Voluntary Carbon Standard
Project Description Template

19 November 2007

Date of the VCS PD: 05th November, 2009

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1 Description of Project:

1.1 Project title

Title: ***Bundled grid-connected wind electricity generation project identified as Bundle E3 in Maharashtra and Gujarat, India***

Version: ***03***

1.2 Type/Category of the project

- According to the Voluntary Carbon Standard, Baseline & Monitoring Methodologies include[1]:
  - Clean Development Mechanism methodologies
  - California Climate Action Registry

  For the VCS project activity under consideration, the project proponent chooses to apply the Clean Development Mechanism Baseline & Monitoring Methodology. According to the categorization of Appendix B to the simplified modalities and procedures for small scale Clean Development Mechanism (CDM) project activities[2] the project activity under consideration fits into the type and category as mentioned below:
  - Type: *Type I – Renewable Energy Projects*
  - Category: *I.D. 'Grid Connected Renewable Energy Generation'*

  For further details regarding the applicability criteria pertaining to the above-mentioned type and category in the context of the project activity, please refer to section 2.2 of the VCS PD.

- Voluntary Carbon Standard 2007.1 defines grouped projects in the following manner:
  "Any combination of GHG projects or project categories that meets the requirements of the VCS 2007.1 can be registered as a grouped project. A grouped project can include one or more sub-groups, for example a combination of project categories or projects, as long as each sub group retains its distinctive characteristics. A grouped project shall have one central GHG information system and controls associated with the project and its monitoring. It is anticipated that such central GHG information system and controls will include items identified in ISO14064-3:2006, clause 4.5.
  A number of projects and their related methodologies included in a single VCS Project Description (VCS PD) at the time of the validation."

  For the project activity under consideration, the various individual components bundled together, *i.e.*, wind-mills fall under the purview of the same project category (as indicated above) and follow the same methodology, *i.e.*, AMS-I.D, as established in Section 2.2 of the Project Description. Furthermore, the bundled project does not have one central greenhouse gas (GHG) information system and controls associated with the project and its monitoring, as required for a grouped project by the VCS guidelines

[1] Please refer to: http://www.v-c-s.org/methodologies.html
[2] Refer to: http://cdm.unfccc.int/methodologies/SSCmethodologies

(mentioned above). Hence the VCS project activity under consideration is not a grouped project activity as defined in the VCS Guidelines.

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

- The total capacity of power generation of the bundled project activity under consideration is 7.75 MW and the average annual emission reductions from the bundle are to the tune of 11,922 tonnes CO_2 equivalent. Therefore the project activity fall under the project type "Projects" as specified in the "Voluntary Carbon Standard 2007.1" by the VCS Association:
    - *Micro project*: Less than 5,000 tonnes CO_2 equivalent emissions reductions per year
    - *Projects:* 5,000 – 1,000,000 tCO_2-e per year
    - *Mega Project*: More than 1,000,000 tonnes CO_2 equivalent emissions reductions per year

1.4 A brief description of the project:

The project activity under consideration entails generation of clean power by harnessing wind energy, a non-conventional renewable energy resource and export of the electricity generated to the Maharashtra State Electricity Distribution Company Limited (in the state of Maharashtra, India) and Gujarat Urja Vikas Nigam Limited (in the state of Gujarat, India) on the basis of Power Purchase Agreements signed for each of the individual wind-mills with the respective state authorities. The electricity exported from the wind-mills installed under the project activity to the grid thereby replaces an equivalent amount that would have otherwise been generated by the fossil-fuel fired thermal power dominated electricity grid. Therefore the project activity results in an equivalent amount of GHG emission reduction which otherwise would have resulted from electricity generation at the fossil fuel dominated grid end as per the generation mix.

The project activity is a bundled wind energy project with total capacity of 7.75 MW, comprising of six Wind Turbine Generators (WTGs), five out of which have a capacity of 1.25 MW each and one has a capacity of 1.5 MW. The WTGs have been commissioned in the period between 05/02/2007 and 31/03/2007. The relevant details of the individual components of the bundled project activity including the names of the project promoters, the installed wind power generation capacity for each wind turbine and the unique WTG location number of the respective wind turbines have been tabulated below:

Sl. No.	Project Promoting Company[3]	Cumulative Installed Capacity (MW)	Number of WTGs Installed	WTG Location Nos.
1	UIC Udyog Limited	5.00 MW	4	K-537, K-539, K-542, K-543
2	Khatau Narbheram & Co	1.50 MW	1	W-55
3	Hind Metals and Industries (P) Limited	1.25 MW	1	J-43

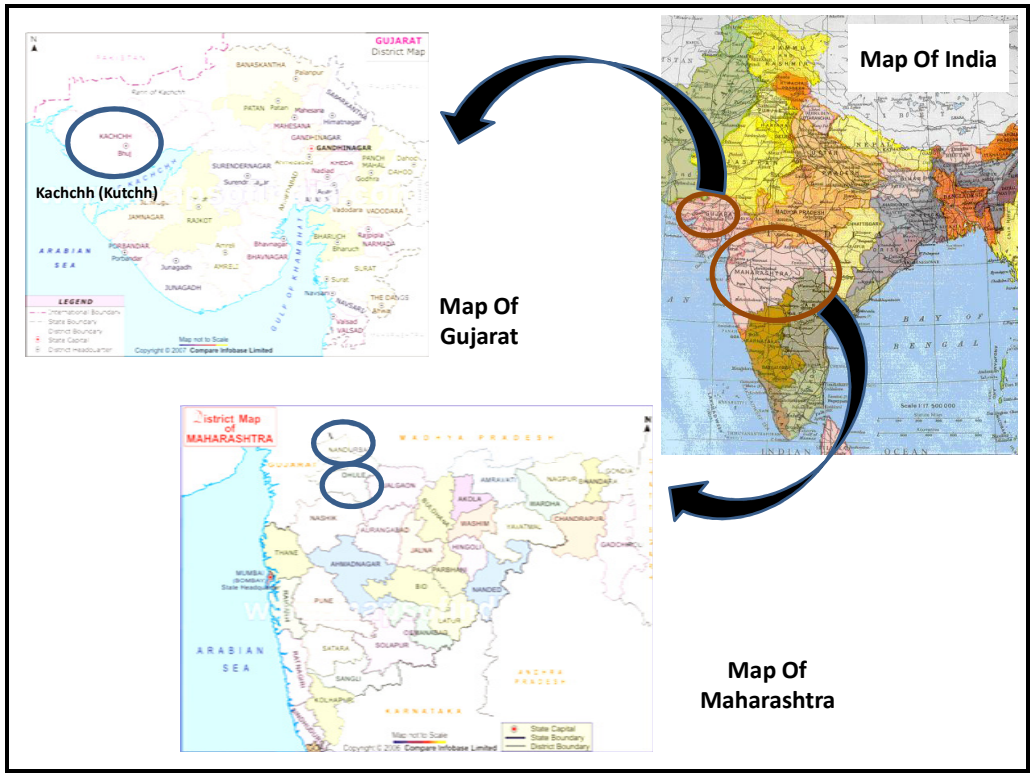
[3] Hereafter referred to as ***"Project Promoters"*** in the rest of the VCS PD.

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

The location of each individual WTG installed under the project activity has been detailed in the following table:

Sl.No.	WTG Loc. No.	Installed Capacity (MW)	Location			Local Grid Station	Grid Sub-station	Geographical Co-ordinates	
			Village	District	State			Latitude	Longitude
1	K-537	1.25	Akrale	Nandurbar	Maharashtra	Maharashtra State Electricity Distribution Company Limited	132 kV/ 33 kV Nandurbar Sub-station	21°21' 50.6''N	74°20' 51.4''E
2	K-539	1.25	Akrale	Nandurbar				21°22' 35.4''N	74°21' 19.8''E
3	K-542	1.25	Akrale	Nandurbar				21°22' 16.3''N	74°21' 41.3''E
4	K-543	1.25	Akrale	Nandurbar				21°22'26.0'' N	74°22' 05.9''E
5	J-43	1.25	Dusane	Dhule			220/33 kV Jamde Sub-station	21°10'24.5'' N	74°24'18.6'' E
6	W-55	1.5	Arikhana	Kutchh	Gujarat	Gujarat Energy Transmission Corporation Limited	GETCO Suthri Sub-station	23°05'00.3''N	68°52'51.3''E

Maps depicting the districts and states in which the wind-mills are located are provided below:



1.6 Duration of the project activity/crediting period:

Project lifetime: 20 years

Length of crediting period: 10 years

Project start date:

Voluntary Carbon Standard 2007.1 defines the project start date as follows:
"Date on which the project began reducing or removing GHG emissions"

For the bundled project activity under consideration, the project start date, *i.e.*, the date on which the project began reducing GHG emissions by power generation is the *earliest* of the dates of the commissioning of the individual WTGs by the respective State Electricity Authorities (Maharashtra State Electricity Distribution Company Limited and Gujarat Energy Development Agency). The commissioning date for each of the wind mills under the bundled project activity is provided in the table below.

Name of the Project Promoting Company	WTG Location No.	Location	Commissioning Date
UIC Udyog Limited	K-537	Maharashtra	29/03/2007
	K-539		29/03/2007
	K-542		31/03/2007
	K-543		31/03/2007
Khatau Narbheram & Co	W-55	Gujarat	31/03/2007
Hind Metals and Industries (P) Limited	J-43	Maharashtra	05/02/2007
Reference: Commissioning Certificates issued by the respective State Electricity Authorities			

As evident from the table above, the earliest commissioning date is 05/02/2007 for the WTG promoted by Hind Metals and Industries (P) Limited in Location No. J-43.

Therefore the Project start date for the bundled VCS project activity under consideration is 05/02/2007.

Crediting period start date:

Voluntary Carbon Standard 2007.1 defines the crediting period start date as follows: *"The date on which the first monitoring period commences"*

For the bundled project activity under consideration, the crediting period start date, *i.e.*, the date on which the first monitoring period of GHG abatement by the project commenced is the date on which project began reducing GHG emissions by power generation. Hence, it is the *earliest* of the dates of the commissioning of the individual WTGs by the respective State Electricity Authorities, which is 05/02/2007 for the WTG promoted by Hind Metals and Industries (P) Limited in Location No. J-43 (as established above).

Therefore the Crediting Period start date for the bundled VCS project activity under consideration is 05/02/2007.

Operating Years	**CO_2 Emission Reductions (tonnes of CO_2)**
05th Feb 2007- 04th Feb 2008	10,569
05th Feb 2008- 04th Feb 2009	12,072
05th Feb 2009- 04th Feb 2010	12,072
05th Feb 2010- 04th Feb 2011	12,072
05th Feb 2011- 04th Feb 2012	12,072
05th Feb 2012- 04th Feb 2013	12,072
05th Feb 2013- 04th Feb 2014	12,072
05th Feb 2014- 04th Feb 2015	12,072
05th Feb 2015- 04th Feb 2016	12,072
05th Feb 2016- 04th Feb 2017	12,072
Total estimated reductions (tonnes of CO_2 e)	**119,217**
Total number of crediting years	10
Annual average over the crediting period of estimated reductions (tonnes of CO_2 e)	**11,922**

1.7 Conditions prior to project initiation:

In the absence of the project activity, an equivalent quantum of electricity would have been generated by the fossil-fuel dominated Northern Eastern Western North

Eastern (NEWNE) Regional Electricity Grid of India[4] generation mix. The same would in turn result in GHG emissions at the grid end as per the carbon intensity of the above mentioned grid. This scenario has been identified as the baseline scenario for the project activity under consideration (*please refer to section 2.4 of the VCS PD for further details*).

