PRE CDM VCU MONITORING REPORT OF

"WIND POWER PROJECT AT RAJKOT, GUJARAT"

Project Title	Wind Power Project at Rajkot, Gujarat
Version	Version 2
Report ID	*RWERPL001*
Date of Issue	02/07/2013
Project ID	*PL1045*
Monitoring Period	29/03/2012 to 31/10/2012
Prepared By	ReNew Wind Energy (Rajkot) Private Limited
Contact	601 – 604, 6th Floor, 4A, DLF Corporate Park, Gurgaon, Haryana, PIN – 122001, India; Tel: +91 124 4896670/80; Email: parag@renewpower.in; Website: www.renewpower.in

Table of Contents

Sr.No		Project Details	Sec.
1			
	1.1	Summary Description of the Project	3
	1.2	Sectoral Scope and Project Type	3
	1.3	Project Proponent	3
	1.4	Other Entities Involved in the Project	3
	1.5	Project Start Date	3
	1.6	Project Crediting Period	3
	1.7	Project Location	4
	1.8	Title and Reference of Methodology	5
2		Implementation Status	6
	2.1	Implementation Status of the Project Activity	6
	2.2	Project Description Deviations	6
	2.3	Grouped Project	6
3		Data and Parameters	6
	3.1	Data and Parameters Available at Validation	6
	3.2	Data and Parameters Monitored	8
	3.3	Description of the Monitoring Plan	9
4		Quantification of GHG Emission Reductions and Removals	10
	4.1	Baseline Emissions	10
	4.2	Project Emissions	10
	4.3	Leakage	10
	4.4	Summary of GHG Emission Reductions & Removals	10
5		Additional Information	11

1 PROJECT DETAILS

1.1 Summary Description of Project

ReNew Wind Energy (Rajkot) Private Limited (RNWERPL), the Project Proponent (PP), is setting up wind power project of 25.2 MW capacity at Villages: Godladha, Madhavipur, Kalasar, Devpara of Rajkot district of Gujarat. The project consists of installation of 12 Suzlon make wind turbines of 2.1 MW capacity each.

1.2 Sectoral Scope and Project Type

Sectoral Scope **:** 1, Energy industries (renewable / non renewable sources)

Type and Category : ACM 0002 "Consolidated baseline methodology for grid-connected electricity generation from renewable sources" (Version 12.3.0).

1.3 Project Proponent

ReNew Wind Energy (Rajkot) Private Limited is the sole project proponent. They are having the overall responsibility to plan, manage, implement and run the wind power project. This includes all compliances as stipulated by the host party, i.e. Government of India as well as the modalities as per registered Clean Development Mechanism Project Design Document (CDM PDD) and Voluntary Carbon Standard Project Description (VCS PD).

1.4 Other Entities Involved in the Project

At present beside SUZLON, who was the turnkey project contractor for implementation, commissioning of the project, and presently involved in overall operation and maintenance activities, there is no other entities involved directly in the project.

1.5 Project Start Date

29/03/2012

1.6 Project Crediting Period

Crediting Period Start Date is 29/03/2012,

Crediting Period End Date is 28/03/2022.

