon**	**Enercon**	**Suzlon Energy Ltd.**		
Model		**NM48 / 750**	**E40 / 600**	**S64 / 1250**	**S66/1250**	**S82/1500**
Operating data						
Rotor Diameter	M	48	44	64	66	82
Hub Height	M	55	56.85	65	74	80
Installed output	kW	750	600	1250	1250	1500
Cut-in wind speed	m/s	3	2	3	3	4
Rated Wind speed	m/s	14	13.5	14	14	12.5
Cut-out Wind speed	m/s	25	25	25	22	20
Rotor						
Swept area	M^2	1824	1486	3218	3421	5281
Generator						
Type		Asynchronous	Enercon ring generator	Asynchronous 4 / 6 Pole	Asynchronous 4 / 6 Pole	Asynchronous 4 / 6 Pole
Rated including Pumping systems with VFDs output	kW	750	600	1250	1250	1500
Rotational Speed	rpm	25	18 – 34	25-34	13.9/ 20.8	25-34
Frequency	Hz	50	16.5 Variable	50	50	50
O & M services Contract? (if any)		Yes	Yes	Yes	Yes	Yes

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

The power generation for the years 2004 to 2007 is based on the actual net generation figures, since the WEGs were installed in phase manner and 6.9 MW were installed in 2004 and there were no installations in 2005 so the values from 2008 to 2010 has been arrived based on the PLF (24.79%) for the year 2005 which is explained in the excel sheet.

Year	**Estimation of annual emission reductions in tonnes of CO_2e**
2004	5,976
2005	11,212
2006	12,272

2007	17,742
2008	22,180
2009	22,180
2010	22,180
Total estimated reductions (tonnes of CO_2e)	113,742
Total number of crediting years	7
Annual average of estimated reductions over the crediting period (tCO_2e)	16,249

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

No public funding is involved in the project activity.

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

According to paragraph 2 of Appendix C to the Simplified Modalities and Procedures for Small-Scale VER Project activities, a small scale project activity shall be deemed to be debundled component of a large project activity if there is a registered small-scale VER project activity or an application to register another small scale VER 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.

The project promoters have confirmed that there is no registered small scale project activity registered within the previous two years with them in the same project category and technology whose project boundary is within 1km of the project boundary of the proposed small scale activity. Thus the project is not a debundled component of any other large-scale project activity.

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 : Grid connected renewable electricity generation
Version : 12
Date : 10th August 2007
VER Standard : VCS 01

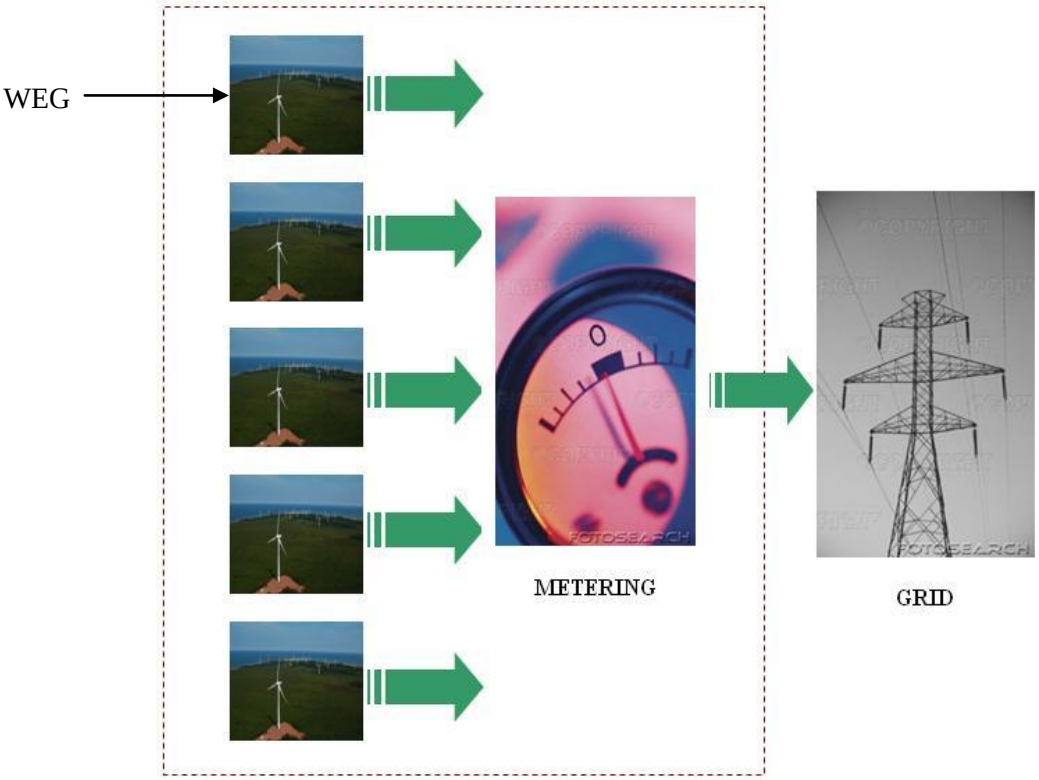
B.2 Justification of the choice of the project category:

Applicability Criteria	Project Activity
This category comprises renewable energy generation units, such as photovoltaics, 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 VER project activity involves generation of electricity from 15 WEGs of different capacity constituting aggregate capacity of 13.65 MW. The renewable energy generated is wheeled through regional grid for captive consumption. This displaces equivalent amount of electricity generated through furnace oil fired power generation prior to the project activity.
If the unit added has both renewable and non-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. If the unit added co-fires fossil fuel[1], the capacity of the entire unit shall not exceed the limit of 5MW.	The project installed capacity is 13.65 MW of power from wind energy only.
Combined heat and power (co-generation) systems are not eligible under this category.	The project activity involves only power generation using wind energy not a co-generation system.
In the case of project activities that involve the addition of renewable energy generation units at an existing renewable power generation facility, the added capacity of the units added by the project should be lower than 15 MW and should be physically distinct[2] from the existing units.	The project activity does not involve any addition of renewable energy generation units at an existing renewable power generation facility.
Project activities that seek to retrofit or modify an existing facility for renewable energy generation are included in this category. To qualify as a small-scale project, the total output of the modified or retrofitted unit shall not exceed the limit of 15 MW.	The project activity is not a retrofit or modification of existing facility.

1 Co-fired system uses both fossil and renewable fuels.
2 Physically distinct units are those that are capable of generating electricity without the operation of existing units, and that do not directly affect the mechanical, thermal, or electrical characteristics of the existing facility. For example, the addition of a steam turbine to an existing combustion turbine to create a combined cycle unit would not be considered "physically distinct".

