

MONITORING REPORT

Liujiashan 10 MW Small Hydropower Project in Jiangxi Province

(CDM Registration Reference Number: 1477)

Crediting Periods: Apr. 10th, 2008 to Apr. 9th, 2015

Monitoring Periods: Apr. 10th, 2008 to Jul. 10th, 2009

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1. Introduction

This document reports the emission reductions generated by the Liujiashan 10 MW Small Hydropower Project in Jiangxi Province, CDM registration reference number is 1477, in the following monitoring period: **Apr. 10th, 2008 (registration date) to Jul. 10th, 2009.**

2. General description of the project

2.1 Project activity

Liujiashan 10 MW Small Hydropower Project in Jiangxi Province developed by Zixi Sanjiang Hydropower Co., Ltd. is located on the Baita River in Zixi County, Fuzhou City, Jiangxi Province. The purpose of the Project is to utilize the water power resources of the Baita River to generate electricity, which is delivered to Central China Power Grid (CCPG) through the Jiangxi Power Grid (JXPG) without CO₂ emissions.

The Project is a newly-built 10 MW hydropower project with a reservoir of 19.9 million m³ storage capacity. The surface area of the reservoir at full water level is 1.07 square kilometer, and the power density is 9.3 W/m². It is estimated that the electricity supplied to the grid will be 25.09 GWh annually. The Project activity will achieve greenhouse gas (GHG) emission reductions by avoiding CO₂ emission from the business-as-usual scenario, electricity generated by those fossil fuel-fired power plants connected into CCPG. The estimated emission reductions are 22207 tCO₂e per year.

2.2 Technical description of the project

Location of the project activity

The Project is sited within Liujiashan Village of Luyang Town, Zixi County, Fuzhou City, Jiangxi Province, P.R.China. The Project's dam site is located in the Baita river canyon 1.2 km downstream from Liujiashan Village and about 6 km from Zixi County. The geographical coordinates of the Project site are 27°49' N-117°07' E in degree.

Technology employed by the project activity

The Project is designed to deliver discharge flow of 22.48 m³/s with 44.62m water head. The total installed capacity of the Project is 10 MW with 0.98 MW of guarantee output. It is estimated that the feed-in electricity to CCPG from the Project is 25.09 GWh per year

through a 35KV transmission line. The Project will install two sets of 5 MW hydro turbines and associated generators.

3. Monitoring methodology and plan

3.1 Monitoring methodology

The monitoring methodology AMS-I.D “Grid connected renewable electricity generation” (version 10) is selected for the project.

3.2 Parameters monitored

To be in line with the monitoring methodology and the monitoring plan in the registered PDD, the following parameter needs to be monitored for the project:

Data / Parameter:	<i>EGy</i>
Data unit:	<i>GWh</i>
Description:	<i>Electricity supplied to the grid by the Project.</i>
Source of data to be used:	<i>Measured by meter installed at the Project site.</i>
Value of data	
Description of measurement methods and procedures to be applied:	<i>The electricity supplied to CCPG by the Project is measured continuously through electronic metering instruments at the Project site and will be recorded by designated staff on a monthly basis.</i>
QA/QC procedures to be applied:	<i>The electricity supplied to the grid will be periodically reviewed with sales receipts from the Electricity Power Company. Calibration of Meters & Metering should be implemented according to national standards and rules (such as DL/T448-2000 the Technical Management Rules for Electric Power Measuring Installations) annually at least.</i>
Any comment:	-

Data / Parameter:	<i>Surface area of the reservoir</i>
Data unit:	<i>m²</i>
Description:	<i>Surface area of the reservoir at full level</i>
Source of data to be used:	-
Value of data	-
Description of measurement methods and procedures to be applied:	<i>The area will be monitored based on topographical data and the height of the dam</i>
QA/QC procedures to be applied:	-
Any comment:	<i>Monitored once at start of the project. Monitored data will be kept during the crediting period.</i>

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

4.1 QA/QC procedures

Data	Uncertainty level of data (High/Medium/Low)	Explain QA/QC procedures planned for these data, or why such procedures are not necessary.
1. EG_y	Low	The electricity supplied to the grid will be periodically reviewed with sales receipts from the Electricity Power Company. Calibration of Meters & Metering should be implemented according to national standards and rules (such as DL/T448-2000 the Technical Management Rules for Electric Power Measuring Installations) annually at least.
2. <i>Surface area of the reservoir</i>	Low	Monitored once at start of the project. Monitored data will be kept during the crediting period.

4.2 Roles and responsibilities

Zixi Sanjiang Hydropower Co., Ltd. is responsible for monitoring, measurement and reporting. In the monitoring period, the project is implemented according to the monitoring plan in the registering PDD.