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

The project activity under consideration entails electricity generation through wind-mills by harnessing wind power potential, a natural and renewable source of energy. The project is expected to generate and export 13.41 million kWh (approx) to the state grids of Maharashtra and Gujarat at an electricity generation PLF of 20% for UIC Udyog Limited and Hind Metals and Industries (P) Limited as per MERC tariff order and 23% for Khatau Narbheram & Co as per GERC tariff order. In the absence of the project activity, an equivalent quantity of electricity would have been generated by the thermal power dominated NEWNE Grid in line with the grid mix. The same would have resulted in GHG emissions as per the carbon intensity of the grid-mix.

As per the combined margin CO_2 emission factor of the NEWNE Regional Grid of India of 0.90 tonnes CO_2/MWh for the year 2007-08[5], the bundled VCS project activity would result in total GHG emission reductions to the tune of 11,922 tonnes CO_2e per annum, which corresponds to emission reductions of 119,217 tonnes over the crediting period of 10 years. For detailed calculation procedure and sample calculation tables of the GHG emission reduction quantum from the project activity, please refer to Sections 4.2, 4.3 and 4.4 of the VCS PD.

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

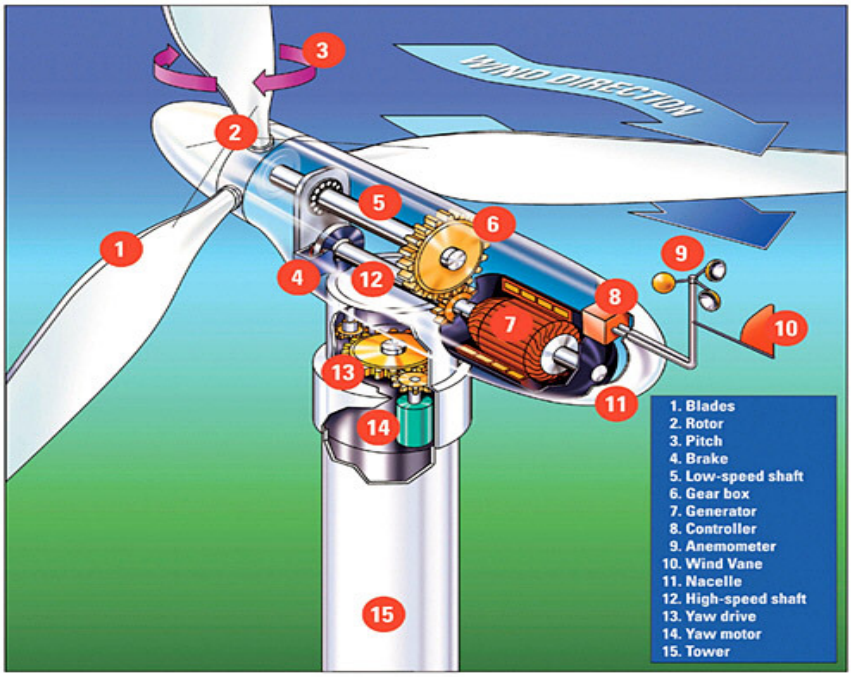
In wind energy generation, kinetic energy of wind blowing at high speeds is converted into mechanical energy while passing through the wind-turbine. The rotation of the turbine blades results in the rotation of the generator mounted on the same shaft, thus generating electricity. As there are no GHG emissions associated with wind electricity generation, the technology is widely recognized as clean technology. The important components of a windmill are as follows:

- Main Tower
- Blades
- Nacelle
- Hub
- Main Shaft
- Gear Box, Bearing and Housing
- Brake
- Generator

The components of a windmill are illustrated below:

[4] The Indian power grid system (or the National Grid) is divided into two regional grids namely Northern – Eastern – Western – North Eastern (NEWNE) Regional Grid and Southern Region Grid. These regional grids have independent state Load Dispatch Centres (LDCs) that manage flow of power in their jurisdiction. Power generated by state owned generation units and private owned generation units is consumed by the respective states. Power generated by central sector plants is shared by all states forming part of the grid in a fixed proportion.

[5] Central Electricity Authority CO_2 Baseline Database Version 4.0 Dated October 2008: www.cea.nic.in



The various WTG models employed by the project activity are shown below:

Name of the project participant	WTG Location No.	WTG Model No.
UIC Udyog Limited	K-537	S-70
	K-539	S-70
	K-542	S-70
	K-543	S-70
Hind Metals and Industries (P) Limited	J-43	S-70
Khatau Narbheram & Co	W-55	S-82

Furthermore, the specifications of the individual WTG models (S-82 and S-70) are presented below:

WTG SPECIFICATIONS:		
PARAMETERS:	**SUZLON S-82 WTG**	**SUZLON S-70 WTG**
Rotor		
Rotor Diameter	82 m	69.1
Hub Height	80 m	74 m
Swept Area	5281 m^2	3750 m^2
Rotational Speed	16.30	13.2/19.8
Rotor Material	GRP	GRP
Regulation	Pitch regulated	Pitch regulated
Operational Data		
Cut-in wind speed	4 m/s	3 m/s
Rated wind speed	14 m/s	12 m/s
Cut-out wind speed	20 m/s	20 m/s
Survival wind speed	65 m/s	65 m/s
Generator		
Type	Asynchronous generator, 4 poles	Asynchronous generator, 4/6 pole
Rated Output	1500 kW	250/1250 kW
Rotational speed	1511 rpm	1010/1515 rpm
Operating voltage	690 V	690 V
Frequency	50 Hz	50 Hz
Protection	IP 54	IP 56

WTG SPECIFICATIONS:		
PARAMETERS:	**SUZLON S-82 WTG**	**SUZLON S-70 WTG**
Insulation class	"H"	"H"
Cooling system	Air cooled	Air cooled
Gear-Box		
Type	Integrated, 3 stage gearbox, 1 planetary & 2 helical	Integrated, 3 stage gearbox, 1 planetary & 2 helical
Gear ratio	1:95.09	1:77.848
Nominal load	1650 kW	1390 kW
Type of cooling	Oil cooling system	Oil cooling system
Yaw Drive		
Yaw drive system	4 active electrical yaw motors	4 active electrical yaw motors
Yaw bearing	Polyamide slide bearing	Polyamide slide bearing
Reference: Purchase Orders issued by the individual Project Promoting companies to Suzlon Energy Limited for WTG supply		

The expected level of performance in terms of electricity generation and GHG abatement (ex-ante emission reduction quantum based on estimated value of annual generation obtained by considering PLF as per the tariff orders of the respective states) is provided below:

Sl. No.	Company	Installed Capacity (MW)	Electricity Exported to the Grid during first crediting period (MWh)	Electricity Exported to the Grid from second crediting period onwards (MWh)	PLF (%)	Source of PLF Data	GHG Abatement for first crediting period (ton CO2e)	GHG Abatement per annum (ton CO2e)
1	UIC Udyog Limited	5	7,177	8,410	20	MERC tariff order	6,459	7,569
2	Khatau Narbheram & Co	1.5	2,464	2,901	23	GERC tariff order	2,218	2,611
3	Hind Metals and Industries (P) Limited	1.25	2,102	2,102	20	MERC tariff order	1,892	1,892
Total		**7.75**	**11,743**	**13,413**			**10,569**	**12,072**

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

The project activity under consideration complies with the applicable regional and national level legal and regulatory requirements for installation and operation of wind-mills. The same is tabulated below:

Project Proponent	Sl. No.	Authority	Clearance	Date	Reference No.
UIC Udyog Limited	1	Maharashtra State Electricity Distribution Company Limited	Power Purchase Agreement	24/05/2207	AM 38678
	2	Maharashtra Energy Development Agency	Infrastructure clearance	23/03/2007	PGN-I/IC/UIC Wires Ltd./5.00 MW/06-07/1738
	3		Clearance for commissioning	28/03/2007	PGN-I/IC/UIC Wires Ltd./2.5 MW/06-07/1810

				30/03/2007	PGN-I/IC/UIC Wires Ltd./1.25 MW/06-07/1907, PGN-I/IC/UIC Wires Ltd./1.25 MW/06-07/1933
	4	Maharashtra State Electricity Distribution Company Limited	Commissioning Certificate	02/04/2007	SE/DHL/Tech/Wind/2733
				30/03/2007	SE/DHL/Tech/Wind/2702
	5	Government of Maharashtra/ Land seller	Land sale deed	22/03/2007	1656
				22/03/2007	1657
				14/03/2007	1535
Khatau Narbheram & Co	1	Gujarat Energy Development Agency	Commissioning Certificate	17/04/2007	GEDA/PWF/SGWPL-KN&C/Abdasa/2006-07/238
	2	Government of Gujarat/ Land seller	Land sale/lease deed	24/01/2007	472
	3	Gujarat Urja Vikas Nigam Limited	Power Purchase Agreement	04/12/2007	E 653451
Hind Metals and Industries (P) Limited	1	Maharashtra State Electricity Distribution Company Limited	Commissioning Certificate	14/02/2007	SE/DHL/Tech/Wind/1293
	2	Maharashtra Energy Development Agency	Clearance for commissioning	12/10/2006	PGN-I/IC/Hind Metals/1.25 MW/06-07/6610
	3			28/09/2006	PGN-I/IC/Hind Metals/1.25 MW/06-07/6260
	4	Government of Maharashtra/ Land seller	Land sale deed	26/09/2006	02913
	5	Maharashtra State Electricity Distribution Company Limited	Power Purchase Agreement	09/03/2007	AR 600823
	6	Government of Maharashtra	Plan approval	25/09/2006	SEA/Sec-2/A.E.-3/565/2006-07

Since four WTGs promoted by UIC Udyog Limited are clubbed together in groups of two turbines each (K-542, K-543 and K-537, K-539), two sets of documents are available for the same.
The documents related to relevant statutory clearances for each component of the bundled project activity would be made available during Project Validation.

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

The amount of GHG emission reductions that the project activity would result in directly depends on the quantity of electricity generated by the wind-mills. The various factors that might contribute to a substantial variation in the GHG emission reduction quantum from the project as compared to that predicted in the VCS PD are summarised below:

- Substantial variation in the wind availability/ plant load factor as compared to the values predicted on the basis of the wind resource availability report

- Plant stoppages and loss of generation due to
    - Equipment or component failure associated with the WTGs
    - Evacuation problems associated with the local grid failures
    - Physical damages to equipment and erected structures caused by natural calamities or other factors not under the control of the project promoters.

The factors mentioned above pose risks to the project performance and hence the GHG abatement quantum of the project. However, the average annual GHG emission reduction potential of the bundled project activity has been projected in the VCS PD based on actual retroactive electricity generation from the bundle and therefore actual GHG emission reduction per annum is least likely to vary substantially from the projected value as provided in the PD.

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 involves power generation by installation of WTGs at several locations in the states of Maharashtra and Gujarat, India. The process of wind power generation does not involve fossil fuel combustion or any other direct or indirect emission of GHGs. Further, the same is negligible compared to the GHG emission reductions over the lifetime through displacement of equivalent electricity generation by thermal power intensive grid. As mentioned above, there are no GHG emissions attributable to the project activity and thus removal or destruction of the same is not possible. This confirms that the project was not implemented 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).

No mechanisms pertaining to Renewable Energy Certificates (RECs) have been implemented in the host country of the project activity under consideration, i.e., India as on the date of this document. However, in the event that any such future REC mechanisms are implemented for availing GHG abatement benefits and issuance of RECs imply that carbon credits cannot be issued under global mechanisms or vice-versa, the project proponents shall apply for issuance of only one of the two benefits, i.e., RECs or carbon credits.

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

It is to be noted that for each of the wind-mills under consideration that the GHG abatement benefits (CERs/VCUs) for any particular duration of time can be claimed only under one GHG abatement scheme (CDM/VCS). Hence, the VCUs accumulated for the project activity from the date of crediting period would be claimed under the VCS mechanism. Furthermore, the VCS crediting period of the individual wind-mill would extend till the date of CDM Registration, after which CERs would be claimed under CDM for the same. In case of failure in registration in the CDM cycle, the carbon credits related benefits will be continued to be claimed under VCS scheme.