B.3. Description of the project boundary:

The project boundary encompasses the physical, geographical site of the renewable generation source. In the context of the proposed project activity, the schematic of the project boundary is as follows:



WEG (Wind Energy Generator): The wind turbine generator converts mechanical energy of wing into electrical energy.

Metering : The amount of electricity generation can be measured from each WEG with the help of electronic meter.

Grid : High-voltage network for power transmission

B.4. Description of baseline and its development:

Baseline Estimation

Prior to start of the project activity (2003-04), 47,039,826.00 kWh which figures around 88.2% of total power consumption was from furnace oil (Source: Annual Report, Loyal Textile Mills Ltd.). However, the current year (2006-07) energy consumption from furnace oil shows a reduced furnace oil consumption of around 24,449,560.00 kWh i.e. 22.39% of total consumption. At the same time energy generation from WEGs had been contributing towards a larger chunk of the total consumption. The pattern of consumption during the year 2006-07 clearly shows a net generation of 25,659,201.00 kWh from wind energy (Source: Annual report, Loyal Textile Mills Ltd). A comparison of the figures clearly demonstrates that the reduction in furnace oil based generation is equivalent to the generation achieved from wind energy. Therefore, the project activity is a displacement of furnace oil based power generation

by wind resources. The following table clearly describes the baseline for the project activity (Source: Loyal Textile Mills Ltd. audited financial Annual Reports)
Power consumption through different sources (kWh)[1]

Year	2003-04	2004-05	2005-06	2006-07
Furnace Oil	47039826	45386904	39985257	24449560
Grid	4258560	4191879	20934431	57963963
Diesel	2001779	3312929	1749586	1117176
Wind	7486	7760214	15626295	25659201
Total	**53307651**	**60651926**	**78295569**	**109189900**

Power consumption through different sources (%)

Furnace Oil	88.24	74.83	51.07	22.39
Grid	7.99	6.91	26.74	53.09
Diesel	3.76	5.46	2.23	1.02
Wind	0.01	12.79	19.96	23.50

As described in AMS I-D, version 12 small-scale methodology paragraph 8 "For a system where all generators use exclusively fuel oil and/or diesel fuel, the baseline is the annual kWh generated by the renewable unit times an emission coefficient for a modern diesel generating unit of the relevant capacity operating at optimal load as given in Table I.D.1". As the capacity of furnace oil generating unit is more than 200kW the methodology allows to use the emission factor of 0.8 kg CO_2e/kWh for all the load factors hence the same is considered for emission reduction calculation.

Table I.D.I

Emission factors for diesel generator systems (in kg CO_2e/kWh*) for three different levels of load factors**

Cases:	Mini-grid with 24 hour service	i) Mini-grid with temporary service (4-6 hr/day) ii)Productive applications iii) Water pumps	Mini-grid with storage
Load factors [%]	25%	50%	100%
<15 kW	2.4	1.4	1.2
>=15 <35 kW	1.9	1.3	1.1
>=35 <135 kW	1.3	1.0	1.0
>=135<200 kW	0.9	0.8	0.8
> 200 kW***	0.8	0.8	0.8

*) A conversion factor of 3.2 kg CO2 per kg of diesel has been used (following revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories)
**) Figures are derived from fuel curves in the online manual of RET Screen lnternational's PV 2000 model, downloadable from http://retscreen.net/
***) default values

[1] Audited annual financial reports of LTML for 2003-04, 2004-05, 2005-06 and 2006-07

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:

The installed capacity of the project is 13.65 MW, which is less than the limiting capacity of 15 MW and is thus eligible to use small-scale simplified methodologies. Further, the project activity is generation of electricity for captive consumption wheeling through regional grid using wind potential. Hence, the type and category of the project activity matches with I.D. as specified in Appendix B of the indicative simplified baseline and monitoring methodologies for small-scale CDM project activities.

As per additionality test B specified in criterion 10 of VCS version 01 additionality has been demonstrated as per the latest version (version 04) "Tool for the demonstration and assessment of additionality" has been used in order to assess additionality and substantiate that the proposed project is not a business-as-usual scenario. The detail steps of the additionality tool are discussed below:

STEP 1 – Identification of alternatives to the project activity consistent with current laws and regulations

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

The following alternatives had been identified to the project activity:

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

In this alternative, the proposed project activity the generated power will be banked and wheeled through the Southern Regional Grid for captive consumption in Loyal Textile Mills and its group companies Loyal Super Fabrics, Valli Textile Mills and its sister concern Shri Chintamani Textile Mills thereby reducing the dependence on the use of power generated from fossil fuels in these plants. As wind power is a non emitting energy resource, this project activity would not generate any GHG emissions.

Alternative 2: Investment in other fuel sources for power generation

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

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

The continuation of the current scenario would mean that the project activity would not be implemented with the result that the current furnace oil based power generation for captive consumption would remain unchanged. There would be no displacement of fossil-fuel based electricity. Which means, an increase in greenhouse emissions, especially CO_2, would result from this alternative.

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

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

As per the additionality tool Step 2 (Investment Analysis) or Step 3 (Barrier Analysis) has to be demonstrated. The barriers of the project activity is demonstrated as per the Step 3, since this is asmall scale project activity Attachment A to Appendix B is used.

STEP 3: Barrier Analysis

Investment Barrier:

The WEGs included in this project activity are located in Tirunelveli district of Tamil Nadu, and each area needs dedicated, infrastructural requirements like control room, office, metering station, feeder systems etc. As a matter of fact the unit cost of furnace oil and the wind is demonstrated the same is as follows.

Cost of Furnace Oil Power

The electricity generation through furnace oil generators is 47039826 kWh (2003-04) and the fuel oil consumption is 11334898 litres. The average cost of fuel is 12.49 Rs/Litre with this the average cost per unit is around 3.01 Rs/kWh the calculation for arriving the same is as follows. The other costs such as O&M are not considered, as the Power Plant needs to be maintained. Therefore only the fuel is the saving through WEGS.

Year	2003-04	
Furnace oil[2]		**Units**
Unit Generation	47039826	kWh
FO Consumption for power generation	11334898	Litres
Average Cost of FO	12.49	Rs./Lt
Total Cost Rs./Unit	141572876 3.010	Rs. Rs./Unit

Cost of Wind Power

In case of WEG the power has to be essentially purchased from the state electricity board, paying for all including the maximum demand. However for power consumed from grid the HT tariff is Rs. 3.5 / kWh[3]. The electricity board only adjust the amount of units from the total consumption therefore it has been considered that the cost of wind power as Rs. 3.5 /kWh

It can be seen from the discussion, that investment in wind power generation was obviously not the best option for the promoter before starting the project activity. Though furnace oil was the most economically viable alternative, yet keeping the environmental concerns in mind, LTML decided to go ahead with their investment in spite of the underlying uncertainties associated with wind power generation.

