

Salora International Limited

Monitoring Report

6.25 MW Wind Power Generation project
of Salora International Limited

VCS PROJECT ID: VCS151

Ver No. 02
09/11/2010

Monitoring period: July-06 to July-09

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PROJECT DETAILS

Project Title	6.25 MW Wind Power Generation project of Salora International Limited
Document	Monitoring Report
Version No.	02
Date	09/11/2010
VCS Project ID	VCS151
CDM Methodology followed	AMS I.D Ver 13 : Grid connected renewable electricity generation
Project location	The project activity is installed in the state of Maharashtra in India.

WTG Tag No.	Capacity (MW)	Location
J-104	1.25	Village: Petle; Dist Dhule
J-106	1.25	Village: Petle; Dist Dhule
J-107	1.25	Village: Petle; Dist Dhule
J-108	1.25	Village: Petle; Dist Dhule
J-109	1.25	Village: Petle; Dist Dhule

Monitoring period 31/07/06 to 31/07/09 (both days included)

Project commissioning date	WTG	Date of commissioning
	J-104	31-July-06
	J-106	3-Aug-06
	J-107	1-Aug-06
	J-108	1-Aug-06
	J-109	1-Aug-06

CO₂ emission reduced 20348 tCO₂e

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Summary

In the monitoring period mentioned in the table above, the project has exported a net of 22422 MWh of power to the state grid which has resulted in GHG emission reduction of 20348 tCO₂e.

INTRODUCTION

Salora International Limited (SIL) has installed and operates a state electricity grid-connected wind farm in Dhule District, Maharashtra, India. The wind farm consists of five Suzlon make Wind Turbine Generators (WTGs) of 1250 kW rated capacity each, for a total capacity of 6.25 MW. The project activity generates electricity by converting the kinetic energy of the wind into mechanical energy that is used to turn a generator. Thus wind energy is converted to electrical energy. The power generated in the Wind Turbine Generators (WTG) is thereafter evacuated to the electrical grid. The wind project by BIL results in reduction of GHG emissions generated by the current energy mix in India's NEWNE power grid, which is dominated by power generated from other conventional sources such as coal.

The purpose of this monitoring report is to calculate the GHG emission reduction achieved by this project activity for the period 31 July 2006 to 31 July 2009, both days included.

REFERENCES

METHODOLOGY APPLIED

The project participant has applied a VCS Program approved methodology from Clean Development Mechanism. The methodology applied is **AMS I.D Ver 13** for grid connected renewable electricity generation.

APPROVED BASELINE AND MONITORING METHODOLOGY

Main Category: Type I – Renewable energy projects

Sub Category: I.D – Grid connected renewable electricity generation

Version: 13

CALCULATION WORKSHEET

The emission reduction calculation has been worked out in the Excel worksheet *SIL_PM_VCS151_Ver 2.xls*.

SIMPLE OPERATING AND BUILD MARGIN EMISSION FACTORS

Central Electricity Authority, the National Authority on electrical systems in India has calculated the Simple Operating Margin and Build Margin emission factors using the 'Tools to calculate the emission factor for an electricity system' Ver 01.1 and publishes their result in User's Guide Ver 4.0 of 'CO2 Baseline Database for The Indian Power Sector'. The Combined Margin emission factor of NEWNE Grid has been worked out using the published results and the weighting factors applicable to wind power projects as given in 'Tools to calculate the emission factor for an electricity system' Ver 01.1. The project uses the ex-ante option for Simple Operation Margin Emission Factor and Build Margin Emission Factor to calculate the combined margin Emission Factor of the NEWNE Grid.

PROJECT DESCRIPTION

VCS PROJECT DESCRIPTION

Salora International Limited (SIL) has installed and operates a state electricity grid-connected wind farm in Dhule District, Maharashtra, India. The wind farm consists of five Suzlon make Wind Turbine Generators (WTGs) of 1250 kW rated capacity each, for a total capacity of 6.25 MW. The wind project by BIL results in reduction of GHG emissions generated by the current energy mix in India's NEWNE power grid, which is dominated by power generated from other conventional sources such as coal.

