

25.5 MW WIND ENERGY FARM AT NANDURBAR MAHARASHTRA BY HZL

Document Prepared By

Hindustan Zinc Limited

Contact Information

Mr. Bhagwan Lal Ahuja

Hindustan Zinc Limited

CPP-CLZS

Chanderiya Lead Zinc Smelter, Putholi

Chittorgarh-312021, Rajasthan

Phone: +91 -9799190066

Email: Bhagwan.ahuja@vedanta.co.in

Website:-www.hzlindia.com

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Prepared By	Bhagwan lal Ahuja
Contact	AGM (CDM Cell) CPP-CLZS Chanderiya Lead Zinc Smelter Putholi Chittorgarh-312021 Rajasthan INDIA Mob:-91-9799190066 Tele +91-1472-257950 Email: Bhagwan.ahuja@vedanta.co.in Website:- www.hzlindia.com

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1 PROJECT DETAILS

1.1 Summary Description of Project

Hindustan Zinc Ltd. (HZL), a vertically integrated natural resources enterprise, headquartered at Udaipur, Rajasthan having broad operations ranging from exploration, mining, ore processing to smelting of non-ferrous metals is the owner and project proponent of the proposed project activity.

The project activity primarily aims at reducing Green House Gas (GHG) emissions through utilization of renewable energy technology for generation of electrical energy. The electricity generated from the project activity (approximately 45,033 MWh annually) will displace equivalent electricity generation in grid connected power plants. The project activity will reduce the anthropogenic GHG emissions (approximately 42,912 tCO₂ annually) associated with the equivalent amount of electricity generation from the fossil fuel based grid connected power plants.

The project activity involves installation and operation of seventeen Suzlon make 1.5 MW Wind Electric Generators (WEGs) by Hindustan Zinc Limited (HZL) in the state of Maharashtra. All of these 17 WEGs are commissioned in the month of Sept 2011. The cumulative capacity of the project activity is 25.5 MW. The electricity generated from the project activity will be exported to regional Grid.

The technology employed by the project activity converts kinetic energy in wind to mechanical energy and mechanical energy to electrical energy using wind turbine generators (WEGs). In this process, there are no greenhouse gas emissions or burning of any fossil fuels. The electricity is generated through sustainable means without causing any negative effect to the environment and therefore the technology is environmentally safe and sound.

Wind turbines produce electricity by using the natural power of wind to drive a generator. Wind has considerable amount of kinetic energy when blowing at high speeds. When this kinetic energy passes through the blades of the wind turbines, it is converted into mechanical energy and rotates the wind blades. When the wind blades rotate, the connected generator also rotates, thereby producing electricity. The Project activity envisages installation of WEGs of S-82 Suzlon make (1500 kW WEGs). The WEGs generate 3-phase power at 400V, which is stepped up to 33 KV. The project can operate in the frequency range of 46–54 Hz and in the voltage range of 400 V $\pm$ 20%.

Details of the commissioning of the project activity as follows;

LOCATION No	Date of commissioning	Connected Load (MW)
C-02,06,07,28,29,30,32	02/09/2011	10.5 MW
C-05,20	09/09/2011	3.0 MW
C-04,18,37,67	15/09/2011	6.0 MW
C-03,19	21/09/2011	3.0 MW
C-26,27	29/09/2011	3.0 MW

The total GHG emission reduction in this monitoring period 02 Sept 2011 to 26 Dec 2012 is 61,924 tCO₂e.

1.2 Sectoral Scope and Project Type

Sectoral Scope – Energy Industries (renewable/non-renewable sources).

Project Type: Renewable Energy projects

Project activity is not a grouped project activity.

1.3 Project Proponent

Organization name	Hindustan Zinc Limited
Contact person	Mr. Bhagwan Lal Ahuja
Title	AGM (CDM Cell)
Address	CPP-CLZS Chanderiya Lead Zinc Smelter Putholi Chittorgarh-312021 Rajasthan INDIA
Telephone	91-1472-257950
Email	Bhagwan.ahuja@vedanta.co.in

1.4 Other Entities Involved in the Project

No other entities other than Hindustan Zinc Limited are involved

1.5 Project Start Date

02/09/2011, date of commissioning of first WTG

1.6 Project Crediting Period

Project activity has Renewable crediting period of 21 years for the CDM project.