Placing a recently installed HFO plant as standby and going for WEGs definitely was an expensive venture. Moreover, the project promoters had to make additional investment in terms of the evacuation and consumption facilities as the power requirement was earlier being met through furnace oil based

[2] The generation, fuel consumption is considered from the Annual Performance report of DG set, the average cost of furnace oil from Audited financial annual reports is considered.

[3] Tariff Order for fixation of tariffs for Tamil Nadu Electricity Board from 16.03.2003, against TNEB petition No. TP1 of 2002

power plant and there was no grid involvement. Captive generation of power using WEGs also involves an additional expenditure of Maximum Demand charges payable to TNEB on a monthly basis. Yet, the project promoter decided to go ahead with the project activity considering the financing through the sale of carbon credits that would make the project activity viable for the project promoter.

Barriers due to prevailing practice:

a) Analyze other activities similar to the proposed project activity:

Tamil Nadu is one of the most industrialized states of India and hence, supply -demand gap always exists. 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.

Wind farms are located only in following 8 states of India out of 29 states and 6 union territories: Gujarat, Karnataka, Kerala, Maharashtra, Tamil Nadu, Andhra Pradesh, Rajasthan and West Bengal, last two states being latest entries. As per the 2004-2005 report the installed capacity of wind was 2443.94 MW out of total 37751.51 MW which is about 6.5%. The level of grid penetration as in the year 2004 –2005 is a mere 6.47% as against 35% from the fossil fuel based power plants. This substantiates that although the state of Tamilnadu is in the forefront of wind farm development, in terms of grid penetration levels and the percentage contribution to the grid system, the wind farms are still in developing stages. (Source: Southern Regional Electricity Board Annual Report 2004-2005).

Hence it is evident that wind energy is not a regular prevailing practice to meet the electricity demand of the country

b) Discuss any similar options that are occurring:

The uniqueness of the project activity lies in the fact that the project promoters were dependent on furnace oil based captive power generation rather than the grid, prior to investing on WEGs. Most of the captive WEG investors seem to have been meeting their power demand from the grid before opting to go for wind power. However, shifting from HFO based power generation to wind energy also means shifting to the grid and wheeling the power generated through the same for captive consumption. In the present case the project promoter had to make additional infrastructural arrangements for the same which would not have been required in case of a shift from grid power to wind energy.

Other barriers:

a) **Regulatory Barrier**

The frequent change in the Tamil Nadu Power Policy is one of the major barriers that restrict private sector investment in this sector. The following table gives a clear idea of the changes in the Tariff Policy (in terms of the buy-back rate for captive power consumption) of the state and the way it stands as a barrier towards investment.

Sl.No.	Period	Buy-back

		(INR/unit)
1.	Jan 1993 – May 1994	1.25
2.	May 1994 – Dec 1995	2.00
3.	Dec 1995 – April 2000	2.25 (5% annual escalation)
4.	April 2000 – March 2001	2.70
5.	March 2001 – Sep 2001	2.25 (5% annual escalation)
6.	Sep 2001 – March 2002	2.70
7.	March 2002 – June 2006	2.70 (No annual escalation)
8.	June 2006 – Onwards	2.90 (No annual escalation)

Moreover, third party sales in Tamil Nadu is not permitted, which is an added risk to project developer.

A comparative study of the policies in the different states in India will also give an idea of the unfavourable policy in Tamil Nadu.

State Government policies for Wind Power Projects [4]

State	Banking charges	Buy-Back	Third Party Sale	Capital Subsidy
Andhra Pradesh	12 months	INR 2.25/kWh (Escalation 95-96) Presently Rs 3.37	Not allowed	NIL
Tamilnadu	**5 % for 12 months**	**INR 2.90/kWh (No escalation)**	**Not allowed**	**NIL**
Karnataka	2 % every month for 12 months	INR 3.40/kWh	Allowed to HT Consumers	Same as for other industries
Kerala	6 months	To be agreed mutually	-	15 %(max Rs. 5 lakhs)
Uttar Pradesh	12 months	INR 2.25/kWh (5 % Escalation from 95-96)	Allowed	Same as for other industries
West Bengal	6 months	To be decided case to case basis	Not allowed	-
Gujarat	6 months	INR 3.32/kWh	Not allowed	-

[4] http://www.indianwindpower.com/potential.html#top

Madhya Pradesh	2 %for 12 months	Present Rs. 3.90/kWh	Allowed	Same as for other industries
Maharashtra	2 % for 12 months	INR 3.50/kWh	Allowed	30 %(max Rs 20 lakhs per project)
Rajasthan	2 % for 12 months	Present INR 3.32 /kWh.	Allowed	-

b) Operational Barrier

The project promoter is very well experienced in textile business and they are not having in depth knowledge in renewable energy based power generation – specifically wind turbine technology. Therefore, the project promoter is bound to hire the services of the technology provider even for the operation and maintenance of the WEGs with an agreement fixed for a ten year term. The contract will have to be renewed after the 10 year term which might significantly increase the operating and maintenance costs of the WEGs. Hence, the operation cost acts as a barrier for the project promoter for the implementation of the project activity.

Compared to other power plants the capacity utilisation factor (CUF) for wind turbines is very less. The project promoter had the option to continue the use of the HFO power plant that had already been operational. Yet, he decided to go for wind power in spite of the associated risks. Moreover, lack of long term wind data for the identified sites in India makes the wind pattern prediction further difficult and uncertain. In most cases it is only on the basis of a one year data collected by the technology supplier themselves that the projections are made.

Moreover, the grid quality in India does not allow supplying the full generation from WEGs to it. Therefore even though the WEGs may generate enough, the extra generation cannot be exported to grid due to the risks associated with the grid quality. Hence WEGs are forced to put away the production in case of high excess generation.
(Source: http://planning.up.nic.in/innovations/inno3/ae/wind_power.htm)

The land value of high wind potential areas are also very high; this will further increase the initial investment of the project.

Thus, the high capital cost (primarily enhanced due to shift from HFO plant to WEGs), low capacity utilisation factor (CUF), lack of long term wind data for prediction and varying policy of the state government stood as majors barriers for the implementation of this project activity. However, the prospects of financing through the revenue generated from the sale of carbon credits will help in minimising the risks associated with the project activity.

STEP 4. Common practice analysis Sub-step

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

The wind power installations in Southern Region are low compared to total generation. A comparative statement showing the installed capacities in Southern Region has been taken from the Ministry of Power

Annual Reports of that respective year during the project concept stage. It is clear from the table below that installed capacity of wind is 4.13% when compared to the total generation. It shows low development of wind power in compared to other sources.

