



Monitoring report form (Version 03.2)

Monitoring report

Title of the project activity	Liujiashan 10 MW Small Hydropower Project in Jiangxi Province
Reference number of the project activity	1477
Version number of the monitoring report	01
Completion date of the monitoring report	10/07/2014
Registration date of the project activity	10/04/2008
Monitoring period number and duration of this monitoring period	3 rd Monitoring period: 11/09/2011-20/04/2014 (first and last days included)
Project participant(s)	Zixi Sanjiang Hydropower Co., Ltd. (project owner) China Carbon N.V. (Buyer)
Host Party(ies)	P.R. China
Sectoral scope(s) and applied methodology(ies)	Sectoral scope: 1. Energy industries (renewable/non-renewable sources) Applied methodology: AMS-I.D.- Grid connected renewable electricity generation (Version 10)
Estimated amount of GHG emission reductions or net anthropogenic GHG removals by sinks for this monitoring period in the registered PDD	57,981 tCO ₂ e
Actual GHG emission reductions or net anthropogenic GHG removals by sinks achieved in this monitoring period	47,740 tCO ₂ e
Actual GHG emission reductions or net anthropogenic GHG removals by sinks achieved during the period up to 31 December 2012 (if applicable)	27,624 tCO ₂ e
Actual GHG emission reductions or net anthropogenic GHG removals by sinks achieved during the period from 1 January 2013 onwards (if applicable).	20,116 tCO ₂ e

SECTION A. Description of project activity**A.1. Purpose and general description of project activity**

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Liujiasan 10 MW Small Hydropower Project in Jiangxi Province (hereafter referred to as the Project) 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 resources of the Baita river to generate electricity to deliver to Central China Power Grid (CCPG) through the Jiangxi Power Grid (JXPG) without CO₂ emissions.

The Project is a 10 MW hydropower project with a reservoir of 19.9 million m³ storage capacity. The reservoir surface area at full reservoir level is 1.07 square kilometer, and the power density (defined as installed capacity divided by the surface area) 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 22,207 tCO₂e per year.

The project started to construct on 20/10/ 2004, commissioned on 28/08/2006.

During the 3rd monitoring period (11/09/2011-20/04/2014), the project has achieved 47,740 tones of CO₂e emission reduction.

A.2. Location of project activity

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The host party of the project is P.R. China. The Project is sited within Liujiasan 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 Liujiasan Village and about 6 km from Zixi County. The geographical coordinates of the Project site are 27°49' N-117°07' E in degree.

A.3. Parties and project participant(s)

Party involved ((host) indicates a host Party)	Private and/or public entity(ies) project participants (as applicable)	Indicate if the Party involved wishes to be considered as project participant (Yes/No)
P.R. China	Zixi Sanjiang Hydropower Co., Ltd. (project owner)	No
Netherlands	China Carbon N.V. (buyer)	No

A.4. Reference of applied methodology

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The methodology applied for the Project is the approved methodology for small-scale CDM project- AMS-I.D. "Grid connected renewable electricity generation" (version 10)

For more information about the methodology please refer to:

<http://cdm.unfccc.int/methodologies/PAmethodologies/approved.html>.

A.5. Crediting period of project activity

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The renewable crediting period is adopted for the Project. The starting date of the crediting period is 10/04/2008. The first 7-year crediting period is 10/04/2008-09/04/2015.

SECTION B. Implementation of project activity

B.1. Description of implemented registered project activity

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The Project is a diversion hydropower station. It is designed to deliver discharge flow of 22.48 m³/s with 44.62 m 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 approximately 25.09 GWh per year through a 35KV transmission line. The Project installs two sets of 5 MW hydro turbines and associated generators. Key technical parameters of the hydro turbine and the generator are listed in Table 1.

Table 1. Key technical parameters of the hydro turbine and the generator

Hydro Turbine		Generator	
Turbine Type	HLD74-LJ-120	Generator Type	SF4000-14/2600
Rated head	42.3m	Rated Capacity	5000 kW
Wheel diameter	120 cm	Rated voltage	6300 V
Rated flow	11.24 m ³ /s	Rated current	458 A
Rated speed	428.6 r/min	Rated power factor	0.8

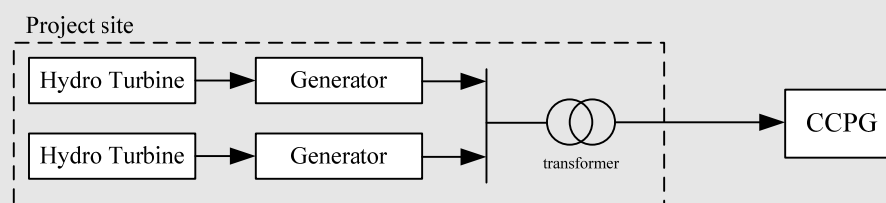


Figure 1 Technology flow chart of the Project

The project commissioned on 28/08/2006.