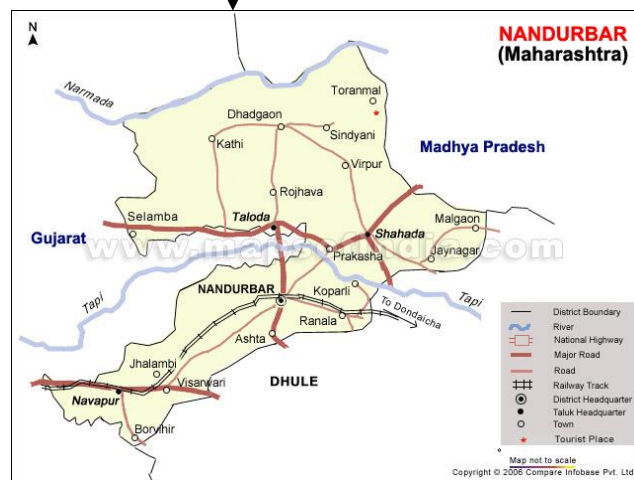
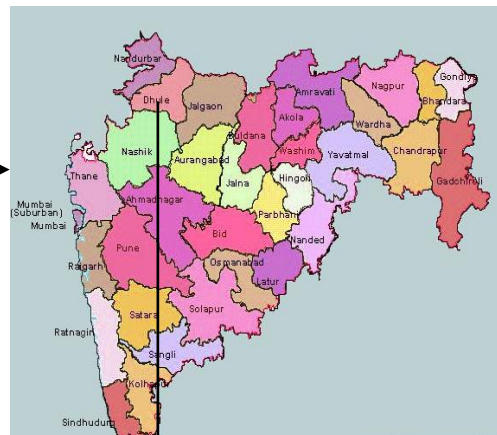
Start date of crediting period for VCS verification: 02/09/2011 (Date of commissioning of first WTG)

End date of crediting period for VCS verification: 26/12/2012 (Date one day prior to the start date of crediting period of CDM project activity)

1.7 Project Location

The project activity consists of seventeen 1.5 MW wind turbines in the district of Nandurbar in the state of Maharashtra, India. The nearest railway station to Nandurbar is Nandurbar railway station and nearest airport is situated at Nasik which is 188 Kms from Nandurbar. Details of the location of the project activity:

Sr. No.	WTG. No.	Latitude	Longitude
1	C-02	21°18'10"N	74°18'32"E
2	C-03	21°17'55"N	74°18'28"E
3	C-04	21°17'17"N	74°18'16"E
4	C-05	21°17'30"N	74°18'32"E
5	C-06	21°17'47"N	74°18'09"E
6	C-07	21°17'59"N	74°18'05"E
7	C-18	21°17'14"N	74°17'51"E
8	C-19	21°17'29"N	74°17'51"E
9	C-20	21°17'43"N	74°17'49"E
10	C-26	21°18'47"N	74°17'09"E
11	C-27	21°18'54"N	74°16'51"E
12	C-28	21°17'31"N	74°17'05"E
13	C-29	21°17'38"N	74°16'56"E
14	C-30	21°17'25"N	74°16'42"E
15	C-32	21°17'17"N	74°16'10"E
16	C-37	21°15'45"N	74°19'33"E
17	C-67	21°15'06"N	74°16'20"E



1.8 Title and Reference of Methodology

Title of the baseline methodology: "Consolidated Baseline Methodology for grid connected electricity generation from renewable sources".

Reference: ACM0002, Version 12.3.0 (EB 66), Sectoral Scope: 01

The following tools and guidance's have been followed (References):

1. Tool to calculate the emission factor for an electricity system (Version 02.2.1)
2. Tool for the demonstration and assessment of additionality (Version 06.0.0)

1.9 Other Programs

1.9.1 Emissions Trading Programs and Other Binding Limits

This project activity is voluntary initiative of HZL and it is not to meet any local laws or regulatory compliances. HZL has submitted an undertaking that they shall not claim for GHG emission reduction credits for the given period (20/10/11 – 30/11/12) under any other emission trading program.

1.9.2 Other Forms of Environmental Credit

The project activity generates Carbon Credits under Clean Development Mechanism (Ref.No:7981) from 27/12/2012; however the VCUs that are claimed are from the date of commissioning till 26/12/2012 . Project proponent has submitted an undertaking to the VVB that they shall not claim for GHG emission reduction credits for the given period under any other emission trading program."