The wind-mills installed under the project activity are eligible to apply under other GHG programs like CDM and VCS. The details of the progress of the individual wind-mill projects in the CDM route (if applicable) are presented below:

Project Promoting Company	WTG Location No	Other GHG Program(s)	Application Status
UIC Udyog Limited	K-537, K-539, K-542, K-543	CDM	Validation
Khatau Narbheram & Co	W-55	CDM	
Hind Metals and Industries (P) Limited	J-43	CDM	

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

A. Primary Project Representative: UIC Udyog Limited (Details provided below)

B. Individual Project Participants

1. UIC Udyog Limited:

Organization:	UIC Udyog Limited
Roles & Responsibilities:	Individual Project Participant or Project Promoter/developer
Street/P.O.Box:	227, A. J. C. Bose Road
Building:	Anandalok
City:	Kolkata
State/Region:	West Bengal
Country:	India
Telephone:	+91-33-2280-8811
Fax:	+91-33-2280-9492
E-Mail:	uicl@giascl01.vsnl.net.in
URL:	http://www.uicwires.com
Represented by:	
Title:	
Salutation:	Mr.
Last Name:	Saha
Middle Name:	
First Name:	Jayanta
Mobile:	+91-98309-81099
Direct Fax:	
Direct tel:	
Personal E-Mail:	ja_saha@yahoo.co.in

2. Khatau Narbheram & Co.:

Organization:	Khatau Narbheram & Co.
Roles & Responsibilities:	Individual Project Participant or Project Promoter/developer
Street/P.O.Box:	113, Park Street
Building:	Poddar Point, Block – A, 5th Floor
Pin:	700016
City:	Kolkata
State/Region:	West Bengal
Country:	India
Telephone:	+91-33-2226-4777
Fax:	+91-33-2226-4539
E-Mail:	accountskol@athamines.com
URL:	
Represented by:	
Title:	
Salutation:	Mr.
Last Name:	Dave
Middle Name:	
First Name:	Devendra
Mobile:	+91-97487-36344

Direct Fax:	
Direct tel:	+91-33-2226-4777
Personal E-Mail:	d.dave@athamines.con

3. Hind Metals and Industries (P) Limited:

Organization:	Hind Metals and Industries (P) Limited
Roles & Responsibilities:	Individual Project Participant or Project Promoter/developer
Street/P.O.Box:	28, Gurudwara Road
Building:	
City:	Barbil
State/Region:	Orissa
Country:	India
Telephone:	+91-6767-277339
Fax:	+91-6767-276858
E-Mail:	connect@hindmetals.org
URL:	
Represented by:	
Title:	
Salutation:	Mr.
Last Name:	Pradhan
Middle Name:	
First Name:	Sushil
Mobile:	+91-94370-78032
Direct Fax:	
Direct tel:	
Personal E-Mail:	

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.):

Purpose:

The purpose of the wind-mills set up by the project activity is as follows:

- Generating clean power by utilising the renewable natural resource *i.e.,* wind power and exporting the electricity generated to the grid. Hence the project activity does not cause emissions of greenhouse gases (GHGs) that would have otherwise been caused by power generation by the combustion of non-renewable sources of energy.
- Harnessing the wind power potential existing in India for power generation that has not been exploited to its full potential till date
- Contribution to the industrial development of India by providing support in terms of enhanced power availability
- Increasing the share of renewable energy directly in the regional electricity grid and indirectly in the national electricity grid
- Contribution to the causes of fossil-fuel conservation and climate change mitigation
- Contribution to the cause of energy security of the nation
- Reduction of import of fossil fuels leading to saving of national revenue

Contribution of the Project Activity to Sustainable Development:

The contribution of the project activity to the sustainable development of the host country India is evident from the following:

Social Well Being	• The project generates clean power without negative impacts on surroundings • No human displacement due to the project activity and hence no requirement of relocation • The local population has been employed during the installation, commissioning and operation of the wind mills, thus proper training imparted to the people involved results in the skill development of the local inhabitants and also improvement in their economic condition.
Economic Well being	• The project activity is responsible for creating business opportunities for many local stakeholders • It is an effort on the part of the project proponent to contribute towards grid stability and bridging the demand-supply gap in electricity in the regional grid and in turn in the national grid • The project activity contributes towards the conservation of fossil-fuels and makes these non-renewable sources of energy available for other important purposes. • It indirectly contributes towards industrial development of the region by creating a support in terms of supplying power for industries to come up in due course of time
Technological Well being	• The project activity generates clean power by harnessing the potential wind energy for power generation • It also helps in reducing the losses due to power transmission and distribution from the existing generating stations of the grid to remote areas
Environmental Well being	• The project activity displaces an equivalent quantum of power generated by the combustion of fossil fuels, the non-renewable energy sources at the grid connected thermal power plants, thus reducing GHG emissions and contributing to the overall cause of mitigation of global warming • The project activity by setting up wind-mills for power generation does not cause environmental disturbance or ecological imbalance to the surroundings • The project activity also contributes to the reduction in the emissions of SOx, NOx, and SPM associated with combustion of fossil fuels for generation of thermal power

1.17 List of commercially sensitive information (if applicable):

Not Applicable

2 VCS Methodology:

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

Title of Approved Baseline Methodology: 'Grid Connected Renewable Electricity Generation'
Reference of the Approved Baseline Methodology: Category I.D - Renewable Energy Projects: Approved Small Scale Methodology AMS –I.D. / Version 14 of the Appendix B of Simplified Modalities and Procedures (M & P) of Small Scale CDM Project Activities

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

The applicability criteria of the methodology AMS-I.D. and their relevance with respect to the project activity under consideration are addressed as follows:

1. "This category comprises renewable energy generation units, such as photovoltaics, hydro, tidal/wave, wind, geothermal and renewable biomass, that supply electricity to and/or displace electricity from an electricity distribution system that is or would have been supplied by at least one fossil fuel fired generating unit."

The project activity involves the setting up of wind mills, *i.e.*, renewable generating units of cumulative generation capacity 7.75 MW to harness a renewable source of energy (wind power potential) and export the generated electricity to the fossil fuel dominated electricity generation and distribution system, *i.e.*, the NEWNE Regional Electricity Grid of India[6]. In the process, an equivalent quantum of electricity that would have been generated by the grid in line with the grid electricity generation mix is displaced by the project activity.
The carbon intensity of the fossil-fuel dominated generation mix of the grid is evident from the value of the Simple Operating Margin CO_2 Emission Factor of the NEWNE Grid system: 1.00 tonnes CO_2e/MWh (Please refer to Section 4.3 of the Project Description for details on the same). As per the worksheet named "Data" of the Central Electricity Authority CO_2 Baseline Database Version 4.0, Dated October 2008, the ranges of carbon intensity of various types of power generation applications in the Indian Power System presently operational are provided below:

Carbon Intensity of India's Present Power Generation Capacity Installation			
Power Plant Type	**Power Generation Fuel**	**Carbon Intensity (CO_2e/MWh)**	
		Lower Limit	**Upper Limit**
Hydro	-	0.00	0.00
Nuclear	-	0.00	0.00
Thermal	Coal, Lignite	0.94	2.13
	Oil (Diesel, LSHS, Naphtha)	0.52	0.93
	Gas (NG, Naphtha, CCPP/CCGT)	0.39	0.76
	Multi-fuel (Coal, Oil, Naphtha, Gas)	0.80	0.86

Hence, it is evident from the above table that the first two types of power plants, *i.e.*, hydro and nuclear are zero GHG emission sources of power and GHG emissions

[6] The NEWNE Regional Electricity Grid of India is primarily constituted of fossil- fuel fired thermal power plants. Refer to CO_2 Baseline Database Version 4.0 Dated October 2008 available at http://www.cea.nic.in/planning/c%20and%20e/Government%20of%20India%20website.htm

associated with power generation are solely attributable to the various thermal power plants. Furthermore, the Simple Operating Margin CO_2 Emission Factor of the NEWNE Grid system value of 1.00 tonnes CO_2e/MWh suggests that the present power generation mix of India has a majority of fossil-fuel fired thermal power plants. It is also most close to the range of values of carbon intensity of coal fired thermal power plants, indicating that most of the power plants installed and presently operational in India are coal-fired. Thus, it is established that the power grid the project activity exports the power generated is predominantly constituted by fossil-fuel fired applications.

Hence the project activity complies with this criterion.

2. "If the unit added has both renewable and non-renewable components (e.g. a wind/diesel unit), the eligibility limit of 15MW for a small-scale CDM project activity applies only to the renewable component. If the unit added co-fires fossil fuel, the capacity of the entire unit shall not exceed the limit of 15MW".

The project activity involves only wind power generation. The gross wind power generation capacity of the bundled project activity is 7.75 MW (5 X 1.25 MW, 1 X 1.5 MW), which is less than 15 MW, as stipulated in the applicability criterion under consideration.
Hence the project activity complies with this criterion.

3. "Combined heat and power (co-generation) systems are not eligible under this category"

The project activity involves generation of electricity only by harnessing the wind power potential of the region through WTGs and is not a co-generation system.
Hence the project activity complies with this criterion.

4. "In the case of project activities that involve the addition of renewable energy generation units at an existing renewable power generation facility, the added capacity of the units added by the project should be lower than 15 MW and should be physically distinct from the existing units."

The project activity does not involve the addition of renewable energy generation units at an existing renewable power generation facility.
Hence the project activity complies with this criterion.

5. "Project activities that seek to retrofit or modify an existing facility for renewable energy generation are included in this category. To qualify as a small scale project, the total output of the modified or retrofitted unit shall not exceed the limit of 15 MW"

The renewable energy generating wind-mills employed by the project activity are newly set up and it does not involve retrofitting or modification of any existing facility for renewable energy generation.
Hence the project activity complies with this criterion.

Thus, the project activity fulfills all the applicability criteria of the simplified small scale methodology AMS-I.D./ Version 14.

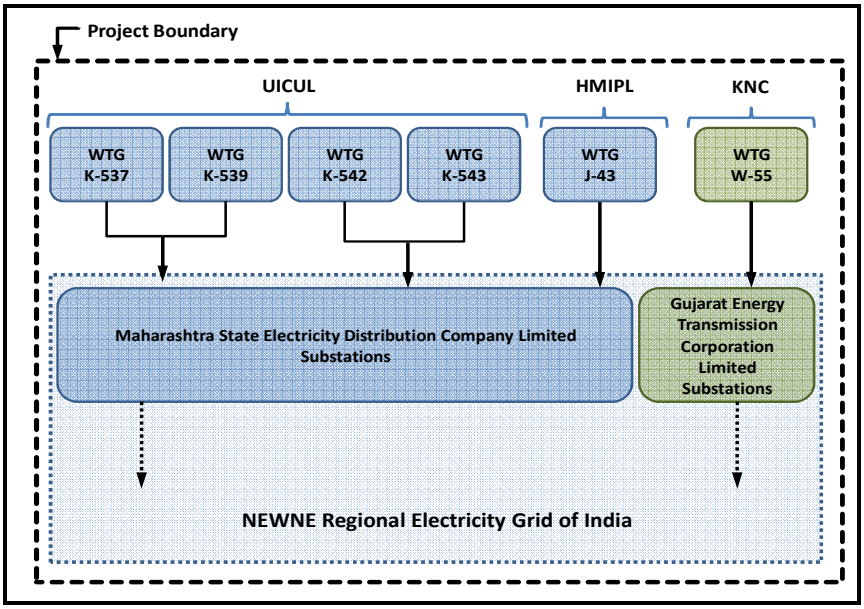
2.3 Identifying GHG sources, sinks and reservoirs for the baseline scenario and for the project:

The various GHG emission sources, sinks and reservoirs are identified for any GHG abatement project within its project boundary. The project boundary for the project activity under consideration encompassing various GHG emission sources for the baseline as well as for the project scenario is identified as follows:

1. *For calculation of Project Emissions from various sources:* Each of the individual wind-mills generating electricity has been included within the project boundary. There are no project emissions attributable to the project activity (please refer to section 4.3 of the VCS PD for details).
2. *For calculation of Baseline Emissions from various sources:* The NEWNE Regional Grid of India has been considered within the project boundary. The carbon intensity of the various GHG emission sources considered under this header, *i.e.*, the NEWNE Grid generation mix has been calculated by the Central Electricity Authority, Government of India (please refer to the section 4.2 of the VCS PD for details).

