



Voluntary Carbon Standard
Project Description

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1 Description of the Project:

1.1 Project title

Bundled Wind Power Project in Tamilnadu, India, co-ordinated by Tamilnadu Spinning Mills Association (TASMA V1A)

Version : 02

Date : 15/03/2010

1.2 Type/Category of the project

As per the Voluntary Carbon Standard (VCS-2007.1), the Project falls under UNFCCC Clean Development Mechanism.

As per applied approved consolidated methodology, ACM0002, Version 10, the project type and category is as below:

Project Type : Renewable Energy Project

Category : “Grid connected electricity generation from Renewable sources”

The project activity is a grouped project, consisting of 84 Wind Turbine Generators (WTGs) installed in different passes (Aralvaimozhi, Senkottah, Palghat and Theni passes) located in the State of Tamilnadu, India. Since, the PP has chosen multiple financial indicators to prove the additionality, this grouped project is further sub-categorized as follows for better understanding.

1. Sub-Project-1 → (16 WTGs; 6.75 MW)
2. Sub-Project-2 → (06 WTGs; 5.15 MW)
3. Sub-Project-3 → (62 WTGs; 36.2 MW)
- Total → (82 WTGs; 48.1MW)

1.3 Estimated amount of emission reductions over the crediting period including project size:

This project activity falls under ‘projects’ group and involves 48.1 MW wind energy generation which reduces approximately 837722 tCO₂e per 10 years. The generated power from this project activity is supplied to the southern regional grid of India, dominated by the fossil fuel based power plants.

Table-1: Estimated amount of emission reductions over crediting period

Years	Annual estimation reductions in tonnes of CO ₂ e
Year 1	8848
Year 2	59999
Year 3	93197
Year 4	93197
Year 5	93197
Year 6	93197
Year 7	93197

Year 8	93197
Year 9	93197
Year 10	93197
Year 11	23299
Total estimated reductions in tonnes of CO₂ e	837722
Total No of crediting years	10
Annual average over the crediting period of estimated reductions (tonnes of CO₂e)	83772.2

Note: Year 1 includes 2nd April 2008 to 31st December 2008

Year 2 to year 10 includes 1st January to 31st December of that year

Year 11 includes 1st January 2018 to 1st April 2018. Hence total number of crediting period is therefore 10 years only. The credit starts from 2nd April 2008 to 1st April, 2018.

1.4 A brief description of the project:

Purpose of the project activity: The project activity is a grouped Wind power project in Tamilnadu, India, co-ordinated by Tamilnadu Spinning Mills Association (referred as TASMA-V1 (A)). The intent of the Project Activity is to reduce GHG emission and promote sustainable development by use of renewable energy (Wind) for generation of power by bringing together a number of investors with small power requirements to invest into wind turbines. In the absence of the project activity, the equivalent amount of electricity would have been generated by the power plants connected with the southern grid which is predominantly based on fossil fuel.

Project Scenario: The project activity involves the installation of WTGs which generates approximately 886.339 GWh of Power over the period of 10 years. The Project activity thus reduces the anthropogenic emissions of greenhouse gases (GHGs) in to the atmosphere associated with the equivalent amount of electricity generation from renewable and cleaner energy source i.e. Wind. The electricity thus generated is already being supplied to the Southern regional grid. All the 84 WTGs involved in this project have commissioned and connected with the southern regional grid. The electricity thus generated is being used in one of the following manners:

1. Export the entire energy to the southern grid
(Or)
2. Wheel the required energy for captive consumption and banking the surplus energy or exporting the surplus energy to the grid.

The baseline scenario of the project activity would be the same as that of the pre-project scenario i.e. drawing power from the grid connected fossil fuel intensive power plants as per the ACM0002 methodology.

Contribution of the project activity to sustainable development:

Ministry of Environment and Forests, Government of India has suggested that social well being, economic well being, environmental well being and technological well being are the four indicators for sustainable development in its host country approval eligibility criteria for Clean Development Mechanism (CDM) projects¹. This criteria can also be adopted for VCS.

The project activity contributes to sustainable development in the following manner.

Social well-being:

- Improves electricity availability in the region and reduces electricity deficit situation in Tamilnadu;
- Contribution towards the policy objectives of Government of India and Government of Tamilnadu of incremental capacity from renewable sources;
- The Project activity has created employment opportunities for the local people during the erection and commissioning of the WTG;
- Project activity promotes infrastructural development like approach roads in the areas where the Project activity is located.

Environmental well being:

- CO₂ abatement through use of renewable energy.
- The project activity does not lead to any emissions like (SO_x, NO_x, Suspended Particulate Matters (SPM), etc). Thus the project activity would displace an equivalent quantum of electricity generated by the fossil fuel dominated grid-mix, thus resulting in reduction of the corresponding local air pollutants (NO_x, SO₂, Suspended Particulate Matters (SPM), etc) and environmental impacts caused by usage of fossil fuels for electricity generation.
- Use of renewable energy source (wind energy) for energy generation helps in conservation of natural resources like coal and petroleum fuels.

Economic well being:

- The project activity results in generation of additional employment opportunities directly and indirectly which helps improving the standard of living of the people in and around the project activity location.
- VCS provides financial incentives, which encourage channeling more investment into cleaner energy projects and also result in improved returns to the project stakeholders.
- It also promotes industrial growth by catering to the energy needs arising out of the supply-demand gap of electricity.

¹ http://cdmindia.nic.in/host_approval_criteria.htm

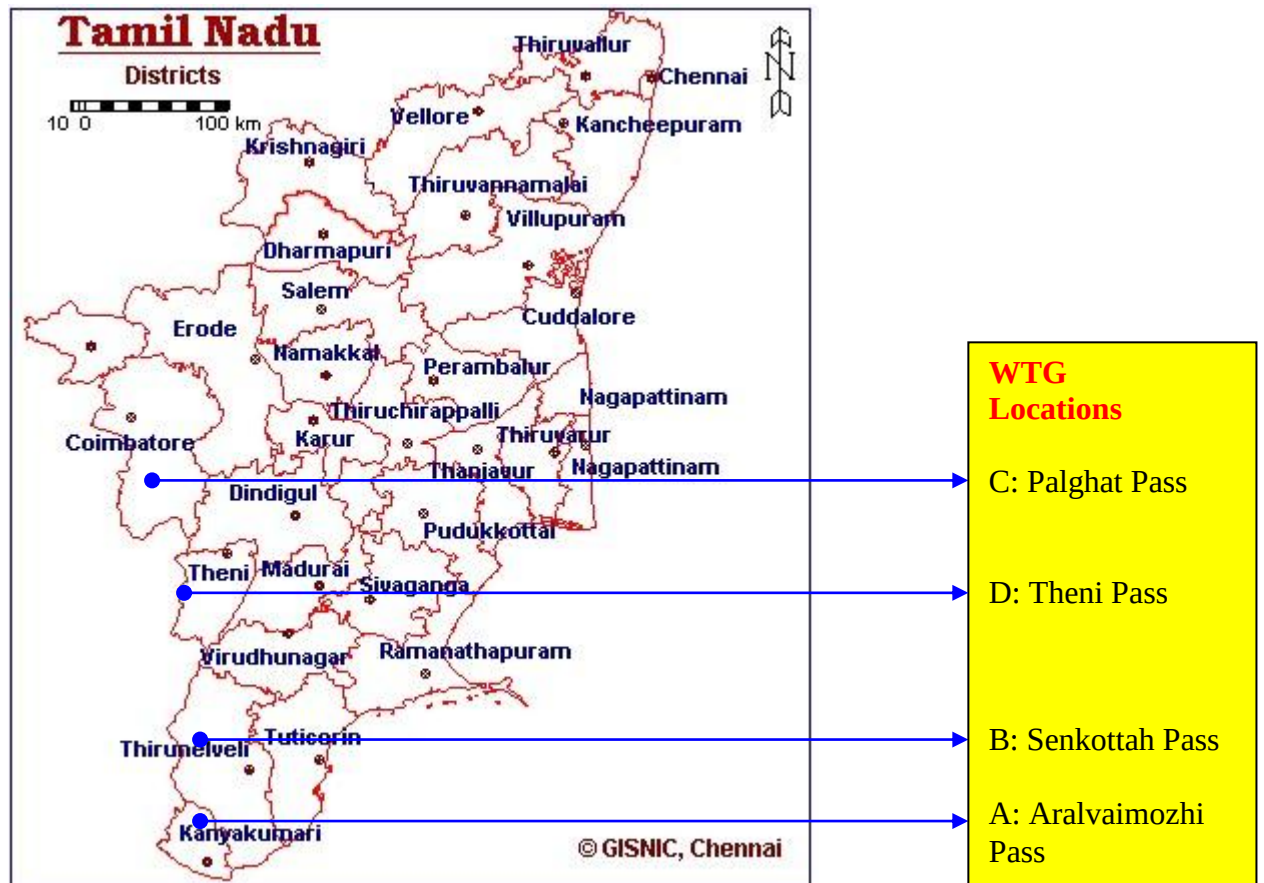
- Infrastructural development conceive from implementation of project activity shall lead to the economic development of the local people.

Technological well being:

- The technology leads to utilization of environmentally safe and sound technologies in power sector. The project demonstrates harnessing only wind power potential in the region and doesn't consume any depleting resources like coal and other fossil fuel resources. Hence the project technology contributes to the national energy and ecological security
- The project encourages other promoters to adopt similar technology in the relevant sector and hence the project leads to technological well being.
- Increased investment in wind energy projects will further push R&D efforts by technology providers to develop more efficient and better machinery in future.

1.5 Project location including geographic and physical information allowing the unique identification and delineation of the specific extent of the project:

The map below shows the geographical location of the project sites. All these sites are identified as potential locations for the wind electricity generation by the Ministry of New and Renewable Energy (MNRE), Govt. of India. The details of the individual WTGs under the project activity like Capacity, unique High Tension Service Connection (HTSC) number and Global Positioning System are presented in Appendix- 1 at the end of VCS PD.



1.6 Duration of the project activity/crediting period:

The starting date of the project activity is 02nd April 2008. (Based on the earliest commissioning date of the Wind Mills in the group)

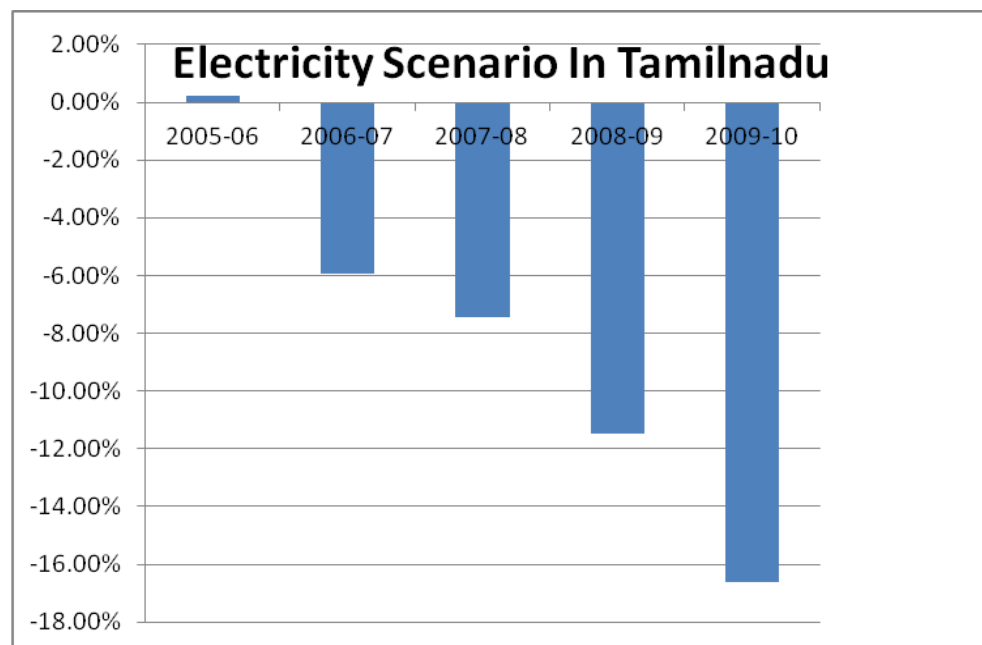
The crediting period starts from 02/04/2008

The starting date of credit period is considered from 2nd April 2008. The chosen crediting period is 10 years (from 2nd April 2008 to 1st April 2018).

1.7 Conditions prior to project initiation:

As per the below statistics & chart representation, Tamilnadu has constantly been plagued with a demand supply gap in the Power sector for the past five years. Such a gap is a major hindrance to the growth of a developing economy like India.

S.NO	YEAR	INSTALLED CAPACITY (In MW)	AVERAGE SUPPLY (In MW)	PEAK DEMAND (In MW)	SHORTFALL (In %)
1	2005-06	10031	8225	8209	0.20%
2	2006-07	10098	8280	8803	-5.94%
3	2007-08	10122	8300	8969	-7.46%
4	2008-09	10214	8375	9459	-11.45%
5	2009-10	10214	8375	10046	-16.63%



In spite of significant growth in electricity generation over the years, the shortage of power continues to exist in Tamilnadu primarily on account of growth in demand for power, outstripping the growth in generation and generating capacity addition. Even

now, Tamilnadu is facing an acute power shortage of around 3000 – 4000 MW² every day.

Hence, in the absence of the project activity, equal amount of electricity would have been generated from the operation of existing power plants connected to Southern grid which are predominantly fossil fuel based or through future capacity additions to the grid.

1.8 A description of how the project will achieve GHG emission reductions and/or removal enhancements:

The project activity generates electricity, using renewable source of energy (wind) which is a clean source of electricity generation. In the absence of the project, the equivalent amount of energy would have been drawn from the grid which is predominantly fossil fuel based generation. Hence, the project displaces the fossil fuel based generation. Thus the project activity achieves GHG emission reduction by employing a cleaner technology to generate electricity.

1.9 Project technologies, products, services and the expected level of activity:

Technology:

Wind energy generation is a clean technology for production of electricity, with no emission of Green House Gases.

The project activity has employed Horizontal Axis WTGs of different capacities. All the WTGs deployed in the project activity are from well-known international manufacturers. All these machines are type tested and approved by the Ministry of New and Renewable Energy (MNRE), Government of India.

The Technical Components of WTGs sub-project wise are as follows:

S.No	Make	Capacity (In KW)	Technical Parameters				References
			Model	Hub Height (In Meters)	Rotor Dia (In Meter)	Gear Type	
1	VESTAS RRB	225	V-27	50	27	With Gear	Purchase Order
2	PIONEER WINCON	250	P 250/29	50	29	With Gear	Purchase Order
3	CWEL		C-2920/250	50	29.2	With Gear	Purchase Order
4	ENERCON	800	E-53	72-74	52.9	Gearless	Purchase Order
5	SUZLON	1250	S64	65	64	With Gear	Purchase Order
			S66	74	66		
		600	S52	75	52		
		1500	S82	78.5	82		
6	RRB ENERGY LTD.,	600	PS-600	50	47	With Gear	Purchase Order
				65	47	With Gear	Purchase Order
7	REGEN	1500	Vensys 70	85	70	With Gear	Purchase Order

² <http://www.tn.gov.in/policynotes/pdf/energy.pdf>

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	POWERTECH PVT. LTD.,		Vensys 77	85	77	With Gear	Purchase Order
8	GAMESA WIND TURBINES PVT. LTD.,	850	G52	65	52	With Gear	Purchase Order
			G58	65	58		
9	SOUTHERN WIND FARMS LTD.,	225	GWL225	29.5	45	With Gear	Purchase Order
10	Siva Wind turbines	250	SIVA 250/50	30	50	With Gear	Purchase Order
11	Vestas Wind technologies	1650	V82	78	82	With Gear	Purchase Order

The project activity involves the installation of 84 WTGs with the following capacity distributions.

Table: 1

Capacity Wise Details			
SL. NO	CAPACITY (KW)	NO.OF MACHINES	TOTAL CAPACITY (MW)
1	225	8	1.800
2	250	23	5.750
3	600	37	22.200
4	800	6	4.800
5	1250	7	8.750
6	1500	1	1.500
7	1650	2	3.300
	TOTAL	84	48.100

The sub projects covered by this project activity involves the following makes of WTGs

Table: 2

MAKE WISE DETAILS				
SL. NO	MAKE	CAPACITY (KW)	NO.OF MACHINES	TOTAL CAPACITY (MW)
1	Southern Wind Farms Ltd.,	225	2	0.450
2	VESTAS RRB	225	6	1.350
3	Chiranjeevi Wind Energy Ltd.,	250	11	2.750
4	PIONEER WINCON	250	12	3.000
5	SUZLON	600	3	1.800
6	VESTAS RRB	600	34	20.400

7	ENERCON	800	6	4.800
8	SUZLON	1250	7	8.750
9	SUZLON	1500	1	1.500
10	VESTAS RRB	1650	2	3.300
	TOTAL		84	48.100

The wind turbines have an average lifetime of 20 years.

1.10 Compliance with relevant local laws and regulations related to the project:

The wind power project does not require compliance of any local laws and regulations. However, the NOC has to be obtained from TNEB. EPA/EWA has to be executed with TNEB and all these requirements have been complied with.

Table 6: Relevant applicable laws & regulations and Compliance status of the project activity

Regulations	Compliance status
NOC from TNEB	Complied
Energy Purchase Agreement with TNEB	Complied
Energy Wheeling Agreement with TNEB	Complied

The project proponent has conducted discussions with members of the local population. The local population welcomes the project due to various benefits such as employment, development of infrastructure in the area and improvement in their standards of living.