	2002-03		2003-04	
	Installed Capacity (MW)	**%**	**Installed Capacity (MW)**	**%**
Hydro	10012.84	35.19%	10327.84	35.25%
Thermal (Coal+Gas+Diesel)	16638.22	58.48%	16982.32	57.96%
Wind	1020.7	3.59%	1209.2	4.13%
Nuclear	780	2.74%	780	2.66%
Total	28451.76	100.00%	29299.36	100.00%

Source: Ministry of Power, Annual Report 2002-03, 2003-04

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

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

The uniqueness of the project activity lies in the fact that the project promoters were dependent on furnace oil based captive power generation rather than the grid, prior to investing on WEGs. Most of the captive WEG investors seem to have been meeting their power demand from the grid before opting to go for wind power. However, shifting from HFO based power generation to wind energy also means shifting to the grid and wheeling the power generated through the same for captive consumption. In the present case the project promoter had to make additional infrastructural arrangements for the same which would not have been required in case of a shift from grid power to wind energy.

B.6. Emission reductions:

B.6.1. Explanation of methodological choices:

The energy consumption pattern of the project promoter is given in section B.4 which clearly indicates that the project promoter was mainly dependent on furnace oil based generators before shifting towards wind mill. As prescribed in the methodology AMS I.D, Version 12 paragraph 8 "For a system where all generators use exclusively fuel oil and/or diesel fuel, the baseline is the annual kWh generated by the renewable unit times an emission coefficient for a modern diesel generating unit of the relevant capacity operating at optimal load as given in Table I.D.1. As the capacity of furnace oil generating unit is more than 200kW the methodology allows to use the emission factor of 0.8 kg CO_2e/kWh for all the load factors hence the same is considered for emission reduction calculation.

The emission reduction is calculated as:

$$ER = BE - \text{Project Emission (PE)} - \text{Leakage (L)} \qquad (1)$$

Where,

ER = Emission Reduction

BE = Baseline Emission

The project activity is from wind energy sources (renewable) and therefore contributes no project emission and leakage.

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

Estimation of the baseline emission of the project activity = amount of net unit generated from all WEGs multiplied with the emission co-efficient for a modern Furnace oil generating unit of relevant capacity.

$$BE = \sum_n E_{WEG} * E\ Coeff_{Fo} \quad (2)$$

$\sum_n E_{WEG}$ = Amount of net unit generated from all WEGs during the monitoring period
$E\ Coeff_{FO}$ = Emission co-efficient for Furnace oil Unit

Emission co-efficient for Furnace oil is given in the below Table I.D.1:

Emission factors for diesel generator systems (in kg CO_2e/kWh*) for three different levels of load factors**

Cases:	Mini-grid with 24 hour service	i) Mini-grid with temporary service (4-6 hr/day) ii)Productive applications iii) Water pumps	Mini-grid with storage
Load factors [%]	25%	50%	100%
<15 kW	2.4	1.4	1.2
>=15 <35 kW	1.9	1.3	1.1
>=35 <135 kW	1.3	1.0	1.0
>=135<200 kW	0.9	0.8	0.8
> 200 kW***	0.8	0.8	0.8

*) A conversion factor of 3.2 kg CO2 per kg of diesel has been used (following revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories)
**) Figures are derived from fuel curves in the online manual of RET Screen lnternational's PV 2000 model, downloadable from http://retscreen.net/
***) default values

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

Data / Parameter:	$E\ Coeff_{Fo}$
Data unit:	Kg CO_2e/kWh
Description:	Emission co-efficient for a modern diesel generating unit of relevant capacity
Source of data used:	Methodology AMS-I D, Version 12, UNFCCC (http://cdm.unfccc.int/)
Value applied:	0.8
Justification of the choice of data or	Emission Factor is estimated and officially published by UNFCCC (http://cdm.unfccc.int/UserManagement/FileStorage/CDMWF_AM_PHPV5WESACMBTJ2YY54GAJYSIEI3HD)

description of measurement methods and procedures actually applied :	in Small Scale CDM methodology (AMS I-D, Version 12)
Any Comment:	Default values for more than 200kW is used as provided in the methodology AMS-I D, Version 12. (http://cdm.unfccc.int/UserManagement/FileStorage/CDMWF_AM_PHPV5WESACMBTJ2YY54GAJYSIEI3HD)

B.6.3 Ex-ante calculation of emission reductions:

Project Emission (PE):

Wind based power generation, is environment friendly and does not have any associated emissions. Therefore, this project activity does not have any emissions from the source. So,

$$PE = 0$$

Leakage (L):

Leakage is not applicable to wind power projects and hence will be zero. So,

$$L = 0$$

Baseline Emissions (BE):

The emission reduction per annum is calculated based on, the annual net unit generation from all WEGs included in the bundle and wheeled through Regional Grid for captive consumption multiplied with the emission co-efficient for a modern diesel generating unit of relevant capacity.

For demonstration of calculation of emission reductions the net electricity from 25/03/2004 till 24/03/2011 is considered.

$BE = \sum_n E_{WEG} * E\ Coeff_{Fo}$
$= 142177500\ kWh * 0.8\ Kg\ CO_2/kWh$
$= 113742\ tCO_2e$

Therefore,

$ER = BE – (PE + L)$
$= 113742 – 0$
$= 113742\ tCO_2e$

Where,

ER	= Emission Reduction
$\sum_n E_{WEG}$	= Amount of net unit generated during the monitoring period
$E\ Coeff_{Fo}$	= Emission co-efficient for Furnace oil Unit

The power generation for the years 2004 to 2007 is based on the actual net generation figures, since the WEGs were installed in phase manner and 6.9 MW were installed in 2004 and there were no installations in 2005 so the values from 2008 to 2010 has been arrived based on the PLF (24.79%) for the year 2005 which is explained in the excel sheet.

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

Year	Estimation of project activity emissions (tCO2 e)	Estimation of baseline emissions (tCO2 e)	Estimation of Leakage (tCO2 e)	Estimation of overall emission reductions (tCO2 e)
2004	0	5,976	0	5,976
2005	0	11,212	0	11,212
2006	0	12,272	0	12,272
2007	0	17,742	0	17,742
2008	0	22,180	0	22,180
2009	0	22,180	0	22,180
2010	0	22,180	0	22,180
Total (Tonnes of CO_2e)	0	113,742		113,742

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

B.7.1 Data and parameters monitored:

Data / Parameter:	E_{WEG}
Data unit:	kWh
Description:	Net unit Power supplied to the grid
Source of data to be used:	The data will be based on the operations of the wind turbines over the crediting period.
Value of data	142177500
Description of measurement methods and procedures to be applied:	The data can be very accurately measured. The electronic meters installed at the sub stations (grid interconnection point) by the TNEB will be used to measure the electricity supplied to the grid on a monthly basis. Every month these meter readings will be recorded by the officers of the TNEB. These records will be archived for crosschecking yearly figures. The meters at the sub station will be two-way meters and will be owned by SEB. SEB will take the readings from these meters and the same reading may be used to determine the net power wheeled to the user and determine the extent of mitigation of GHG over a period of time. Net generation = Total Export (kWh) – (Total Import (kWh) + Wheeling (kWh)) For each WEG monthly billing period is fixed and therefore, might not be the same date for all the WEGs. To calculate generation up to 31/12/2007, December month generation data for each WEGs has been taken to calculate the daily average generation and generation for rest of the days up to 31st December has been calculated accordingly.
QA/QC procedures to	QA/QC procedures for this are planned. These data will be directly used for

be applied:	calculation of emission reductions. Sales record to the grid and other records are used to ensure the consistency.
Any comment:	

