

Monitoring Report for Gold Standard

(Version 02)

Fujian Zhangpu Liuaio 45 MW Wind Power Project

**(CDM registration reference number: 1318 & GS
Project ID 375)**

Monitoring periods:

28 May 2008 to 27 May 2009

Dated: August 4, 2009

1. Introduction

This document reports the emission reductions generated by the Fujian Zhangpu Liuao 45MW Wind Power Project, CDM registration reference number 1318, in the following monitoring period:

28 May 2008 to 27 May 2009(The second monitoring period of the 1st crediting period)

2. General description of the project

2.1 Project activity

The Fujian Zhangpu Liuao 45 MW Wind Power Project is located in Liuao town, Zhangpu County, Fujian Province, P.R.C. It involves the installation of 36 turbines, each of which has a rated output of 1250kW, providing a total capacity of 45MW. The electricity generated from the project is fed into the East China Power Grid.



The project helps reduce GHG emissions generated from the high-growth, coal-dominated power generation. And also, it contributes to sustainability in the region by reducing pollution, creating employment opportunities, promoting the local tourism industry and improving the livelihoods of local people. At a larger scale, the project assists China in stimulating and accelerating the commercialization of

grid-connected renewable energy technologies and markets in China.

All the 36 turbines of the project have been put into operation since January 2008.

2.2 Technical description of the project

Location of the project activity

The project site is located in the east of Liuaio peninsula, Zhangpu County in Fujian Province. It has the Taiwan Strait to the east, Gulei Peninsula in the southwest and Jiugang town in the north. The site is 48km from the Zhangpu county government in the northwest, 100km from Zhangzhou Municipality in the north. The exact geographical coordinates of the project are $117^{\circ} 28' 20'' \sim 117^{\circ} 29' 43''$ E, $23^{\circ} 34' 25'' \sim 24^{\circ} 0' 39''$ N.

Technology employed by the project activity

Turbines of model 64/1250 manufactured by Suzlon are used for the project. The height of the wheel hub is 65m. The turbines are arranged in a matrix shape with row spacing of 7D and column spacing of 5D. According to the turbine layout, each turbine will be equipped with one transformer. The wind power generated will be delivered to the 110kV step-up substation by 35kV transmission lines. The power in the 110kV step-up substation will be transmitted to Changjiaoying substation.

3. Monitoring methodology and plan

The monitoring methodology ACM0002 (version 6) – “Consolidated monitoring methodology for grid-connected electricity generation from renewable sources” is selected for the project.

Data and parameters monitored (according to B7.1 of the registered PDD):

Data / Parameter:	EGy
Data unit:	MWh
Description:	Net electricity delivered to grid in year y
Source of data to be used:	Measured by meters
Value of data applied for the purpose of calculating expected emission reductions in section B.5	Estimation of annual electricity generation delivered to grid: 95,602 MWh
Description of measurement methods and procedures to be applied:	Hourly measured and monthly recorded
QA/QC procedures to be applied:	According to national standard, meters will be calibrated periodically. Data measured by meters will be cross checked by electricity sales receipt.
Any comment:	

4. Quality Control(QC) and Quality Assurance(QA)

4.1 QA/QC procedures

Uncertainty level of data is low. Electricity delivered to the grid by the project is the electricity exported to the grid by the project minus the electricity imported from the project.

A pair of meters(one main meter and one backup meter) with accuracy of 0.2s have been installed at the wind farm to monitor the electricity exported to and imported from the grid. When the main meter is out of order, the readings from the backup meter will be used for reference.

Electricity exported and imported is continuously measured by the main meter, daily recorded and monthly aggregated. Periodical electricity sales receipts are used for double check.

4.2 Calibration

Both meters were calibrated by a qualified third party on 01/12/2007 and 01/12/2008, in accordance with relevant national regulation. Calibration certificates of both meters and the accreditation certificate for the calibrator have been provided to the verifier.

4.3 Roles and responsibilities

The monitoring plan clearly states the roles and responsibilities of the three persons from the project owner who are involved in the monitoring of grid-connected electricity generation by the project.