1.11 Identification of risks that may substantially affect the project's GHG emission reductions or removal enhancements:

The risks that may substantially affect the project's GHG emission reductions are

- Wind availability
- Grid availability
- Machine availability (repair & maintenance)

1.12 Demonstration to confirm that the project was not implemented to create GHG emissions primarily for the purpose of its subsequent removal or destruction.

The project activity primarily aims at displacement of grid electricity in which majority of power is generated from fossil fuels like coal. Therefore the aim of the project activity is to reduce GHG emissions instead of to create GHG emissions primarily for the purpose of its subsequent removal or destruction.

1.13 Demonstration that the project has not created another form of environmental credit (for example renewable energy certificates).

The project so far has not created any other form of environmental credit the same is confirmed in our declaration letter submitted to DOE. Also, the project is seeking for registration under CDM. However, the emission reductions out of the VCS programme

i.e. the VCUs will be considered only for the period during which no CDM/CER benefits are claimed.

1.14 Project rejected under other GHG programs (if applicable):

The project activity has never been rejected under any other GHG program. However, it may be applied for CDM registration in future also. VCU revenue will be considered only for the period during which no CDM/CER benefits are claimed.

1.15 Project proponents roles and responsibilities, including contact information of the project proponent, other project participants:

Table 7: Roles and Responsibilities of the Project Proponent

Project Proponent	Roles & Responsibilities
Tamilnadu Spinning Mills Association (TASMA)	- To ensure that the project activity is in compliance with all the local laws and regulations applicable to the project activity. - It is under the purview of their duty to ensure that parameters are monitored efficiently and the records are maintained in a proper manner, so that it eases the validation/verification procedures.

Table 8: Contact Information of the project proponents

Organization:	Tamilnadu Spinning Mills Association (TASMA)
Street/P.O.Box:	Door No.24, Thiruvalluvar Nagar
Building:	Spencer Compound
City:	Dindigul
State/Region:	Tamil Nadu
Postfix/ZIP:	624 003
Country:	India
Telephone:	+91 451 2433637 / +91 451 2428756 / +91 451 2431513
FAX:	+91 451 2421467
E-Mail:	dispa@rediffmail.com , tasma_dispa@yahoo.co.in
URL:	www.tasma.in
Represented by:	K.Venkatachalam
Title:	Chief Advisor
Salutation:	Mr.
Last Name:	Karuppaih
Middle Name:	
First Name:	Venkatachalam
Department:	All
Mobile:	+91 9842133318 / +91 94433 69858
Direct FAX:	+91 451 2421467
Direct tel:	+91 451 2431513
Personal-Mail:	kvmasterminds@gmail.com

1.16 Any information relevant for the eligibility of the project and quantification of emission reductions or removal enhancements, including legislative, technical, economic, sectoral, social, environmental, geographic, site-specific and temporal information.

The project qualifies all the requirements of GHG programme including CDM and VCS programme. The project does not perceive any risk related to quantification of emission reductions or removal enhancements, including legislative, technical, economic, sectoral, social, environmental or geographic.

The project participants have obtained all clearances from the necessary relevant Authorities. The project activities' contribution towards sustainable development in terms of society, environment and economy (both direct and indirect impacts) are stated below:

Economic Impacts:

- Creates employment opportunities in the project vicinity during erection, commissioning, operation & maintenance.
- Employment creation both temporary and permanent
- Improving the local infrastructure like roads
- Improved power supply

Social Impacts:

- Promotes self employment among the unemployed youth (eg. civil contractors, spare parts shops, hotels, restaurants, security personnel etc.,)
- Connectivity improvements in the local area through improved local transportation.

Environmental Impacts:

The environmental footprint of Wind Turbine Generators is minimal, since:

- Wind is one of the cleanest forms of renewable energy and power generation does not involve any fossil fuels.
- Produces electricity without GHG emissions.
- The materials used in the WTGs are non hazardous in nature.
- Impact on land, air and water is nil, since there are no discharges or Emissions during the project lifetime.

Technological Impacts:

There are continuous research and development on the geometry of the wind blades, height of towers, diameters of towers etc., which improves well for the technological well being in the development of wind energy to produce clean electricity.

Also, the generated electricity from the project activity is connected to the grid. The project activity improves the supply of electricity with clean, renewable wind power while contributing to the regional/local economic development. Wind energy plants

provide local distributed generation, and provide site-specific reliability and transmission and distribution benefits including:

- improved power quality;
- reactive power control;
- mitigation of transmission and distribution congestion,

All the above are the contributions of the project activity for the sustainable development.

1.17 List of commercially sensitive information (if applicable):

There is no commercially sensitive information which has been excluded from the public version of the VCS PD for this project activity.

2 VCS Methodology:

2.1 Title and reference of the VCS methodology applied to the project activity and explanation of methodology choices:

The project activity uses approved consolidated baseline and monitoring methodology: **ACM0002**.

Title: – “Consolidated Baseline Methodology for grid connected electricity generation from renewable sources”, Version 10 (EB 47), Sectoral scope: 1

The methodology ACM0002 refers to the latest approved versions of the following tools:

Table 11 Tools applicable to the project activity

Title	Tool for the demonstration and assessment of additionality
Version	5.2
Dated	26 th August 2008
Reference	http://cdm.unfccc.int/methodologies/PAmethodologies/approved.html

Title	Tool to calculate the emission factor for an electricity system
Version	2.0
Dated	16 th October 2009
Reference	http://cdm.unfccc.int/methodologies/PAmethodologies/approved.html

2.2 Justification of the choice of the methodology and why it is applicable to the project activity:

Approved methodology ACM0002 “Grid connected electricity generation from Renewable sources”, version 10, has been considered as the appropriate methodology for this project activity because,

Table 12: Justification for applicable methodology i.e. ACM0002.

S.No.	Applicability conditions of ACM0002	Project activity conditions
1	This methodology is applicable to grid-connected renewable power generation project activities that (a) install a new power plant at a site where no renewable power plant was operated prior to the implementation of the project activity (greenfield plant); (b) involve a capacity addition; (c) involve a retrofit of (an) existing plant(s); or (d) involve a replacement of (an) existing plant(s).	The project activity has installed wind turbine generators for generation of electricity that use renewable energy source (Greenfield)
2	The methodology is applicable under the following conditions: The project activity is the installation, capacity addition, retrofit or replacement of a power plant/unit of one of the following types: hydro power plant/unit (either with a run-of-river reservoir or an accumulation reservoir), wind power plant/unit, geothermal power plant/unit, solar power plant/unit, wave power plant/unit or tidal power plant/unit;	The project activity is wind power plant.
3	In the case of capacity additions, retrofits or replacements: the existing plant started commercial operation prior to the start of a minimum historical reference period of five years, used for the calculation of baseline emissions and defined in the baseline emission section, and no capacity expansion or retrofit of the plant has been undertaken between the start of this minimum historical reference period and the implementation of the project activity;	The project activity has installed wind turbine generators for generation of electricity that use renewable energy source (Greenfield)
4	In case of hydro power plants, one of the following conditions must apply: 1. The project activity is implemented in an existing reservoir, with no change in the volume of reservoir; or 2. The project activity is implemented in an existing reservoir, where the volume of reservoir is increased and the power density of the project activity, as per definitions given in the Project Emissions section, is greater than 4 W/m ² ; or 3. The project activity results in new reservoirs and the power density of the power plant, as per definitions given in the Project Emissions section, is greater than 4 W/m ² .	The project activity does not involve Hydro power project, hence not relevant to the project activity.
5	The methodology is not applicable to the following: • Project activities that involve switching from fossil fuels to renewable energy sources at the site of the project activity, since in this case the baseline may be the continued use of fossil fuels at the site; • Biomass fired power plants; • Hydro power plants that result in new reservoirs or in the increase in existing reservoirs where the power density of the power plant is less than 4 W/m ² .	The project activity is installation of wind turbine generators and hence not relevant to the project activity.
	In the case of retrofits, replacements, or capacity additions, this methodology is only applicable if the most	This is the greenfield project activity, hence not relevant to

plausible baseline scenario, as a result of the identification of baseline scenario, is “the continuation of the current situation, i.e. to use the power generation equipment that was already in use prior to the implementation of the project activity and undertaking business as usual maintenance”.	the project activity.
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2.3 Identifying GHG sources, sinks and reservoirs for the baseline scenario and for the project:

As per the methodology, the spatial extent of the project boundary includes the project power plant and all power plants connected physically to the electricity system that the VCS project power plant is connected to i.e. it includes all the power plants connected to the southern grid. The schematic diagram of the project boundary is shown below.

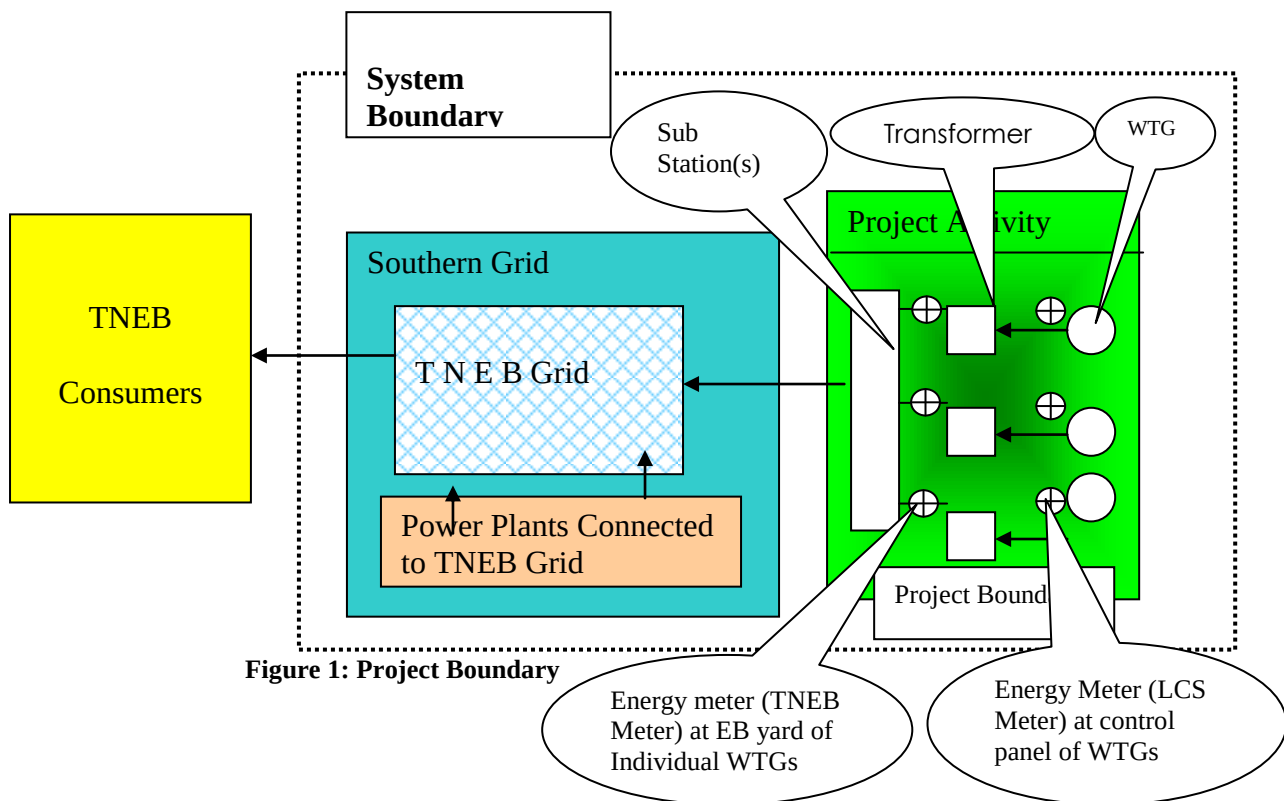


Figure 1: Project Boundary

Table: 13: Sources and Gases Included in the Project Boundary

Source		Gas	Included?	Justification/ explanation
Baseline	GHGs emissions from electricity generation by existing fuel mix in the southern grid that is displaced due to the project activity	CO ₂	Yes	Main emission source
		CH ₄	No	Minor emission source, excluded for simplification. This is conservative.
		N ₂ O	No	Minor emission source, excluded for simplification. This is conservative.
Project activity	Electricity generation by wind turbine generators	CO ₂	No	As per methodology ACM0002, wind energy project does not create any GHG emissions.
		CH ₄	No	The project activity is renewable energy project which does not create any emissions.
		N ₂ O	No	The project activity is renewable energy project which does not create any emissions.

2.4 Description of how the baseline scenario is identified and description of the identified baseline scenario:

Baseline scenario description

The Indian electricity system is broadly divided into two grids, the new Integrated Northern, Eastern, Western and North Eastern Grids (NEWNE) and the Southern Grid, as per the following Table No.14. Each grid covers several States. As the grids are interconnected, there is inter-state and inter- regional exchange. A small power exchange also takes place with the neighboring countries, Bhutan and Nepal.

Table 14: Geographical scope of the regional electricity grids³

Northern Eastern Western North Eastern				Southern
Haryana	Bihar	Gujarat	Assam	AP
HP	Jharkand	MP	Manipur	Karnataka
JK	Orissa	Chhattisgarh	Meghalaya	Kerala
Rajasthan	WB	Maharashtra	Nagaland	Tamil Nadu
UP	D.V.C	Goa	Tripura	Lakshadweep
Uttaranchal	A&N	D.N.H	Arunachal Pradesh	Pondicherry

³ CO₂ Baseline Database for the Indian Power Sector, User Guide, Version 3.0, December 2007

Chandigarh	Sikkim	Daman&Diu	Mizoram	
Delhi				

For the purpose of identifying the appropriate baseline scenario to any project, it is required that the “project electricity system is defined by the spatial extent of the power plants that can be dispatched without significant transmission constraints”. This implies that the grid emission factors are most appropriately calculated at the level of the regional grids. As the project activity is in Tamilnadu which is under the Southern region, the Southern regional grid is identified as the appropriate project electricity system and all the baseline calculations are made accordingly.

In the absence of the present project activity, the quantum of Electricity now delivered to the grid, would have otherwise been generated by the operation of the grid connected power plants of the southern grid, which would have reflected in the Operating Margin (OM). Further, the project activity would have prevented addition of new generation sources, which would have reflected in the Build Margin (BM) also. Thus the reflection in OM & BM will automatically reflect in the Combined Margin (CM) of the project activity as discussed in Section - 4.2 of the PD. Hence, it is clear that the present project activity considerably reduces GHG emissions to the applicable extent.

2.5 Description of how the emissions of GHG by source in baseline scenario are reduced below those that would have occurred in the absence of the project activity (assessment and demonstration of additionality):

The additionality is demonstrated based on the following test:

As per ‘**Tool for the demonstration and assessment of additionality**’, version 5.2, the step-wise approach to demonstrate and assess additionality is presented below:

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

Here the realistic and credible alternatives to the project activity(s) are defined through the following Sub-steps:

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

Following are the identified realistic and credible alternative scenarios for the project activity:

1. *Proposed project activity (installation and operation of WTGs) is not undertaken as a VCS project activity;*

The sub-bundle owners could have preceded the implementation of the project without VCS benefit. This is in compliance with all applicable legal and regulatory requirements and can be a part of the baseline. However, the Project activity is not feasible without VCU revenues as explained below in Step 2.

2. *Continuation of current situation*

The Sub-bundle owners would have continued without investment in Project activity with their usual business activities. The southern region grid would continue with the fossil fuel based power projects and this would result in

GHG emissions. Hence, the new capacity add-on from a fossil fuel based power plant is appropriate, realistic & credible baseline alternative for the project activity.

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

The list of alternatives described in sub step 1a is in compliance with all mandatory applicable legal and regulatory requirements. Hence the proposed project activity is not the only alternative that is in compliance with all mandatory applicable legal and regulatory requirements.

The project activity has crossed sub-step 1 of additionality demonstration, and hence this assessment has moved to the next step 2 investment analysis.

Step 2: Investment analysis

It is demonstrated in this step that the project activity is not economically or financially feasible, without the revenue from the sale of Verified Carbon Units (VCUs).

To conduct the above analysis, following Sub-steps have been followed:

Sub-step 2a: Determination of appropriate analysis method

As the project generates income other than the VCS benefits (revenues from the sale of electricity to the grid or electricity bill saved due to wheeling of power), Option I that is the Simple Cost Analysis cannot be applied in this case. Among the two options - Investment Comparison analysis (Option II) and Benchmark analysis (Option III), the benchmark analysis has been applied for investment analysis as the alternative to the project activity does not require any investment on behalf of the project proponent and is neither in the control of the project proponent.

Sub-step 2b: Option III. Apply Benchmark analysis

Selection of financial indicator:

The Internal rate of return (IRR) is one of the known financial indicators used by the bank, financial institutions and project developers for making investment decisions. The project promoter used benchmark analysis to compare the investment analysis. For benchmark analysis, the Project Proponent has chosen multiple financial indicators to assess the financial attractiveness of the project activity and hence the project activity has been categorized into three sub-project activities as tabulated below.

S.No	Sub-Project Name	Financial Indicator Used	Benchmark
1	Sub-Project 1	Equity IRR	Expected Cost of Equity
2	Sub-Project 2	Equity IRR	Expected Cost of Equity
3	Sub-Project 3	Equity IRR	Expected Cost of Equity

Choice of Benchmark value:

The approach of calculating benchmark for all the sub projects is same.

As per Para 12 of guidance on Assessment of Investment analysis, version 03, EB 51 annex 58, it states that “In cases where a benchmark approach is used the applied benchmark shall be appropriate to the type of IRR calculated. Local commercial lending rates or weighted average costs of capital (WACC) are appropriate benchmarks for a project IRR. Required/expected returns on equity are appropriate benchmarks for equity IRR. Benchmarks supplied by relevant national authorities are also appropriate if

the DOE can validate that they are applicable to the project activity and the type of IRR calculation presented.”