B.7.2 Description of the monitoring plan:

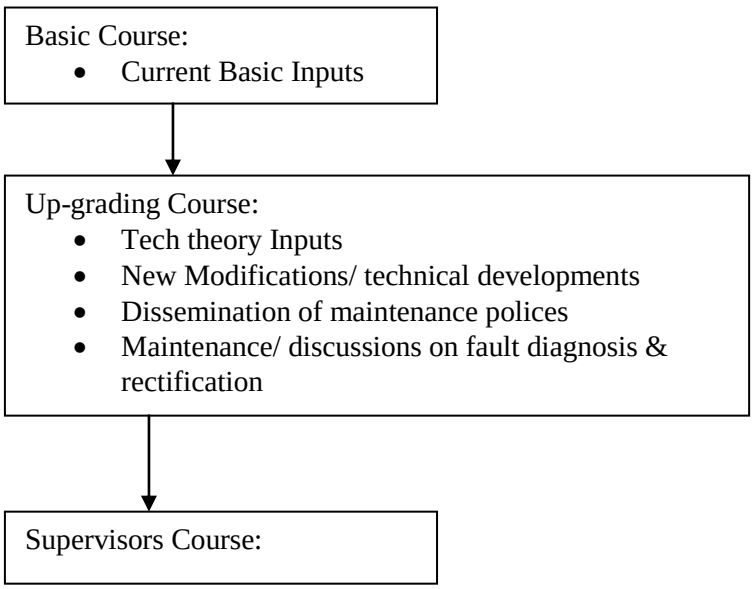
The monitoring plan for the project activity has been developed as per the applied methodology, AMS I-D / Version 12

The project is a captive wind energy project. Units of energy (generated from Wind power) wheeled through Regional Grid for captive consumption. The methodology covers the monitoring of net units exported to grid and the other parameters affecting the quantity of power export and CO_2 emissions thereof. The net emission reductions will result from the net units of power available from the wind. The net unit generation can be calculated as:

Net generation = Total Export (kWh) – (Total Import (kWh) + Wheeling (kWh))

The WEG suppliers for this project activity Enercon India Pvt. Ltd, Suzlon Energy Ltd., and NEG Micon India Limited provide initial training to the responsible persons to ensure value added services. The training programme covers all aspects of Electrical, Electronics and Mechanical Engineering for the technical personnel and Management capsules for Managerial level.

Basically, training for technicians is conducted on a three tier basis, ensuring graded inputs being provided for them spread out over a period of time, to ensure proper assimilation and development of skill levels commensurate to the knowledge levels and experience gained. Initially when a person joins he is made to undergo the basic course, for duration of around 19 weeks. Thereafter, he returns back for added inputs every three years, till he attains the level of supervisor. A schematic diagram of the training sequence is shown below:



Sequence of "On the Job Training" (OJT):
Skill development of inductees will be carried out in three phases, as per details, and in the sequences listed below:

First line Worker: As a first line worker, an individual will be progressively cleared to perform the following types of servicing:

- Visual
- Visual plus Grease
- External electrics, from transformer up to sub-station

Second line Worker: As a second line worker, an individual will be progressively cleared to perform the following types of servicing:

- Mechanical
- Electrical

The WEG suppliers for this project activity would monitor the power generated by the WEGs with DCS controlled system and data are collected by Site Engineers appointed by service providers. Following are few important points for Operation, Maintenance and calibration of WEGs and Meters:

Operation & Maintenance of WEGs:

1. Visual maintenance: The visual maintenance is to be carried out 3 months after commissioning of the WEGs. It covers:
    A. Tighten all bolt connections to the required torque
        - Foundation bolts
        - Tower to tower bolt connections
        - Tower –ball bearing slewing rim
        - Break disc-generator rotor
        - Guide plates
        - Generator rotor-rotor hub
        - Rotor hub-blade flange bearing
        - SRB fastening bolts

    B. Hand-tighten all mounted parts for the entire turbine such as fans, motors, control cabinets, handrails, spinner casing, lamps and balancing weights.
    C. Check the oil levels of the yaw and pitch gears and the hydraulic units and top up, if necessary.
    D. Measure generator air gap.

2. Grease Maintenance: the grease maintenance is to be carried out 3 months after visual maintenance. It covers:
    A. All visual maintenance check points to be carried out.
    B. Lubricate nipples in yaw gears
    C. Lubricate the yaw control toothing
    D. Replace the permanent lubricators for the ball bearing slewing rim of yaw

3. Electrical Maintenance: the electrical maintenance is to be carried out 3 months after grease maintenance. It covers:
    A. All visual maintenance check points to be carried out.

B. General:
   a) Check earthing connection of converter component-tower & foundation earth, control cabinet to power cabinet.
   b) Check cable connection –transformer cable, control cabinet, power cabinet.
   c) Check software updation
   d) Check all internal and external lighting of turbine.
   e) Check all controllers
   f) Checking of all pcb's for updated version & alteration if necessary

C. Measurement:
   a) Measurement of earth resistance
   b) Measurement of phase voltage
   c) Measurement of sensor distances

D. Tests:
   a) Conduct overspeed swith test
   b) Conduct battery test
   c) Conduct testing of Emergency switches

4. Mechanical Maintenance: The mechanical maintenance is to be carried out 3 months after electrical maintenance. It covers:
   A. All visual maintenance points to be carried out
   B. All grease maintenance points to be carried out
   C. Foundation checking completely
   D. Check oil level of pitch gearbox, yaw gearbox, hydraulic pump and top up to the mark
   E. Check the main bearing play
   F. Carryout paintwork
   G. Cleaning of nacelle, hub & tower from inside

5. 4 yearly mechanical maintenance: 4 yearly mechanical maintenance is to be carried after 4 years completion of operation. It covers:
   A. All visual maintenance points to be carried out
   B. All grease maintenance points to be carried out
   C. All mechanical maintenance points to be carried out.
   D. Oil change
   E. Generator air gap checking

Metering:

The delivered Energy shall be metered by the parties at the high voltage side of the step up transformer installed at the project site.

Daily Meter Reading

Daily energy meter reading for all WTGs will be taken by the maintenance staff, and will be recorded in the generation log, in a controlled format The Daily Generation information will be sent to LTML Head Office at the closure of the business hours on a daily basis.