1.9.3 Participation under Other GHG Programs

The project activity under consideration here has already been registered under the Clean Development Mechanism of UNFCCC. The requisite details are provided below:

CDM Project Reference # - 7981

Project Title: **25.5 MW Wind energy farm at Nandurbar , Maharashtra by HZL**

Weblink:

<http://cdm.unfccc.int/Projects/DB/DNV-CUK1351776938.73/view>

Project Proponent: Hindustan Zinc Limited

2 IMPLEMENTATION STATUS

2.1 Implementation Status of the Project Activity

Start date is 02/09/2011 (commissioning date of first WTG)

Details of the project activity are as follows;

LOCATION No	Date of commissioning	Connected Load (MW)
C-02,06,07,28,29,30,32	02/09/2011	10.5 MW
C-05,20	09/09/2011	3.0 MW
C-04,18,37,67	15/09/2011	6.0 MW
C-03,19	21/09/2011	3.0 MW
C-26,27	29/09/2011	3.0 MW

The project promoter signed operation and maintenance agreements with the O & M contractor of the wind turbines. The performance of the turbines, safety in operation and scheduled / breakdown maintenances is the responsibility of O & M contractor and are organized and monitored by them, hence the authority and responsibility of project management on site lies with the O & M contractor will maintains all the data / records for the project monitoring. Suzlon is the O&M contractor for the project activity. During the monitoring period no such events or situations occurred which will cause impact on the actual operation of the project activity.

During the monitoring period (02/09/2011- 26/12/2012) the project activity was operated and monitored in accordance with the applicable baseline and monitoring methodology ACM0002, Version 12.3.0 and registered PDD.

All the WEGs are in operation and No abnormal circumstance occurred during this monitoring period. Suzlon operation and maintenance activities are ISO 9001:2008 certified and all the events are recorded in the log book available at the project site. As a part of regular maintenance the machines are stopped for mechanical and electrical maintenance.

As per the VCS guidelines 'if the energy generating equipment is transferred from another activity, leakage is to be considered'. In the project activity, there is no transfer of energy generating equipment and therefore the leakage from the project activity is considered as zero. There are no changes like project proponent or other entities during the monitoring period

2.2 Deviations

2.2.1 Methodology Deviations

There is no methodology deviation involved in the monitoring plan.

2.2.2 Project Description Deviations

According to point 2 of para 3.6.1 of the VCS Standard Version 3.4, 'Where the deviation does not impact the applicability of the methodology, additionality or the appropriateness of the baseline scenario, and the project remains in compliance with the applied methodology, the deviation shall be described and justified in the monitoring report. This shall include a description of when the changes occurred and the reasons for the changes.'

The Monitoring plan described in the CDM registered PDD includes parameters like X, Y, A and B. However, these parameters do not be utilised in the calculation of the emission reductions, as these are calculated from the credit note values of EGexport,y, Egimport,y and the difference between the two, viz., EGfacility,y. So that these parameters has been removed from the data and parameters monitored.

As per registered project description, all meters should be calibrated annually. However, in this monitoring period, calibration frequency of the meters is not maintained annually. There was a delay in year 2012 for the metering points Feeder 1 and Feeder 11. Hence, according to point 2 of para 3.6.1 of VCS standards Version 3.4, it is considered as deviation in the project description.

As per para 253 section 9.5.1 of the CDM validation and verification standard Version 05.0, PP is supposed to apply conservative assumptions or discount factor to the calculation extent required to ensure that emission reductions will not be over-estimated as a result of the deviation. PP has considered this point while preparing monitoring report. Using section 3.3.4 of VCS Validation and Verification Manual, version 3.1 and para 238 under 9.4.4.2 of the CDM validation and verification standard Version 05.0, PP has applied an error equivalent to the accuracy class of the meter for the months of the year 2012 for the metering points Feeder 1 and Feeder 11 where there was a delay in calibration. It is because the meters were working within the permissible limit as per the calibration certificates.

This is a project description deviation. However, as per 3.6.1.2 of VCS standard 3.4, this deviation is not impacting the applicability of the methodology, additionality or the appropriateness of the baseline scenario, and the project remains in compliance with the applied methodology. This deviation is also specifically related to this monitoring period and will not impact the subsequent monitoring periods.