Furthermore, there are no GHG sequestration sinks or storage reservoirs to be considered for the emission reduction computation for the project activity.

The project boundary as identified above is demonstrated by the following block diagram.



However, as per the methodology followed for the purpose of determining baseline emissions, project emissions and emission reductions for the project activity under consideration (AMS-I.D.), identification of the GHG emission sources, sinks and reservoirs for the baseline and project scenarios of the project activity is not necessary.

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

As per the methodology AMS I.D., the identified baseline would entail continuation of existing scenario: electricity generation by the grid as per the mix of power generating sources.

In absence of the project activity under consideration, an equivalent amount of electricity would have been generated by the NEWNE Regional Electricity Grid of India as per the mix of power generating sources. The NEWNE Regional Electricity Grid will undergo a few capacity additions in due course of time to bridge the demand-supply gap in the long run. The most plausible choice in such a situation based on the existing grid-mix is the setting up of fossil-fuel fired thermal power plants, resulting in GHG emissions as per the carbon intensity of recent capacity augmentation of the above-mentioned grid as has been elucidated below:

The method of calculation of Build Margin Emission Factor of the NEWNE Grid system, as per the guidelines of Page 12, Point (b) of the Step 4 of the 'Tool to calculate the emission factor for an electricity system'/EB 35 states the consideration of "*The set of power capacity additions in the electricity system that comprise 20% of the system generation (in MWh) and that have been built most recently*".

As per the following calculation based on data sourced from the Central Electricity Authority CO_2 Baseline Database Version 4.0, Dated October 2008, the break-up of capacities installed under various types of power plants is provided below:

Break-up of the recent capacity installations of at least 19,639MW:			
Power Plant Type	**Power Generation Fuel**	**Installed Capacity (MW)**	**Capacity Utilisation (PLF)**
Hydro	-	6,215	Low/Medium
Nuclear	-	1,080	High
Thermal	Coal, Lignite	10,455	High
	Naphtha	1,480	
	Gas	463	
Total		**19,693**	**-**

It is evident from the above table that hydro and nuclear power plants (zero GHG emission power plants) constitute just over a third of the total recently installed power plants. Hence, it may be argued that the recent capacity addition in the NEWNE Regional Electricity Grid of India is carbon intensive in nature, dominated by a majority of fossil-fuel fired thermal power plants. Furthermore, the same is evident from the Build Margin CO_2 Emission Factor of the NEWNE Grid system: 0.60 tonnes CO_2e/MWh (Please refer to Section 4.3 of the Project Description for further details on the same) falling in the range of fossil-fuel fired thermal power plants, as depicted in the tables furnished in Section 2.2 of the Project Description.

The baseline scenario of electricity generation by the grid as per the mix of power generating sources is in compliance with all applicable legal and regulatory requirements and would also not entail any investment by the project promoters, as was required for the project activity under consideration.

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):

Barriers and Additionality (As per the UNFCCC/CDM Additionality guidance for small scale CDM projects)

As per the decision 17/cp.7 paragraph 43, a CDM project activity is additional if anthropogenic emissions of greenhouse gases by sources are reduced below those that would have occurred in the absence of the registered CDM project activity. The additionality aspects of the project are discussed below in accordance with Attachment A of appendix B of the simplified M & P for small scale CDM project activities that states:

"Project participants shall provide an explanation to show that the project activity would not have occurred anyway due to at least one of the following barriers:
(a) Investment barrier: a financially more viable alternative to the project activity would have led to higher emissions;
(b) Technological barrier: a less technologically advanced alternative to the project activity involves lower risks due to the performance uncertainty or low market share of the new technology adopted for the project activity and so would have led to higher emissions;
(c) Barrier due to prevailing practice: prevailing practice or existing regulatory or policy requirements would have led to implementation of a technology with higher emissions;
(d) Other barriers: without the project activity, for another specific reason identified by the project participant, such as institutional barriers or limited information, managerial resources, organizational capacity, financial resources, or capacity to absorb new technologies, emissions would have been higher."

Investment Additionality:

Investment analysis has been conducted for each of the individual components of the bundled project activity under consideration with the project Internal Rate of Return (IRR) as the financial indicator. IRR is one of the known financial indicators used by banks, financial institutions and project developers for financial evaluation of project feasibility during investment making decisions. The internal rate of return (IRR) for the individual wind power plants were calculated and compared with the benchmark or hurdle rate of investment for the approval for projects of the individual cases.

The project proponents conducted an investment analysis by comparing the internal rate of return against a suitable benchmark. For the project to be financially feasible the returns should be enough to service the debt involved, i.e., greater than or at least equal to the prime lending rate (PLR). This is because the PLR is the benchmark interest rate at which commercial banks in India lend to their most credit worthy customers and hence companies borrow at a rates equal to or higher than the PLR. Hence, for any project to be financially attractive, the IRR of the project must be higher than the rate of borrowing on debt (i.e. higher than the PLR). Accordingly, if any project's IRR does not exceed the PLR, it could be considered a financially unattractive project.

The project IRRs for each of the wind-mills under consideration were found to be lesser than the hurdle rate of investment for the project approval in each case. This justifies the additionality for each of the individual wind farm projects considered under the bundle.

Justification for performing Benchmark Analysis:
As per the guidance provided in the document 'Guidance on the Assessment of Investment Analysis'/ Version 02/ EB 45 available at http://cdm.unfccc.int/EB/041/eb41_repan45.pdf,
"If the proposed baseline scenario leaves the project participant no other choice than to make an investment to supply the same (or substitute) products or services, a

benchmark analysis is not appropriate and an investment comparison analysis shall be used. If the alternative to the project activity is the supply of electricity from a grid this is not to be considered an investment and a benchmark approach is considered appropriate."

For the project activity under consideration, the baseline scenario as highlighted in section 2.4 of this document entails an equivalent amount of electricity generation by the NEWNE and Southern Regional Electricity Grid of India as per the mix of power generating sources. This scenario does not involve any investment by the project promoters. Hence the benchmark approach has been chosen as the appropriate method for performing investment analysis by the individual entities for each of the cases under consideration.

Sl. No.	Company	Wind-mill Capacity (MW)	Project IRR (Without GHG Benefits)	Benchmark		Comments / Remarks
				Type	Value	
1	UIC Udyog Limited	5.00	8.75 %	RBI Prime Lending Rate. Source: RBI Bulletin dated May 2006[7]	10.50 %	Project IRRs are less than the Benchmark / Hurdle rate of investment
2	Khatau Narbheram & Co	1.50	5.47 %	RBI Prime Lending Rate. Source: RBI Bulletin dated December 2006[8]	11.25 %	
3	Hind Metals and Industries (P) Limited	1.25	8.60 %	RBI Prime Lending Rate. Source: RBI Bulletin dated May 2006[9]	10.50 %	

Furthermore, the various assumptions in the calculation of the IRRs provided above have been elucidated below.

Various Assumptions in Calculating Project IRR:

Sl. No.	Parameters	Unit	Value			Reference
			UICUL	KNC	HMIL	
1	PLF considered for first year of operation	%	24.66	29.68	24.66	Generation figures specified by Suzlon energy Limited
	PLF considered from second year of operation		20	-	20	As per MERC tariff order
			-	23	-	As per GERC tariff order
2	Project Lifetime	Years	20	20	20	Purchase Orders issued by the respective project promoters to Suzlon
3	Capacity of each individual WTG	MW	1.25	1.5	1.25	
4	No of WTGs installed	Nos.	4	1	1	

[7] Link: http://rbidocs.rbi.org.in/rdocs/Bulletin/PDFs/70520.pdf

[8] http://rbidocs.rbi.org.in/rdocs/Bulletin/PDFs/74643.pdf

[9] Link: http://rbidocs.rbi.org.in/rdocs/Bulletin/PDFs/70520.pdf

Sl. No.	Parameters	Unit	Value			Reference
			UICUL	KNC	HMIL	
5	Estimated annual net generation from each WTG	Lakh kWh	27	39	27	(against proposals from Suzlon to the individual project proponents for the WTG supply and associated services) and the Power Purchase Agreement signed with the State Electricity Authorities
6	Tariff for Power Sale to the SEB	INR/kWh	3.50	3.37	3.50	
7	Estimated annual escalation in Tariff	INR/kWh	0.15	0	0.15	
8	Total Project Cost:					
A	- Cost of Land	INR Lakhs	60	12	15	
B	- Cost of windmills & Electrical Items	INR Lakhs	2,056.20	750.53	513.04	
C	- Erection, Commissioning and other services	INR Lakhs	291.68	73.12	72.92	
D	- Evacuation and substation charges	INR Lakhs	150	46.05	37.5	
9	Insurance	INR Lakhs	2.06	0.88	0.67	
10	O&M cost	INR Lakhs	42	14.5	10	
11	Service Tax on O&M cost each year	%	12.24	12.24	12.24	
12	O&M free for no. of years	Years	1	2	2	
13	Annual escalation on O&M cost	%	5	5	5	
14	Income Tax Rate	%	33.66	33.66	33.66	Financial Budget of India
15	Minimum Alternate Tax Rate	%	10.00	0	10.00	
16	Book Depreciation Rate	%	4.5	4.5	4.5	As per respective state tariff order MERC Wind Tariff Order dated 24th November, 2003 GERC Wind Tariff Order dated 11th August, 2006
17	Accelerated Depreciation Rate	%	80	80	80	Direct Tax Ready Reckoner
18	Reactive energy withdrawal charges	INR/kVArh	10% of the active energy delivered to the grid at 0.25 INR/kVArh			As per respective state tariff order MERC Wind Tariff Order dated 24th November, 2003 GERC Wind Tariff Order dated 11th August, 2006

Sensitivity Analysis:

A Sensitivity Analysis is conducted to ensure the credibility and robustness of the IRR calculation with reasonable variations in the values of the various assumptions made for the relevant parameters, such that the IRR (without consideration of GHG abatement benefits) increases. For the IRR calculation presented above, an increment in the IRR can be a resultant of the increase in the project revenue, attributable to the following scenarios identified and addressed below:

1. *Increased Tariff Rate realisation for power sale:*

   An increment in the tariff rate for electricity sale to the respective State Electricity Boards (SEBs) is not possible due to the following reasons:

   a) For the WTG promoted by KNC in Gujarat governed by the Gujarat Electricity Regulatory Commission's (GERC) Wind Tariff Order[10] dated 11th August, 2006, the tariff would remain fixed at a value of INR 3.37/kWh for the entire lifetime of the project activity, *i.e.*, 20 years, as reflected by the tariff determination calculations.
   b) For the WTGs promoted by UICUL and HMIPL in Maharashtra governed by the Maharashtra Electricity Regulatory Commission's (MERC) Wind Tariff Order dated 24th November, 2003[11], the tariff rate of INR 3.50/kWh with an annual escalation of INR 0.15/kWh would be considered for the first 13 years of WTG operation and then revised as per the 'cost plus' approach resulting in values that would be lesser than the above mentioned value.

Hence, it may be argued that sensitivity analysis need not be performed for the project activity under consideration with respect to the tariff realisation from power sale to the SEB.