Joint Meter Reading:

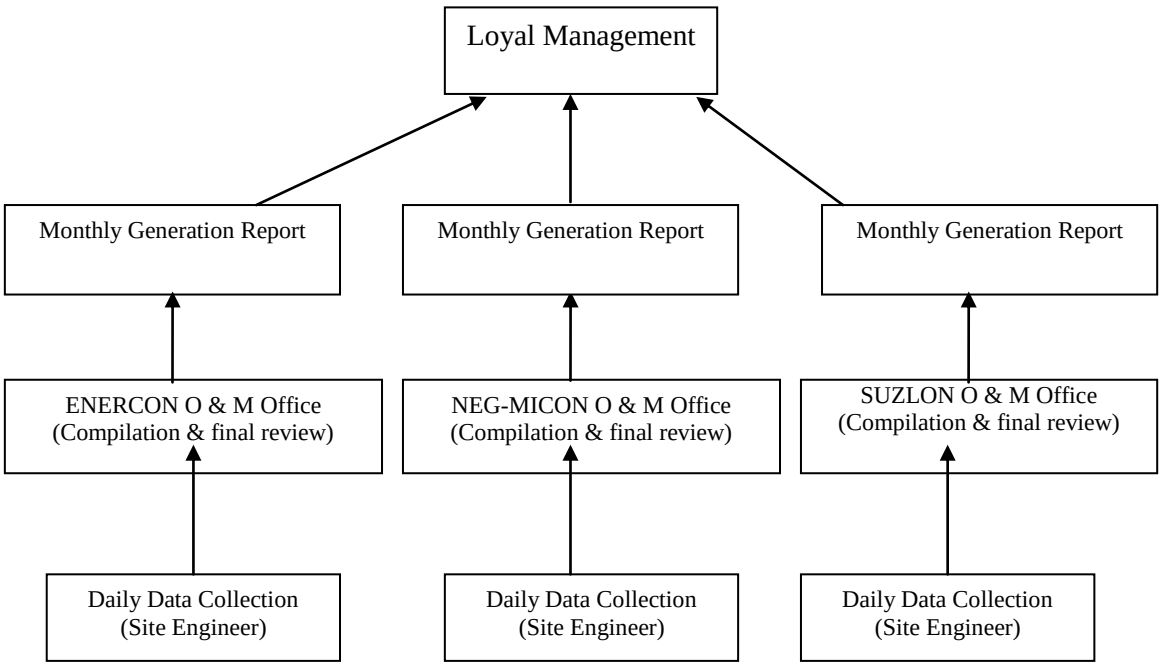
The monthly meter reading shall being taken jointly by the Parties (TNEB and Owner) on the fixed day of the following month. At the conclusion of each meter reading, an appointed representative of the TNEB and the company, shall sign a document indicating the number of the kilowatt-hour indicated by the meter. The main meter reading will be used for recording electricity generation. Emission reduction calculation is based on monthly joint meter reading.

The electronic meters installed at the sub stations (grid interconnection point) by the TNEB will be used to measure the electricity supplied to the grid on a monthly basis. Every month these meter readings will be recorded by the officers of the TNEB. These records will be archived for crosschecking yearly figures. The meters at the sub station will be two-way meters and will be owned by SEB. SEB will take the readings from these meters and the same reading may be used to determine the net power wheeled to the user and determine the extent of mitigation of GHG over a period of time.

Net generation = Total Export (kWh) – (Total Import (kWh) + Wheeling (kWh))

For each WEG monthly billing period is fixed and therefore, might not be the same date for all the WEGs. To calculate generation up to a fixed date of monitoring period, monthly generation data of the last monitoring month for each WEGs shall be taken to calculate the daily average generation and generation for rest of the last day of the monitoring shall be calculated accordingly.

Further the service providers store the data and they forward it to the management on a monthly basis.



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

15/12/2007
M/s Loyal Textile Mills Ltd and its consultants. The consultant is not a project participant.

SECTION C. Duration of the project activity / crediting period

C.1 Duration of the project activity:

C.1.1. Starting date of the project activity:

25/03/2004 (Date of Commissioning of the first WEG in the bundle)

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:

25/03/2004 (From the day the project started)

C.2.1.2. Length of the first crediting period:

7 years

C.2.2. Fixed crediting period:

C.2.2.1. Starting date:

N/A

C.2.2.2. Length:

N/A

SECTION D. Environmental impacts

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

As per the Schedule 1 of Ministry of Environment and Forests (Government of India) notification dated January 27, 1994, - 30 activities are required to undertake environmental impact assessment 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, because the WEGs installed for generation of power use wind (cleanest possible source of renewable energy).

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:

N/A

SECTION E. Stakeholders' comments

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

Loyal Textile Mills Ltd. has installed wind mills in various locations of Tirunelveli district. A local stakeholder consultation meeting had been conducted in order to identify the concerns of the people regarding the implementation of the project activity.

The stakeholders identified for the project were:

- Local Representative (Panchayat President)
- Land Owners
- WEG technicians
- Local people

The stakeholders meeting was conducted in Chinnaputhur village on 21/07/2006 and on 22/07/2006 in Bogempatti. A separate questionnaire had been circulated to the stakeholders and their comments were received in writing. Loyal Textile Mill representatives explained about the project activity and the benefits of its implementation. The local people have been informed about wind power and its role in reduction of Green House Gas emissions. The stakeholders did not identify any negative impact due to the project activity. However, as the land for the project activity has been purchased from the villagers, they were benefited by the revenue through this project. Land values in the villages have also increased to some extent due to the project activity.

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 LTML representatives. The comments can be summarized as positive.

The Panchayat president and local people expressed satisfaction due to the project activity since the project activity has created employment opportunities, led to increase in land values for the nearby villagers which has positively helped in improving standard of life as well as socio-economic conditions of the villages.

The stakeholder's comments are summarized & separately attached as Appendix B. The summary clearly indicates that all the stakeholders agree that the project activity has helped to improve the socio-economic environment of the local area.

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

The local public had raised questions regarding impact of windmills on rainfall & groundwater, their role in green house gas reduction & climate change, employment opportunities, etc.