5. GHG Calculations

5.1 Project activity emissions

Being a wind power project, there are no project emissions according to the ACM0002 methodology. There was no fossil fuel consumption by the project for electricity generation during the monitoring period.

5.2 Leakages

According to ACM0002, the main indirect emissions potentially giving rise to leakage in the context of electric sector projects result from power plant construction, fuel handling(mining, processing, and transportation) and land inundation (for hydroelectric projects). The project developer does not need to consider such indirect emissions when applying the methodology. Project

activities using this baseline methodology shall not claim any credit for the project on account of reducing these emissions below the level of the baseline scenario. The diesel engine which is in place for emergency purpose has not been used during the monitoring period. The leakage from the project is zero.

5.3 Baseline emissions

The baseline emission BE_y during the monitoring period results from:

$$BE_y = EG_y * EF_y$$

Where

EG_y – Net electricity delivered to the grid in year y during the monitoring period

EF_y – Emission factor of the grid (calculated ex-ante and will not be updated during the first crediting period) in year y

$$EG_y = EG_{\text{export},y} - EG_{\text{import},y}$$

Where

$EG_{\text{export},y}$ – Electricity exported to the grid in year y

$EG_{\text{import},y}$ – Electricity imported from the grid in year y

Table 1. Electricity Exported to the Grid

Period	Exported electricity by meter reading(kWh)				Exported electricity from sales receipts (kWh)	Value of exported electricity used for the calculation of emission reductions(kWh)
	Meter reading at period start	Meter reading at period end	Magnification	Exported electricity from meter reading		
	A	B	C	D=(B-A)*C	E	F=Min(D,E) ¹
28 May 2008- 27 Jun. 2008	131.2893	141.1190	440,000	4,325,068	4,325,024	4,325,024
28 Jun. 2008- 27 Jul. 2008	141.1190	148.3223	440,000	3,169,452	3,169,320	3,169,320
28 Jul. 2008 - 27 Aug 2008	148.3223	158.6821	440,000	4,558,312	4,556,992	4,556,992
28 Aug 2008- 27 Sep 2008	158.6821	167.8038	440,000	4,013,548	4,009,148	4,009,148
28 Sep 2008- 27 Oct. 2008	167.8038	184.1670	440,000	7,199,808	7,197,872 ²	7,197,872
28 Oct. 2008- 27 Nov. 2008	184.1670	203.5566	440,000	8,531,424	8,531,424 ³	8,531,424
28 Nov. 2008- 30 Nov. 2008	203.5566	205.7223	440,000	8,299,940	8,291,844	8,291,844

¹ For consideration of conservativeness, smaller value of exported electricity is used for the calculation of emission reductions

² For the period from 28/05/2008 to 27/10/2008, the value in the sales receipts is smaller because reactive power was deducted for the periods.

³ For this month, there is no reactive power. Therefore, the value in the sales receipts are the same as meter readings.

1 Dec. 2008 - 27 Dec. 2008	0.0000	16.6978	440,000			
28 Dec. 2008- 27 Jan. 2009	16.6978	39.9064	440,000	10,211,784	10,198,836	10,198,836
28 Jan. 2009- 25 Feb. 2009 ⁴	39.9064	51.9086	440,000	5,280,968	5,268,470	5,268,470
26 Feb. 2009- 27 Mar. 2009	51.9086	71.0052	440,000	8,402,504	8,389,289	8,389,289
28 Mar. 2009- 27 Apr. 2009	71.0052	92.7728	440,000	9,577,744	9,561,426	9,561,426
28 Apr. 2009- 27 May 2009	92.7728	107.5208	440,000	6,489,120	6,475,872 ⁵	6,475,872
Total				80,059,672	79,975,517	79,975,517

⁴ The date of recording for this month are two days earlier than usual due to the upgrading of the marketing system required by the grid company.

⁵ Starting from 28/11/2008, the grid company requires that line loss is taken into account in the sales receipts. This is described in the PPA signed on 28/12/2008 between the grid company and the project owner.