2. *Increased electricity generation from the project activity, represented by an increment in the Plant Load Factor (PLF)*

For a fixed tariff rate for wind energy, the IRR will depend on the electricity generation quantum, which is in turn dependent on the PLF. Greater the value of the PLF, more will be the generation, hence resulting in a higher IRR. The sensitivity analysis with respect to the variation of the PLF has been highlighted below, wherein the values of PLFs at which the IRRs touch the corresponding benchmarks in each case have been presented.

Project Proponent	Financial Analysis			Benchmark %	Sensitivity Analysis		
	Generation Lakh Units	PLF	IRR		PLF	Generation Lakh Units	IRR %
UIC Udyog	108 87.60	24.66%(year 1) 20.00%	8.75%	10.5	22.56%	98.81	10.5
Hind Metals	27 21.90	24.66%(year 1) 20.00%	8.60%	10.5	22.72	24.88	10.50%
Khatau Narbheram	39.00 30.22	29.68%(year 1) 23%	5.47%	11.25%	33.00%	43.36	11.25%

The sensitivity analysis for variation in PLF of ± 10% has been tabulated below:

Project Proponent	Sensitivity Analysis			
	PLF (-10%)	IRR %	PLF (+10%)	IRR %
UIC Udyog	18%	7.28%	22%	10.13%
Hind	18%	7.09%	22%	10.01%

[10] http://geda.org.in/pdf/wind_final_order.pdf

[11] http://www.mercindia.org.in/pdf/Detail_Wind_Energy_Order.pdf

Metals				
Khatau Narbheram	20.70%	3.91%	25.30%	6.93%

Project IRRs for all the three projects have been calculated by considering the guaranteed generation provided by the equipment supplier, *i.e.*, Suzlon Energy Ltd, that are on the higher side as compared to the corresponding generation values obtained from the PLFs specified by the Electricity Regulatory Commissions' Tariff Orders for the respective states/regions, as follows:

- In case of 1.5 MW WTG promoted by KNC, in the State of Gujarat, project IRR has been calculated by considering the 23% PLF as specified by the GERC for windmills in Gujarat as per the GERC Wind Tariff Order dated 11th August, 2006. Hence the PLF considered for IRR calculation of the project activity is the average PLF considered by GERC based on actual operation and performance of WTGs currently installed in the same location.
- A similar explanation may also be provided for the WTGs promoted by UICUL and HMIPL, wherein as per MERC Wind Tariff Order dated 24th November, 2003[12], the average PLF for wind mills in Maharashtra is 20% which is lower than the 24.66% PLF taken into consideration for IRR calculation as per electricity generation specified by Suzlon Energy Ltd. Hence the PLF considered for this project is greater than the average PLF considered by MERC based on actual operation and performance of WTGs currently installed in the same location.

For WTGs in Maharashtra, at 22.56% and 22.72% PLF for UIC Udyog Limited and Hind Metals & Industries (P) Limited respectively, the project IRR touches the benchmark. The possibility of achieving an average PLF of 22.56% is remote.To further strengthen the appropriateness of the input value of 20% CUF considered in the project activity, an analysis of past few year's data that has been sourced from Maharashtra Energy Development Agency (MEDA) website (www.mahaurja.com) suggests that the PLF of wind power projects in Maharashtra did not even reach 20%.Table below shows PLF values for past few years.

Plant Load Factor (PLF) for Maharashtra[13]:

Year	Installed Capacity in the year in MW	Cumulative Capacity in MW	Generation (MUs)	PLF in % based on current year's installed capacity
2001 - 2002	206.425	399.355	332.04	9.49
2002 - 2003	0.000	399.355	672.46	19.22
2003 - 2004	7.930	407.285	705.5	19.77
2004 - 2005	48.750	456.035	742.96	18.60
2005 - 2006	545.100	1001.135	790.53	9.01

Plant Load Factor (PLF) for Gujarat:

[12] Link: http://www.mercindia.org.in/pdf/Detail_Wind_Energy_Order.pdf

http://www.mercindia.org.in/pdf/Annexures.pdf

[13] http://www.mahaurja.com/Download/Sitewise_WindInstallationInfo.xls

Year	Installed Capacity MW	Generation (kWh)	PLF in % based on installed capacity
Feb 2007 – Jan 2008	3.75	4756147	14.48%[14]
April 2007 – Feb 2008	1.25	1765469	17.6%[15]
April 2007 – Feb 2008	12	15409048	14.9%[16]
April 2007 – Feb 2008	1.5	2795083	21.57%[17]
April 2007 – Feb 2008	3	4884264	18.59%
April 2007 – Feb 2008	7.5	12066433	18.62%

Thus, it can be justified that the annual electricity generation quantum considered for IRR calculation is greater than the expected level of performance of each of the WTGs considered under the bundled project activity based on observed wind power generation potential in the past.

The above argument can be further substantiated by observing the actual PLF of WTGs based on their operation. The actual PLF of the WTGs in the project activity under consideration have been tabulated below:

Sl. No	Project Proponents	Actual PLF based on actual generation data from commission till Dec 2008
1	UIC Udyog	17.01%
2	Hind Metals	12.96%
3	Khatau Narbheram	17.52%

In addition, O&M cost is a small percentage of the total project cost. Hence, variation of O&M cost does not significantly affect the financial analysis carried out for the project activity under consideration by the individual project proponents. Also, indicatives O&M expenses have already been mentioned in the PO placed to the equipment supplier.

[14] http://cdm.unfccc.int/UserManagement/FileStorage/2HM4Z4PDMSVJTBKKITJQDRDB34C0OJ

[15] http://cdm.unfccc.int/UserManagement/FileStorage/M6R8F97VCUIZ2BTAJDWS5L40OHYGX1

[16] http://cdm.unfccc.int/UserManagement/FileStorage/M6R8F97VCUIZ2BTAJDWS5L40OHYGX1

[17] http://cdm.unfccc.int/UserManagement/FileStorage/4VBCK0AJ7ISYP9613RXOH8LU5TZND2

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:

Title of Approved Monitoring Methodology: 'Grid Connected Renewable Electricity Generation'

Reference of the Approved Monitoring Methodology: Category I.D - Renewable Energy Projects: Approved Small Scale Methodology AMS –I.D. / Version 14

As per the Indicative simplified baseline and monitoring methodology AMS-I.D./ Version 14,

"Monitoring shall consist of metering the electricity generated by the renewable technology"

Please refer to the subsequent Sections 3.2, 3.3 and 3.4 of the VCS PD for details pertaining to the monitoring aspects for the project activity.

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

- *Purpose of monitoring:*

The Monitoring and Verification (M&V) procedures define a project-specific standard against which the project's performance (i.e. GHG reductions) and conformance with all relevant criteria will be monitored and verified. It includes developing suitable data collection methods and data interpretation techniques for monitoring and verification of GHG emissions with specific focus on technical / efficiency / performance parameters. It also allows scope for review, scrutiny and benchmarking of all these information against reports pertaining to the M & V plan.

The M&V Plan provides a range of data measurement, estimation and collection options/techniques in each case indicating preferred options consistent with good practices to allow project managers and operational staff, auditors, and verifiers to apply the most practical and cost-effective measurement approaches to the project. The aim is to enable this project have a clear, credible, and accurate set of monitoring, evaluation and verification procedures. The purpose of these procedures would be to direct and support continuous monitoring of project performance/key project indicators to determine project outcomes, greenhouse gas (GHG) emission reductions.

Effective GHG abatement monitoring and realization of associated benefits stand on the quantification and keeping a track of the GHG emission reductions the project results in. The project activity would reduce the carbon dioxide whereas an appropriate monitoring system would ensure this reduction is quantified and helps maintaining the required level.
Also a proactive and efficient monitoring system brings about the flaws in the system if any are identified and opens up the opportunities for improvement.

The general monitoring principles are based on:

- *Frequency:* Since the emission reduction units from the project activity would be determined by the electrical energy exported to the State Electricity Authorities by the project activity, it becomes important for the project activity to monitor the amount of electricity exported. The data will be recorded by a main meter and a check-meter at the individual grid-substations pertaining to the respective WTGs as detailed in section 1.5 of the PD. Generation meters located at the generator outlet of each WTG would also measure the gross generation by each individual WTG on a continuous basis. The meters will be provided with totalisers from which cumulative readings can be taken at the end of each month.
- *Reliability:* The reliability of the monitoring system is governed by the accuracy of the measurement system and the quality of the equipment to produce the result. The energy meters connected to Maharashtra State Electricity Distribution Company Limited are of accuracy class 0.2 while the meters connected to Gujarat Energy Transmission Corporation Limited have an accuracy class of 0.5 ensure accurate data monitoring. All energy meters will be calibrated on a annual basis by the respective State Electricity Authorities for ensuring reliability of the system.
- *Registration and Reporting:* Registration of data would be in the records maintained by the project proponent and there from the Electricity Export Invoices raised to the State Electricity Authorities. Monthly reports would be prepared stating the net electricity exported and archived for a period of two years beyond the crediting period of the project activityin the paper/ electronic form.

- *Types of data and information to be reported, including units of measurement:*

Please refer to "Section 3.3: Data and parameters monitored" of the VCS PD for the monitoring details pertaining to types, units and sources of data and description of the monitoring procedure.

- *Origin of the data*

There are primarily two types of data sources to be utilised for calculation of the GHG abatement quantum of the project activity:

- *Internal:* Documents or records maintained by the project proponent which in turn are used to raise monthly invoices to the State Electricity Authorities (Maharashtra State Electricity Distribution Company Limited and Gujarat Energy Transmission Corporation Limited)
- *External:* Public Domain Sources like the Central Electricity Authority CO_2 Baseline Database Version 4.0

For further details, please refer to the "Section 3.3: Data and parameters monitored" of the VCS PD.

- *Monitoring, including estimation, modelling, measurement or calculation approaches*

For detailed GHG emission reduction procedures and sample calculation tables, please refer to the sections 4.2, 4.3 and 4.4 of the VCS PD.

- *Monitoring times and periods, considering the needs of intended users*

Please refer to the "Section 3.3: Data and parameters monitored" of the VCS PD.

- *Monitoring roles and responsibilities*

Please refer to the "Section 3.4: Description of the Monitoring Plan" of the VCS PD.

- *Managing data quality*

*Please refer to the "*Section 3.4: Description of the Monitoring Plan" of the VCS PD.

- *Data uncertainty due to defects in energy meters*

In the event of defects in main energy meters, relevant data would be obtained from check-meters. Such arrangement ensure that data uncertainty is avoided in case of uncertainty in the main meter.

- *Data uncertainty during meter failure*

In the absence of alternative arrangements like check-meters both for internal meter and external meter for obtaining the measurements of the parameters monitored, the relevant data would be discarded and the corresponding time period for which the project operational data is absent would be removed from that monitoring period of the project activity crediting period. Reliability of the data derived from meter readings shall be ensured by means of the calibration of the energy meters and incorporation of the error correction applied to the meter readings from the date of last calibration.

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

The following parameters would be monitored as mentioned in the tables presented below. For details of calculation procedures and sample calculation tables, please refer to the Sections 4.2 and 4.3 of the VCS PD.