The representatives of Loyal Textile Mills explained about the project and replied to the questions raised by the stakeholders. 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

Project Participant:

Organization:	Loyal Textile Mills Ltd
Street/P.O.Box:	No. 21/4, Mill Street
Building:	
City:	Kovilpatti
State/Region:	Tamil Nadu
Postfix/ZIP:	628501
Country:	India
Telephone:	+91 4632 220001-5
FAX:	
E-Mail:	CTM@loyaltextiles.com
URL:	
Represented by:	
Title:	Vice President (Operations)
Salutation:	Mr.
Last Name:	Kannan
Middle Name:	
First Name:	Raju
Department:	Finance
Mobile:	+91 98403 52168
Direct FAX:	+91 4632 221353
Direct tel:	
Personal E-Mail:	aarthikannan@hotmail.com

Annex 2

INFORMATION REGARDING PUBLIC FUNDING

No public funding of any kind is applicable for the project activity

Annex 3

BASELINE INFORMATION
Please refer to Section B. 4

Annex 4

MONITORING INFORMATION
Please refer to Section B.7.2

- - - - -

Appendix A

WEG Details

Site.No.	VILLAGE	WEG	MODEL	COMMISSIONING DATE	HTSC No.	Location No.
1	Pattakuruchi	NEG MICON	NM48 / 750	25/03/2004	723	316/3
2	Pattakuruchi	NEG MICON	NM48 / 750	25/03/2004	724	317/1
3	Pulliyur	NEG MICON	NM48 / 750	30/03/2004	774	388
4	Pulliyur	NEG MICON	NM48 / 750	30/03/2004	775	391
5	Ayakudi	NEG MICON	NM48 / 750	21/09/2004	921	74
6	Ayakudi	NEG MICON	NM48 / 750	21/09/2004	922	80
7	Panagudi	ENERCON	E40 / 600	20/08/2004	872	392/2
8	Dhanakarkulam	ENERCON	E40 / 600	29/09/2004	959	1013/2
9	Dhanakarkulam	ENERCON	E40 / 600	29/09/2004	960	1015/4B
10	Panagudi	ENERCON	E40 / 600	20/08/2004	873	383
11	Melillandaikulam	SUZLON	S64 / 1250	22/03/2006	1646	209/1
12	Veerakeralampudur	SUZLON	S66 /1250	17/03/2007	2197	307/3
13	Veerakeralampudur	SUZLON.	S66 /1250	17/03/2007	2198	693/1
14	Kasturirengapuram	SUZLON	S82 / 1500	22/05/2007	2356	R224
15	Kasturirengapuram	SUZLON	S82 / 1500	31/08/2007	2393	434/3B(part)

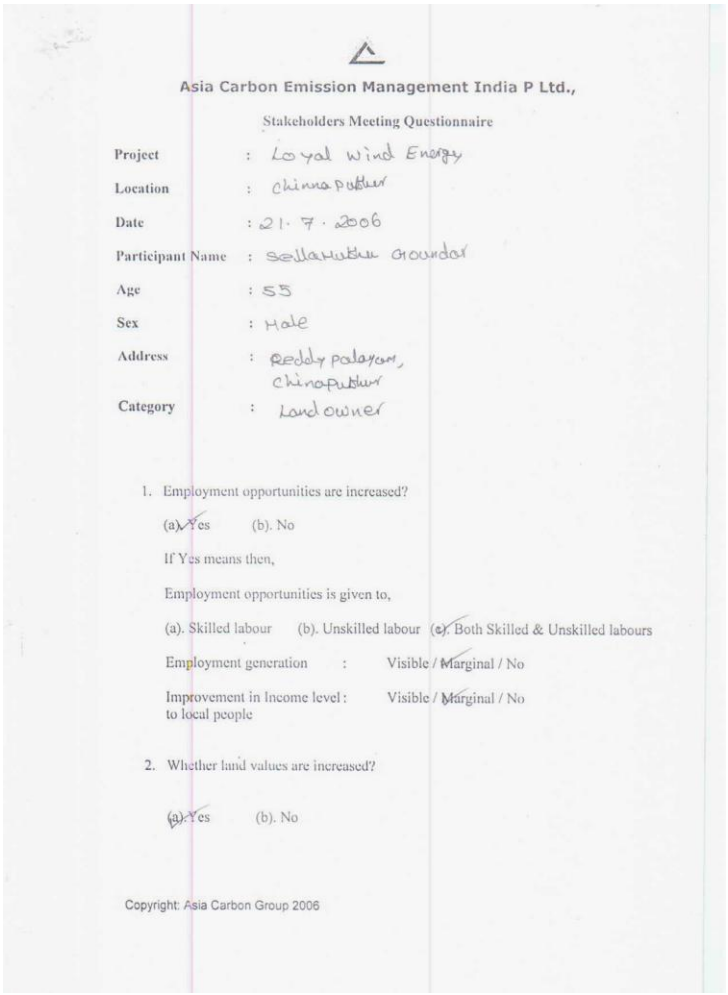
Appendix B
Summary of Stakeholder Comments

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.	P. Velusamy	Public	YBMM	S	YV	Y	N	Y	YMMVN
2.	P. Sakthivel	Public	YBMM	S	YV	Y	N	Y	YMMVN
3.	B. N. Palaniswamy	Public	YBMM	S	YV	Y	N	Y	YMMVN
4.	S. Loganathan	Public	YBMM	Y	YV	Y	N	Y	YMMVN
5.	P. Somasundaram	Public	YBMM	Y	YV	Y	N	E	E
6.	S. Shanmugam	Public	YBMM	Y	YV	Y	N	Y	YMMVN
7.	C. Neelaimuthu	Public	YBMM	Y	YV	Y	N	Y	YMMVN
8.	B. Velusamy	Public	YBMM	Y	YM	Y	N	Y	YMMVN
9.	S. Sakthipadmavathi	Panchayat President	YBMM	Y	YV	Y	N	Y	YMMVN
10.	P. Ganeshkumar	Public	YBMM	Y	YV	Y	N	Y	YMVVN
11.	K. Kamaraj	Operator	YBVV	Y	YVMM	Y	N	Y	YMVMV
12.	S. Rajasekar	Operator	YBVV	Y	YVMN	Y	N	Y	YMMNN
13.	T. Rajarajan	Operator	YSVV	Y	YVVV	Y	N	Y	YVVVN
14.	D. Nagaraj	Operator	YBMM	Y	YVMN	Y	N	Y	E

15.	Sellamuthu Goundar	Land owner	YBMM	Y	YV	Y	N	Y	YVVVN
16.	Ramasamy Goundar	Land owner	YBMM	Y	YV	Y	N	Y	YMVVN
17.	Thirumalaisamy Goundar	Land owner	YBMM	Y	YV	Y	N	Y	YVVVN
18.	R. Eswaran	Public	YBMV	Y	YV	Y	N	E	YVVVN
19.	S. Palanisamy	Public	YBMV	Y	YV	Y	N	Y	YVVVN
20.	T. Dhandapani	Public	YBVV	Y	YV	Y	N	Y	YVVVN
21.	P. Karuppan	Public	YBVV	Y	YV	Y	N	Y	YVVVN
22.	R. Renganayagam	Public	YBVV	Y	YV	Y	N	Y	YVVVN
23.	P. Hanuman Kumar	Operator	YBMV	Y	YV	Y	N	Y	YMVVN
24.	V. Devaraj	Operator	YBMM	Y	YV	Y	N	Y	YMMVN
25.	M. Ravi	Operator	YBMM	Y	YV	Y	N	Y	YVMVN
26.	G. Navaneetham	Operator	YBMM	Y	YV	Y	N	Y	YVMMN
27.	M. Ramesh Kumar	Operator	YBMM	Y	YV	Y	N	Y	YVMVN