Equity being nothing but the return earned by the project, has to be compared with a benchmark to determine the adequacy of the return. PP has chosen Expected return of equity as the benchmark. Therefore, no other benchmark is more suitable than WACC in cases where project IRR is used to demonstrate the Additionality.

The sub-bundle participant has been taken their investment decision to install WTGs in FY 2007-08, hence the information on the various assumption parameters to evaluate the benchmark available to PP is of FY 2006-07 (for sub-project 1) & 2007-08 (for sub-project 2). Hence it would be consistent and conservative for all the assumption parameters. The parameters involved in the formulae for evaluating WACC are explained below in detail:

CoE – Cost of Equity:

The Capital Asset Pricing Model (CAPM) approach is a generally accepted methodology for determining the Cost of Equity. CAPM is based on the portfolio theory of finance and is expressed by the following formula⁴

$$\text{CoE} = r_f + \text{Equity Beta } (\beta) * [E(r_m) - r_f]$$

Where:

- r_f - is the risk-free rate of return
- $E(r_m)$ - the expected rate of return on a market portfolio
- Equity Beta (β) - coefficient reflecting the volatility (risk) of the stock relative to the market, which measures the systematic risk of the stock

The **Risk free rate (r_f)** has been taken from the long term government bond rates prevailing prior to the investment decision of the project activity. The investment decision of WTGs included in the bundle has been made in FY 2007-08 (for sub-project 1) & 2008-09 (for sub-project 2). Hence the govt. bond rates prevailing prior to investment decision i.e. during 2006-07 & 2007-08 has been considered. The weighted average yield of Government Securities during FY 2006-07 is 7.89%⁵ & FY 2007-08 is 8.12%⁶.

Market Risk Premium ($E(r_m) - r_f$),

The market risk premium, as measured and applied in practice is the premium above the risk free rate is the return that investors expect to earn on a portfolio of equities. Equity indices are indicator of expected market return. With a view to eliminating the unsystematic risk associated with the projects totally, index containing 500 companies has been taken to represent the market return. A period starting since 1999 to 2007 has been considered to remove the impact of short term volatility. Selection of BSE 500 represent a more robust and efficient face of the market. BSE-500 Index is a broad-based Index constituting 500 companies across 20 sectors listed at the Exchange, representing approximately 93% of the total market capitalization on BSE and covers all 20 major industries of the economy. The BSE - 500 indices is scientifically calculated and the 500 companies are selected based on market capitalization, liquidity and balanced industry representation. Thus, this is the largest quantum of data (500 companies) available among all the other indices and provides the most comprehensive view of the Indian Capital Market. As per Para 13 of Guidelines on

⁴ *Cost of Capital for Central Sector Utilities by Crisil Advisory Services*

⁵ http://rbidocs.rbi.org.in/rdocs/Publications/PDFs/121T_HB150909.pdf

⁶ http://rbidocs.rbi.org.in/rdocs/Publications/PDFs/121T_HB150909.pdf

assessment of investment analysis, Annex 58 of EB 51 meeting report, *“In the cases of projects which could be developed by an entity other than the project participant the **benchmark** should be based on parameters that are standard in the market. The DOE’s validation of the benchmark shall also include its opinion on whether a company-specific benchmark or a benchmark based on parameters that are standard in the market is suitable in the context of the underlying project activity”*.

Thus, the PP has used the equity index BSE 500, which is one of the standard and most appropriate indices in the market.

The market risk premium is calculated as the difference between the expected return on a market portfolio (also called market return) and the risk-free return.

The **expected rate of return on a market portfolio ($E(r_m)$)**

The expected rate of return is the CAGR (compound annual growth rate) of BSE 500 calculated in the following manner:

Expected Market return = $[(\text{index value at end} / \text{index value at beginning})^{(1 / \text{no. of years})}] - 1$

The Expected market return at the time of investment decision for each WTG with different investment decision time has been estimated and shown in financial excel sheets.

Equity Beta is the measure of the expected volatility of a particular stock relative to a well-diversified market portfolio. It indicates the sensitivity to market risk for the security. The beta of the stock or portfolio describes the relation of its returns with that of the financial market as a whole.

In order to estimate the cost of equity for any power generation company operating in India considering the specific characteristics of the project type and not linked to subjective profitability expectation or risk profile of the project promoter, beta values of power generating companies in India which is listed in the BSE 500 of stock exchange at the time of investment decision. The selected company has invested significantly in to the Wind power projects and also a mix of Public and private sector companies listed in BSE 500. Equity Beta values of selected companies of 5 years prior to investment decision have been sourced from Bloomberg⁷. The financial excel sheet gives equity beta value of power generating companies at the time of investment decision making:

For the realistic and conservative estimation of beta value, the average of five years of Beta value of five Power generating companies having diversified business portfolio listed in BSE 500 has been considered. The Lifetime of the project activity is 20 years and hence to evaluate realistic beta, the average of 5 years of beta value has been considered. The beta thus taken is appropriate as all the above mentioned companies have invested in power generation (including wind power) and are listed in the BSE 500 index. So, with respect to the decision making context and the project type, the beta considered is applicable.

The results are shown in the financial excel sheets.

The project participants have taken few assumptions for investment analyses as per the information available at the time of decision making along with related references which is presented below sub-project wise:

⁷ The screen shots from Bloomberg is submitted to DOE for Validation

The references of the aforementioned key assumption parameters are:

Parameters	Reference
Name of Company	Offer letter
No of WTGs	Offer letter
WTG Capacity (In KW)	Offer letter
Project Cost (In Millions)	Offers from respective WTG suppliers
Plant Load Factor (In %)	As per third Party engineering Company contracted by TASMA to evaluate the credible site specific PLF of each WTG in the bundle.
O&M Cost (In % on Capital Cost)	TNERC Order no 03, dated 15/05/2006 and TNERC Order no 01, dated 20/03/2009
Wheeling Charges (In % on Wheeled Energy)	TNERC Order no 03, dated 15/05/2006 and TNERC Order no 01, dated 20/03/2009
Banking Charges (In % on total energy banked)	TNERC Order no 03, dated 15/05/2006 and TNERC Order no 01, dated 20/03/2009
Insurance Charges (In % on capital cost)	TNERC Order no 03, dated 15/05/2006 and TNERC Order no 01, dated 20/03/2009
Loan Processing Charges (In % of loan amount)	IREDA investment guidelines
Tariff for sale to TNEB (INR/kWh)	TNERC Order no 03, dated 15/05/2006 and TNERC Order no 01, dated 20/03/2009
Revenue saving from electricity generation (INR/kWh)	TNERC Order no 03, dated 15/05/2006 and TNERC Order no 01, dated 20/03/2009
Equity (In %)	TNERC Order no 03, dated 15/05/2006 and TNERC Order no 01, dated 20/03/2009
Debt (In %)	TNERC Order no 03, dated 15/05/2006 and TNERC Order no 01, dated 20/03/2009
Interest Rate (In %)	SBI Prime Lending Rate at the time of investment decision of respective WTGs in the bundle
Repayment period (In Years)	TNERC Order no 03, dated 15/05/2006 and TNERC Order no 01, dated 20/03/2009

The calculated values of **Post tax Equity IRR (for sub-project 1, 2 and 3)** for 20 year cash flow without VCUs revenue are given below along with taken benchmark in each case of investment. The results of financial indicator and benchmark are shown in the financial excel sheet.

The above results illustrates that for all the WTGs in the sub-project activities, Equity IRR is below the benchmark and thus additional revenue from VCS is very much required for the project. Hence, the Project is additional.

Sensitivity analysis

Choice of parameter for variation:

To substantiate the robustness of the results obtained above, the sensitivity analysis has been conducted. As per Para 20 of “**Guidelines on the assessment of investment analysis**”, version 03, Annex 58 of EB 51 meeting report, the criteria for choosing the sensitivity analysis parameter is:

Parameters contributing $\pm 20\%$ of revenue:

For this bundled wind project activity, the only source of revenue is the electricity bill saved due to wheeling of power to PP’s manufacturing unit and tariff received from generation for

sale to EB. This revenue is dependent on the power tariff and power generation as presented below:

$$\begin{aligned}\text{Revenue} &= \text{power tariff} * \text{power generation} \\ &= \text{power tariff} * (\text{installed capacity} * \text{PLF})\end{aligned}$$

Since the probability of variation in PLF is more as it is dependent on many variables like grid availability, wind speed, breakdown/shutdowns etc., it has been chosen as the parameter for variation which can directly affect the revenue.

Parameters contributing $\pm 20\%$ of cost:

Parameters which can affect 20% of the total cost/revenue for this case are the investment cost and O&M cost.

Thus PLF, Power tariff, Project cost and O&M cost were the chosen parameters of variation for conducting sensitivity analysis.

Range of variation of chosen parameters:

As per Para 21 of Guidance on assessment of investment analysis, version 03, The sensitivity analysis was carried on project IRR varying the O&M Cost, Power tariff, Project cost and PLF by $\pm 10\%$ following the above mentioned guidelines.

The result of the sensitivity is presented sub-project wise in financial excel sheets

It is shown through the above analysis that even at the best PLF, Power tariff, low O&M Cost and low Project cost also, the Post tax Project & Equity IRR without VCS revenue for each WTG investment does not meet the benchmark value. Hence, the Project activity without VCS revenue is not a financially viable option and therefore it can be considered as additional.

Steps 2a, 2b, 2c are passed satisfactorily. Proceed to step 4

Step 4. Common practice analysis

As per **Tool for the demonstration and assessment of additionality, version 5.2**, following are the steps involved in common practice analysis:

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

- (1) *Provide an analysis of any other activities that are operational and that are similar to the proposed project activity. Projects are considered similar if they are in the same country/region and/or rely on a broadly similar technology, are of a similar scale, and take place in a comparable environment with respect to regulatory framework, investment climate, access to technology, access to financing, etc. Other CDM project activities (registered project activities and project activities which have been published on the UNFCCC website for global stakeholder consultation as part of the validation process) are not to be included in this analysis. Provide documented evidence and, where relevant, quantitative information. On the basis of that analysis, describe whether and to which extent similar activities have already diffused in the relevant region.*

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

- (2) *If similar activities are widely observed and commonly carried out, it calls into question the claim that the proposed project activity is financially unattractive (as contended in Step 2) or faces barriers (as contended in Step 3). Therefore, if similar activities are identified above, then it is necessary to demonstrate why the existence of these activities does not contradict the claim that the proposed project activity is financially/economically unattractive or subject to barriers. This can be done by comparing the proposed project activity to the other similar activities, and pointing out and explaining essential distinctions*

between them that explain why the similar activities enjoyed certain benefits that rendered it financially/economically attractive (e.g., subsidies or other financial flows) and which the proposed project activity cannot use or did not face the barriers to which the proposed project activity is subject. If necessary data/information of some similar projects are not accessible for PPs to conduct this analysis, such projects can be excluded from this analysis. In case similar projects are not accessible, the PDD should include justification about non-accessibility of data/information.

The project activity concerned is the bundling of 84 WTGs by TASMA and the generated wind power is used for meeting the captive needs or to export to the grid. To arrive at the scenario, (with respect to regulatory framework, investment climate, access to technology, access to financing, etc.) in which the project proponent took the investment decision, following analysis is presented to show the wind power development history in the state of Tamil Nadu.

The following table shows growth of the installation of WTG project in Tamil Nadu, till March 2008.

State	Up to March'2002	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08
Tamil Nadu	877.0	133.6	371.2	675.5	857.55	577.90	380.67

(Source: http://cwet.res.in/web/Docu/Year_Wise_Installed_Capacity_as_on_28_02_2011.pdf)

After the initial inception of the windmills in 1990-01, there was an increase in the total installed capacity in the years 1994-95 and 1995-96, later when it was realized that the windmills without any generation incentives was not viable there was a sudden decrease in the installation of the windmills. Subsequent to this, the scenario continued in the similar manner where very few projects came up. The windmills that were installed before the year 2001 were also in a different policy regime and investment climate.

Certain policy shifts of the government of Tamil Nadu took place during late 2001 and early 2002 which made the wind energy investment not so attractive. The following are the policy shifts that took place.

- The Tariff has changed from Rs. 2.25/kWh with 5% escalation each year to fixed Rs.2.70/ kWh by an order dated 27.09.2001 by the Tamil Nadu Electricity Board.
- The wheeling and Banking charges have increased from 2% to 5% by an order dated 27.09.2001 by the Tamil Nadu Electricity Board.

The above said arguments are depicted pictographically in the bar diagram below.

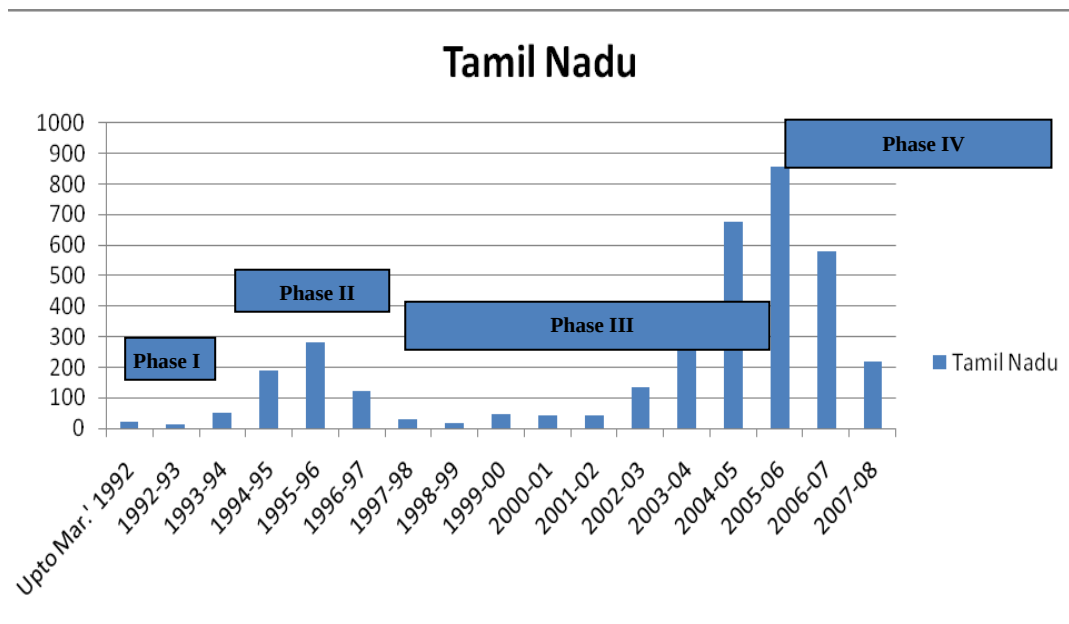


Figure 2 Graphical representation of year wise Installed Capacity in Tamilnadu and regime

Phases	Stages of development in Wind sector
Phase I	This is the starting phase of wind development. Most of the WTGs installed are of experimental nature and by the government agencies without the commercial motive.
Phase II	The wind energy sector picked up because of initial inertia considering that the wind energy generation and the revenues will be enough to sustain the business. But this was not the case as can be seen from the downfall of the installed capacities in the next phase.
Phase III	In this phase, the installation of the WTGs rapidly decreased because the wind machines did not generate revenues as claimed by the promoters and the government policies were favorable to the projects which are exporting to the grid and not to the captive power plants. Moreover in 2001 the wheeling charges increased from 2% to 5% for the captive consumers and the banking charges were subsequently increased in 2002 to 5% thereby making the investments in the wind for captive consumption less attractive.
Phase IV	This is the CDM/VCS regime and the windmill installations in this period rapidly increased considering the CDM/VCS will make the project viable.

Hence, the windmills with installed capacity more than 15 MW established after the year 2002-03 to the date of the investment decision of this bundle are in the same investment regime and came up only after considering the carbon revenues as demonstrated below.

The CDM project activity is a large scale project and hence an analysis of all private wind farm owners with an installed capacity of 15 MW or above, in the state of Tamil Nadu, under the Regime IV i.e. after 2002-03 till March 2008 has been considered and presented below.

Name of Owner ⁸	Capacity MW in the Regime IV ⁹	CDM or VCS ¹⁰	Web-links and Explanation
Madras Cement Ltd.	142.350	Yes	Installations under the 3 CDM PDDs titled 1) "41.6 MW grid connected electricity generation project by Madras Cements Limited in Tamil Nadu." http://cdm.unfccc.int/UserManagement/FileStorage/8VW717YLM7QAINAKXV3USR446DSWZX 2) 46.2 MW wind energy project in Tamilnadu, India. http://cdm.unfccc.int/UserManagement/FileStorage/Y6B79J5VNDMS80OLGQ4IXRTCAZFE2P 3) 74 MW wind energy project in Tamilnadu, India. http://cdm.unfccc.int/UserManagement/FileStorage/QKS35DUH7M1L86BOYX20TA9GJEWPCF
Simran wind power project	51.600	Yes	Two PDDs titled: 1) Grid connected wind energy project in Tamil Nadu by Simran Wind Project Private Ltd. http://cdm.unfccc.int/UserManagement/FileStorage/GEVSCPXKMHDY9FQ42ZNJI1RAU6BO85 2) 33.9 MW bundled wind power project in states of Karnataka and Tamil Nadu. This is a VCS project.
Super wind power project	36.000	Yes	PDD titled "Grid connected wind energy project in Tamil Nadu by Super Wind project private ltd" http://cdm.unfccc.int/UserManagement/FileStorage/WKRL8XZM9Q03VES6ICJF7YOG42B1TA
DLF Home developers	34.500	Yes	PDD titled "Wind Power based electricity generation project in India by DLF Home Developers Limited" http://cdm.unfccc.int/Projects/Validation/DB/34CAG54CUL49MILW9S0SKWCWU38SSX/view.html
Soundararaja Mills Ltd.	33.850	Yes	4 CDM project PDDs titled 1) 10.005 MW captive grid connected wind power project by the members of IWPA at Coimbatore. http://cdm.unfccc.int/UserManagement/FileStorage/3COOHDRDG8SZBFGC437328KXEIBKCV 2) 40.68 MW grid connected electricity generation project by Indian Wind Power Association at Tirunelveli in Tamil Nadu. http://cdm.unfccc.int/UserManagement/FileStorage/J9R5JA7N8U1SS5YVOAT77VR38US32P 3) Bundled Wind power project in Tamil Nadu, India, co-ordinated by Tamil Nadu Spinning

⁸ The data on private wind farm owners with greater than 15 MW installed capacity has been taken from <http://www.windpowerindia.com/statpriv.html>.