This project activity reduces the GHG emissions generated by the current energy mix in India's NEWNE Power Grid. This power grid is dominated by power generated from fossil fuel. The wind power project of SIL provides its entire generation to MSEDCL under a 13 year Power Purchase Agreement signed with the power distribution company..

PROJECT PARTICIPANTS

The project participant is **Salora International Limited**.

PROJECT LOCATION

The project activity is installed in the state of Maharashtra in India. The GPS coordinates of the Wind Turbine Generators are given in the table below.

Sr.No.	WTG	Location	Latitude	Longitude
1	J104	R.S.No.59 & R.S.No.01 Village: Petle, Panhalipada, Isharde; Taluka Sakri; Dist Dhule; Maharashtra	N21 12 15.0	E74 19 22.9
2	J106		N21 13 25.7	E74 19 06.5
3	J107	R.S.No.138, R.S.No.01 & R.S.No.16, Village: Petle; Taluka Sakri; Dist Dhule; Maharashtra	N21 13 45.1	E74 19 06.8
4	J108		N21 13 16.3	E74 18 59.8
5	J109		N21 14 39.0	E74 18 55.7

ROLES AND RESPONSIBILITIES

The representative of the project participant, i.e. SIL will be responsible for

- Monitoring the project activity for smooth operation of the WTGs,
- Coordination with the O&M contractor to ensure highest possible availability of the WTGs for generation,
- Collection and updation of all data in the project monitoring worksheet,
- Generation and distribution of monthly reports to the Management of the Project Proponent accounting for
 - The actual emission reduction achieved
 - Any specific event affecting the performance of the project
- Annual internal audit to verify the data updated in the emission reduction calculation worksheet against the Monthly Report "Break-up of Net Export Units (kWh) as recorded at Main Meter of MSEDCL" as submitted by MSEDCL.

- Archiving all data from their respective sources for the purpose of verification for the entire crediting period and an additional period of two years after the end of the crediting period, or the last issuance of VCUs for the project, whichever occurs later.

PARAMETERS BEING MONITORED ACCORDING TO MONITORING PLAN

Type of data	Unit of measurement	Source	Monitoring frequency	Data quality assurance
Net power exported to NEWNE Grid from the project activity	kWh	Report "Import kWh generation(Energy delivered at MSEDCL Grid) issued monthly by MSEDCL.	Monthly	Meters are calibrated annually and readings are taken jointly by representatives from MSEDCL and representative of project participant
Simple Operating Margin (OM) emission factor of the NEWNE Grid	tCO ₂ /MW	User's Guide Ver 4 of 'CO ₂ Baseline Database for The Indian Power Sector' Ver 4 by Central Electricity Authority		Calculated using the 'Tools to calculate the emission factor for an electricity system' Ver 01.1. Central Electricity Authority, the National Authority on electrical systems in India
Build Margin emission factor of the NEWNE Grid	tCO ₂ /MW	User's Guide Ver 4 of 'CO ₂ Baseline Database for The Indian Power Sector' Ver 4 by Central Electricity Authority		Calculated by Central Electricity Authority, the National Authority on electrical systems in India using the UNFCCC approved 'Tools to calculate the emission factor for an electricity system' Ver 01.1.
Weighting factors to be applied to SOM and BM	dimensionless	'Tools to calculate the emission factor for an electricity system' Ver 01.1. approved by UNFCCC	Not applicable	Approved by UNFCCC

QUALITY ASSURANCE (QA) / QUALITY CONTROL (QC) MEASURES

The energy meters are calibrated annually for ensuring reliability of the system. The list of instruments used for monitoring the Project, along with the frequency of calibration is given in Sections 3.2 and 3.3 of the VCS-PD Ver 01. In the event of a malfunction or break down, all efforts are made to repair/replace the equipment to ensure smooth operation of the WTGs and the various monitoring and support equipments connected to them.