Total number of years: 10

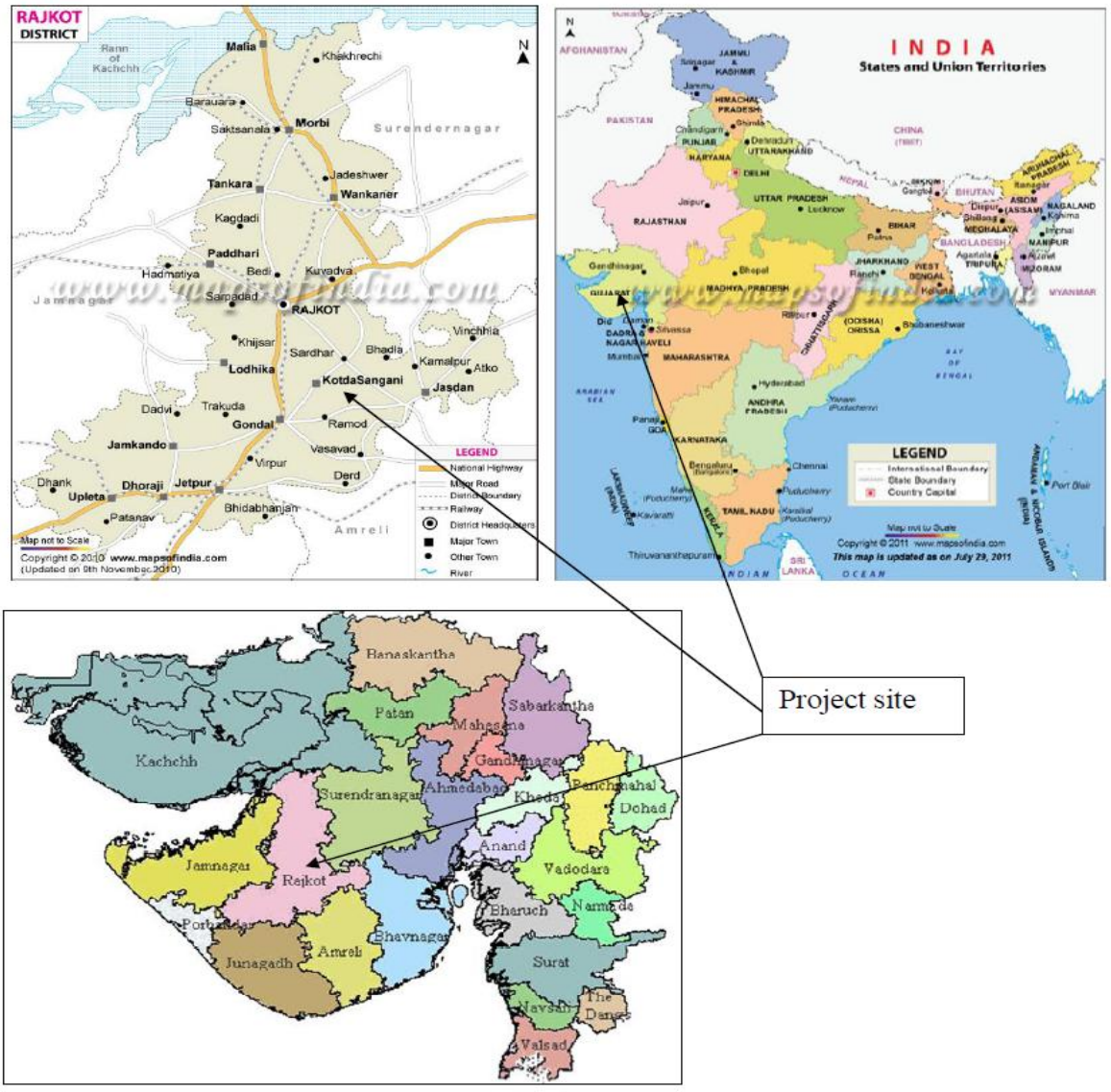
Possible renewal: 2 times

1.7 Project Location

The project is located in Godladha, Madhavipur, Kalasar & Devpara villages of Rajkot district in the State of Gujarat, India.

Wind turbine wise detailed geo-coordinates are given below:

Location No.	Village/Taluka/District/State	Geographical Coordinates
G 034	Godladhar/Jasdan/Rajkot/Gujarat	N22 02 39.2 E71 18 58.5
G 036	Godladhar/Jasdan/Rajkot/Gujarat	N22 03 01.8, E71 18 08.2
G 037	Madhavipur/Jasdan/Rajkot/Gujarat	N22 03 33.6 , E71 18 01.5
G 038	Godladhar/Jasdan/Rajkot/Gujarat	N22 02 52.1 E71 18 58.9
G 039	Godladhar/Jasdan/Rajkot/Gujarat	N22 03 14.8 E71 18 45.6
G 041	Madhavipur/Jasdan/Rajkot/Gujarat	N22 03 47.3, E71 17 49.0
G 042	Madhavipur/Jasdan/Rajkot/Gujarat	N22 03 45.5, E71 18 10.6
G 046	Kalasar /Jasdan/Rajkot/Gujarat	N22 05 06.0, E71 16 42.6
G 055	Devpara /Jasdan/Rajkot/Gujarat	N22 06 04.6, E71 14 19.7
G 056	Devpara /Jasdan/Rajkot/Gujarat	N22 06 18.1, E71 14 15.1
G 068	Madava /Jasdan/Rajkot/Gujarat	N22 08 36.6, E71 14 06.0
G 112	Kalasar/Jasdan/Rajkot/Gujarat	N22 04 54.0, E71 16 18.0



1.8 Title and Reference of Methodology

Title:
"Consolidated baseline methodology for grid-connected electricity generation from renewable sources" ACM0002 (Version 12.3.0)

Reference:
ACM0002 (Version 12.3.0) draws upon the following tools which have been used in the PDD:

Tool to calculate the emission factor for an electricity system (Version 02.2.1)
Tool for demonstration and assessment of additionality (Version 6.0.0)

2 IMPLEMENTATION STATUS

2.1 Implementation Status of the Project Activity

The project has been successfully implemented and declared commissioned by Gujarat Energy Development Agency (GEDA) on 29/03/2012. The project is running successfully then on and there is no such incidence happened in the project which will affect the GHG emission reductions and its monitoring.

2.2 Project Description Deviations

Not Applicable

2.3 Grouped Project

This is not grouped project.

3 DATA AND PARAMETERS

3.1 Data and Parameters Available at Validation

Data Unit / Parameter:	$EF_{grid,OM,y}$
Data unit:	tCO_2e/MWh
Description:	Simple operating margin for NEWNE grid
Source of data:	CO_2 baseline database (Version 7.0) published by CEA in January 2012[1]
Value applied:	0.9842
Purpose of the data:	Calculation of baseline emissions
Any comment:	Fixed ex-ante for entire crediting period

Data Unit / Parameter:	$EF_{grid,BM,y}$
Data unit:	tCO_2e/MWh
Description:	Build margin for NEWNE grid
Source of data:	CO_2 baseline database (Version 7.0) published by CEA in January 2012[2]
Value applied:	0.8587
Purpose of the data:	Calculation of baseline emissions

[1] http://www.cea.nic.in/reports/planning/cdm_co2/cdm_co2.htm
[2] http://www.cea.nic.in/reports/planning/cdm_co2/cdm_co2.htm

Any comment:	Fixed ex-ante for entire crediting period

Data Unit / Parameter:	$EF_{grid, CM, y}$
Data unit:	tCO_2e/MWh
Description:	Emission factor for NEWNE grid
Source of data:	Calculated as per the procedure described in PDD section B.6.1
Value applied:	0.9528
Purpose of the data:	Calculation of baseline emissions
Any comment:	-

3.2 Data and Parameters Monitored

Describe data and parameters monitored subsequent to validation using the following table (copy table for each data unit/parameter).

Data Unit / Parameter:	$EG_{facility,y}$
Data unit:	MWh/ year
Description:	Quantity of net electricity generation supplied by the project plant/unit to the grid in year *y*
Source of data:	Certificate for share of electricity generated by Wind farm provided by GETCO
Description of measurement methods and procedures to be applied:	The electricity generated and fed into the grid shall be monitored using energy meters which are electronic tri-vector meters. Monitoring: Continuous measurement and at least monthly recording. Archiving: Electronic and Paper Data type: Measured & Calculated Recording Frequency: Continuous monitoring and monthly recording Responsibility: The O&M site-in-charge shall be responsible for the regular recording of data. Calibration Frequency: once in 3 years