⁹ The capacity of installations under the Regime IV, i.e. commissioned year 2002 onwards and before the project start date, in the state of Tamil Nadu, has been sourced from the Directory of Indian Wind power 2009

¹⁰ The CDM status of the projects has been taken from the CDM pipeline in <http://cdm.unfccc.int>, MoEF site and other publicly available sources.

			Mills Association (TASMA-II) http://cdm.unfccc.int/UserManagement/FileStorage/6QDL0CJW95NYIX8U14H3STGKAF2BEV 4) 21.00 MW grid connected electricity generation project by Indian Wind Power Association at Tirunelveli in Tamil Nadu. http://cdm.unfccc.int/UserManagement/FileStorage/UMHY7TQXXEBNNYBUIC017UDWWZXTCI
KPR Mill Pvt. Ltd.	32.250	Yes	Two CDM PDDs titled: 1) 19.27 MW Grid connected wind electricity generation project by KPR Mills in Tamil Nadu. http://cdm.unfccc.int/Projects/Validation/DB/YKCHA6D5FCSEO3JMVP8UXJWRMDBCH8/view.html 2) 19.8 MW grid connected Wind farm project by KPR Mill Private Limited, Tamil Nadu, India http://cdm.unfccc.int/Projects/Validation/DB/AB7TO0OZGUKE6HYPB4TWCPS5536AGVF/view.html
Grace Infrastructure (P) Ltd.	31.000	Yes	Installations under CDM PDD titled "31 MW Wind energy project in, India by Grace Infrastructure Pvt Ltd" http://cdm.unfccc.int/filestorage/B6Z2OG01EJM Q53AXWTFPCPDVRUH4IS7/PDD%20Grace.pdf?t=TnJ8MTI5Nzg0MTIwMi43Nw== 2DjDa81uVvNdsAWjqzYYKMKLDv4=
Vishal Export Overseas Ltd	29.275	Yes	All the installations were envisaged to be CDM projects as reported publicly in the company's annual report Page 18 http://vishalexports.co.in/annual%20reports/Annual%20Report-2005-06.pdf
Shanmugavel Group	25.500	Yes	CDM PDD titled "Bundled Wind power project in Tamilnadu, India co-ordinated by the TamilNadu Spinning Mills Association (TASMA)" http://cdm.unfccc.int/UserManagement/FileStorage/AE2042RXII12SBXNF29XDKVT2BCEWG
Best & Co.	25.000	Yes	CDM PDD titled "Bundled Wind power project in Tamil Nadu, India, co-ordinated by Tamil Nadu Spinning Mills Association (TASMA-II)" http://cdm.unfccc.int/UserManagement/FileStorage/6QDL0CJW95NYIX8U14H3STGKAF2BEV
Bannari Amman Spinning Mills Ltd.	23.400	Yes	Two CDM PDDs titled 1) "STL Wind Power Project" http://www.dnv.com/focus/climate_change/upload/version%20%20-%20pdd%20%20sept%2005.pdf 2) Eco Friendly Electricity Export to Grid http://cdm.unfccc.int/UserManagement/FileStorage/5YH92G186JW12SR91FFB9RC302T651 3) Bannari Amman Spinning Mills Wind Power Project managed by Enercon (India) Ltd. https://cdm.unfccc.int/Projects/Validation/DB/FYPAQ52NJB35JZRDUIC0GVD36E6S33/view.html

Lakshmi Machine Works Ltd	23.000	Yes	CDM PDD titled "27.95 MW wind energy project in Coimbatore district in Tamilnadu, India." http://cdm.unfccc.int/UserManagement/FileStorage/7LXZLFECVXR5YBOJ5TH8J6XNHIPOCN
Premier Fine Yarns Pvt. Ltd.	22.850	Yes	Two CDM PDD titled "Grid connected renewable electricity generation project by M/s. Premier Mills Pvt Ltd in Tamilnadu, India" http://cdm.unfccc.int/Projects/Validation/DB/J0J2B6K3O92EEUAFD3OGYLE03TNZ7I/view.html 2) "Bundled wind power project in Tamil Nadu managed by Enercon India Limited-II" http://cdmindia.nic.in/cdmindia/projects/PCN_785_07.pdf
Sapthagiri Distilleries	21.000	Yes	CDM project titled "53.75 MW Bundled wind Power project in Tamil Nadu and Karnataka by KBD Group, India" http://cdm.unfccc.int/UserManagement/FileStorage/QN0BCHDRZ8PI17S2JEMLVW9TYFGO65
TCS Textiles Ltd.	20.750	Yes	CDM PDD titled 1) "Bundled Wind power project in Tamilnadu, India co-ordinated by the TamilNadu Spinning Mills Association (TASMA)" http://cdm.unfccc.int/UserManagement/FileStorage/AE2042RXII12SBXNF29XDKVT2BCEWG 2) "19.80 MW bundled wind energy project in Tirunelveli and Coimbatore districts in Tamilnadu, India" http://cdm.unfccc.int/UserManagement/FileStorage/F6UP274DD1DCT3XJTKRJCJZDZNPZY7
Loyal Textile Mills Ltd	20.450	Yes	CDM PDD titled "22.25 MW Captive Wind Power Project in Tamil Nadu" http://cdm.unfccc.int/UserManagement/FileStorage/TPAONMX73CHPZ69AQ5CSP9BI1UKU99
Ashok Leyland Fin. Ltd	20.025	Yes	CDM PDD titled "56.25 MW bundled wind energy project in Tirunelveli and Coimbatore districts in Tamilnadu, India." http://cdm.unfccc.int/Projects/Validation/DB/37X42BG16GG63VK5L84D6WZ0UM8YGG/view.html
Arvind A Traders	19.350	Yes	Two CDM PDDs titled: 1) "16.45 MW bundled grid connected renewable energy project in Tamil Nadu, India" http://www.tuvdotcom.com/pi/web/PinDownload.xml?strUrlId=3&strUserId=&TUVdotCOMID=9105043814&strType=UserManualDownload&strDocumentID=19694&strTypeID=8&menuOption=process&isManualNeeded=true&isPictureNeeded=false&isRatingNeeded=false&isSecureNeeded=false&isIDNeeded=false&isTypeNeeded=true&isHolderNeeded=true 2) 37.6 MW Bundled Wind Power Project in Nagercoil, Tamilnadu http://www.dnv.com/focus/climate_change/Upload/Nagercoil%20PDD.pdf
Muthoot Fincorp Ltd.	18.750	Yes	Three CDM PDDs titled: 1) Wind based bundled renewable energy project, Tamilnadu, India. http://www.dnv.com/certification/climatechange/upload/pdd%20-%2020.15%20mw.pdf 2) Emissions free electricity generation using

			wind energy http://cdm.unfccc.int/UserManagement/FileStorage/QIOVC8LXWS06YB91FZ5R3E4KTJGUPA 3) 23.75MW grid connected electricity generation project at Tirunelveli in Tamil Nadu. http://www.sgsqualitynetwork.com/tradeassurance/ccp/projects/512/PDD%2023.75MW%20grid%20connected%20electricity%20generation%20project%20at%20Tirunelveli%20in%20Tamil%20Nadu..pdf
CPCL	17.600	Yes	CDM PDD titled "17.6 MW captive grid connected electricity generation from wind energy project by Chennai Petroleum Corporation Limited." http://cdm.unfccc.int/Projects/DB/BVQI1257245548.54/view
Suzlon Infrastructure Limited	17.500	Yes	Three CDM PDDs titled: 1) "16.25 MW grid connected electricity generation project at Coimbatore in Tamil Nadu" http://cdm.unfccc.int/UserManagement/FileStorage/FM6BIMO4FTLNNUKVLSTLYJLM14NRCM 2) "38.75 MW grid connected electricity generation project at Tirunelveli in Tamil Nadu" http://cdm.unfccc.int/UserManagement/FileStorage/Y5UO445ZIR7VMGE34PQUDGRTHCKRSB 3) "23.75MW grid connected electricity generation project at Tirunelveli in Tamil Nadu" http://www.sgsqualitynetwork.com/tradeassurance/ccp/projects/512/PDD%2023.75MW%20grid%20connected%20electricity%20generation%20project%20at%20Tirunelveli%20in%20Tamil%20Nadu..pdf
Premier Spinning & Weaving Mills Pvt. Ltd	16.250	Yes	CDM PDD titled: 1) "Grid connected renewable electricity generation project by M/s. Premier Mills Pvt Ltd in Tamilnadu, India" http://cdm.unfccc.int/Projects/Validation/DB/J0J2B6K3O92EEUAFD3OGYLE03TNZ7I/view.html 2) "Bundled wind power project in Tamil Nadu managed by Enercon India Limited-II" http://cdmindia.nic.in/cdmindia/projects/PCN_785_07.pdf
Rasi Seeds (P) Ltd.	16.250	Yes	Two CDM PDDs titled 1) "Bundled Wind power project in Tamil Nadu, India, co-ordinated by Tamil Nadu Spinning Mills Association (TASMA-II)" http://cdm.unfccc.int/filestorage/1ZIKQ3A0ENJ57YGVOPCF SX48M2W9RL/PDD%20Tasma-II.pdf?t=Z1F8MTI5NzgZnZQ3Ni4wNw== mYMPjXDdNWokW8MpwicTb_SPUHs= 2) "Bundled Wind power project in Tamilnadu, India co-ordinated by the TamilNadu Spinning Mills Association (TASMA)" http://cdm.unfccc.int/UserManagement/FileStorage/AE2042RXII12SBXNF29XDKVT2BCEWG

Ambika Cotton Mills Ltd.	15.400	Yes	Two CDM PDDs titled: 1) Bundled Wind power project in Tamilnadu, India co-ordinated by the TamilNadu Spinning Mills Association (TASMA) http://cdm.unfccc.int/UserManagement/FileStorage/AE2042RXII12SBXNF29XDKVT2BCEWG 2) Bundled Wind power project in Tamil Nadu, India, co-ordinated by Tamil Nadu Spinning Mills Association (TASMA-II) http://cdm.unfccc.int/filestorage/1ZIKQ3A0ENJ57YGVOPCFXSX48M2W9RL/PDD%20Tasma-II.pdf?t=Z1F8MTI5NzgzNzQ3Ni4wNw== mYMpjXDdNW0KW8MpwicTb_SPUHs=
Jayajyoti & Co. Ltd	15.000	Yes	The installations are under the PDD titled "Bundled Wind power project in Tamilnadu, India co-ordinated by the TamilNadu Spinning Mills Association (TASMA)" http://cdm.unfccc.int/UserManagement/FileStorage/AE2042RXII12SBXNF29XDKVT2BCEWG
NEG Micon India Private Limited	25.70	Yes	The installations are under the PDD titled "25.70 MW Bundled Wind Power Project in Udumalpet, Tamilnadu" http://www.dnv.com/focus/climate_change/Upload/Udumalpet%20PDD.pdf
Powerica Limited	16.5	Yes	The installations are under the PDD titled "Wind power project at Tamilnadu by Powerica Limited" http://cdm.unfccc.int/UserManagement/FileStorage/F2VB36X574LWJ0TUHZQG18YKRIPED9

It can be seen all private wind farm installations, in the similar regulatory and investment climate as that of the project activity and with capacity of over 15 MW in the state of Tamil Nadu, are CDM/VCS projects. Hence, all similar wind energy large scale project activities in the State of Tamilnadu without approaching CDM/VCS revenue is not a common practice in the region.

The approval and registration of the proposed project activity as a VCS project would lead to additional revenue thereby improving the returns from the project activity overcoming investment and regulatory policy risk to a certain extent. The successful registration also provides an incentive for other proponents to invest in wind power projects. Thus the VCS revenue acts as a risk mitigation tool in overcoming barriers.

3 Monitoring:

3.1 Title and reference of the VCS methodology (which includes the monitoring requirements) applied to the project activity and explanation of methodology choices:

The project activity falls under the purview of the approved VCS methodology ACM0002 "Consolidated methodology for grid-connected electricity generation from renewable sources".

Table 20

Methodological details

Sectoral scope	01
Methodology Applicable	ACM0002

Version	10
Dated	Valid from 11 th June 2009
Reference	http://cdm.unfccc.int/methodologies/PAmethodologies/approved.html

The methodology ACM0002 refers to the latest approved versions of the following tools:

- ✓ Tool to calculate the emission factor for an electricity system, Version 2.0
- ✓ Tool for the demonstration and assessment of Additionality, Version 5.2

3.2 Monitoring, including estimation, modelling, measurement or calculation approaches:

Purpose of monitoring:

The purpose of monitoring procedure is to record the real and measurable emission reduction in an efficient way which results in availing the revenues that accrues from the project activity. Hence, TASMA is responsible for the monitoring/calculation of actual credible emission reduction in the most transparent and relevant manner.

Types of data and information to be reported, including units of measurement (Origin of the data):

The Key records that will be maintained are:

- Project Activity Matrix giving all ID details
- VCUs Computed on a yearly basis
- Calibration Certificates for the main energy Meters

Monitoring, including estimation, modelling, measurement or calculation approaches:

TASMA will be responsible to calculate the emission figures. Calculation of emission figures will be based on the recorded generation for a period and the emission factor recorded in the VCS PD.

The generation registered by the main meter alone will hold well for the purpose of billing as long as the error in the main meter is within the permissible limits. The calibration of the main meter will be the responsibility of the TNEB. The calibration of the main meter will be done as per the procedure set out by CEA.

If, on any occasion, it is found that the main meter is beyond permissible limit of error, TNEB will be informed about it and TNEB will make necessary efforts to correct the meter and recalibrate the same. During the time when the main meter is not functioning, the same will be replaced with a spare meter and the faulty meter will be sent to the Meter Relay Testing (MRT). The MRT in turn will remove the chip and send it to the meter manufacturer for retrieving the generation recorded. The retrieved reading will be used for billing.

Monitoring times and periods, considering the needs of intended users:

The monthly meter reading of main meter is being taken jointly by the Parties (TNEB and site in-charge of the WTG owner) on the fixed day of the month. At the conclusion of meter reading on each occasion, an appointed official of the TNEB shall sign the

meter card provided for this purpose and the said entries will be verified by the site in-charge. The main meter reading recorded will be the units of electricity generated. Emission reduction calculation is based on the main meter reading.

Monitoring roles and responsibilities:

- Tasma will be responsible to calculate the emission figures. Calculation of emission figures will be based on the recorded generation for a period and the emission factor recorded in the VCS PD.
- Changes in Project boundary in any event will be monitored through the Regional Representatives of Tasma and recorded by Tasma.
- All documents will be numbered and identified along with retention periods.
- Each WTG which is part of the project activity will be uniquely identified. The ID number will have the following structure:

Company ID+ WTG ID - as provided by Tasma

- The site in-charge will be responsible for operation and maintenance of wind mill.

Managing data quality:

- The monitoring activity will be centrally executed by Tasma.
- The systems and procedures maintained to implement the monitoring plan/data collection will be done using the above said procedures set up by Tasma.