4.3 Calibration

Calibration of Meters is implemented according to national standards and rules (such as DL/T448-2000 the Technical Management Rules for Electric Power Measuring Installations) in 2007, 2008 and 2009. All the records is documented and maintained by the Project owner for DOE's verification.

5. GHG calculations

According to the methodology AMS-I.D: $ER_y = BE_y - PE_y - L_y$

5.1 Project activity emissions

The surface area of the reservoir at full water level was measured by Water resource

Bureau of Zixi County after the implementation of the project. The actual measuring result of the surface area at full water level was 1.07km². The power density of the project is 9.3W/m², which is greater than 4W/m² and less than 10 W/m². According to the methodology ACM0002, the project activity emissions (PE_y) are calculated as:

$$PE_y = EF_{RES} \times EG_y / 1000$$

Where:

EF_{RES} -- The default emission factor for emissions from reservoir, and the default value as per EB23 is 90 kgCO₂e/MWh.

5.2 Leakages

As newly built hydropower plants, there is no energy generating equipment be transferred from another activity and no existing equipment be transferred to another activity involved in the project activities. No leakage is considered in the Project. The leakage from the project is zero.

$$L_y = 0$$

5.3 Baseline emissions

Baseline emissions (BE_y in tCO₂e) can be calculated as the electricity supplied by the project activity to the grid (EG_y in MWh) multiplied by the baseline emissions factor (EF_y in tCO₂e/MWh):

$$BE_y = EG_y \times EF_y$$

Where:

EG_y -- Electricity supplied to the grid during the monitoring period (MWh);

EF_y -- Emission factor of the grid (tCO₂e /MWh) (0.9751tCO₂e /MWh, as calculated ex-ante in the registered PDD and will not be updated during the first crediting period).

Electricity supplied by the project to the grid and corresponding baseline emission, project emission and leakage are listed monthly as below:

Date		Electricity supplied to the grid	Emission Factor	Baseline Emission	Project Emission	Leakage	Emission Reduction
From	To	A	B	C=A*B	D=A*90/1000	E	F=C-D-E
		MWh	tCO ₂ e/MWh	tCO ₂ e	tCO ₂ e	tCO ₂ e	tCO ₂ e
10/04/2008	22/04/2008	1202.25	0.9751	1172	108	0	1064
23/04/2008	22/05/2008	1219.26	0.9751	1189	110	0	1079
23/05/2008	22/06/2008	3428.04	0.9751	3343	309	0	3034
23/06/2008	22/07/2008	2376.15	0.9751	2317	214	0	2103
23/07/2008	12/08/2008	1599.99	0.9751	1560	144	0	1416
13/08/2008	21/09/2008	1700.58	0.9751	1658	153	0	1505
22/09/2008	21/10/2008	1087.59	0.9751	1061	98	0	963
22/10/2008	19/11/2008	1280.79	0.9751	1249	115	0	1134
20/11/2008	21/12/2008	770.28	0.9751	751	69	0	682
22/12/2008	19/01/2009	372.12	0.9751	363	33	0	329
20/01/2009	15/02/2009	237.30	0.9751	231	21	0	210
16/02/2009	16/03/2009	1671.60	0.9751	1630	150	0	1480
17/03/2009	15/04/2009	2190.09	0.9751	2136	197	0	1938
16/04/2009	27/04/2009	1115.73	0.9751	1088	100	0	988
28/04/2009	09/06/2009	3404.94	0.9751	3320	306	0	3014
10/06/2009	10/07/2009	2062.41	0.9751	2011	186	0	1825
Total		25719.12		25079	2315	0	22764

5.4 Emission reductions

The electricity supplied to the grid (EG_y) is: 25719.12MWh.

The baseline emission (BE_y) can be calculated by the formula below:

$$BE_y = EG_y \times EF_y = 25719.12 \text{MWh} \times 0.9751 \text{tCO}_2\text{e/MWh} = 25079 \text{tCO}_2\text{e}$$

$$PE_y = EF_{REs} \times EG_y / 1000 = 25719.12 \text{MWh} \times 90 \text{kgCO}_2\text{e/MWh} / 1000 = 2315 \text{tCO}_2\text{e}$$

As the leakage from the project activity is zero, the emission reduction during the monitoring period (10/04/2008-10/07/2009) is:

$$ER_y = BE_y - PE_y - L_y = 25079 - 2315 - 0 = 22764 \text{tCO}_2\text{e}$$

Based on the calculation above, the emission reduction during the monitoring period is 22764 tCO₂e, which is equal to 46.78 tCO₂e per day, and less than the emission

reductions (60.84 tCO₂e per day) estimated in the registered PDD.

6. Entity responsible for this monitoring report

Entity: Cleanergy Investment Service (Beijing) Co., Ltd.

Address: Capital Times Square, 88 Xichang'an Jie, Beijing, China, 100031.

Tel: +86-10-83914567

Fax: +86-10-83914555