	Accuracy Class: 0.2S (Active) and 0.5S (Reactive)
Frequency of monitoring/recording:	Continuous measurement and at least monthly recording
Value monitored:	27,655.843
Monitoring equipment:	Electronic Tri-vector meter with accuracy class 0.2S (Active) and 0.5S (Reactive)
QA/QC procedures to be applied:	The Quantity of net electricity generation from the certificate for share of electricity will be cross-checked with the invoices for the sale of power by the project proponent. The meter(s) shall be calibrated and maintained by the state utility as per their own schedule and this frequency of meter calibration is not within the control of the Project Proponent.
Calculation method:	Not Applicable
Any comment:	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 Unit / Parameter:	$EG_{WTG_yard,i,y}$
Data unit:	MWh/ year
Description:	Sum of electricity generation measured at individual yard meters of all project WTGs that are connected to feeders.
Source of data:	Yard meter readings of project activity WTGs
Description of measurement methods and procedures to be applied:	This parameter would only be used for calculation of EG facility,i,y in cases when the start/end dates of monitoring period do not match with the start/end dates of certificate for share of electricity generated by Wind farm provided by GETCO/SLDC or if there are both project and non- project WTGs connected to a particular feeder i. This parameter is the sum of electricity measured at yard meters of all the project WTGs on a continuous basis. These meter readings will be recorded at on a daily basis. O&M contactor will have the responsibility of monitoring this

	parameter. This value will be used in an appropriate apportioning formula specified in PDD section B.7.3 to calculate quantity of net electricity generation supplied by the project to the grid. Monitoring: Continuous measurement and at daily recording. Archiving: Electronic and/or Paper Data type: Measured & Calculated Note: Accuracy Class of all the meters have been specified in appendix 5 of this PDD
Frequency of monitoring/recording:	Continuous measurement and daily recording
Value monitored:	Not applicable. PP is claiming emission reduction as per the share certificate and hence, the dates of the monitoring period are in line with the share certificate.
Monitoring equipment:	Electronic Tri-vector meter with accuracy class 0.2S (Active) and 0.5S (Reactive)
QA/QC procedures to be applied:	The yard meters installed near individual WTGs will be tested at least once in a year and calibrated (if required).
Calculation method:	Not Applicable
Any comment:	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.

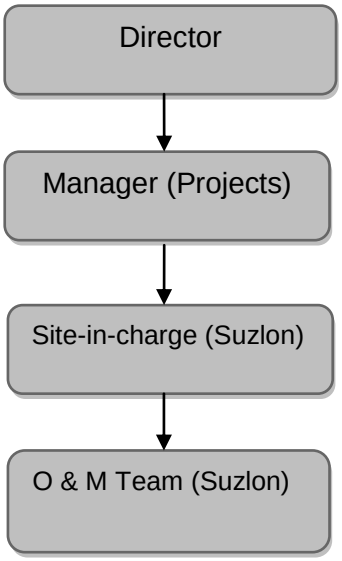
Data Unit / Parameter:	$EG_{Allyeard,i,y}$
Data unit:	MWh/ year
Description:	Sum of electricity generation measured at individual yard meters of all project WTGs that are connected to feeder.
Source of data:	Yard meter readings of project activity WTGs
Description of measurement methods and procedures to be applied:	This parameter would only be used for calculation of EG facility,i,y in cases when the start/end dates of monitoring period do not match with the start/end dates of certificate for share of electricity generated by Wind farm provided by GETCO/SLDC or if there are both project and non- project WTGs connected to a particular

	feeder i. This parameter is the sum of electricity measured at yard meters of all the project WTGs on a continuous basis. These meter readings will be recorded at on a daily basis. O&M contactor will have the responsibility of monitoring this parameter. This value will be used in an appropriate apportioning formula specified in PDD section B.7.3 to calculate quantity of net electricity generation supplied by the project to the grid. Monitoring: Continuous measurement and at daily recording. Archiving: Electronic and/or Paper Data type: Measured & Calculated Note: Accuracy Class of all the meters have been specified in appendix 5 of this PDD
Frequency of monitoring/recording:	Continuous measurement and daily recording
Value monitored:	Not applicable. PP is claiming emission reduction as per the share certificate and hence, the dates of the monitoring period are in line with the share certificate.
Monitoring equipment:	Electronic Tri-vector meter with accuracy class 0.2S (Active) and 0.5S (Reactive)
QA/QC procedures to be applied:	The yard meters installed near individual WTGs will be tested at least once in a year and calibrated (if required).
Calculation method:	Not Applicable
Any comment:	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