Table 21: Details of parameter to be monitored

Data Variable	Data unit	Measured/ Calculated/ Estimated	Recording frequency	Party responsible
EG _y	MWh	Measured	Monthly	Tasma

3.3 Data and parameters monitored / Selecting relevant GHG sources, sinks and reservoirs for monitoring or estimating GHG emissions and removals:

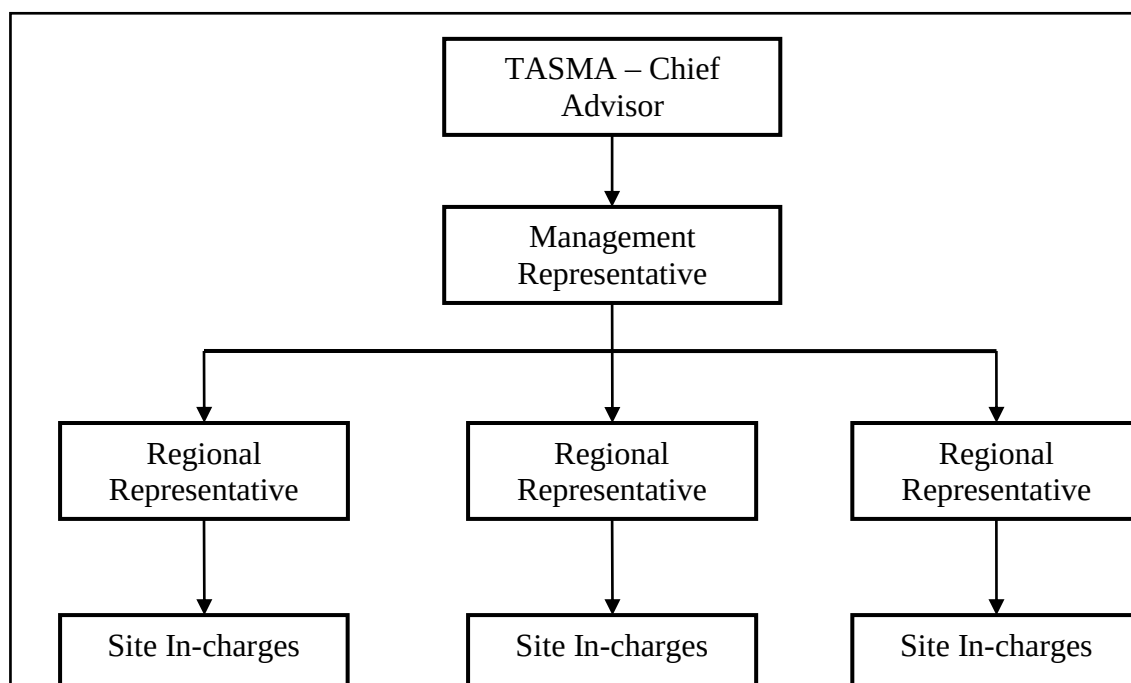
Table 22

Data / Parameter:	EG_y
Data unit:	MWh
Description:	Net electricity supplied to the grid
Source of data to be used:	TNEB statement
Value of data applied for the purpose of calculating expected emission reductions	The total generation considered for 10 years: 8,86,339 MWh
Description of measurement methods and procedures to be	Measured by Energy Meters which shall not be inferior to that of 0.5S accuracy Class

applied:	Net generation = (Total Export – Total Import) To be certified by TNEB Statement/Meter Card Monthly Measurement by TNEB.
QA/QC procedures to be applied:	QA/QC of Monitoring Equipment Calibration procedure: Main meter is calibrated by the TNEB as per guidelines provided by CEA (Central Electricity Authority (Installation and Operation of Meters) Regulations, 2006. Calibration frequency: Every five years At the time of commissioning of the WTG, calibrated and duly tested meter will be installed for measuring the electricity and first calibration will be done after five years from the date of commissioning of the WTG. The same procedure will be followed for each WTG. For WTGs which are captive in nature, the wheeling charges of 5% is charged by the TNEB for using the TNEB grid for transmitting electricity from the point of injection to point of delivery and therefore available for VCU credit.
Any comment:	Data will be archived during the whole crediting period + 2 years

3.4 Description of the monitoring plan

The monitoring activity will be centrally executed by TASMA. The organization for monitoring will be as follows:



The Management Structure for monitoring emission reductions would provide for:

- Operation and Maintenance
- Maintenance of Meters and Calibration
- Calculation of Emission Figures

- Local Environmental Care
 - Changes in project boundary
 - Documents and Records
 - Periodic Review meetings
-
- TASMA through the project members will appoint a site in-charge for each site with the responsibility of operation, maintenance and safety of WTGs.
 - The Project Sponsor / Project members will abide by all regulatory and statutory requirements as prescribed under the State and Central laws and regulations
 - The generation from the WTGs will be monitored by LCS meters attached with the wind mill and also by the main meter which is owned by TNEB.
 - TNEB meter shall meet the Indian and regional electricity authority's standards (CEA) (with set calibration schedules).
 - The generation for the purpose of emission reduction calculation will be based on the TNEB meter, which is a statutory body.
 - All the monitoring data will be recorded and kept under safe custody of the site in-charge
 - Also any change within the project boundary, will be recorded and informed to TASMA.

Measurement Frequency:

Frequency of measurement by TNEB – Once in a month

Frequency of measurement by Site In charge – Once a month along with TNEB official Calibration of the Energy Meter - This is carried out by TNEB (As per CEA / TNERC norms)

4 GHG Emission Reductions:

4.1 Explanation of methodological choice:

As per the applied approved methodology ACM0002 (Version 10) Emission Reductions are calculated as:

$$ER_y = BE_y - PE_y - L_y$$

Where:

ER_y - Emission reductions in year y (t CO₂e/yr)
 BE_y - Baseline emissions in year y (t CO₂e/yr)
 PE_y - Project emissions in year y (t CO₂e/yr)
 LE_y - Leakage Emissions in year y (t CO₂e/yr)

Baseline Emissions:

The baseline emissions include only CO₂ emissions from electricity generation in Fossil fuel fired power plants that are displaced due to project activity, calculated as follows:

$$BE_y = (EG_y - EG_{\text{baseline}}) \times EF_{\text{grid,CM},y}$$

Where:

BE_y = Baseline emissions in year y (tCO₂/yr)
 EG_y = Electricity supplied by the project activity to the grid (MWh)
 EG_{baseline} = Baseline electricity supplied to the grid in the case of modified or retrofit facilities (MWh). As it is a new power plants this value is taken as zero
 $EF_{\text{grid,CM},y}$ = Combined margin CO₂ emission factor for grid connected power generation in year y calculated using the latest version of the "Tool to calculate the emission factor for an electricity system"

According to the Tool to calculate the emission factor for an electricity system, version 2.0, $EF_{\text{grid,CM},y}$ i.e. baseline emission factor (EF_y) is calculated as a combined margin (CM), consisting of the combination of operating margin (OM) and build margin (BM) factors according to the following below steps. Calculations for this combined margin are based on data from an official source and are made publicly available.

As per "**Tool to calculate the emission factor for an electricity system**", **version-2.0**, the steps followed to calculate Combined margin of Southern regional grid are as follows:

Step 1: Identify the relevant electric power system:

Historically, the Indian power system was divided into five independent regional grids, namely Northern, Eastern, Western, Southern, and North-Eastern. Each grid covered several states. Since August 2006, however, all regional grids except the Southern Grid have been integrated and are operating in synchronous mode, i.e. at same frequency. Consequently, the Northern, Eastern, Western and North-Eastern grids will be treated as a single grid and is being named as NEWNE grid from FY 2007-08 onwards for the purpose of CO₂ Baseline Database.

Table 1 Geographical scope of the two electricity grids

NEWNE Grid				Southern Grid
Northern	Eastern	Western	North-Eastern	Southern
Chandigarh	Bihar	Chhattisgarh	Arunachal Pradesh	Andhra Pradesh
Delhi	Jharkhand	Gujarat	Assam	Karnataka
Haryana	Orissa	Daman & Diu	Manipur	Kerala
Himachal Pradesh	West Bengal	Dadar & Nagar Haveli	Meghalaya	Tamil Nadu
Jammu & Kashmir	Sikkim	Madhya Pradesh	Mizoram	Pondicherry
Punjab	Andaman-Nicobar	Maharashtra	Nagaland	Lakshadweep
Rajasthan		Goa	Tripura	
Uttar Pradesh				
Uttarakhand				

The proposed project is located in the state of Tamilnadu and will be feeding the electricity in the Southern regional grid. Therefore the proposed project would have impact on all the generation facilities in this grid. Thus all the power generation facilities connected to this grid form the boundary for the purpose of baseline estimation. The Southern grid is also connected with other regional grids, however, the net exchange of energy within the regional grids is very small and negligible and hence other regional grids are not included in the boundary for estimation of baseline emissions.

Step 2. Select a method to determine the operating margin (OM)

The calculation of the operating margin emission factor ($EF_{grid,OM,y}$) is based on one of the following methods:

- a) Simple OM, or
- b) Simple adjusted OM, or
- c) Dispatch data analysis OM, or
- d) Average OM.

Due to non-availability of archived dispatch data in the public domain for the Southern grid, 'Dispatch Data Analysis' (1c) has not been chosen, though it should be the first methodological choice.

As per Tool to calculate emission factor of an electricity system, version-2.0, the simple operating margin (Simple OM) can be used only if low-cost/must-run resources constitute less than 50% of total grid generation in (a) average of the five most recent years, or 2) based on long-term averages for hydroelectricity production.

From the available information published by CEA "CO₂ database for Indian Power sector", it can be seen from the table below that low cost/must run sources for Southern regional Grid accounts for less than 50% of the total generation in the last five years. Hence the Simple OM method has been used to calculate the Operating Margin Emission factor applicable.

Table 2 All India Region wise generating installed capacity (MW) of power utilities including allocated shares in joint and central sector utilities (As on 31 July 2009)

SL. NO.	REGION	THERMAL				Nuclear	HYDRO	R.E.S. @	TOTAL
		COAL	GAS	DSL	TOTAL		(Renewable)	(MNRE)	
1	Northern	19087.95	3531.19	12.99	22632.13	1180.00	13425.15	1766.37	39003.65
2	Western	26335.18	7748.22	17.48	34100.88	1840.00	7448.50	4023.62	47413.00
3	Southern	16982.50	4150.20	939.32	22072.02	1100.00	10993.18	7047.90	41213.10
4	Eastern	16709.92	190.00	17.20	16917.12	0.00	3933.93	227.41	21078.46
5	N. Eastern	93.33	766.00	142.74	1002.07	0.00	1116.00	171.00	2289.07
6	Islands	0.00	0.00	70.02	70.02	0.00	0.00	6.11	76.13
7	All India	79208.88	16385.61	1199.75	96794.24	4120.00	36916.76	13242.41	151073.41

Captive Genrating capacity connected to the Grid (MW) = 19509.49

RES -Renewable Energy Sources includes Small Hydro Project(SHP), Biomass Gas(BG), Biomass Power(BP), Urban & Industrial waste Power(U&I), and Wind Energy.

Step 3. Calculate the operating margin emission factor according to the selected method

The simple OM emission factor is calculated as the generation-weighted average CO₂ emissions per unit net electricity generation (tCO₂/MWh) of all generating power plants serving the system, not including low cost/must-run power plants / units, using the following equation:

$$EF_{OM,y} = [\sum_{i,j} F_{i,j,y} * COEF_{i,j}] / [\sum_j GEN_{j,y}] \dots \dots \dots (3)$$

Where $F_{i,j,y}$ and $COEF_{i,j}$ are the fuel consumption and associated carbon coefficient of the fossil fuel i consumed by power plant j in the grid in year(s) y . $GEN_{j,y}$ is the electricity generation by power plant j connected to the grid excluding zero- or low-operating cost sources in year(s) y .

As per ACM0002 version 10, the OM emission factor can be calculated using *ex ante* generation-weighted average of the most recent 3 years for which data is available or using *ex post* generation data in the year in which the project generation occurs. The OM emission factor is calculated using *ex ante* generation weighted average of the most recent 3 years (2005-06, 2006-07 and 2007-08) and hence does not require yearly monitoring of the OM emission factor. The Central Electricity Authority, Ministry of Power, Government of India has published a database of Carbon Dioxide Emission from the power sector in India based on detailed authenticated information obtained from all operating power stations in the country. This database i.e. The CO₂ Baseline Database provides information about the Combined Margin Emission Factors of all the regional electricity grids in India.

Step 4. Identify the cohort of power units to be included in the build margin (BM)

The database of Carbon Dioxide Emission from the power sector in India published by CEA has calculated the build margin in accordance with the Grid Tool, as the average emissions intensity of the 20% most recent capacity additions in the grid based on net generation. Depending on the region, the build margin covers units commissioned in the last five to ten years.

Step 5. Calculate the build margin emission factor

The Build Margin emission factor $EF_{BM,y}$ is calculated ex-ante based on the most recent information available on plants already built .The Build Margin emission factor $EF_{BM,y}$ is given as the generation weighted average emission factor of the selected representative set of recent power plants represented by the 5 most recent plants or the most recent 20% of the generating units built (summation is over such plants specified

by k). The most 20% of the generating units built recently is used for build margin emission factor calculation.

Step 6. Calculate the combined margin (CM) emissions factor

The combined margin emissions factor is calculated as follows:

$$EF_y = w_{OM} * EF_{grid,OM,y} + w_{BM} * EF_{grid,BM,y}$$

Where:

$EF_{grid,BM,y}$	Build margin CO ₂ emission factor in year y (tCO ₂ /MWh)
$EF_{grid,OM,y}$	Operating margin CO ₂ emission factor in year y (tCO ₂ /MWh)
w_{OM}	Weighting of operating margin emissions factor (%)
w_{BM}	Weighting of build margin emissions factor (%)

For wind and solar projects, ACM0002 allows the usage of the default weights as follows:

$$w_{OM} = 0.75 \text{ and } w_{BM} = 0.25.$$

The details of calculation of OM, BM and CM are shown in the following Section **(Section-4.2)** of the PD.

Project Emissions:

The project generates by the installation of wind turbines and hence there is no project emission from the project activity.

$$PE_y = 0$$

Leakage Emissions:

There is no leakage involved in the project activity.

$$L_y = 0$$

4.2 Quantifying GHG emissions and/or removals for the baseline scenario:

Base Line Emissions: (BE_y)

According to ACM0002, Baseline Emission is calculated by the following formula.

$$BE_y = EG_y * EF_y$$

Baseline emission factor (combined margin)

$$\begin{aligned} EF_y \text{ (tCO}_2\text{e/MWh)} &= w_{OM} * EF_{OM,y} \text{ (tCO}_2\text{e/MWh)} + w_{BM} * EF_{BM,y} \text{ (tCO}_2\text{e/MWh)} \\ &= (0.75 * 0.98756) + (0.25 * 0.81792) \\ &= 0.94515 \text{ t CO}_2\text{e/MWh} \end{aligned}$$

Annual electricity supplied to the grid by the Project

EG_y = Electricity supplied by the project activity to the Grid (MWh)

4.3 Quantifying GHG emissions and/or removals for the project:

Project Emissions: (PE_y)

According to ACM0002, there is no project emission for grid connected wind based power generation. Hence in this case it is considered as

$$PE_y = 0 \text{ tCO}_2/\text{year}$$

Where,

PE_y - Project Emission for the year.

4.4 Quantifying GHG emission reductions and removal enhancements for the GHG project:

Emissions Reduction: (ER_y)

For a given year, the emission reductions contributed by the project activity (ER_y) is calculated as follows:

$$ER_y = BE_y - PE_y - L_y$$

Where,

BE_y	-	Base Line Emission for the year 'y'
ER_y	-	Emission reductions for the year 'y'
PE_y	-	Project Emissions for the year 'y'
L_y	-	Leakage for the year 'y'

$$ER_y = BE_y$$

Years	Annual estimation reductions in tonnes of CO ₂ e
Year 1(2 nd April 2008 to 31 st Dec 2008)	8848
Year 2	59999
Year 3	93197
Year 4	93197
Year 5	93197
Year 6	93197
Year 7	93197
Year 8	93197
Year 9	93197
Year 10	93197
Year 11(1 st Jan 2018 to 1 st April 2018)	23299
Total estimated reductions in tonnes of CO₂ e	837722
Total No of crediting years	10

Annual average over the crediting period of estimated reductions (tonnes of CO₂e)	83772.2
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5 Environmental Impact:

As per the prevailing local /host country laws no environmental impact assessment is required, (the Schedule 1 of Ministry of Environment and Forests (Government of India) notification dated September 14, 2006), 38 activities are required to undertake environmental impact assessment studies. The details of these activities are available at <http://envfor.nic.in/legis/eia/so1533.pdf>.

However the project participant has carried out Aspect and Impact analysis of all the activities of the project and concluded that there is no negative environmental impact due to the project activity and wind energy is one of the cleanest sources of energy.

6 Stake holder's comments:

The local stakeholders have already been contacted for several CDM/VCS projects of TASMA. For this project also, a questionnaire survey was conducted covering the people living in the villages nearby the site where the WTGs are located.

The basic points covered in the questionnaire are given below:

Sl No	Questions
1.	What do you think about the environment in your locality after this project?
2.	Is your environment affected by the wind mill?
3.	Is your TV Reception affected by the Windmill?
4.	Does the project affect the livelihood?
5.	Does the project improve the livelihood?
6.	Has employment increased due to the project?
7.	Is there any Noise problem due to the wind mill?
8.	Is there any water problem due to the windmill?
9.	Is there any Vibration problem due to the windmill?
10.	Is there any problem with respect to construction?
11.	Does the wind mill affect the migration of birds?
12.	Does the wind mill affect the grazing of cattle?
13.	Are there any benefits from the windmill?
14.	Is the power cut reduces after implementation of the project?
15.	Is there improvement in infrastructure capacity (roads, hospitals etc..) due to installation of windmill project in your area?
16.	Comments and suggestions
17.	Any other points for consideration

Summary of the comments received

The overall opinion expressed through the questionnaire was based on the experience of the local stake holders with the already existing windmills. The overall response was that the impact of windmills in the locality will be of positive nature.

The summary analysis of questionnaire survey is presented below:-

SI No	Questions	Response By Majority of respondents
1.	What do you think about the environment in your locality after this project?	Very Good
2.	Is your environment affected by the wind mill?	Not at all affected
3.	Is your TV Reception affected by the Windmill?	Not at all affected
4.	Does the project affect the livelihood?	Not at all affected
5.	Does the project improve the livelihood?	Good Improvement
6.	Has employment increased due to the project?	Good Improvement
7.	Is there any Noise problem due to the wind mill?	Not at all
8.	Is there any water problem due to the windmill?	Not at all
9.	Is there any Vibration problem due to the windmill?	Not at all
10.	Is there any problem with respect to construction?	Not at all
11.	Does the wind mill affect the migration of birds?	Not at all
12.	Does the wind mill affect the grazing of cattle?	Not at all
13.	Are there any benefits from the windmill?	Good Benefits
14.	Is the power cut reduces after implementation of the project?	Significantly
15.	Is there improvement in infrastructure capacity (roads, hospitals etc.) due to installation of windmill project in your area?	Significantly
16.	Comments and suggestions	• Plantation to be considered • Approach roads should not affect water catchments • Provide employment for locals
17.	Any other points for consideration	• Many good suggestions were given which are already been taken care / will be considered in future also.