2.3 Grouped Project

There is no grouping involved in the project activity

3 DATA AND PARAMETERS

3.1 Data and Parameters Available at Validation

Data / Parameter	EF _{grid,OM,y}
Data unit	tCO ₂ /MWh
Description	Operating Margin emission factor for NEWNE grid
Source of data	Referred from CO ₂ Baseline Database for the Indian Power Sector prepared by Central Electricity Authority, Version 7.0.
Value applied:	0.9842
Justification of choice of data or description of measurement methods	The operating margin emission factor has been published by CEA in accordance with the 'Tool to calculate the emission factor for an electricity system.' The option of ex ante calculation based on Simple Operating Margin Method have been applied using a three year generation weighted average (2008-09, 2009-10 and 2010-

and procedures applied	11).
Purpose of the data	Baseline calculations
Comments	This value is determined ex-ante and will be fixed for the crediting period

Data / Parameter	EFgrid,BM,y
Data unit	tCO2/MWh
Description	Build Margin emission factor for NEWNE grid
Source of data	Referred from CO ₂ Baseline Database for the Indian Power Sector prepared by Central Electricity Authority Version 6.0.
Value applied:	0.8123
Justification of choice of data or description of measurement methods and procedures applied	The build margin emission factor has been published by CEA in accordance with the 'Tool to calculate the emission factor for an electricity system.' The build margin is calculated as the average emissions intensity of the 20% most recent capacity additions in the grid based on net generation. The build margin has been taken corresponding to the year 2009-10, the latest year for which data is available.
Purpose of the data	Baseline calculations
Comments	This value is determined ex-ante and will be fixed for the crediting period

Data / Parameter	EFgrid,CM, y								
Data unit	tCO2/MWh								
Description	Combined Margin CO ₂ emission factor for NEWNE grid								
Source of data	Calculated based on values given in the CO ₂ Baseline Database Version 7.0 for the Indian Power Sector prepared by Central Electricity Authority								
Value applied:	0.9529								
Justification of choice of data or description of measurement methods and procedures applied	The combined margin emission factor has been determined based on data published by the CEA, applying a 75% weightage for EFgrid, OM,y and 25% for EFgrid,BM,y in accordance with the 'Tool to calculate the emission factor for an electricity system.' <table border="1"> <thead> <tr> <th colspan="2">Combined Margin Estimation for NEWNE Grid (tCO2/MWh)</th></tr> </thead> <tbody> <tr> <td>Operating Margin (EFgrid, OM,y)</td><td>0.9842</td></tr> <tr> <td>Build Margin (EFgrid, BM, y)</td><td>0.8123</td></tr> <tr> <td>Combined Margin (EFCO₂,grid,y)</td><td>0.9529</td></tr> </tbody> </table>	Combined Margin Estimation for NEWNE Grid (tCO2/MWh)		Operating Margin (EFgrid, OM,y)	0.9842	Build Margin (EFgrid, BM, y)	0.8123	Combined Margin (EFCO ₂ ,grid,y)	0.9529
Combined Margin Estimation for NEWNE Grid (tCO2/MWh)									
Operating Margin (EFgrid, OM,y)	0.9842								
Build Margin (EFgrid, BM, y)	0.8123								
Combined Margin (EFCO ₂ ,grid,y)	0.9529								
Purpose of the data	Baseline calculations								
Comments	This value is determined ex-ante and will be fixed for the crediting period								

3.2 Data and Parameters Monitored

Data / Parameter	EG facility, y
Data unit	MWh
Description	Net electricity supplied to grid
Source of data	MSEDCL reports on energy delivered at MSEDCL grid (Credit Notes)
Description of measurement methods and procedures to be applied	The net electricity supplied to the grid is the basis for estimating emission reductions from the project activity. The power generated by each WEG is stepped up via a step-up transformer and fed into the 33 kV Feeder line. Power from WEGs of other project activities is also fed in the same 33 kV feeder line. This common feeder line culminates at the 33 kV/220 kV substation, where the joint-metering is done on monthly basis. A Main Meter and Check Meter of 0.2 accuracy class are connected to individual feeders at the sub-station where all the WEGs (including that of the project activity) are connected. Electricity exported and imported from each feeder (measured by main meter and check meter) is recorded on a monthly basis by MSEDCL officials and representatives of the project promoter (O&M contractors). Based on this monthly recording, MSEDCL calculate the net electricity supplied by the project activity WEGs to the grid.
Frequency of monitoring/recording	Measured: Continuously Reporting Frequency: Monthly (Calculated)
Value monitored:	64985.27 MWh
Monitoring equipment	Annexure 1.
QA/QC procedures to be applied	The quantity of net electricity supplied will be cross-verified from the invoices/sales receipts raised to the state utility.
Purpose of the data	Calculation of baseline emissions
Calculation method	The net electricity supplied to the grid is calculated as follows: Net Electricity supplied to the grid by Project Activity = Total electricity exported by project activity - Total electricity imported by project activity
Comments	The data will be kept for two years after the crediting period or from last issuance. The values shall be