Table 2. Electricity Imported from the Grid

Period	Imported electricity by meter reading(kWh)				Imported electricity from sales receipts(kWh)	Value of imported electricity used for the calculation of emission reductions(kWh)
	Meter reading at period start	Meter reading at period end	Magnification	Imported electricity from meter reading		
	A	B	C	D=(B-A)*C	E	F=Max(D,E)
28 May 2008- 27 Jun. 2008	0.4671	0.5442	440,000	33,924	33,924	33,924
28 Jun.,2008- 27 Jul. 2008	0.5442	0.667	440,000	54,032	54,032	54,032
28 Jul. 2008 - 27 Aug. 2008	0.667	0.7784	440,000	49,016	49,016	49,016
28 Aug. 2008- 27 Sep. 2008	0.7784	0.9022	440,000	54,472	54,472	54,472
28 Sep. 2008- 27 Oct. 2008	0.9022	0.9568	440,000	24,024	24,024	24,024
28 Oct. 2008- 27 Nov. 2008	0.9568	0.9933	440,000	16,060	16,060	16,060
28 Nov. 2008- 30 Nov. 2008	0.9933	0.9938	440,000	5,280	5,280	5,280
1 Dec. 2008 - 27 Dec. 2008	0	0.0115	440,000			
28 Dec. 2008- 27 Jan. 2009	0.0115	0.0373	440,000	11,352	11,352	11,352
28 Jan. 2009- 25 Feb. 2009	0.0373	0.1509	440,000	49,984	49,984	49,984
26 Feb. 2009- 27 Mar. 2009	0.1509	0.2204	440,000	30,580	30,580	30,580
28 Mar. 2009- 27 Apr. 2009	0.2204	0.2817	440,000	26,972	26,972	26,972
28 Apr. 2009- 27 May 2009	0.2817	0.4006	440,000	52,316	52,316	52,316
Total				408,012	408,012	408,012

$$EG_y = EG_{\text{export},y} - EG_{\text{import},y} = 79,975,517 - 408,012 = 79,567,505 \text{ kWh}$$

$$BE_y = EG_y * EF_y = 79,567.505 \text{ MWh} \times 0.880 \text{ tCO}_2\text{e/MWh} = 70,019 \text{ tCO}_2\text{e}$$

5.4 Emission reductions

As the emissions and leakage from the project activity are zero, emission reduction is equal to baseline emission.

$$ER_y = BE_y - PE_y - L_y = BE_y - 0 - 0 = BE_y = 70,019 \text{ tCO}_2\text{e}$$

Emission reduction generated in the monitoring period: **70,019 tCO₂e**

5.5 Comparison of ERs verified and estimated

The estimated annual ERs in the PDD are 84,130tCO₂e. The actual annual emission reduction has been verified as 70,019tCO₂ for the same period.

6. Results of monitoring sustainable development indicators

6.1 Employment

Employment (number): 66 persons were hired short-term for the construction of the wind farm and 7 persons were recruited long term for the operation and maintenance of the wind farm. Increase of employment (in number) as a result of the project is evident. The number of jobs created is different from what it stated in the GS Annex submitted for validation. It is because that at the validation stage, the project owner's answer about 300 jobs is the number of job opportunities that may be provided by the Liua Wind Farm which includes three phases. The 45MW is the phase 2 project. It was a misunderstanding during validation.

Having said that, the initial sustainable development assessment carried out during validation is not significantly affected by the difference in numbers. The project still has a very positive contribution to the sustainable development in the area. Not only jobs are created, employment quality is also quite high. Annual salary for the 7 persons mentioned above is 35,000yuan/person, which is much higher than Zhangzhou's average annual salary of 22,270 yuan in 2008.

6.2 Replantation

Construction contract for replantation was signed on September 20, 2008 between the Datang Zhangzhou Wind Power Co., Ltd and Zhangpu County Forestry Bureau. The latter is commissioned by the former to carry out replantation at the lifting site of the 36 wind turbines (onshore windbreaks). The contract worth 111,700RMB. The below picture shows the replantation at the site.



7. Entity who is responsible for this monitoring report

Project Owner

Datang Zhangzhou Wind Power Co., Ltd

CDM Project Consultant

CDM Department of China National Water Resources & Electric Power Materials & Equipment Co., Ltd. (CWEME)

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