Report on how due account was taken of any comments received

The responses are categorised as positive and negative based on the comments. The positive responses indicate that respondent feels that the project activity will lead to overall good for the society.

All of the individual respondents are of the view that the project activity is of good to them and the society. It has added to the electricity generation of the state grid without causing any pollution.

No negative comments were received that required follow up action.

7 Schedule:

Table: 28 Chronological plans

Parameter	Date/period
<i>Start date of the project activity</i>	<i>2nd April 2008</i>
<i>Bundling End Date</i>	<i>14th December 2009</i>
<i>Project termination</i>	<i>31st March 2028</i>
<i>Project lifetime</i>	<i>20 years</i>
<i>Stake Holder Consultation</i>	<i>December 2009</i>
<i>Agreement with the DOE</i>	<i>20th February 2010</i>
<i>VCS PD completion (version 1)</i>	<i>25th February 2010</i>
<i>Monitoring frequency by TNEB & Site In-charge</i>	<i>Monthly</i>
<i>Reporting frequency to TASMA by Regional Representative</i>	<i>Once in three months</i>

8 Ownership:

8.1 Proof of Title:

The Commissioning certificate issued by the TNEB for all the WTGs is the vital evidence for the proof of title of the sub-project owners. Also, an authorization letter is given by each individual sub project owner to TASMA to deal with the processes. The above said documents are provided to the DOE for verification.

8.2 Projects that reduce GHG emissions from activities that participate in an emissions trading program (if applicable):

>> Not applicable

Appendix-1– WTG Identification, Location and HTSC Number

Sl. No.	Company Code	Name of the Mills/ Companies	No. of WTGs	Capacity (In MW)	Total Capacity (In MW)	HTSC No	Latitude (N)	Longitude (E)
1	A1	Ambika Cotton Mills Limited.,	2	0.800	1.600	183	11.73	76.65
2	A1	Ambika Cotton Mills Limited.,				183	11.73	76.69
3	A2	Bright Castings	1	0.600	0.600	2651	9	77.42
4	A3	Concorde Agencies	1	0.225	0.225	2675	8.99	77.42
5	A4	Concorde Textiles	2	0.225	0.450	2628	8.99	77.42
6	A4	Concorde Textiles				2621	8.99	77.41
7	A5	Hemalatha Mills Pvt. Ltd.,	1	0.225	0.225	774	10.94	77.23
8	A7	Pavathal Spinning Mills Pvt. Ltd.,	1	0.250	0.250	1545	10.77	77.41
9	A9	Santhi Casting Works	1	0.600	0.600	2612	8.24	77.6
10	A12	SRG Apparels Pvt. Ltd.,	2	0.250	0.500	2618	8.28	77.62
11	A12	SRG Apparels Pvt. Ltd.,				2618	8.28	77.6
12	A13	Sri Dhanalakshmi Sizing & Spinning Mill	3	0.600	1.800	2620	8.24	77.64
13	A13	Sri Dhanalakshmi Sizing & Spinning Mill				2630	8.25	77.62
14	A13	Sri Dhanalakshmi Sizing & Spinning Mill				2638	8.23	77.63
15	A14	Thangamman Process	1	0.250	0.250	728	10.9	77.17

16	A19	Warsaw International	1	0.250	0.250	606	10.94	77.25
17	B1	Associated Autotex Ancillaries Pvt. Ltd.,	1	0.800	0.800	164	10.58	77.44
18	B2	Auto Coats	1	0.800	0.800	172	10.58	77.44
19	B3	Doller Industries Ltd.,	1	1.250	1.250	2688	8.16	77.45
20	B4	KG Entertainment Company (P) Ltd.,	1	1.250	1.250	1546	10.74	77.43
21	B5	Narasu's Roller Flour Mills	1	0.800	0.800	161	10.57	77.44
22	B6	Sushrushah Medicare Centre Pvt. Ltd.,	1	0.250	0.250	2793	8.22	77.6
23	C0001	A. Duraisamy Modern Rice Mill	1	0.225	0.225	1677	10.76	77.39
24	C0004	Ahill Knit Exports	1	0.250	0.250	1615	10.78	77.4
25	C0008	Archana Jewel Craft	1	0.250	0.250	839	10.89	77.27
26	C0009	Arul Steels	1	0.600	0.600	82	8.97	77.69
27	C0010	Arun Textiles Pvt. Ltd.,	2	0.600	1.200	649	10.89	77.33
28	C0010	Arun Textiles Pvt. Ltd.,				660	10.92	77.36
29	C0011	Aruna Alloy Steels Pvt. Ltd.,	1	1.650	1.650	12	9.93	77.54
30	C0019	C. Dorairaj	1	0.600	0.600	838	10.93	77.2
31	C0020	C. Natarajan	1	0.225	0.225	2816	8.15	77.36
32	C0023	Cheran Textile Mills	1	0.600	0.600	719	10.88	77.27
33	C0024	Chiranjeevi Wind Energy Ltd.,	2	0.250	0.500	662	10.55	77.15
34	C0024	Chiranjeevi Wind Energy Ltd.,				129	10.54	77.11
35	C0026	Coimbatore Pioneer Fertilizers Ltd.,	2	0.600	1.200	656	10.9	77.25
36	C0026	Coimbatore Pioneer Fertilizers Ltd.,				657	10.89	77.25

37	C0027	Concorde Textiles	2	0.600	1.200	2818	9.06	77.42
38	C0027	Concorde Textiles				2925	9.05	77.41
39	C0029	Divya Spinning Mill Pvt. Ltd.,	1	1.250	1.250	1708	10.72	77.43
40	C0030	Dollar Industries Ltd.,	1	1.250	1.250	2935	8.96	77.67
41	C0032	Eveready Spinning Mills Pvt. Ltd.,	1	0.600	0.600	713	10.88	77.27
42	C0033	Eveready Textiles	1	0.600	0.600	695	10.88	77.27
43	C0037	Green Energy	1	0.250	0.250	3018	9.04	77.38
44	C0044	Jayanthi Textile Products Unit II	1	1.250	1.250	219	10.85	77.12
45	C0045	Jayavarma Textiles Pvt. Ltd.,	1	1.250	1.250	791	10.86	77.15
46	C0049	Karpagham Tex	1	0.600	0.600	705	10.91	77.19
47	C0052	Lakshminarayan Gaurishanker Enterprises Pvt. Ltd.,	4	0.250	1.000	818	10.95	77.27
48	C0052	Lakshminarayan Gaurishanker Enterprises Pvt. Ltd.,				799	10.95	77.26
49	C0052	Lakshminarayan Gaurishanker Enterprises Pvt. Ltd.,				789	10.95	77.27
50	C0052	Lakshminarayan Gaurishanker Enterprises Pvt. Ltd.,				788	10.94	77.26
51	C0054	Madras Hardtools Pvt. Ltd.,	2	0.250	0.500	120	10.54	77.15
52	C0054	Madras Hardtools Pvt. Ltd.,				2889	9.02	77.4
53	C0060	Micro Colour Makers	1	0.250	0.250	1544	10.78	77.41
54	C0062	N. Leelavathy	1	0.225	0.225	2815	8.14	77.36
55	C0063	N. Muthukumaar	1	0.600	0.600	718	10.91	77.19
56	C0064	Narasu's Spinning Mills	1	0.600	0.600	1653	10.76	77.43
57	C0065	P. Periyaswamy HUF	1	0.600	0.600	707	10.91	77.19

58	C0069	P.S.K. Engineering Construction & Co.,	1	1.500	1.500	230	10.85	77.15
59	C0070	Pallava Textile Ltd.,	1	1.650	1.650	38	9.9	77.48
60	C0074	Perfect Gears (Chennai) Pvt. Ltd.,	1	0.250	0.250	2773	9.01	77.32
61	C0076	Shristi Cotspinn Pvt. Ltd.,	1	0.600	0.600	133	10.88	77.25
62	C0083	Raju & Co.,	1	0.600	0.600	81	8.96	77.69
63	C0086	S C Energiaa Pvt. Ltd.,	1	0.250	0.250	252	8.14	77.33
64	C0088	Sabari Jewellery	1	0.250	0.250	1658	10.69	77.31
65	C0092	Salona Cotspin Ltd.,	1	0.600	0.600	687	10.9	77.25
66	C0093	Santhi Casting Works	2	0.600	1.200	107	8.96	77.69
67	C0093	Santhi Casting Works				106	8.95	77.73
68	C0094	Saravana Textile Mills	2	0.600	1.200	693	10.88	77.27
69	C0094	Saravana Textile Mills				694	10.87	77.27
70	C0095	Scientific MES Technik Pvt. Ltd.,	1	0.600	0.600	105	8.98	77.68
71	C0102	Siva Subramania Textiles	1	0.600	0.600	652	10.91	77.29
72	C0104	Soundara Knit Wears	1	0.600	0.600	706	10.9	77.18
73	C0107	Sree Kandiamman Industries	1	0.250	0.250	2811	8.28	77.57
74	C0109	Sri Dhanalakshmi Sizing and Spinning Mill	1	0.600	0.600	2859	8.2	77.34
75	C0111	Sri Jagannatha Spinners	1	0.600	0.600	688	10.91	77.14
76	C0119	Srinivasan Associates Pvt. Ltd.,	1	0.600	0.600	836	10.89	77.31
77	C0120	Sripathi Paper and Boards Pvt. Ltd.,	1	0.600	0.600	817	10.9	77.3
78	C0124	Sun Chem Products (P) Ltd.,	1	0.250	0.250	2786	8.98	77.31

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79	C0125	Sun Industrial Automations & Solutions	1	0.600	0.600	2922	8.98	77.37
80	C0129	T.N. Nantagopal & Sons,	1	0.600	0.600	2979	9.02	77.39
81	C0132	Thirupur Suriya Textiles Pvt. Ltd.,	1	1.250	1.250	128	10.87	77.14
82	C0134	Twowin Export	1	0.225	0.225	1652	10.73	77.34
83	C0135	Vellingiri Andavar Textiles Pvt. Ltd.,	1	0.600	0.600	692	10.92	77.14
84	C0140	VXL Systems	1	0.800	0.800	1704	10.75	77.44
			84		48.100			

Appendix 2- Input values

Sl. No.	Comp Code	Name of the Mills/ Companies	No. of WTGs	Total Capacity (In MW)	O&M Cost (In % on Capital Cost)	Wheeling Charges (In % on Wheeled Energy)	Banking Charges (In % on total energy banked)	Insurance Charges (In % on capital cost)	Loan Processing Charges (In % of loan amount)	Tariff for sale to TNEB (INR/kWh)	Revenue saving from electricity generation (INR/kWh)	Equity (In %)	Debt (In %)	Interest Rate (In %)	Repayment period (In Years)
1	A1	Ambika Cotton Mills Limited.,	2	1.600	1.10	5.00	5.00	0.75	1.12	0.00	3.50	30.00	70.00	12.375	10.00
					1.10	5.00	5.00	0.75	1.12	0.00	3.50	30.00	70.00	12.375	10.00
2	A2	Bright Castings	1	0.600	1.10	5.00	5.00	0.75	1.12	0.00	3.50	30.00	70.00	12.375	10.00
3	A3	Concorde Agencies	1	0.225	1.10	0.00	0.00	0.75	1.12	3.39	0.00	30.00	70.00	12.375	10.00
4	A4	Concorde Textiles	2	0.450	1.10	0.00	0.00	0.75	1.12	2.90	0.00	30.00	70.00	12.375	10.00
					1.10	0.00	0.00	0.75	1.12	2.90	0.00	30.00	70.00	12.375	10.00
5	A5	Hemalatha Mills Pvt. Ltd.,	1	0.225	1.10	5.00	5.00	0.75	1.12	0.00	3.50	30.00	70.00	12.375	10.00

VCS Project Description

6	A7	Pavathal Spinning Mills Pvt. Ltd.,	1	0.250	1.10	5.00	5.00	0.75	1.12	0.00	3.50	30.00	70.00	12.375	10.00
7	A9	Santhi Casting Works	1	0.600	1.10	5.00	5.00	0.75	1.12	0.00	3.50	30.00	70.00	12.375	10.00
8	A12	SRG Apparels Pvt. Ltd.,	2	0.500	1.10	0.00	0.00	0.75	1.12	2.90	0.00	30.00	70.00	12.375	10.00
					1.10	0.00	0.00	0.75	1.12	2.90	0.00	30.00	70.00	12.375	10.00
9	A13	Sri Dhanalakshmi Sizing & Spinning Mill	3	1.800	1.10	5.00	5.00	0.75	1.12	0.00	3.50	30.00	70.00	12.375	10.00
					1.10	5.00	5.00	0.75	1.12	0.00	3.50	30.00	70.00	12.375	10.00
					1.10	5.00	5.00	0.75	1.12	0.00	3.50	30.00	70.00	12.375	10.00
10	A14	Thangamman Process	1	0.250	1.10	5.00	5.00	0.75	1.12	0.00	3.50	30.00	70.00	12.375	10.00
11	A19	Warsaw International	1	0.250	1.10	0.00	0.00	0.75	1.12	2.90	0.00	30.00	70.00	12.375	10.00
12	B1	Associated Autotex Ancillaries Pvt. Ltd.,	1	0.800	1.10	5.00	5.00	0.75	1.12	0.00	3.50	30.00	70.00	12.50	10.00
13	B2	Auto Coats	1	0.800	1.10	0.00	0.00	0.75	1.12	3.39	0.00	30.00	70.00	12.50	10.00
14	B3	Doller Industries Ltd.,	1	1.250	1.10	0.00	0.00	0.75	1.12	3.39	0.00	30.00	70.00	12.50	10.00
15	B4	KG Entertainment Company (P) Ltd.,	1	1.250	1.10	0.00	0.00	0.75	1.12	3.39	0.00	30.00	70.00	12.50	10.00
16	B5	Narasu's Roller Flour Mills	1	0.800	1.10	5.00	5.00	0.75	1.12	0.00	3.50	30.00	70.00	12.50	10.00
17	B6	Sushrushah Medicare Centre Pvt. Ltd.,	1	0.250	1.10	0.00	0.00	0.75	1.12	3.39	0.00	30.00	70.00	12.50	10.00
18	C0001	A. Duraisamy Modern Rice Mill	1	0.225	1.10	5.00	5.00	0.75	0.56	0.00	3.50	30.00	70.00	13.625	10.00

VCS Project Description

19	C0004	Ahill Knit Exports	1	0.250	1.10	0.00	0.00	0.75	0.56	3.39	0.00	30.00	70.00	13.625	10.00
20	C0008	Archana Jewel Craft	1	0.250	1.10	0.00	0.00	0.75	0.56	3.39	0.00	30.00	70.00	13.625	10.00
21	C0009	Arul Steels	1	0.600	1.10	0.00	0.00	0.75	0.56	3.39	0.00	30.00	70.00	13.00	10.00
22	C0010	Arun Textiles Pvt. Ltd.,	2	1.200	1.10	5.00	5.00	0.75	0.56	0.00	3.50	30.00	70.00	13.00	10.00
					1.10	5.00	5.00	0.75	0.56	0.00	3.50	30.00	70.00	13.00	10.00
23	C0011	Aruna Alloy Steels Pvt. Ltd.,	1	1.650	1.10	5.00	5.00	0.75	0.56	0.00	3.50	30.00	70.00	13.625	10.00
24	C0019	C. Dorairaj	1	0.600	1.10	0.00	0.00	0.75	0.56	3.39	0.00	30.00	70.00	13.625	10.00
25	C0020	C. Natarajan	1	0.225	1.10	0.00	0.00	0.75	0.56	3.39	0.00	30.00	70.00	13.00	10.00
26	C0023	Cheran Textile Mills	1	0.600	1.10	0.00	0.00	0.75	0.56	3.39	0.00	30.00	70.00	13.625	10.00
27	C0024	Chiranjeevi Wind Energy Ltd.,	2	0.500	1.10	0.00	0.00	0.75	0.56	3.39	0.00	30.00	70.00	13.625	10.00
					1.10	0.00	0.00	0.75	0.56	3.39	0.00	30.00	70.00	13.625	10.00
28	C0026	Coimbatore Pioneer Fertilizers Ltd.,	2	1.200	1.10	0.00	0.00	0.75	0.56	3.39	0.00	30.00	70.00	13.625	10.00
					1.10	0.00	0.00	0.75	0.56	3.39	0.00	30.00	70.00	13.625	10.00
29	C0027	Concorde Textiles	2	1.200	1.10	0.00	0.00	0.75	0.56	3.39	0.00	30.00	70.00	13.00	10.00
					1.10	0.00	0.00	0.75	0.56	3.39	0.00	30.00	70.00	13.00	10.00
30	C0029	Divya Spinning Mill Pvt. Ltd.,	1	1.250	1.10	0.00	0.00	0.75	0.56	3.39	0.00	30.00	70.00	13.625	10.00
31	C0030	Dollar Industries Ltd.,	1	1.250	1.10	0.00	0.00	0.75	0.56	3.39	0.00	30.00	70.00	13.625	10.00
32	C0032	Eveready Spinning Mills Pvt. Ltd.,	1	0.600	1.10	0.00	0.00	0.75	0.56	3.39	0.00	30.00	70.00	13.625	10.00
33	C0033	Eveready Textiles	1	0.600	1.10	0.00	0.00	0.75	0.56	3.39	0.00	30.00	70.00	13.625	10.00
34	C0037	Green Energy	1	0.250	1.10	0.00	0.00	0.75	0.56	3.39	0.00	30.00	70.00	11.50	10.00

