Monitoring Report

5 MW Small Scale Wind Based Power Generation for Captive Use by Balkrishna Industries Limited (BIL) in Rajasthan, India

VCS PROJECT ID: VCS137

Ver No. 04

03/03/2010

Monitoring period: Mar-06 to July-09

CONTENTS

PROJECT DETAILS

Project Title	5 MW Small Scale Wind Based Power Generation for Captive Use by Balkrishna Industries Limited (BIL) in Rajasthan, India
Document	Monitoring Report
Version No.	04
Date	25/02/2010
VCS Project ID	VCS137
CDM Methodology followed	AMS I.D Ver 13 : Grid connected renewable electricity generation
Project location	The project activity is installed in the state of Rajasthan in India.

WTG Tag No.	Capacity (MW)	Location
J-270	1.25	Village: Mada; Dist Jaisalmer
J-275	1.25	Village: Mada; Dist Jaisalmer
J-276	1.25	Village: Mada; Dist Jaisalmer
J-280	1.25	Village: Mada; Dist Jaisalmer

Monitoring period	28/03/06 to 31/07/09 (both days included)
Project commissioning date	

WTG	Date of commissioning
J-270	29-Dec-04
J-275	29-Dec-04
J-276	29-Dec-04
J-280	29-Dec-04

CO_2 emission reduced	**24911** tCO_2e
Contact details	Balkrishna Industries Limited (BIL) **Mr. Ashok B. Jain** 72 N.M. Joshi Marg 418, Creative Industrial Estate Mumbai 400011 Maharashtra, INDIA Tele: +91-22-66663800 Mobile: +91 99 8706 6130

Summary

The project was commissioned on 29/12/2004. In the monitoring period mentioned in the table above, the project has exported a net of 27465 MWh of power to the state grid which has resulted in GHG emission reduction of 24911 tCO_2e.

INTRODUCTION

Balkrishna Industries Limited (BIL) has installed and operates a state electricity grid-connected wind farm in Jaisalmer District, Rajasthan, India. The wind farm consists of four Suzlon make Wind Turbine Generators (WTGs) of 1250 kW rated capacity each, for a total capacity of 5.0 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 28 March 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 *BIL_PM_VCS137 ver 4.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

Balkrishna Industries Limited (BIL) has installed and operates a state electricity grid-connected wind farm in Jaisalmer District, Rajasthan, India. The wind farm consists of four Suzlon make Wind Turbine Generators (WTGs) of 1250 kW rated capacity each, for a total capacity of 5.0 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.

BIL operates a tyre manufacturing unit at Bhiwadi, Rajasthan. Prior to the project activity the power requirement of this facility was being met by power drawn from the state power grid. DG sets available at site are used to generate and supply power to critical sections of the manufacturing unit during times when there are problems with availability of power from the state grid. BIL has attempted to reduce GHG emission due to its activities by setting up a renewable energy project based on wind energy and wheeling the power generated there to partially replace the power received from the state power grid. Power generated by the WTGs in the project activity is provided to the RVPNL[1]/JVVNL[2] under a 20 year Wheeling and Banking Agreement.

PROJECT PARTICIPANTS

The project participant is **BALKRISHNA INDUSTRIES LIMITED**.

PROJECT LOCATION

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

Sr.No.	WTG	Location	Latitude	Longitude
1	J-270	Village: Mada; Dist: Jaisalmer; Rajasthan	26° 39' 57.1" N	70° 51' 45.2" E
2	J-275	Village: Mada; Dist: Jaisalmer; Rajasthan	26° 39' 48.1" N	70° 51' 21.9" E
3	J-276	Village: Mada; Dist: Jaisalmer; Rajasthan	26° 39' 37.9" N	70° 51' 21.3" E
4	J-280	Village: Mada; Dist: Jaisalmer; Rajasthan	26° 39' 38.6" N	70° 50' 59.42" E

ROLES AND RESPONSIBILITIES

The representative of the project participant, i.e. BIL 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

[1] Rajasthan Rajya Vidyut Prasaran Nigam Limited
[2] Jaipur Vidyut Vitran Nigam Limited

- 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 RVPNL" as submitted by RVPNL.
- 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	Monthly "Break-up of Net Export Units (kWh) as Recorded at Main Meter of RVPNL" issued monthly by Suzlon Energy Ltd based on the Joint Meter Reading Report authorized by JVVNL and RVPNL.	Monthly	Meters are calibrated annually and readings are taken jointly by representatives from RVPNL, JVVNL and representative of project participant
Simple Operating Margin (OM) emission factor of the NEWNE Grid	tCO2/MW	User's Guide Ver 4 of 'CO2 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	tCO2/MW	User's Guide Ver 4 of 'CO2 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.

Due to non-availability of calibration/test certificates of the meters for the year 2006, the net energy figures for the period March 2006 to February 2006 has been reduced by 0.2%, i.e. the maximum permissible error of the instrument. The test reports before and following this period show that the meter error was within the permissible range for the instrument.

EMISSION REDUCTIONS

Total emission reduction per month from both the measures commencing from 28/03/2006 to 31/07/2009 are given below:

(All figures are in tCO2e)

Month	2005-06	2006-07	2007-08	2008-09	2009-10
April		463.39	516.69	443.89	548.20
May		1134.12	922.99	1454.48	996.65
June		972.97	1147.90	779.64	932.70
July		1267.46	972.56	1212.15	847.21
August		593.85	928.22	907.53	
September		444.52	566.08	680.34	
October		481.69	255.50	405.29	
November		153.82	113.89	287.28	
December		311.36	299.52	365.35	
January		268.05	425.65	444.12	
February		406.00	256.78	264.27	
March	44.79	386.74	564.04	443.51	
Annual Total	**44.79**	**6883.98**	**6969.83**	**7687.86**	**3324.76**
Total for monitoring period		**24911**			

* Machines were commissioned on 29/12/04

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:

Description	Meter No.	Date
Meter Test Record	SEL-12	18/10/2004
Meter Test Record	SEL-12	21/07/2005
Joint inspection/test Report	SEL-12 (Main Meter)	11/03/2007
Joint inspection/test Report	SEL-12 (Back-up Meter)	11/03/2007
Joint inspection/test Report	SEL-12 (Main Meter)	16/02/2008
Joint inspection/test Report	SEL-12 (Back-up Meter)	16/02/2008
Joint inspection/test Report	SEL-12 (Main Meter)	30/01/2009
Joint inspection/test Report	SEL-12 (Back-up Meter)	30/01/2009