<table>
<tr><td>Data / Parameter:</td><td>$E_{EXP,NET,i,y}$</td></tr>
<tr><td>Data unit:</td><td>kWh /Year</td></tr>
<tr><td>Description:</td><td>Net Electricity Exported to grid by the ith WTG in the year y</td></tr>
<tr><td>Source of data to be used:</td><td>Electricity Export Bills of the ith WTG at regular intervals (monthly)</td></tr>
<tr><td>Value of data applied for the purpose of calculating expected emission reductions</td><td>
<table>
<tr><td>i</td><td>1</td><td>2</td><td>3</td></tr>
<tr><td>WTG Loc. No.</td><td>K-537, K-539, K-542, K-543</td><td>W-55</td><td>J-43</td></tr>
<tr><td>$E_{EXP,NET,i,y}$</td><td>8,409,600</td><td>2,901,312</td><td>2,102,400</td></tr>
</table>
</td></tr>
<tr><td>Description of measurement methods and procedures to be applied:</td><td>$E_{EXP,NET,,i,y}$ will be calculated from the sum of the monthly data obtained from the electricity export bills. The process of calculation of the billed amount is described in section 4.2. Net electricity exported to the grid by the project activity is calculated as follows:
$E_{EXP,NET,i,y,m} = E_{EXP,i,y,m} - E_{IMP,i,y,m}$
$E_{EXP,NET,i,y} = \sum_{m=1}^{12} E_{EXP,NET,i,m}$
$E_{EXP,NET,y} = \sum_{i=1}^{n} E_{EXP,NET,i,y}$
where 'm' stands for each month from January (m=1) to December (m=12)
$E_{EXP,NET,,i,y}$ will be calculated from data measured by the generation meters at the outlet of the generator of each WTG by means of measurements from the main meter (check-meter also present) at the grid sub-station.(Joint meter reading). The meters will be an import-export meter provided with a totaliser from which cumulative reading can be taken to yield the net electricity exported to the</td></tr>
</table>

	state grid at the end of every month.
QA/QC procedures to be applied:	The parameter would be monitored continuously and recorded at monthly intervals. The main meter as well as the check meter will be maintained and calibrated by the Maharashtra State Electricity Distribution Company Limited and Paschim Gujarat Vij Company Limited on a regular basis as per their internal calibration schedule as specified in the power purchase agreement. The senior manager, O&M will be in charge of the power plant and responsible for verifying the quantum of electricity exported to the grid *vis-à-vis* the net electricity generated from the wind power generating unit within the same time period. For detailed roles and responsibilities of relevant personnel involved in the monitoring of the project activity, please refer to Section 3.4 of the VCS PD
Any comment:	The relevant data will be recorded in electronic form and the same along with the electricity bills will be archived for two years beyond the crediting period.

Data / Parameter:	$EF_{GRID,OM}$
Data unit:	tCO_2/ MWh
Description:	Operating Margin CO_2 emission factor of the grid
Source of data to be used:	CO_2 Baseline Database
Value of data applied for the purpose of calculating expected emission reductions	1.00 Obtained from the CO_2 Baseline Database Version 4.0, Dated October 2008 (Operating Margin Emission Factor for NEWNE Regional Electricity Grid) published by Central Electricity Authority (CEA), India
Description of measurement methods and procedures to be applied:	Information available from authorised government agencies – National standard value has been calculated by Central Electricity Authority (CEA) as per guidelines of the 'Tool to calculate the emission factor for an electricity system'[18]
QA/QC procedures to be applied:	Not Applicable
Any comment:	The emission factor would be fixed ex-ante based on the most recent available version of the CEA CO_2 Baseline Database or other public domain sources for all instance of verification and issuance over the duration of the entire crediting period of the project activity.

Data / Parameter:	$EF_{GRID,BM}$
Data unit:	tCO_2/ MWh
Description:	Build Margin CO_2 emission factor of the grid
Source of data to be used:	CO_2 Baseline Database
Value of data applied for the purpose of calculating expected emission reductions	0.60 as per CO_2 Baseline Database Version 4.0, Dated October 2008 (Build Margin Emission Factor for NEWNE Regional Grid) published by Central Electricity Authority (CEA), India,
Description of measurement methods and procedures to be applied:	Information available from authorised government agencies – National standard value has been calculated by Central Electricity Authority (CEA) as per guidelines Tool to calculate the emission factor for an electricity system'
QA/QC procedures to be	Not Applicable

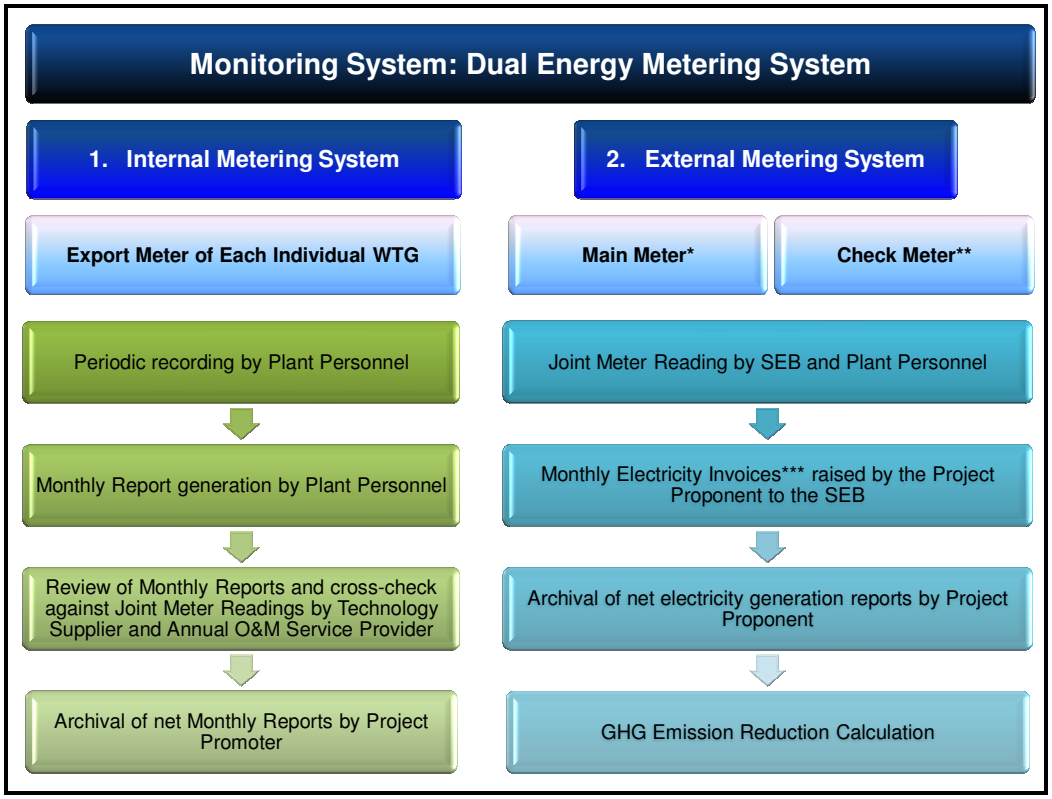
[18] CDM Methodology Tool by UNFCCC; please refer to:
http://cdm.unfccc.int/methodologies/Tools/EB35_repan12_Tool_grid_emission.pdf

applied:	
Any comment:	The emission factor would be fixed ex-ante over the duration of the entire crediting period of the project activity. The relevant data will be recorded in electronic form and the same will be archived for two years beyond the crediting period.

Data / Parameter:	EF_{GRID}
Data unit:	tCO_2/ MWh
Description:	Combined Margin CO_2 emission factor of the grid
Source of data to be used:	CO_2 Baseline Database
Value of data applied for the purpose of calculating expected emission reductions	0.90 as per the calculation procedure explained in section 4.2 of the Project Description
Description of measurement methods and procedures to be applied:	Information available from authorised government agencies – National standard value has been calculated by Central Electricity Authority (CEA) as per guidelines Tool to calculate the emission factor for an electricity system'
QA/QC procedures to be applied:	Not Applicable
Any comment:	The emission factor would be fixed ex-ante the duration of the entire crediting period of the project activity. The relevant data will be recorded in electronic form and the same will be archived for two years beyond the crediting period.

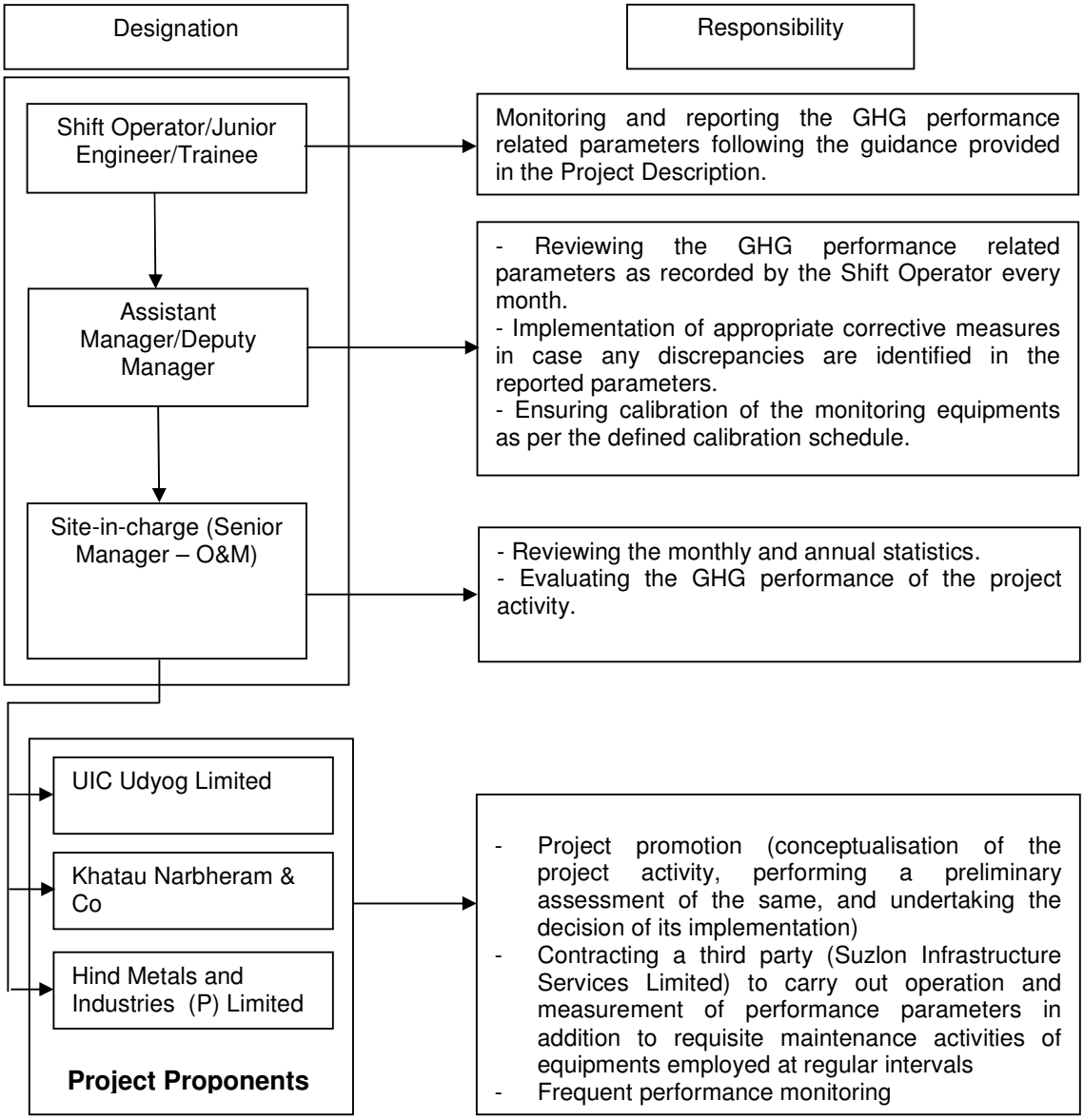
3.4 Description of the monitoring plan

Monitoring Plan:
The project promoters have implemented an operational structure in order to monitor GHG emission reductions from the project activity. The system in practice to monitor the electrical energy generated and there from the GHG emission reduction quantum from the project activity is provided in the following figure.



* Sealed, maintained and calibrated by the SEB. Also, the meter readings of the main meter are used for the Electricity Bills raised for electricity exported.
** In the event of some problems with the main meter, the meter readings of the check meter are used for the Electricity Bills raised for electricity exported.
*** The net exported electricity quantum as appearing in these bills are the most conservative value of the same. Hence ER calculations are based on it.