VCS Project Description

35	C0044	Jayanthi Textile Products Unit II	1	1.250	1.10	5.00	5.00	0.75	0.56	0.00	3.50	30.00	70.00	13.625	10.00
36	C0045	Jayavarma Textiles Pvt. Ltd.,	1	1.250	1.10	5.00	5.00	0.75	0.56	0.00	3.50	30.00	70.00	13.00	10.00
37	C0049	Karpagham Tex	1	0.600	1.10	0.00	0.00	0.75	0.56	3.39	0.00	30.00	70.00	13.625	10.00
38	C0052	Lakshminarayan Gaurishanker Enterprises Pvt. Ltd.,	4	1.000	1.10	0.00	0.00	0.75	0.56	3.39	0.00	30.00	70.00	13.625	10.00
					1.10	0.00	0.00	0.75	0.56	3.39	0.00	30.00	70.00	13.625	10.00
					1.10	0.00	0.00	0.75	0.56	3.39	0.00	30.00	70.00	13.625	10.00
					1.10	0.00	0.00	0.75	0.56	3.39	0.00	30.00	70.00	13.625	10.00
39	C0054	Madras Hardtools Pvt. Ltd.,	1	0.2500	1.10	0.00	0.00	0.75	0.56	3.39	0.00	30.00	70.00	13.00	10.00
40	C0054	Madras Hardtools Pvt. Ltd.,	1	0.2500	1.10	0.00	0.00	0.75	0.56	3.39	0.00	30.00	70.00	13.625	10.00
41	C0060	Micro Colour Makers	1	0.250	1.10	0.00	0.00	0.75	0.56	2.90	0.00	30.00	70.00	13.00	10.00
42	C0062	N. Leelavathy	1	0.225	1.10	0.00	0.00	0.75	0.56	3.39	0.00	30.00	70.00	13.00	10.00
43	C0063	N. Muthukumaar	1	0.600	1.10	0.00	0.00	0.75	0.56	3.39	0.00	30.00	70.00	13.625	10.00
44	C0064	Narasu's Spinning Mills	1	0.600	1.10	5.00	5.00	0.75	0.56	0.00	3.50	30.00	70.00	13.625	10.00
45	C0065	P. Periyaswamy HUF	1	0.600	1.10	0.00	0.00	0.75	0.56	3.39	0.00	30.00	70.00	13.625	10.00
46	C0069	P.S.K. Engineering Construction & Co.,	1	1.500	1.10	0.00	0.00	0.75	0.56	3.39	0.00	30.00	70.00	13.625	10.00
47	C0070	Pallava Textile Ltd.,	1	1.650	1.10	5.00	5.00	0.75	0.56	0.00	3.50	30.00	70.00	13.625	10.00
48	C0074	Perfect Gears (Chennai) Pvt.	1	0.250	1.10	0.00	0.00	0.75	0.56	3.39	0.00	30.00	70.00	13.625	10.00

VCS Project Description

		Ltd.,													
49	C0076	Shristi Cotspinn Pvt. Ltd.,	1	0.600	1.10	5.00	5.00	0.75	0.56	0.00	3.50	30.00	70.00	13.625	10.00
50	C0083	Raju & Co.,	1	0.600	1.10	0.00	0.00	0.75	0.56	3.39	0.00	30.00	70.00	13.00	10.00
51	C0086	S C Energiaa Pvt. Ltd.,	1	0.250	1.10	0.00	0.00	0.75	0.56	3.39	0.00	30.00	70.00	13.625	10.00
52	C0088	Sabari Jewellery	1	0.250	1.10	0.00	0.00	0.75	0.56	3.39	0.00	30.00	70.00	13.625	10.00
53	C0092	Salona Cotspin Ltd.,	1	0.600	1.10	5.00	5.00	0.75	0.56	0.00	3.50	30.00	70.00	13.625	10.00
54	C0093	Santhi Casting Works	2	1.200	1.10	0.00	0.00	0.75	0.56	3.39	0.00	30.00	70.00	13.00	10.00
					1.10	0.00	0.00	0.75	0.56	3.39	0.00	30.00	70.00	13.00	10.00
55	C0094	Saravana Textile Mills	2	1.200	1.10	0.00	0.00	0.75	0.56	3.39	0.00	30.00	70.00	13.625	10.00
					1.10	0.00	0.00	0.75	0.56	3.39	0.00	30.00	70.00	13.625	10.00
56	C0095	Scientific MES Technik Pvt. Ltd.,	1	0.600	1.10	0.00	0.00	0.75	0.56	3.39	0.00	30.00	70.00	13.625	10.00
57	C0102	Siva Subramania Textiles	1	0.600	1.10	5.00	5.00	0.75	0.56	0.00	3.50	30.00	70.00	13.625	10.00
58	C0104	Soundara Knit Wears	1	0.600	1.10	0.00	0.00	0.75	0.56	3.39	0.00	30.00	70.00	13.625	10.00
59	C0107	Sree Kandiamman Industries	1	0.250	1.10	0.00	0.00	0.75	0.56	3.39	0.00	30.00	70.00	13.625	10.00
60	C0109	Sri Dhanalakshmi Sizing and Spinning Mill	1	0.600	1.10	0.00	0.00	0.75	0.56	3.39	0.00	30.00	70.00	13.625	10.00
61	C0111	Sri Jagannatha Spinners	1	0.600	1.10	5.00	5.00	0.75	0.56	0.00	3.50	30.00	70.00	13.625	10.00
62	C0119	Srinivasan Associates Pvt.	1	0.600	1.10	0.00	0.00	0.75	0.56	3.39	0.00	30.00	70.00	13.625	10.00

VCS Project Description

		Ltd.,													
63	C0120	Sripathi Paper and Boards Pvt. Ltd.,	1	0.600	1.10	5.00	5.00	0.75	0.56	0.00	3.50	30.00	70.00	13.625	10.00
64	C0124	Sun Chem Products (P) Ltd.,	1	0.250	1.10	0.00	0.00	0.75	0.56	3.39	0.00	30.00	70.00	13.625	10.00
65	C0125	Sun Industrial Automations & Solutions	1	0.600	1.10	0.00	0.00	0.75	0.56	3.39	0.00	30.00	70.00	13.625	10.00
66	C0129	T.N. Nantagopal & Sons,	1	0.600	1.10	0.00	0.00	0.75	0.56	3.39	0.00	30.00	70.00	13.625	10.00
67	C0132	Thirupur Suriya Textiles Pvt. Ltd.,	1	1.250	1.10	5.00	5.00	0.75	0.56	0.00	3.50	30.00	70.00	13.625	10.00
68	C0134	Twowin Export	1	0.225	1.10	0.00	0.00	0.75	0.56	3.39	0.00	30.00	70.00	13.625	10.00
69	C0135	Vellingiri Andavar Textiles Pvt. Ltd.,	1	0.600	1.10	5.00	5.00	0.75	0.56	0.00	3.50	30.00	70.00	13.625	10.00
70	C0140	VXL Systems	1	0.800	1.10	0.00	0.00	0.75	0.56	3.39	0.00	30.00	70.00	13.625	10.00

Appendix 3- Input values

S.No	Name of the Company	Company code	Total Capacity	Project Cost/MW as per Purchase Order/MW (in INR Millions)	Project Cost/MW as per Offer (in INR Millions)	Plant Load Factor (PLF)	Offer date	Board decision date (investment decision date)	Purchase Order Date
1	Ambika Cotton Mills Limited	A1	1.6	51.88	61.22	21.79%	07-01-08	09-01-08	10-01-08
2	Bright Castings	A2	0.6	55.24	63.95	22.19%	10-01-08	20-02-08	07-03-08
3	Concorde Agencies	A3	0.225	55.96	64.55	25.35%	06-01-08	16-01-08	04-02-08
4	Concorde Textiles	A4	0.45	55.96	64.6	25.35%	06-01-08	16-01-08	04-02-08
5	Hemalatha Mills Pvt. Ltd.,	A5	0.225	51.80	58.5	20.90%	25-02-08	03-03-08	05-03-08
6	Pavathal Spinning Mills Pvt. Ltd.,	A7	0.25	53.70	61.25	21.84%	01-08-07	02-01-08	02-07-08
7	Santhi Casting Works	A9	0.6	55.28	64	22.04%	20-11-07	07-01-08	28-01-08
8	SRG Apparels Pvt. Ltd.,	A12	0.5	45.87	51.8	21.03%	23-11-07	16-01-08	28-01-08
9	Sri Dhanalakshmi Sizing & Spinning Mill	A13	1.8	60	64	22.04%	01-12-07	14-01-08	25-01-08
10	Thangamman Process	A14	0.25	53.81	61.1	22.87%	15-12-07	01-02-08	15-02-08
11	Warsaw International	A19	0.25	51.48	53.25	21.11%	25-01-08	25-03-11	23-02-08
12	Associated Autotex Ancillaries Pvt. Ltd.,	B1	0.8	51.88	60.5	21.79%	15-10-07	04-07-08	21-07-08

VCS Project Description

13	Auto Coats	B2	0.8	51.88	57	21.79%	15-10-07	04-07-08	21-07-08
14	Doller Industries Ltd.,	B3	1.25	50.73	56.7	24.93%		07-07-08	16-07-08
15	KG Entertainment Company (P) Ltd.,	B4	1.25	51.15	58	24.02%	24-11-07	09-04-08	21-05-08
16	Narasu's Roller Flour Mills	B5	0.8	53.40	64.4	22.84%	17-12-07	15-05-08	04-06-08
17	Sushrushah Medicare Centre Pvt. Ltd.,	B6	0.25	42.60	51	21.03%	18-07-08	21-07-08	25-07-08
18	A. Duraisamy Modern Rice Mill	C0001	0.225	57.51	60.30	22.20%	10-04-09	16-04-09	01-05-09
19	Ahill Knit Exports	C0004	0.25	54.88	54.88	21.93%	14-01-09	30-01-09	09-02-09
20	Archana Jewel Craft	C0008	0.25	58.57	60.88	22.82%	13-07-09	21-07-09	31-07-09
21	Arul Steels	C0009	0.6	56.21	56.21	22.75%	11-08-08	12-08-08	13-08-08
22	Arun Textiles Pvt. Ltd.,	C0010	1.2	61.48	64.45	24.45%	15-07-08	25-07-08	03-08-08
23	Aruna Alloy Steels Pvt. Ltd.,	C0011	1.65	66.34	68.60	26.76%	20-12-08	24-12-08	29-12-08
24	C. Dorairaj	C0019	0.6	56.72	57.65	22.16%	27-07-09	29-07-09	03-08-09
25	C. Natarajan	C0020	0.225	56.34	58.50	24.89%	02-07-08	05-08-08	18-08-08
26	Cheran Textile Mills	C0023	0.6	56.84	58.00	22.16%	17-07-09	18-07-09	21-07-09
27	Chiranjivevi Wind Energy Ltd.,	C0024A	0.5	53.40	53.40	22.10%	15-01-09	16-01-09	17-01-09
28	Coimbatore Pioneer Fertilizers Ltd.,	C0026	1.2	54.24	54.24	22.16%	25-10-08	31-10-08	03-01-09
29	Concorde Textiles	C0027(A)	1.2	56.21	57.48	22.91%	10-08-08	24-09-08	27-09-08
30	Divya Spinning Mill Pvt. Ltd.,	C0029	1.25	62.93	64.44	24.58%	25-06-09	30-06-09	06-07-09
31	Dollar Industries Ltd.,	C0030	1.25	63.00	63.00	24.25%	09-07-09	14-07-09	20-07-09
32	Eveready Spinning	C0032(A)	0.6	57.40	58.40	22.16%	07-08-09	10-08-09	12-08-09

	Mills Pvt. Ltd.,								
33	Eveready Textiles	C0033	0.6	56.93	57.45	22.16%	22-06-09	23-06-09	26-06-09
34	Green Energy	C0037	0.25	58.95	60.14	22.98%	21-09-09	03-10-09	28-10-09
35	Jayanthi Textile Products Unit II	C0044(A)	1.25	60.93	63.82	24.06%	06-01-09	09-01-09	16-01-09
36	Jayavarma Textiles Pvt. Ltd.,	C0045	1.25	63.02	65.62	24.06%	18-09-08	23-09-08	29-09-08
37	Karpagham Tex	C0049	0.6	58.96	61.85	22.82%	14-08-09	17-08-09	23-08-09
38	Lakshminarayan Gaurishanker Enterprises Pvt. Ltd.,	C0052	1	55.88	56.20	22.82%	12-02-09	16-02-09	30-03-09
39	Madras Hardtools Pvt. Ltd.,	C0054(A)	0.25	59.20	56.40	22.10%	25-07-08	01-08-08	04-08-08
40	Madras Hardtools Pvt. Ltd.,	C0054(B)	0.25	59.20	58.45	24.24%	20-03-09	03-04-09	27-04-09
41	Micro Colour Makers	C0060	0.25	54.88	54.88	21.93%	16-07-08	21-07-08	02-08-08
42	N. Leelavathy	C0062	0.225	56.70	58.88	24.89%	02-07-08	05-08-08	18-08-08
43	N. Muthukumaar	C0063	0.6	59.62	62.50	22.82%	03-08-09	11-08-09	24-08-09
44	Narasu's Spinning Mills	C0064	0.6	64.13	65.82	25.12%	09-11-08	27-11-08	12-12-08
45	P. Periyaswamy HUF	C0065	0.6	58.08	60.44	22.82%	12-08-09	14-08-09	24-08-09
46	P.S.K. Engineering Construction & Co.,	C0069	1.5	64.58	68.13	27.15%	03-08-09	04-08-09	09-08-09
47	Pallava Textile Ltd.,	C0070	1.65	66.63	70.00	26.76%	19-08-09	22-08-09	26-08-09
48	Perfect Gears (Chennai) Pvt. Ltd.,	C0074	0.25	55.39	55.50	22.98%	09-01-09	12-01-09	14-01-09
49	Preethi Cotspin Pvt. Ltd.,	C0076(A)	0.6	58.06	60.00	22.16%	09-05-09	24-05-09	10-06-09
50	Raju & Co.,	C0083	0.6	56.21	56.21	22.75%	08-08-08	09-08-08	13-08-08
51	S C Energiaa Pvt.	C0086	0.25	56.60	57.75	23.67%	16-01-09	20-01-09	23-01-09

	Ltd.,								
52	Sabari Jewellery	C0088	0.25	54.10	54.10	21.93%	11-02-09	13-02-09	16-02-09
53	Salona Cotspin Ltd.,	C0092(A)	0.6	58.45	60.69	22.16%	27-04-09	04-05-09	22-05-09
54	Santhi Casting Works	C0093	1.2	56.94	58.54	23.39%	29-08-08	30-08-08	03-09-08
55	Saravana Textile Mills	C0094	1.2	56.96	58.00	22.16%	22-06-09	23-06-09	26-06-09
56	Scientific MES Technik Pvt. Ltd.,	C0095	0.6	57.02	57.88	23.39%	19-01-09	21-01-09	23-01-09
57	Siva Subramania Textiles	C0102	0.6	58.72	60.71	22.16%	05-02-09	06-02-09	09-02-09
58	Soundara Knit Wears	C0104	0.6	58.40	61.25	22.82%	19-08-09	20-08-09	23-08-09
59	Sree Kandiamman Industries	C0107	0.25	55.75	56.34	22.17%	27-02-09	02-03-09	06-03-09
60	Sri Dhanalakshmi Sizing and Spinning Mill	C0109(B)	0.6	55.03	57.95	24.58%	27-01-09	02-02-09	20-03-09
61	Sri Jagannatha Spinners	C0111	0.6	61.14	61.90	22.82%	12-06-09	15-06-09	18-06-09
62	Srinivasan Associates Pvt. Ltd.,	C0119	0.6	57.77	60.00	22.48%	03-07-09	08-07-09	17-07-09
63	Sripathi Paper and Boards Pvt. Ltd.,	C0120	0.6	60.66	61.85	22.16%	17-03-09	23-03-09	26-03-09
64	Sun Chem Products (P) Ltd.,	C0124	0.25	56.49	58.80	24.24%	22-12-08	26-12-08	03-01-09
65	Sun Industrial Automations & Solutions	C0125	0.6	62.84	62.84	24.50%	14-07-09	15-07-09	18-07-09
66	T.N. Nantagopal & Sons,	C0129	0.6	60.04	61.33	22.91%	20-07-09	21-07-09	24-07-09
67	Thirupur Suriya Textiles Pvt. Ltd.,	C0132	1.25	61.07	63.66	24.06%	18-12-08	20-12-08	25-12-08
68	Twowin Export	C0134	0.225	55.58	56.54	22.20%	20-02-09	25-02-09	02-03-09

69	Vellingiri Andavar Textiles Pvt. Ltd.,	C0135	0.6	60.45	62.30	22.82%	08-06-09	12-06-09	15-06-09
70	VXL Systems	C0140	0.8	59.29	60.00	22.69%	20-06-09	23-06-09	30-06-09