	monitored ex-post and CERs will be calculated at actual.
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Data / Parameter	EG _{y, Export}
Data unit	MWh
Description	Sum of Gross electricity generated by all 17 WEGs of project activity connected to substation of the state utility
Source of data	MSEDCL report on energy delivered at MSEDCL grid (Credit Notes)
Description of measurement methods and procedures to be applied	- There is a main meter and check meter for each feeder at the respective sub-station to which the project activity WTGs are connected. - The meters are electronic TOD meters with an accuracy class of 0.2. - The electricity export data will be monitored via monthly joint meter readings of the energy meters connected to feeders at sub-stations. - The joint meter readings would be carried out for Main & Check Energy meters of each feeder at the relevant substation by representatives of the project promoter (O&M contractors) and representatives of MSEDCL. - The O&M contractor would provide WTG controller generation data to MSEDCL for the respective month. MSEDCL would generate a credit note reporting the electricity export and import for the project activity WEGs. The credit note will be forwarded to the project proponent.
Frequency of monitoring/recording	Measured: Continuously Reporting Frequency: Monthly
Value monitored:	65235.524 MWh
Monitoring equipment	Annexure 1.
QA/QC procedures to be applied	Testing of energy meters will be carried out by MSEDCL officials on an annual basis. The primary monitoring is done through a main meter which is located at the sub-station. In the case the main meter malfunctions, the Check meter readings would be considered for billing purposes.

Purpose of the data	Calculation of baseline emissions
Calculation method	Not applicable
Comments	The data will be kept for two years after the end of the crediting period or the last issuance of CERs for this project activity, whichever occurs later.

Data / Parameter	EG _{y, Import}
Data unit	MWh
Description	Electricity imported from the grid by the project activity
Source of data	MSEDCL report on energy delivered at MSEDCL grid (Credit Notes)
Description of measurement methods and procedures to be applied	- There is a main meter and check meter for each feeder at the respective sub-station to which the project activity WTGs are connected. - The meters are electronic TOD meters with an accuracy class of 0.2. - The electricity import data will be monitored via monthly joint meter readings of the energy meters connected to feeders at sub-stations. - The joint meter readings would be carried out for Main & Check Energy meters of each feeder at the relevant substation by representatives of O&M contractors and representatives of MSEDCL. - The O&M contractor would provide WTG controller generation data to MSEDCL for the respective month. - MSEDCL generate the Credit Note based on the joint meter readings and the WTG controller data. The credit note report the electricity imported by the project activity . The credit note will be forwarded to the project promoter from MSEDCL.
Frequency of monitoring/recording	- Measured: Continuously - Reporting Frequency: Monthly
Value monitored:	250.251 MWh

Monitoring equipment	Annexure 1.
QA/QC procedures to be applied	Testing of energy meters will be carried out by MSEDCL officials on an annual basis. The primary monitoring is done through a main meter which is located at the sub-station. In the case the main meter malfunctions, the Check meter readings would be considered for billing purposes.
Purpose of the data	Calculation of baseline emissions
Calculation method	Not applicable
Comments	The data will be kept for two years after the end of the crediting period or the last issuance of CERs for this project activity, whichever occurs later.