Y = Yes, N = No, B = Both Skilled & Unskilled Labours, V = Visible, M = Marginal, S = Slightly increased. MM = (Please refer to Appendix C)

Appendix C: Format Questionnaire for Stakeholder Meeting



Asia Carbon Emission Management India P Ltd.,

Stakeholders Meeting Questionnaire

Project : Loyal Wind Energy

Location : Chinnapuliur

Date : 21.7.2006

Participant Name : Sellamuthu Goundar

Age : 55

Sex : Male

Address : Reddy palayam, Chinapuliur

Category : Land owner

1. Employment opportunities are increased?

(a). Yes (b). No

If Yes means then,

Employment opportunities is given to,

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

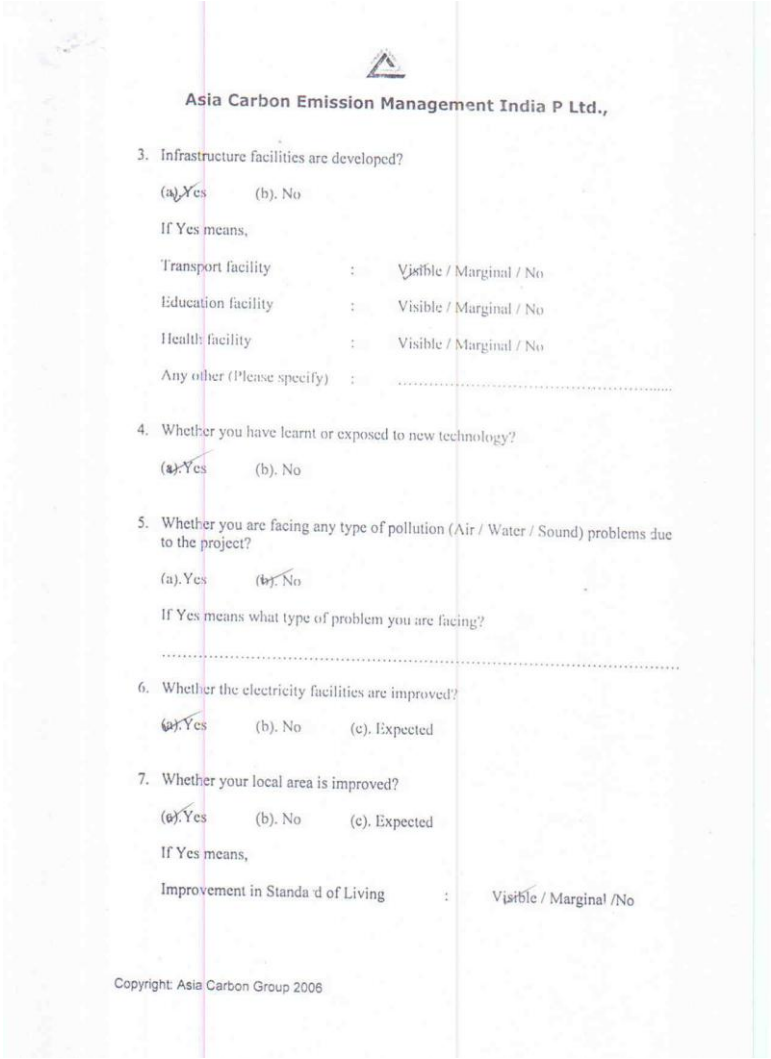
Employment generation : Visible / Marginal / No

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

2. Whether land values are increased?

(a). Yes (b). No

Copyright: Asia Carbon Group 2006



Asia Carbon Emission Management India P Ltd.,

3. Infrastructure facilities are developed?

(a). Yes (b). No

If Yes means,

Transport facility : Visible / Marginal / No

Education facility : Visible / Marginal / No

Health facility : Visible / Marginal / No

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

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

(a). Yes (b). No

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

(a). Yes (b). No

If Yes means what type of problem you are facing?

.....

6. Whether the electricity facilities are improved?

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

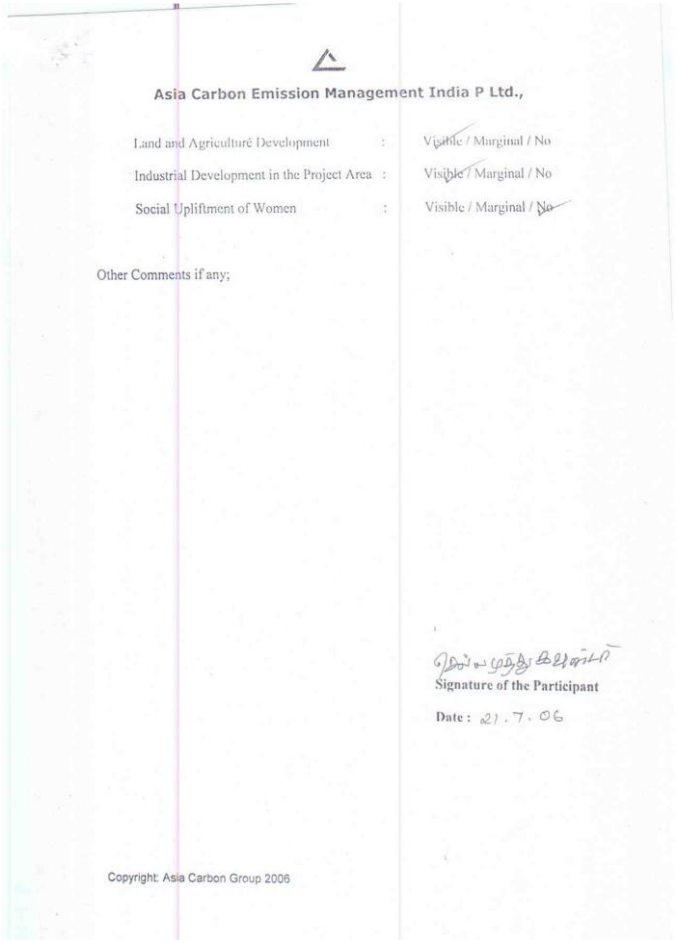
7. Whether your local area is improved?

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

If Yes means,

Improvement in Standa d of Living : Visible / Marginal /No

Copyright: Asia Carbon Group 2006



Asia Carbon Emission Management India P Ltd.,

Land and Agriculture Development : Visible / Marginal / No

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

Social Upliftment of Women : Visible / Marginal / No

Other Comments if any;

Signature of the Participant

Date : 21.7.06

Copyright: Asia Carbon Group 2006