The gateway meter installed at the substation was change from F500287 to F500310 on 18/03/2012.

There were no events or situations that occurred during the monitoring period, which may impact the applicability of the methodology.

B.2. Post registration changes

B.2.1. Temporary deviations from registered monitoring plan or applied methodology

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There are no temporary deviations from registered monitoring plan or applied methodology.

B.2.2. Corrections

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There are no corrections.

B.2.3. Permanent changes from registered monitoring plan or applied methodology

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In the origin monitoring plan, the electricity supplied to the grid by the project is measured by the meters

installed at the project. In the revised monitoring plan, this parameter is measured by the gateway meter installed at the substation.

The revised monitoring plan of the project has been approved by EB on 27/07/2012.

Refer to: <http://cdm.unfccc.int/Projects/DB/DNV-CUK1197984371.42/view>

B.2.4. Changes to project design of registered project activity

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There are no changes to project design of registered project activity.

B.2.5. Changes to start date of crediting period

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There are no changes to start date of crediting period.

B.2.6. Types of changes specific to afforestation or reforestation project activity

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This is not applicable.

SECTION C. Description of monitoring system

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1. Implementation of the monitoring plan

The Project owner, Zixi Sanjiang Hydropower Co., Ltd will take the responsibility of the monitoring plan implementation.

2. Monitoring procedures

Electricity supplied to and drawn from the grid are monitored and recorded by the gateway meter installed at the substation (Zixi 110kV Transformer Station).

Designed staffs of the grid company read and recorded the readings of the gateway meter at 24:00 every day.

The readings were recorded in daily reading records.

The net electricity supplied to the grid (EG_y) is calculated by the electricity supplied to the grid deducting the electricity drawn from the grid.

The power grid company provided the daily reading records to project owner. The project owner checked and confirmed the records.

The Electricity Transaction Note (ETN) was issued by the grid company based on the readings of the gateway meter and sent to the project owner.

The conservative value between the meter recording and ETNs is adopted for the calculation of the CERs.

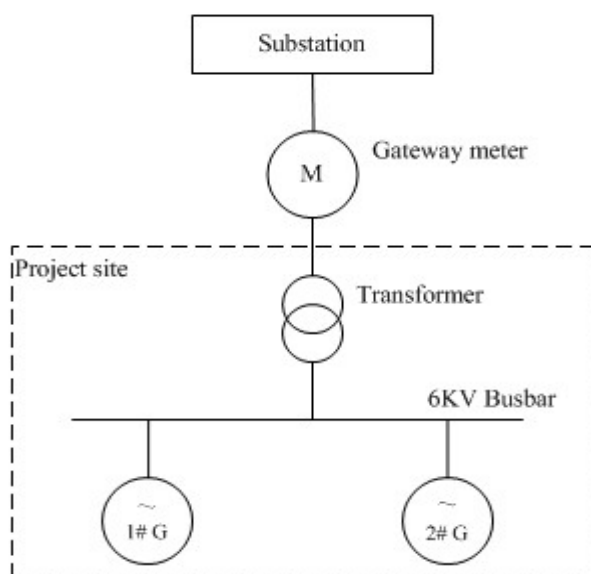


Figure 2. The diagram of Liujiashan 10MW Hydropower Project

3. Quality assurance and quality control

The quality assurance and quality control procedures involves of data monitoring, recording, maintaining and archiving, and monitoring equipment calibration.

The electricity delivered to CCPG by the Project will be monitored through the gateway meter at the substation. The data should be cross-checked against relevant electricity sales receipts and/or records from the grid for quality control. Since the data required to be monitored is consistent with the data required during project operation by the Project owner and the grid company, the Power Purchase Agreement between these two parties can be used as reference to data collection and documentation.

Calibration of Meters & Metering is implemented according to national standards and rules annually at least.

4. Emergency procedures

Problem occurred in monitoring and measurement process will be recorded and reported to company administrator or supervisor. Consequently, the corrective resolution will be adopted to deal with that problem and to avoid it occur again in future.