3.3 Description of the Monitoring Plan

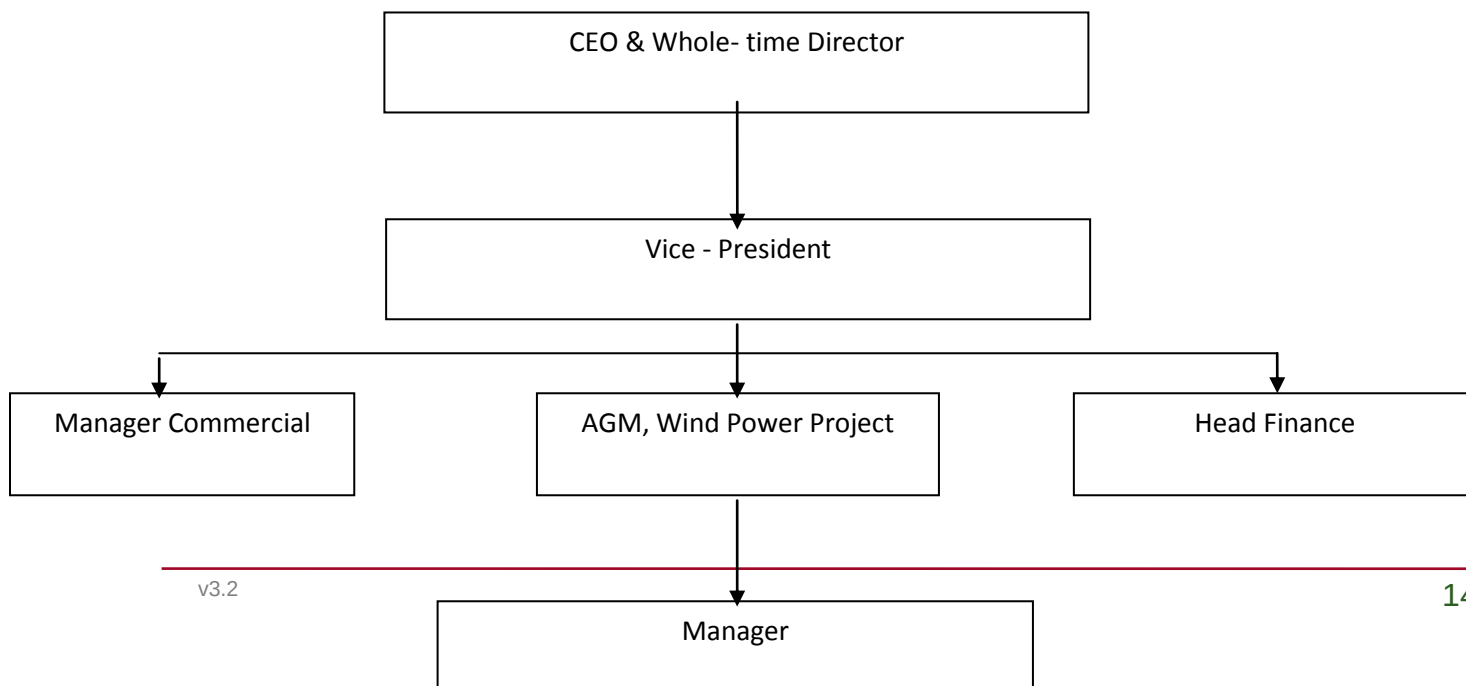
The purpose of the monitoring plan, is to define the organizational structure of the monitoring team, monitoring practices, QA and QC procedures and archiving procedures. The monitoring plan will ensure that the emission reductions from the project activity are reported accurately and transparently.

Roles and Responsibilities of the Monitoring Team

The responsibility of project management as well as monitoring, measurement and reporting lies with HZL. The project proponent has formulated a Monitoring Team to ensure proper and continuous monitoring of the emission reductions as well as performance of turbines and generation of power.

To ensure trouble free operation of all the wind turbines, HZL has entered into a comprehensive Operation and Maintenance agreement with the manufactures of the turbines. The contractor, Suzlon Infrastructure Limited, would be responsible for the operation and maintenance of the WTGs. The O&M personnel are qualified engineers and are trained at the WEG manufacturing facility of Suzlon Infrastructure Limited.

The monitoring will interact with the O&M contractors as well as the State Utility officials for executing the monitoring plan. The structure of the Monitoring Team is as follows:



The site engineer from HZL shall supervise the wind power plant operations under the guidance of the Manager. The Site Engineer of HZL will also interact with the O&M contractors and ensure that the WTG generation reports and JMR statements are forwarded to the Manager for review and electronic archiving. The O&M contractors would be responsible for forwarding monitoring data to Manager of HZL. The Manager would review the monitoring records and suggest corrective action as and when required. The Manager – Commercial will ensure that records of payments for sale of electricity to the state utility are maintained and archived electronically. HZL management will have a CDM review meeting on a bi-annual basis for review of the emission reductions and performance of the project activity.

Metering Arrangements and Procedures

The general conditions set out for metering, recording, meter readings, meter inspections, Test & Checking and communication shall be as per the PPA (power purchase agreement). The electricity exported from the sub-station will be metered using electronic TOD meters. A main and check meter of 0.2 accuracy class would be installed for every feeder at the sub-station of the state electricity board. On a monthly basis, a joint meter reading will be carried out in the presence of the state electricity board officials and representatives of the project promoters.

The total electricity exported and imported by the project activity has been provided by state electricity board. The MSEDCL issue a credit note to project promoter which included the details of the energy generated, exported and imported by the each WEG of the project proponent. This credit note is used for the emission reduction calculation.