Appendix 4: Results –Financial indicator

S.No	Name of the Company	Company code	No .of WTGs	Capacity (in MW)	Equity IRR without VCS Revenue	Equity Project IRR with VCS Revenue	PLF +10%	Tariff +10%	Project Cost - 10%	O&M -10%
1	Ambika Cotton Mills Limited	A1	2	0.8	6.20%	16.52%	8.86%	8.87%	9.17%	6.53%
2	Bright Castings	A2	1	0.6	5.98%	13.89%	8.56%	8.57%	8.88%	6.32%
3	Concorde Agencies	A3	1	0.225	6.04%	17.74%	8.58%	8.59%	8.88%	6.41%
4	Concorde Textiles	A4	2	0.225	5.43%	17.04%	7.94%	7.95%	8.24%	5.79%
5	Hemalatha Mills Pvt. Ltd.,	A5	1	0.225	6.28%	16.74%	8.96%	8.97%	9.28%	6.61%
6	Pavathal Spinning Mills Pvt. Ltd.,	A7	1	0.25	6.29%	14.86%	8.94%	8.95%	9.27%	6.62%
7	Santhi Casting Works	A9	1	0.6	6.35%	15.59%	8.87%	8.87%	9.17%	6.62%
8	SRG Apparels Pvt. Ltd.,	A12	2	0.25	6.23%	16.70%	8.82%	8.84%	9.15%	6.57%
9	Sri Dhanalakshmi Sizing & Spinning Mill	A13	3	0.6	5.34%	13.08%	7.62%	7.62%	7.89%	5.65%
10	Thangamman Process	A14	1	0.25	7.15%	14.42%	9.78%	9.79%	10.11%	7.48%
11	Warsaw International	A19	1	0.25	7.81%	22.74%	10.83%	10.85%	11.20%	3.16%

12	Associated Autotex Ancillaries Pvt. Ltd.,	B1	1	0.8	6.60%	16.33%	9.08%	9.08%	9.36%	6.90%
13	Auto Coats	B2	1	0.8	4.72%	15.08%	7.24%	7.25%	7.53%	5.13%
14	Doller Industries Ltd.,	B3	1	1.25	7.98%	23.89%	11.05%	11.07%	11.48%	8.35%
15	KG Entertainment Company (P) Ltd.,	B4	1	1.25	6.48%	19.79%	9.15%	9.16%	9.49%	6.80%
16	Narasu's Roller Flour Mills	B5	1	0.8	7.63%	17.23%	10.42%	10.43%	10.76%	7.96%
17	Sushrushah Medicare Centre Pvt. Ltd.,	B6	1	0.25	6.24%	15.13%	8.90%	8.92%	9.22%	6.57%
18	A. Duraisamy Modern Rice Mill	C0001	1	0.225	8.02	14.74	10.88	10.97	11.21	8.17
19	Ahill Knit Exports	C0004	1	0.250	6.17	13.09	8.65	8.65	8.94	6.54
20	Archana Jewel Craft	C0008	1	0.250	8.87	16.31	11.80	11.80	12.14	9.21
21	Arul Steels	C0009	1	0.600	6.91	14.49	9.51	9.51	9.81	7.25
22	Arun Textiles Pvt. Ltd.,	C0010	2	0.600	8.69	16.29	11.68	11.78	12.29	9.06
23	Aruna Alloy Steels Pvt. Ltd.,	C0011	1	1.650	9.02	16.84	12.11	12.22	12.51	9.35
24	C. Dorairaj	C0019	1	0.600	9.59	17.61	12.75	12.75	13.16	9.94
25	C. Natarajan	C0020	1	0.225	8.21	17.04	11.08	11.08	11.42	8.56
26	Cheran Textile Mills	C0023	1	0.600	9.41	17.29	12.50	12.50	12.91	9.76
27	Chiranjeevi Wind Energy Ltd.,	C0024A	2	0.250	6.59	14.28	9.11	9.11	9.39	6.92
28	Coimbatore Pioneer Fertilizers Ltd.,	C0026	2	0.600	6.30	13.69	8.74	8.74	9.03	6.61
29	Concorde Textiles	C0027(A)	2	0.600	6.54	13.77	9.06	9.06	9.35	6.88
30	Divya Spinning Mill Pvt. Ltd.,	C0029	1	1.250	8.60	16.25	11.46	11.46	11.84	8.93

31	Dollar Industries Ltd.,	C0030	1	1.250	8.86	16.71	11.81	11.81	12.49	9.18
32	Eveready Spinning Mills Pvt. Ltd.,	C0032(A)	1	0.600	8.68	16.39	11.56	11.56	11.94	9.02
33	Eveready Textiles	C0033	1	0.600	9.69	17.80	12.89	12.89	13.30	10.04
34	Green Energy	C0037	1	0.250	11.23	20.70	15.08	15.08	15.56	11.62
35	Jayanthi Textile Products Unit II	C0044(A)	1	1.250	8.59	15.65	11.54	11.63	11.88	8.94
36	Jayavarma Textiles Pvt. Ltd.,	C0045	1	1.250	7.79	14.63	10.55	10.64	10.87	8.12
37	Karpagham Tex	C0049	1	0.600	8.44	15.53	11.27	11.27	11.60	8.78
38	Lakshminarayan Gaurishanker Enterprises Pvt. Ltd.,	C0052	4	0.250	6.16	13.41	8.55	8.55	8.86	6.47
39	Madras Hardtools Pvt. Ltd.,	C0054(A)	1	0.250	5.66	12.55	8.06	8.06	8.33	6.05
40	Madras Hardtools Pvt. Ltd.,	C0054(B)	1	0.250	11.34	21.39	15.23	15.23	15.69	11.72
41	Micro Colour Makers	C0060	1	0.250	6.60	13.89	9.14	9.14	9.43	6.94
42	N. Leelavathy	C0062	1	0.225	8.04	16.69	10.87	10.87	11.20	8.39
43	N. Muthukumaar	C0063	1	0.600	8.16	15.03	10.93	10.93	11.26	8.49
44	Narasu's Spinning Mills	C0064	1	0.600	9.11	16.56	12.17	12.27	12.57	9.46
45	P. Periyaswamy HUF	C0065	1	0.600	9.08	16.68	12.05	12.05	12.43	9.42
46	P.S.K. Engineering Construction & Co.,	C0069	1	1.500	10.43	19.14	13.93	13.93	14.36	10.78
47	Pallava Textile Ltd.,	C0070	1	1.650	8.37	15.77	11.29	11.37	11.65	8.52
48	Perfect Gears (Chennai) Pvt. Ltd.,	C0074	1	0.250	6.60	14.30	9.12	9.12	9.41	6.94

49	Preethi Cotspin Pvt. Ltd.,	C0076(A)	1	0.600	7.60	14.37	10.38	10.46	10.69	7.75
50	Raju & Co.,	C0083	1	0.600	6.91	14.49	9.51	9.51	9.81	7.25
51	S C Energiaa Pvt. Ltd.,	C0086	1	0.250	6.37	13.83	8.84	8.84	9.12	6.68
52	Sabari Jewellery	C0088	1	0.250	6.55	13.76	9.06	9.06	9.36	6.88
53	Salona Cotspin Ltd.,	C0092(A)	1	0.600	7.31	13.85	9.99	10.08	10.33	7.45
54	Santhi Casting Works	C0093	2	0.600	6.60	13.88	9.13	9.13	9.43	6.94
55	Saravana Textile Mills	C0094	2	0.600	9.41	17.29	12.50	12.50	12.91	9.76
56	Scientific MES Technik Pvt. Ltd.,	C0095	1	0.600	6.06	13.20	8.43	8.43	8.71	6.36
57	Siva Subramania Textiles	C0102	1	0.600	7.87	14.38	10.66	10.75	10.99	8.21
58	Soundara Knit Wears	C0104	1	0.600	8.70	16.01	11.59	11.59	11.93	9.05
59	Sree Kandiamman Industries	C0107	1	0.250	5.74	12.37	8.23	8.23	8.50	6.15
60	Sri Dhanalakshmi Sizing and Spinning Mill	C0109(B)	1	0.600	7.68	15.97	10.44	10.44	10.76	8.03
61	Sri Jagannatha Spinners	C0111	1	0.600	8.06	14.80	10.92	11.01	11.26	8.21
62	Srinivasan Associates Pvt. Ltd.,	C0119	1	0.600	8.33	15.76	11.14	11.14	11.47	8.66
63	Sripathi Paper and Boards Pvt. Ltd.,	C0120	1	0.600	6.92	13.07	9.48	9.56	9.78	7.23
64	Sun Chem Products (P) Ltd.,	C0124	1	0.250	6.50	14.10	9.00	9.00	9.28	6.83
65	Sun Industrial Automations & Solutions	C0125	1	0.600	9.76	17.93	13.02	13.02	13.75	10.11

66	T.N. Nantagopal & Sons,	C0129	1	0.600	8.78	16.14	11.68	11.68	12.02	9.12
67	Thirupur Suriya Textiles Pvt. Ltd.,	C0132	1	1.250	8.13	15.24	10.96	11.05	11.29	8.46
68	Twowin Export	C0134	1	0.225	5.67	12.27	8.17	8.17	8.44	6.08
69	Vellingiri Andavar Textiles Pvt. Ltd.,	C0135	1	0.600	7.39	13.99	10.10	10.20	10.43	7.53
70	VXL Systems	C0140	1	0.800	9.12	16.76	12.10	12.10	12.49	9.46

Appendix 5-Benchmark

S.No	Name of the Company	Company code	No .of WTGs	Capacity (in MW)	Risk free return	Market return	Beta	Post tax return on Equity (Benchmark)
1	Ambika Cotton Mills Limited	A1	2	0.8	7.89%	27.05%	1.09	28.69%
2	Bright Castings	A2	1	0.6	7.89%	24.23%	1.09	25.64%
3	Concorde Agencies	A3	1	0.225	7.89%	27.05%	1.09	28.69%
4	Concorde Textiles	A4	2	0.225	7.89%	27.05%	1.09	28.69%
5	Hemalatha Mills Pvt. Ltd.,	A5	1	0.225	7.89%	23.90%	1.09	25.27%
6	Pavathal Spinning Mills Pvt. Ltd.,	A7	1	0.25	7.89%	27.05%	1.09	28.69%
7	Santhi Casting Works	A9	1	0.6	7.89%	27.05%	1.09	28.69%
8	SRG Apparels	A12	2	0.25	7.89%	27.05%	1.09	28.69%

	Pvt. Ltd.,							
9	Sri Dhanalakshmi Sizing & Spinning Mill	A13	3	0.6	7.89%	27.05%	1.09	28.69%
10	Thangamman Process	A14	1	0.25	7.89%	24.23%	1.09	25.64%
11	Warsaw International	A19	1	0.25	7.89%	24.23%	1.09	25.64%
12	Associated Autotex Ancillaries Pvt. Ltd.,	B1	1	0.8	8.12%	19.60%	1.096	20.69%
13	Auto Coats	B2	1	0.8	8.12%	19.60%	1.096	20.69%
14	Doller Industries Ltd.,	B3	1	1.25	8.12%	19.60%	1.096	20.69%
15	KG Entertainment Company (P) Ltd.,	B4	1	1.25	8.12%	22.33%	1.096	23.69%
16	Narasu's Roller Flour Mills	B5	1	0.8	8.12%	23.60%	1.096	25.08%
17	Sushrushah Medicare Centre Pvt. Ltd.,	B6	1	0.25	8.12%	23.60%	1.096	25.08%
18	A. Duraisamy Modern Rice Mill	C0001	1	0.225	8.12%	15.62%	1.096	16.34%
19	Ahill Knit Exports	C0004	1	0.250	8.12%	13.82%	1.096	14.37%
20	Archana Jewel Craft	C0008	1	0.250	8.12%	19.34%	1.096	20.41%
21	Arul Steels	C0009	1	0.600	7.89%	20.74%	1.096	21.97%

22	Arun Textiles Pvt. Ltd.,	C0010	2	0.600	7.89%	20.69%	1.096	21.92%
23	Aruna Alloy Steels Pvt. Ltd.,	C0011	1	1.650	8.12%	14.52%	1.096	15.13%
24	C. Dorairaj	C0019	1	0.600	8.12%	19.34%	1.096	20.41%
25	C. Natarajan	C0020	1	0.225	8.12%	20.74%	1.096	21.95%
26	Cheran Textile Mills	C0023	1	0.600	8.12%	19.34%	1.096	20.41%
27	Chiranjeevi Wind Energy Ltd.,	C0024A	2	0.250	8.12%	13.82%	1.096	14.37%
28	Coimbatore Pioneer Fertilizers Ltd.,	C0026	2	0.600	8.12%	14.70%	1.096	15.33%
29	Concorde Textiles	C0027(A)	2	0.600	7.89%	18.76%	1.096	19.80%
30	Divya Spinning Mill Pvt. Ltd.,	C0029	1	1.250	8.12%	18.59%	1.096	19.60%
31	Dollar Industries Ltd.,	C0030	1	1.250	8.12%	19.34%	1.096	20.41%
32	Eveready Spinning Mills Pvt. Ltd.,	C0032(A)	1	0.600	8.12%	19.37%	1.096	20.45%
33	Eveready Textiles	C0033	1	0.600	8.12%	18.59%	1.096	19.60%
34	Green Energy	C0037	1	0.250	8.12%	19.22%	1.096	20.28%
35	Jayanthi Textile Products Unit II	C0044(A)	1	1.250	8.12%	13.82%	1.096	14.37%
36	Jayavarma Textiles Pvt. Ltd.,	C0045	1	1.250	8.12%	18.76%	1.096	19.78%
37	Karpagham Tex	C0049	1	0.600	8.12%	19.37%	1.096	20.45%

38	Lakshminarayan Gaurishanker Enterprises Pvt. Ltd.,	C0052	4	0.250	8.12%	13.02%	1.096	13.49%
39	Madras Hardtools Pvt. Ltd.,	C0054(A)	1	0.250	7.89%	20.74%	1.096	21.97%
40	Madras Hardtools Pvt. Ltd.,	C0054(B)	1	0.250	8.12%	15.62%	1.096	16.34%
41	Micro Colour Makers	C0060	1	0.250	7.89%	20.69%	1.096	21.92%
42	N. Leelavathy	C0062	1	0.225	7.89%	20.74%	1.096	21.97%
43	N. Muthukumaar	C0063	1	0.600	8.12%	19.37%	1.096	20.45%
44	Narasu's Spinning Mills	C0064	1	0.600	8.12%	13.61%	1.096	14.14%
45	P. Periyaswamy HUF	C0065	1	0.600	8.12%	19.37%	1.096	20.45%
46	P.S.K. Engineering Construction & Co.,	C0069	1	1.500	8.12%	19.37%	1.096	20.45%
47	Pallava Textile Ltd.,	C0070	1	1.650	8.12%	19.37%	1.096	20.45%
48	Perfect Gears (Chennai) Pvt. Ltd.,	C0074	1	0.250	8.12%	13.82%	1.096	14.37%
49	Preethi Cotspin Pvt. Ltd.,	C0076(A)	1	0.600	8.12%	18.82%	1.096	19.85%
50	Raju & Co.,	C0083	1	0.600	7.89%	20.74%	1.096	21.97%
51	S C Energiaa Pvt. Ltd.,	C0086	1	0.250	8.12%	13.82%	1.096	14.37%

52	Sabari Jewellery	C0088	1	0.250	8.12%	13.02%	1.096	13.49%
53	Salona Cotspin Ltd.,	C0092(A)	1	0.600	8.12%	18.82%	1.096	19.85%
54	Santhi Casting Works	C0093	2	0.600	7.89%	20.74%	1.096	21.97%
55	Saravana Textile Mills	C0094	2	0.600	8.12%	18.59%	1.096	19.60%
56	Scientific MES Technik Pvt. Ltd.,	C0095	1	0.600	8.12%	13.82%	1.096	14.37%
57	Siva Subramania Textiles	C0102	1	0.600	8.12%	13.02%	1.096	13.49%
58	Soundara Knit Wears	C0104	1	0.600	8.12%	19.37%	1.096	20.45%
59	Sree Kandiamman Industries	C0107	1	0.250	8.12%	13.89%	1.096	14.44%
60	Sri Dhanalakshmi Sizing and Spinning Mill	C0109(B)	1	0.600	8.12%	13.02%	1.096	13.49%
61	Sri Jagannatha Spinners	C0111	1	0.600	8.12%	18.59%	1.096	19.60%
62	Srinivasan Associates Pvt. Ltd.,	C0119	1	0.600	8.12%	19.34%	1.096	20.41%
63	Sripathi Paper and Boards Pvt. Ltd.,	C0120	1	0.600	8.12%	13.89%	1.096	14.44%
64	Sun Chem Products (P) Ltd.,	C0124	1	0.250	8.12%	14.52%	1.096	15.13%

65	Sun Industrial Automations & Solutions	C0125	1	0.600	8.12%	19.34%	1.096	20.41%
66	T.N. Nantagopal & Sons,	C0129	1	0.600	8.12%	19.34%	1.096	20.41%
67	Thirupur Suriya Textiles Pvt. Ltd.,	C0132	1	1.250	8.12%	14.52%	1.096	15.13%
68	Twowin Export	C0134	1	0.225	8.12%	13.02%	1.096	13.49%
69	Vellingiri Andavar Textiles Pvt. Ltd.,	C0135	1	0.600	8.12%	18.59%	1.096	19.60%
70	VXL Systems	C0140	1	0.800	8.12%	18.59%	1.096	19.60%

Appendix- 6**Baseline Information**

Variable	Data Source
EG _y – Electricity generated	Records maintained by project proponent
Parameter	Data Source
EF _{OM, y} - Build Margin Emission Factor (tCO ₂ /MWh)	CEA Data, version 05 www.cea.nic.in
EF _{BM, y} = Operating Margin Emission Factor (tCO ₂ /MWh)	CEA Data, version 05 www.cea.nic.in
EF _y – Grid Emission Factor	Calculated as the weighted average of the operating margin and build margin

Share of Must-Run (Hydro/Nuclear) (% of Net Generation)

	2004-05	2005-06	2006-07	2007-08	2008-09
South	21.6%	27.0%	28.3%	27.1%	22.8%
India	18.0%	20.1%	20.9%	21.0%	18.6%