In Monitoring &Verification protocol, the objective is to have clear, credible and accurate monitoring, evaluation and verification procedures. This involves recording, data collection of all wind turbines, metering of electricity generated at substation, on daily basis as well as on monthly basis. The general conditions for metering, recording, meter readings, meter inspections, Test & Checking and communication shall be as per the Power Purchase Agreement with the state utility.

The project proponent proposes following arrangements in order to carry out metering and O & M activities for all wind turbines:



At 33 kV/66 kV Parveda substation (Currently managed by Suzlon), there are two feeders; Feeder 1 to which 7 wind turbines and Feeder 2 to which 5 wind turbines are connected. Main meter, check meter and ABT meters are located at the substation.

The detailed monitoring, recording and apportioning procedure has been described in appendix 3 of the CDM PDD. The meter readings will be reported to the site-in-charge and the compiled reports will be sent to the Manager (Projects) and Director. The Manager will monitor overall activity of the project and report to the Director. As per O & M schedule, the operation and maintenance activities will be carried out by trained and qualified technical staff of Suzlon.

Each party shall maintain complete and accurate records and all other data required by each of them for the purposes of proper administration and the operation of the project.

4 QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS

4.1 Baseline Emissions

According to equation (1) of CDM PDD section B.6.1, the baseline emissions are to be calculated as follows:

$$BE_y = EG_{PJ,y} \cdot EF_{grid,CM,y}$$

According to equation (5) of CDM PDD section B.6.1, Combined margin CO_2 emission factor for grid connected power generation ($EF_{grid,CM,y}$) is calculated as follows:

$$EF_{grid,CM,y} = w_{OM} * EF_{grid,OM,y} + w_{BM} * EF_{grid,BM,y}$$
$$= 0.75 * 0.9842 + 0.25 * 0.8588$$
$$= 0.9528\ tCO_2e/MWh$$

Thus for ex-ante emission reduction calculations, the baseline emission factor for the grid = 0.9528 tCO_2e/MWh

Quantity of net electricity generation that is produced and fed into the grid as a result of the implementation of the CDM project activity ($EG_{PJ,y}$)

$EG_{PJ,y}$ = **$EG_{facility,y}$** = 27,655.843 MWh

Hence, substituting values in equation 1, we get:

BE_y=27,655.843 * 0.9528
= 26,350 tCO_2e (Rounded off to nearest conservative value)

4.2 Project Emissions

Nil

4.3 Leakage

Nil

4.4 Summary of GHG Emission Reductions and Removals

Emission reductions are calculated as follows:

ReNew Wind Energy (Rajkot) Pvt. Ltd.								
Genaration in MWh	Mar-12	Apr-12	May-12	Jun-12	Jul-12	Aug-12	Sep-12	Oct-12
For 23.1 MW	55.021	1266.995	3019.018	1967.445	7380.756	6871.586	2718.494	1744.752
For 2.1 MW	0.000	0.000	295.262	579.422	708.267	624.663	246.880	177.282
Total	55.021	1266.995	3314.280	2546.867	8089.023	7496.249	2965.374	1922.034

$ER_y = BE_y – PE_y$

Where:
ER_y Emission reductions in year y (tCO_2e/yr)
BE_y Baseline emissions in year y (tCO_2e/yr)
PE_y Project emissions in year y (tCO_2e/yr)

According to the above equation, overall **emission reductions** (ER_y) are,
ER_y = BE_y – PE_y
= 26,350 - 0
= 26,350 tCO_2e

5 ADDITIONAL INFORMATION

Total net generation of electricity for the monitoring period = 27,655.843 MU