Quality control and Quality Assurance procedures:

Calibration Procedures:

Main meters and check meters are installed for monitoring the energy exported. The main and check meters shall be calibrated on an annual basis with reference to a portable standard meter. The meters shall be deemed to be working satisfactorily if the errors are within specifications for meters of 0.2 accuracy class. The data registered by the main meter alone will be adopted for the purpose of calculation as long as the error in the main meter is within permissible limits. If during the annual accuracy tests, the main meter is found to be within the permissible limit of error and the corresponding check meter is beyond the limits, the main meter reading shall be considered as usual. However, the check meter shall be calibrated immediately. If the main meter is found to be beyond the permissible limits of error, but corresponding check meter is within limits, then the check meter reading shall be adopted for that period. The main meter shall be calibrated immediately.

Apportioning Procedures in case the dates of monitoring period do not match with billing cycle dates

The monitoring period for the project activity may start from a date that does not coincide with the date of the initial reading of the respective JMR statement. For instance the monitoring period may start on the 20th of the month whereas the JMR Statement may report the net electricity generation data from the first of the month to the first of the next month. In such a scenario, the net electricity generation data from the

start of the monitoring period to the first date of the next month (the apportioning period) would be determined as follows:

$$\text{Apportioned Net Electricity Generation} = \text{Apportioning Ratio} \times \text{Net Electricity Generation as per JMR Statement}$$

The apportioning ratio would be determined as the ratio of the electricity generation at the WTG for the apportioning period to the electricity generation at the WTG for the entire period covered under the JMR statement. This procedure would only have to be followed for the first and last month of the monitoring period if the start and end dates do not coincide with the date of the joint meter readings of the energy meters.

Note:-

In this monitoring period apportioning applied for the month of Dec'12 which is explained below:-				
Apportioned Net Electricity Generation	=	Apportioning Ratio	x	Net Electricity Generation as per JMR Statement
Apportioned Net Electricity Generation for the month of Dec'12	=	0.839	x	1171234
Apportioned Net Electricity Generation for the month of Dec'12	=	982325	kWh	

Data collection and archiving

The daily data on electricity generation from WTGs at the site is collected in electronic form. Monthly JMR statements are collected and maintained in hard copy, and archived electronically. The project proponent shall keep complete and accurate records of all the data as a part of monitoring for at least a period of 2 years after the end of the crediting period or the last issuance of CERs for the project activity, whichever occurs later.

4 QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS

4.1 Baseline Emissions

Baseline emissions (BE_y in tCO₂e) are the product of the baseline emissions factor (EF_y in tCO₂/MWh) times the electricity supplied by the project activity to the grid (EG_y in MWh) as described in registered PDD.

$$BE_y = EF_{CO_2,grid,y} \times EG_{BL,y}$$

Where,

BE_y baseline emissions, tCO₂e

EG_{BL,y} Net Quantity of Electricity exported to MSDCL facility

EF_{CO₂,grid,y} grid emission factor, i.e. 0.9529 t CO₂/MWh (it has been fixed ex-ante)

EG_{BL,y} =EG_{y,Export} – EG_{y,Import}

= 65235.524 -250.251

= 64985.27 MWh

VER CALCULATION SHEET

Month	Electricity generated by each WTG (EG _{WEG})	Quantity of Electricity exported by HZL to MSDCL facility (EG _{y,Export})	Quantity of Electricity imported by HZL from MSDCL facility (EG _{y,Import})	Net Quantity of Electricity Exported to MSDCL facility(EG _y)	Emission Factor	Baseline Emissions
	kWh	kWh	kWh	MWh	tCO ₂ e/MWh	tCO ₂ e
02 Sept 11- 30 Sept 11	2773435	2720237	6901	2713	0.9529	2586
01 Oct 11 - 04 Nov 11	614014	592436	21481	571		544
05 Nov 11 - 30 Nov 11	567598	538795	27887	511		487
01 Dec 11- 01 Jan 12	800456	762937	23449	739		705
02 Jan 12- 31 Jan 12	1583461	1540174	20034	1520		1449
01 Feb 12 - 29 Feb 12	2099138	2046241	22453	2024		1928
01 Mar 12- 01 April 12	3225650	3159945	22515	3137		2990
02 Apr 12- 01 May 12	5627673	5526588	12347	5514		5255
02 May 12 - 31 May 12	11393682	11194086	370	11194		10666
01 Jun 12- 01 July 12	11610417	11399633	1856	11398		10861
02 July 12- 31 July12	10332214	10121052	4993	10116		9640
01 Aug 12- 31 Aug 12	9642912	9479532	6783	9473		9027