SECTION D. Data and parameters

D.1. Data and parameters fixed ex ante or at renewal of crediting period

Data / Parameter:	EF _y
Unit:	tCO ₂ e /MWh
Description:	Emission factor for CCPG
Source of data:	Registered PDD
Value(s) applied):	0.9751
Purpose of data:	Calculation of baseline emissions or baseline net GHG removals by sinks
Additional comment:	The data is calculated ex-ante and is fixed during the first crediting period

Data / Parameter:	EF _{Res}
Unit:	kgCO ₂ e /MWh
Description:	Default emission factor for emissions from reservoirs
Source of data:	EB23, Annex 5
Value(s) applied:	90
Purpose of data:	Calculation of project emissions or baseline net GHG removals by sinks
Additional comment:	The data is calculated ex-ante and is fixed during the first crediting period

D.2. Data and parameters monitored

Data / Parameter:	EG _y														
Unit:	MWh														
Description:	Net electricity supplied to the grid by the Project														
Measured/ Calculated / Default:	Measured														
Source of data:	Measured by the gateway meter installed at the substation														
Value(s) of monitored parameter:	40,002.802														
Monitoring equipment:	<p>Gateway meter (original): Type: DSSD331 Accuracy class: 0.5S Serial number: F500287 Calibration frequency: once per year</p> <table border="1"> <thead> <tr> <th>Calibration Date</th><th>Validity Period</th></tr> </thead> <tbody> <tr> <td>24/10/2010</td><td>24/10/2010-23/10/2011</td></tr> <tr> <td>22/10/2011</td><td>22/10/2011-21/10/2012</td></tr> </tbody> </table> <p>Gateway meter (new): Type: DSSD331-3 Accuracy class: 0.5S Serial number: F500310 Calibration frequency: once per year</p> <table border="1"> <thead> <tr> <th>Calibration Date</th><th>Validity Period</th></tr> </thead> <tbody> <tr> <td>18/03/2012</td><td>18/03/2012-17/03/2013</td></tr> <tr> <td>13/03/2013</td><td>13/03/2013-12/03/2014</td></tr> <tr> <td>11/03/2014</td><td>11/03/2014-10/03/2015</td></tr> </tbody> </table>	Calibration Date	Validity Period	24/10/2010	24/10/2010-23/10/2011	22/10/2011	22/10/2011-21/10/2012	Calibration Date	Validity Period	18/03/2012	18/03/2012-17/03/2013	13/03/2013	13/03/2013-12/03/2014	11/03/2014	11/03/2014-10/03/2015
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13/03/2013	13/03/2013-12/03/2014														
11/03/2014	11/03/2014-10/03/2015														
Measuring/ Reading/ Recording frequency:	Continuously measuring and monthly recording														
Calculation method (if applicable):	The net electricity supplied to the grid (EG _y) is calculated by the electricity supplied to the grid deducting the electricity drawn from the grid.														
QA/QC procedures:	Cross check with the receipts of sales and/or records from the grid														

Purpose of data:	Calculation of baseline emissions or baseline net GHG removals by sinks
Additional comment:	-

Data / Parameter:	A _{PJ}
Unit:	km ²
Description:	Surface area of the reservoir at full level.
Measured/ Calculated / Default:	Measured
Source of data:	Project site
Value(s) of monitored parameter:	1.07
Monitoring equipment:	The area was monitored based on topographical data and the height of the dam
Measuring/ Reading/ Recording frequency:	Monitored once at the start of the project. Monitored data will be kept during the crediting period.
Calculation method (if applicable):	Not applicable
QA/QC procedures:	-
Purpose of data:	Calculation of project emissions or actual net GHG removals by sinks
Additional comment:	-

D.3. Implementation of sampling plan

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Sampling plan is not applicable.

SECTION E. Calculation of emission reductions or GHG removals by sinks

E.1. Calculation of baseline emissions or baseline net GHG removals by sinks

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According to the applied methodology, the baseline emission in year y is calculated as

$$BE_y = EG_y \times EF_y$$

Period		Electricity exported (kWh)	Electricity imported (kWh)	Net supplied power EG (kWh)	EF (tCO _{2e} /MWh)	BE _y (tCO _{2e})
From	to	A	B	C=A-B	D	E=C*D
11/09/2011	10/10/2011	267,540	210	267,330	0.9751	261
11/10/2011	10/11/2011	303,030	630	302,400	0.9751	295