The roles and responsibilities of the relevant personnel involved in monitoring, reporting and verification of various GHG performance related parameters in the project activity are explained in the following schematic diagram:



Performance Review and GHG Internal Audit

In order to ensure proper operation of the project activity, monthly reviews will be conducted by the Site-in-charge (Senior Manager – O&M) of Suzlon Infrastructure Services Limited on behalf of the project proponents. In case of any discrepancies identified between the meter readings of the main and check energy meters during the monthly reviews, the respective meters will be put under vigilance for three days and then the faulty meter will be taken out of the system. In the meantime the electricity consumption of the particular area will be measured by the check meter to ensure continuous monitoring of the relevant parameters.

Internal Audit will be conducted once in a year in order to assess the GHG performance of the project activity. Auditors will consist of people from Suzlon Infrastructure Services Limited. The audit findings and the necessary corrective actions will be documented and reported to the Management Representative(s) of various project proponents for their immediate actions. Compliance with the audit findings and evaluation of implementation of the corrective actions will be a part of the subsequent audit.

4 GHG Emission Reductions:

4.1 Explanation of methodological choice:

The following Approved Small Scale Methodology has been followed for the project activity under consideration:

Title of Approved Methodology: 'Grid Connected Renewable Electricity Generation'
Reference of the Approved Methodology: Category I.D - Renewable Energy Projects: Approved Small Scale Methodology AMS –I.D. / Version 14

For further details regarding the applicability criteria pertaining to the above-Methodology in the context of the project activity, please refer to section 2.2 of the VCS PD.

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

For the project activity under consideration, the baseline is given by paragraph 9 of the methodology AMS-I.D. / Version 14 as follows:
"the baseline is the kWh produced by the renewable generating unit multiplied by an emission coefficient (measured in kg CO_2e/kWh) calculated in a transparent and conservative manner as:
(a) A combined margin (CM)[19], consisting of the combination of operating margin (OM)[20] and build margin (BM)[21] according to the procedures prescribed in the 'Tool to calculate the emission factor for an electricity system'. Any of the four procedures to calculate the operating margin can be chosen, but the restrictions to use the Simple OM and the Average OM calculations must be considered. OR
(b) The weighted average emissions (in kg CO_2e/kWh) of the current generation mix. The data of the year in which project generation occurs must be used.
Calculations must be based on data from an official source (where available) and made publicly available."

The wind power generation project activity displaces an equivalent amount of electricity that would have been generated in the fossil-fuel dominated NEWNE Regional grid generation-mix. Since the displaced electricity generation is the element that is likely to affect both the operating margin in the short run and the build margin in the long run, electricity baselines should reflect a combination of these effects. Therefore an ideal baseline approach is envisaged as the one that combines both Operating and Build Margin as prescribed in first alternative stated above. In case of the project activity under consideration, a combined margin (CM) emission factor, calculated according to the procedures prescribed in the 'Tool to calculate the emission factor for an electricity system' and publicly available in the official website of Central Electricity Authority[22] (CEA), has been used for arriving at the baseline.

Calculation of net units of electricity substituted in the grid

[19] The project activity will have an effect on the both the operating margin and build margin.
[20] Present power generation sources of the grid, weighted according to their actual participation in the grid mix (all generating sources participating in the grid except hydro, geothermal, wind, low cost biomass, nuclear, and solar power)
[21] Weighted average emissions of recent capacity additions (most recent 20% or the 5 most recent plants)
[22] CEA CO2 Baseline Database, Version 4.0, Dated October 2008, available at: www.cea.nic.in

The net electricity exported to the grid by the project activity in the project would be calculated as the sum of the net electricity exported by each individual WTG (electricity imported subtracted from the electricity export quantum) to the nearest sub-station.

$$E_{EXP,NET,i,y} = E_{EXP,i,y} - E_{IMP,i,y} \quad \text{..... (1)}$$

Where,

$E_{EXP,i,y}$ Units of electricity exported to the grid by the i[th] component (WTG) during the project year y (in MWh) – as per the monthly power sale invoices (calculated for invoice generation as per the procedure explained below)

$E_{IMP,i,y}$ Units of electricity imported from the grid by the i[th] component (WTG) during the project year y (in MWh) – as per the monthly power sale invoices

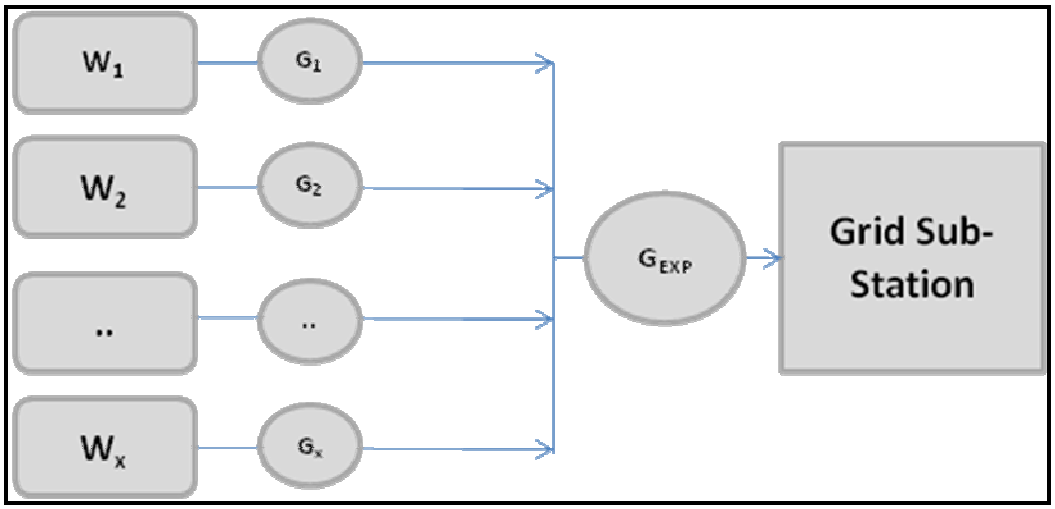
$E_{EXP,NET,i,y}$ Net units of electricity exported to the grid by the i[th] component (WTG) during the project year y (in MWh) – as per the monthly power sale invoices

i Total number of individual wind-mills constituting the project activity[23]

Description of the calculation of electricity export quantum (monthly billed amount) appearing in the monthly power sale invoices:

As the grid sub-station is connected to a number of WTGs, the main export meter at the sub-station measures the cumulative electricity export data of all the connected WTGs. The monthly electricity export by each of the individual WTGs is then calculated in the following manner for the purpose of raising of invoices:

In the figure provided below, $G_{1,m}$, $G_{2,m}$, …., $G_{x,m}$ are the individual electricity generation (in kWh) of the corresponding *x* number of WTGs W_1,W_2, .., W_X, where gross generation $G_{i,m}$ of the *i*th WTG for the month *m* is measured by the generation meter at the outlet of the generator of the *i*[th] WTG.



The total electricity generation for the month *m* of all the wind turbines connected to a particular sub-station feeder is $G_{TOTAL,m}$, *i.e.*,

$$G_{TOTAL,\,m} = G_{1,\,m} + G_{2,\,m} + .. + G_{X,\,m} \quad \text{..... (1a)}$$

[23] i=1 represents K-537, K-539, K-542, K-543 (promoted by UIC Udyog Limited), i=2 represents W-55 (Khatau Narbheram & Co), i=3 represents J-43 (promoted by Hind Metals and Industries (P) Limited).

The main export meter at the grid sub-station (along with a check-meter as back-up) measures the net electricity exported to the grid sub-station by the cluster of *x* WTGs for the month *m, i.e.*, $G_{EXP,m}$.
Due to losses occurring during transmission of electricity from the WTGs to the sub-station,

$$G_{EXP,m} < G_{TOTAL,m}, \quad \text{where} \quad G_{EXP,m} = \sum_{i=1}^{x} G_{EXP,i,m} \quad \text{..... (1b)}$$

Thus the difference between $G_{TOTAL,m}$ and $G_{EXP,m}$ represents the total transmission loss occurring between the WTGs and the sub-station for the month *m*, given by

$$L_{TOTAL,m} = G_{TOTAL,m} - G_{EXP,m} \quad \text{..... (1c)}$$

This transmission loss for the month *m* is shared by all the WTGs ($L_{i,m}$ being the transmission loss attributed to the i^{th} WTG) in proportion of their generation for the month *m*, as shown below:

$$L_{i,m} = \frac{G_{i,m}}{G_{TOTAL,m}} \times L_m, \quad \text{where} \quad L_m = \sum_{i=1}^{x} L_{i,m} \quad \text{..... (1d)}$$

Therefore, the net electricity exported to the grid by an individual WTG W_i in the month *m* is calculated as[24]:

$$G_{EXP,i,m} = G_{i,m} - L_{i,m} \quad \text{..... (1e)}$$

Sl. No.	Symbol	Parameter	Calculated/ Measured	Meter Location	Comments
1	$G_{i,m}$	Gross generation of the i^{th} WTG for the month *m*	Measured	WTG generator outlet	
2	$G_{TOTAL,m}$	Total gross generation of the *x* WTGs for the month *m*	Calculated	-	Sum of *x* items in Sl. No. 1
3	$G_{EXP,m}$	Net electrical energy export from the *x* WTG cluster to the grid sub-station for month *m*	Measured	Grid sub-station	
4	$L_{TOTAL,m}$	Total transmission loss for month *m*	Calculated	-	Difference of Sl. No. 2 and Sl. No. 3
5	$L_{i,m}$	Transmission loss attributable to the i^{th} WTG	Calculated		Proportion of Sl. No. 1 in Sl. No. 2 for the i^{th} item

[24] It is to be noted that the parameter $G_{EXP,i,y} = \sum_{m=1}^{12} G_{EXP,i,m}$ is same as $E_{EXP,i,y}$ appearing in equation (1)

6	$G_{EXP,i,m}$	Net electricity exported to the grid by the ith WTG	Calculated	-	Used to generate the monthly power sale invoice

Hence, for the bundled project activity under consideration,

$$E_{EXP,NET,y} = \sum_{i=1}^{n} E_{EXP,NET,i,y} \text{ ..... (2)}$$

Where,

$E_{EXP,NET,y}$ Net units of electricity exported to the grid by the project activity during the project year y (in MWh) by the project activity.

Baseline Emission Calculations

The Baseline Emission is calculated as,

$$BE_y = E_{EXP,NET,y} \times EF_{GRID} \text{ ..... (3)}$$

Where,

BE_y Baseline Emissions due to displacement of electricity at the grid by the project activity during the year y (in tCO_2)

EF_{GRID} Emission factor of the grid to which the electricity generated by the project activity is exported (in tCO_2/ MWh)

Emission Factor of the Grid (EF_{GRID})

For the project activity, the baseline scenario entails the generation of electricity by the grid connected fossil fuel fired thermal power plants resulting in GHG emissions as per the carbon intensity of the grid. The emission factor for the electricity displaced in the grid due by the electricity generated by the project activity is calculated as per the 'Tool to calculate the emission factor for an electricity system' by CEA and made available publicly for use as a data source for all Indian projects. The NEWNE Regional Electricity Grid of India that is fed by a majority of the majority of fossil fuel based units is considered for baseline emission calculations over the project activity's crediting period. Justification pertaining to the choice of the grid and details of the calculation of its carbon intensity are presented below.

A) Choice of the grid that will be affected by the project activity

As per 'Tool to calculate the emission factor for an electricity system',

"In large countries with layered dispatch systems (e.g. state/ provincial/ regional/ national) the regional grid definition should be used. A state/ provincial grid definition may indeed in many cases be too narrow given significant electricity trade among states/ provinces that might be affected, directly or indirectly, by a CDM project activity."

The Indian power grid system (or the National Grid) is divided into two regional grids namely NEWNE Regional Grid and Southern Region Grid. These regional grids have independent state Load Dispatch Centres (LDCs) that manage flow of power in their jurisdiction. Power generated by state owned generation units and private owned generation units is consumed by the respective states. Power generated by central sector plants is shared by all states forming part of the grid in a fixed proportion. The project activity is located in the states of Maharashtra and Gujarat in Western India and hence falls under the NEWNE Regional Grid of India.