01 Sept 12- 30 Sept 12	3559866	3477538	13124	3464		3301
01 Oct 12 - 31 Oct 12	1116843	1076365	30791	1046		996
01 Nov 12 - 30 Nov 12	635202	601078	18705	582		555
01 Dec12- 26 Dec 12	1031755	998887	16562	982		936
Total	66614316	65235524	250251	64985.27		61924.47

So,

$$BE_Y = 64\,985.27 \times 0.9529$$

$$= 61\,924.47 \text{ tCO}_2$$

$$= 61\,924 \text{ tCO}_2 \text{ (Round down to nearest integer)}$$

MONITORED DATA SHEET

Month	Gross electricity generated by all WEGs owned by PP (Y)	Quantity of Electricity exported by HZL to MSDCL facility (EGy, Export)	Quantity of Electricity imported by HZL from MSDCL facility (EGy, Import)	Net Quantity of Electricity Exported to MSDCL facility(EGy)
	kWh	kWh	kWh	kWh
02 Sept 11- 30 Sept 11	2773435	2720237	6901	2713336
01 Oct 11 - 04 Nov 11	614014	592436	21481	570955
05 Nov 11 - 30 Nov 11	567598	538795	27887	510908
01 Dec 11- 01 Jan 12	800456	762937	23449	739488
02 Jan 12- 31 Jan 12	1583461	1540174	20034	1520140
01 Feb 12 - 29 Feb 12	2099138	2046241	22453	2023788
01 Mar 12- 01 April 12	3225650	3159945	22515	3137430
02 Apr 12- 01 May 12	5627673	5526588	12347	5514241
02 May 12 - 31 May 12	11393682	11194086	370	11193716
01 Jun 12- 01 July 12	11610417	11399633	1856	11397777
02 July 12- 31 July12	10332214	10121052	4993	10116059

01 Aug 12- 31 Aug 12	9642912	9479532	6783	9472749
01 Sept 12- 30 Sept 12	3559866	3477538	13124	3464414
01 Oct 12 - 31 Oct 12	1116843	1076365	30791	1045574
01 Nov 12 - 30 Nov 12	635202	601078	18705	582373
01 Dec12- 26 Dec 12	1031755	998887	16562	982325
Total	66614316	65235524	250251	64985273

4.2 Project Emissions

There are no Project emissions from the project activity

4.3 Leakage

There are no leakage emissions from the project activity

4.4 Summary of GHG Emission Reductions and Removals

$$BE_y = EGPJ_y * EF_{grid, CM, y}$$

$$= 64\,985.27 * 0.9529$$

$$= 61,924 \text{ (Value is rounded down, please refer ER calculation sheet for the same)}$$

According to the approved methodology ACM0002 Emission Reductions are calculated as:-

$$ER_y = BE_y - PE_y$$

$$= 61,924 - 0$$

$$= 61,924 \text{ tCO}_2\text{e}$$

Year	Baseline emissions or removals (tCO ₂ e)	Project emissions or removals (tCO ₂ e)	Leakage emissions (tCO ₂ e)	Net GHG emission reductions or removals (tCO ₂ e)
Year 2011	4321.10	0	0	4321.10
Year 2012	57603.36	0	0	57603.36
Total	61924.47	0	0	61924.47

ANNEXURE-1

Details of Meters.

					2011-12	2012-13	2013-14
Feeder No	Machine No	Meter	Serial No.	After Replaced by ABT meters Serial No.	Calibration Dates	Calibration Dates	Calibration Dates
1	C32	Main	MSP32644		21-06-2011	5-10-2012	17-08-2013
		Back	Msp32642		21-06-2011	5-10-2012	17-08-2013
3	C18,C19,C20,C26,C27,C28,C29,C30	Main	4738073	14831497	17-09-2011	30-07-2012	21-05-2013
		Back	4961771	14831498	17-09-2011	30-07-2012	21-05-2013
4	C02,C03,C04,C05,C06,C07	Main	4961770	14796438	17-09-2011	25-7-2012	22-05-2013
		Back	4961773	14796439	17-09-2011	25-7-2012	22-05-2013
11	C37	Main	MSP32637		22-08-2011	4-10-2012	06-08-2013
		Back	MSP32638		22-08-2011	4-10-2012	06-08-2013
12	C67	Main	MSP32639	14831484	22-08-2011	30-07-2012	22-05-2013
		Back	MSP32640	14796430	22-08-2011	30-07-2012	22-05-2013