11/11/2011	10/12/2011	540,120	1,470	538,650	0.9751	525
11/12/2011	10/03/2012	3,742,200	2,940	3,739,260	0.9751	3,646
11/03/2012	10/04/2012	5,227,320	210	5,227,110	0.9751	5,097
11/04/2012	23/05/2012	4,694,277	630	4,693,647	0.9751	4,577
24/05/2012	23/06/2012	3,006,402	0	3,006,402	0.9751	2,932
24/06/2012	20/07/2012	3,262,014	0	3,262,014	0.9751	3,181
21/07/2012	15/08/2012	3,310,377	0	3,310,377	0.9751	3,228
16/08/2012	15/09/2012	2,217,810	630	2,217,180	0.9751	2,162
16/09/2012	18/10/2012	1,035,720	0	1,035,720	0.9751	1,010
19/10/2012	23/11/2012	1,763,580	210	1,763,370	0.9751	1,719
24/11/2012	23/12/2012	1,400,490	210	1,400,280	0.9751	1,365
24/12/2012	31/12/2012	447,510	0	447,510	0.9751	436
01/01/2013	20/02/2013	1,987,440	630	1,986,810	0.9751	1,937
21/02/2013	25/03/2013	1,832,640	0	1,832,640	0.9751	1,787
26/03/2013	25/04/2013	3,440,640	3,570	3,437,070	0.9751	3,351
26/04/2013	31/05/2013	3,792,390	0	3,792,390	0.9751	3,698
01/06/2013	24/06/2013	3,554,880	0	3,554,880	0.9751	3,466
25/06/2013	15/09/2013	2,168,250	210	2,168,040	0.9751	2,114
16/09/2013	23/12/2013	181,020	210	180,810	0.9751	176
24/12/2013	10/02/2014	1,918,560	210	1,918,350	0.9751	1,871
11/02/2014	20/03/2014	2,101,890	210	2,101,680	0.9751	2,049
21/03/2014	20/04/2014	1,756,680	420	1,756,260	0.9751	1,713
Total		53,952,780	12,600	53,940,180		52,596

E.2. Calculation of project emissions or actual net GHG removals by sinks

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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 1.07 km². 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 applied methodology, the project emission in year y is calculated as

$$PE_y = \frac{EF_{Res} \times EG_y}{1000}$$

Period	EGy(MWh)	EFRes(KgCO ₂ e/MWh)	Project emission (tCO ₂ e)
11/09/2011-20/04/2014	53,952.78 ¹	90	4,856

E.3. Calculation of leakage

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According to the applied methodology, the leakage of the project is not considered, as L_y=0 tCO₂e.

E.4. Summary of calculation of emission reductions or net anthropogenic GHG removals by sinks

¹ For conservative purpose, the total electricity exported to the grid is used for the calculation of PE_y.

Item	Baseline emissions or baseline net GHG removals by sinks (t CO ₂ e)	Project emissions or actual net GHG removals by sinks (t CO ₂ e)	Leakage (t CO ₂ e)	Emission reductions or net anthropogenic GHG removals by sinks (t CO ₂ e)
Total	52,596	4,856	0	47,740

E.5. Comparison of actual emission reductions or net anthropogenic GHG removals by sinks with estimates in registered PDD

Item	Values estimated in ex-ante calculation of registered PDD	Actual values achieved during this monitoring period
Emission reductions or GHG removals by sinks (t CO₂e)	57,981	47,740

According to the registered PDD, the ex-ante estimated average annual emission reductions are 22,207 tCO₂e. This monitoring period covers 953 days, therefore the ex-ante estimated emission reductions should be 57,981 tCO₂e as per the registered PDD ($22,207 \times 953 / 365 = 57,981$).

E.6. Remarks on difference from estimated value in registered PDD

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Due to the comparison in E.5., the emission reductions of this monitoring period (11/09/2011-20/04/2014) are lower than the estimation in the registered PDD.

E.7. Actual emission reductions or net anthropogenic GHG removals by sinks during the first commitment period and the period from 1 January 2013 onwards

Item	Actual values achieved up to 31 December 2012	Actual values achieved from 1 January 2013 onwards
Emission reductions or GHG removals by sinks (t CO₂e)	27,624 tCO ₂ e	20,116 tCO ₂ e

Document information

<i>Version</i>	<i>Date</i>	<i>Description</i>
03.2	5 November 2013	Editorial revision to correct table in page 1.
03.1	2 January 2013	Editorial revision to correct table in section E.5.
03.0	3 December 2012	Revision required to introduce a provision on reporting actual emission reductions or net anthropogenic GHG removals by sinks for the period up to 31 December 2012 and the period from 1 January 2013 onwards (EB70, Annex 11).
02.0	13 March 2012	Revision required to ensure consistency with the "Guidelines for completing the monitoring report form" (EB 66, Annex 20).
01	28 May 2010	EB 54, Annex 34. Initial adoption.
Decision Class: Regulatory		
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Business Function: issuance		
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