Taking into consideration the relevant grid displaced by the project activity and the guidelines for selection of the appropriate grid in large countries with layered dispatch systems like India as given in 'Tool to calculate the emission factor for an electricity system'), the NEWNE Regional Grid has been considered as the most representative

system boundary (i.e. project electricity system) where an equivalent amount of electricity would be replaced by the implementation of the project activity. The carbon intensity of the NEWNE Regional Grid would be determined to arrive at the baseline emission factor for baseline emission calculations for the project activity's crediting period.

B) Determination of the Carbon Intensity of the chosen Grid
CEA has carried out a complete analysis of the electricity generation mix across the country for calculating the emission factor of NEWNE Regional Grid in its CO_2 Baseline Database Version 4.0 Dated October 2008. The project proponent has used the analysis for computation of the grid emission factor by the CEA following the guidelines of the 'Tool to calculate the emission factor for an electricity system'. The combined margin grid emission factor computed from the above analysis is 0.90 for the NEWNE Regional Grid (Please refer to the calculation presented below). The grid emission factor would be fixed ex-ante for the duration of the crediting period of the project activity.

Calculation of the Carbon Intensity of the NEWNE Regional Grid		
Item	**Symbol**	**Value**
Simple Operating Margin (tCO_2/MWh) (incl. Imports)	$EF_{GRID,OM}$	1.00
Build Margin (tCO_2/MWh) (not adjusted for imports)	$EF_{GRID,BM}$	0.60
For intermittent and non-despatchable generation types such as wind and solar photovoltaic, the Central Electricity Authority CO_2 Baseline Database Version 4.0 grid tool allows to weigh the operating margin and build margin at 75% and 25%, respectively. Hence, the calculation formula is: $EF_{GRID} = (EF_{GRID,OM} \times O.75) + (EF_{GRID,BM} \times 0.25)$ ..... (4)		
Combined Margin Emission Factor in tCO_2/MWh (including Imports)	EF_{GRID}	0.90

Summary: Parameters required for calculation of baseline emissions:

Serial No.	Variable	Parameters	Data Sources
1	EF_{GRID}	Grid emission factor	CEA CO_2 Baseline Database, Version 4.0 dated October 2008
2	$E_{EXP,NET,i,y}$	Net electricity exported to the grid	Invoices raised by the individual project participants to the respective State Electricity Boards

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

The Methodology is applied in the context of the project activity in order to calculate the project emissions and leakages as follows:

Project Emissions:
As the project activity is a wind power project, there are no anthropogenic emissions by sources of GHGs within the project boundary as a result of the project activity. Hence there are no project emissions to be considered.
The main emissions in the context of renewable energy projects (including wind-mills) of the power sector are emissions arising due to activities such as power plant construction and fuel handling (extraction, processing, and transport). The GHG emissions due to the above mentioned sources of emission are negligible with respect to the lifetime of the project activity under consideration.

Leakage Emissions:
As per the methodology AMS-I.D./ Version 14,

"*If the energy generating equipment is transferred from another activity or if the existing equipment is transferred to another activity, leakage is to be considered*".
There are no anthropogenic emissions identified by sources outside the project boundary due to the project activity. Furthermore, the equipments (WTGs) used by the project activity are newly procured and hence not transferred from another project. Thus, there are no leakage emissions attributable to the project activity.

Thus, the GHG emissions attributable to the project activity (project emissions) in the project year y are expressed as:

$$PE_y = 0 \text{ ..... (5)}$$

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

Emission Reductions:
The emission reductions of the project activity are calculated as the difference between the baseline emissions and the project emissions:

$$ER_y = BE_y - PE_y \text{ ..... (6)}$$

Where,
ER_y Emission reductions for the project activity in the project year y in tonnes of CO_2e

Years	Estimation of project activity Emissions (tonnes of CO_2 e)	Estimation of baseline Emissions (tonnes of CO_2 e)	Estimation of leakage (tonnes of CO_2 e)	Estimation of overall emission reductions (tonnes of CO2 e)
05th Feb 2007- 04th Feb 2008	0	10,569	0	10,569
05th Feb 2008- 04th Feb 2009	0	12,072	0	12,072
05th Feb 2009- 04th Feb 2010	0	12,072	0	12,072
05th Feb 2010- 04th Feb 2011	0	12,072	0	12,072
05th Feb 2011- 04th Feb 2012	0	12,072	0	12,072
05th Feb 2012- 04th Feb 2013	0	12,072	0	12,072
05th Feb 2013- 04th Feb 2014	0	12,072	0	12,072
05th Feb 2014- 04th Feb 2015	0	12,072	0	12,072
05th Feb 2015- 04th Feb 2016	0	12,072	0	12,072
05th Feb 2016- 04th Feb 2017	0	12,072	0	12,072
Total (tonnes of CO_2e)	**0**	**119,217**	**0**	**119,217**

5 Environmental Impact:

As per the Environmental Impact Assessment (EIA) Notification, Ministry of Environment and Forests (MoEF), Government of India, New Delhi, the 27th January, 1994 (Incorporating amendments made on 04/05/1994, 10/04/1997, 27/1/2000, 13/12/2000, 01/08/2001 and 21/11/2001) - S.O.60 (E), the project does not require EIA submission[25] to MoEF for obtaining No Objection Certificate for project implementation. Furthermore, as per another subsequent Notification by the Ministry of Environment and Forests, Government of India, New Delhi on 14th September 2006[26], the wind power projects have not been considered in the list of industrial projects for which EIA is mandatory.

The project activity does not involve any major construction activity. It primarily requires the installation of the Wind Electric Generators, interfacing the generators with the Maharashtra State Electricity Distribution Company Limited and Gujarat Urja Vikas Nigam Limited by setting up HT transmission lines and installation of other accessories.

However, there are no negative impacts on air, water, soil quality and ambience owing to the project activity.

[25] http://envfor.nic.in/divisions/iass/notif/eia.htm

[26] http://envfor.nic.in/legis/eia/so1533.pdf

6 Stakeholders comments:

The feedback received from various stakeholders have served as valuable inputs justifying the Project Proponent's initiative of clean power generation and simultaneous contribution to sustainable development of the region. Various stakeholders directly or indirectly associated with the project activity were approached and appraised about the various aspects of the project activity by the representatives of the project promoters through a stake-holder meeting, as summarised below:

Summarisation of Meeting Agenda and Discussion Points	
1	***Welcome Speech:*** The organisers welcomed the various stakeholders and briefed them on the meeting agenda and the points to be discussed, also highlighting the utility and importance of the exercise.
2	***Introduction to climate change mechanisms (including VCS):*** The organisers explained the various climate change mechanisms: compliance based (Clean Development Mechanism) and voluntary (Voluntary Carbon Standard) to the various stakeholders in the light of global concerns on global warming and climate change. The contribution of renewable energy projects like wind-mills towards solution of such problems by means of GHG abatement as well as sustainable development of the region was also discussed.
3	***Speech by the Project Promoting Entity:*** The representative from the project promoting organisation highlighted their commitment towards clean energy generation and environment protection by means of this diversification from its core area of activity. The pertinent issues of fossil-fuel depletion, environment pollution abatement, energy security and development of the host nation were also discussed. Furthermore, the various beneficial aspects of the project activity towards socio-economic development of the region on a local level and the host country on a national level were highlighted.
4	***Interactive (Question & Answer) Session:*** Upon requests by the stakeholders, the mechanism of environmental pollution and damage from fossil-fuel combustion was explained. Upon being asked, the stakeholders highlighted the various benefits in their lives attributable to the project activity by means of generation of employment and business opportunities as well as the provision of improved infrastructure and superior amenities in the vicinity of their place of dwelling. The stakeholders were also of the opinion that there were no possible negative impacts of the project activity on their lives. Instead, they were of the opinion that more of such projects should be actively promoted on account of associated environmental as well as socio-economic benefits.
5	***Conclusion and Vote of Thanks:*** The stakeholders were thanked for rendering their valuable time and providing crucial comments and suggestions on the project activity that further fortified the commitment of the project proponent in promoting the noble initiative.
Note: Relevant documents relating to stakeholder consultation will be submittd to the Validator during the Validation exercise.	

7 Schedule:

For the bundled project activity under consideration, the dates of achievements of the various milestones are earliest of the dates of achievement of the same for each individual case. The date of each individual milestone is provided below:

Sl. No.	Activity		UUL	KNC	HMIL	Reference
1	**Project Conception:**					
	a	Purchase Order	13/07/2006	09/01/2007	10/06/2006	Purchase Order placed by individual project proponents to Suzlon Energy Private Limited
2	**Project Implementation**					
	a	Project Commissioning	29/03/2007 31/03/2007	31/03/2007	05/02/2007	Commissioning Certificate issued by relevant Government agencies
3	**Application for availing GHG Abatement Benefits:**					
	a	Appointment of Consultant	18/11/2008	18/11/2008	18/11/2008	Work Order issued by individual project proponents to consultant
	b	Appointment of DOE for Validation/Verification	17/11/2008	14/11/2008	15/11/2008	Work Order issued by individual project proponents to validation agency
	c	Commencement of the Validation Process	Commenced	Commenced	Commenced	
4	**Accrual of GHG Abatement Benefits:**					
	a	Crediting period start date for VCS Verification	05/02/2007	05/02/2007	05/02/2007	Commissioning Certificate issued by relevant Government agencies

8 Ownership:

8.1 Proof of Title:

The requirements of the VCS Project Description pertaining to this section have been addressed as follows:

- *A legislative right*

Not Applicable

- *A right under local common law*

Not Applicable

- *Ownership of the plant, equipment and/or process generating the reductions/removals*

The ownership of the project promoters of the WTGs can be established by means of clearances, approvals and agreements as listed in Section 1.10 of the VCS PD.

- *A contractual arrangement with the owner of the plant, equipment or process that grants all reductions/removals to the proponent*

The project promoters have authorised UIC Udyog Limited for bearing the responsibilities of communication pertaining to procedural formalities under Voluntary Carbon Standard (VCS) registration with the relevant authority(ies) for the Greenhouse Gas abatement project activity. UIC Udyog Limited shall serve as the focal point for all communications with any third party for procedural formalities relating to registration under the Voluntary Carbon Standard (VCS).

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

The requirements of the VCS Project Description pertaining to this section have been addressed as follows:

Project proponents of projects that reduce GHG emissions from activities that:

- *are included in an emissions trading Program; or*
- *take place in a jurisdiction or sector in which binding limits are established on GHG emissions;*

The host country of the project activity under consideration, *i.e.*, India is a non Annex-I, or, a developing nation as recognised by the Kyoto Protocol. Hence, there are no GHG emission reduction targets or commitments for India and it does not fall under the purview of any compliance driven Emission Trading Programs. Furthermore, there are also no such voluntary emission trading programs similar to the VCS existent in the country. This confirms there are no emissions trading programs prevalent in the host country of the project activity under consideration, *i.e.*, India at the time of preparation of the VCS PD.

Shall provide evidence that the reductions or removals generated by the project have or will not be used in the Program or jurisdiction for the purpose of demonstrating compliance. The evidence could include:

- *a letter from the Program operator or designated national authority that emissions allowances (or other GHG credits used in the Program)*

equivalent to the reductions/removals generated by the project have been cancelled from the Program; or national cap as applicable or;

- *purchase and cancellation of GHG allowances equivalent to the reductions/removals generated by the project related to the Program or national cap.*

The host country of the project activity, India, being a non Annex-I nation under the Kyoto Protocol, India does not have GHG emission reduction targets or commitments. This confirms there are no national caps on GHG emissions prevalent in India at the time of preparation of the VCS PD. Therefore, it is not applicable for the project activity.