This has ensured that the uncertainties in the parameters used for calculating the emission reductions from the project are consistent, verifiable and reliable, and any uncertainty is minimal.

The O&M contractor is responsible for upkeep of the instruments and calibration equipments used for minimising uncertainties and ensuring reliability of the Project.

Calibration/test certificates of the meters for the period, as shown in the table below, are not available. Therefore as per the guidance available in Paragraph 4.(a) of Annex 60, EB52 Meeting Report, since the results of the delayed calibration do not show any errors in the measuring equipment greater than the maximum permissible error, maximum permissible error of the instrument, i.e. 0.2%, has been applied to the measured values for arriving at a conservative net generation figure for the said period. In other words, the power export and import figures have been corrected appropriately by applying the correction factor of 0.2%, i.e. the maximum permissible error of the measuring instrument.

J-104	J-106	J-107	J-108	J-109
April-07 to Oct-07 Jun-09	Apr-07 to Apr-08 Jun-09	Apr-07 to Apr-08 Jun-09	Apr-07 to Apr-08 Jun-09	Apr-07 to Apr-08 Jun-09

EMISSION REDUCTIONS

Total emission reduction per month from both the measures commencing from 31/07/2006 to 31/07/2009 are given below:

(All figures are in tCO_{2e})

Month	2006	2007	2008	2009
January		150.85	225.04	147.50
February		199.33	277.68	258.63
March		125.03	358.75	420.32
April		312.54	798.63	855.63
May		471.81	1860.94	1854.13
June		463.79	1204.10	1215.11
July	2.31	540.44	1251.55	1382.54
August	1512.52	715.95	1173.72	
September	472.67	399.73	545.39	
October	89.80	215.08	126.58	
November	62.14	70.00	153.05	
December	142.48	142.63	149.86	
Annual Total	2281.92	3807.18	8125.29	6133.86
Annual total (rounded)	2282.00	3807.00	8125.00	6134.00
Total for monitoring period	20348			

* Machines were commissioned on 31/07/06, 01/08/06 & 03/08/06

It may be noted here that though the estimated emission reduction for the same period as stated in the validated VCS-PD is 28320 tCO₂, the actual emission reduction is less. The major factors that are responsible for lower emission reduction are

- Availability of wind at velocity sufficient for power generation
- Machine stoppage due to grid availability, cable theft, and break down due to various equipment related problems.

APPENDIX 1

Referred documents:

Description	Source	Usage
Generation at controller	Daily Generation Report from SCADA	EG _p , EG _C
Monthly energy export to state power grid	Monthly Report on Break-up of Net Export Units based on Joint Monitoring Report	EG _{WTGi,exp}
Monthly energy import from state power grid	Monthly Report on Break-up of Net Export Units based on Joint Monitoring Report	EG _{WTGi,imp}

Calibration records:

J-104			
Description	Feeder No.	Meter No.	Date
Meter Test Record	Jamde 12	04725806	28/03/2006
Meter Test Record	Jamde 12	04725806	08/10/2007
Meter Test Record	Jamde 12	04725806	27/05/2008
Meter Test Record	Jamde 12	04725806	08/07/2009

J-106 / J-108 / J-109			
Description	Feeder No.	Meter No.	Date
Meter Test Record	Jamde-6	4725778	28/03/2006
Meter Test Record	Jamde 3	4725795	28/03/2006
Meter Test Record	Jamde 3	04862465	27/05/2008
Meter Test Record	Jamde 3	04862465	08/07/2009

J-107			
Description	Feeder No.	Meter No.	Date
Meter Test Record	Jamde-6	4725778	28/03/2006
Meter Test Record	Jamde 3	4725795	28/03/2006
Meter Test Record	Jamde 3	04862465	27/05/2008
Meter Test Record	Jamde 10	04890562	08/07/2009