

**MONITORING REPORT FORM (F-CDM-MR)**
Version 02.0**MONITORING REPORT**

Title of the project activity	48 MW Duduluo River Hydroelectric Power Plant
Reference number of the project activity	2199
Version number of the monitoring report	1.0
Completion date of the monitoring report	25/07/2012
Registration date of the project activity	12/05/2009
Monitoring period number and duration of this monitoring period	21/07/2011 - 15/07/2012
Project participant(s)	Lushui County Quande Hydroelectrical Power Development Ltd.
Host Party(ies)	China
Sectoral scope(s) and applied methodology(ies)	01: Energy Industry ACM0002 - “Consolidated baseline methodology for grid-connected electricity generation from renewable sources”, version 06 ACM0002 - “Consolidated monitoring methodology for zero-emissions grid-connected electricity generation from renewable sources”, version 06
Estimated amount of GHG emission reductions or net anthropogenic GHG removals by sinks for this monitoring period in the registered PDD	164,569 tCO ₂ e (361 days)
Actual GHG emission reductions or net anthropogenic GHG removals by sinks achieved in this monitoring period	135,018

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

>>

48 MW Duduluo River Hydroelectric Power Plant (hereafter refer to as “the project”), is a run-of-river and deep valley hydropower plant without regulating capacity. The total installed capacity of the project is 48MW, consisting of three 16MW hydro turbine and generator units. The main structures include small weirs, diversion tunnels, channels and powerhouse.

Electricity generated from the project is sold to the China Southern Power Grid (CSPG) to replace amount of electricity that would have otherwise been generated by the operation of grid-connected plants and by the addition of new generation sources in the CSPG in the absence of the project activity, thus reduce green house gas emissions.

The construction of the project started on 01/06/2006. The project was connected to the grid on 17/09/2008 when the first and second set of the turbine was put into operation. The third set of turbine was put into operation on 26/10/2008, and has been running smoothly since then.

In the third monitoring period (from 21/07/2011 to 15/07/2012, total 361 days), 160,088.19 MWh were exported to CSPG, and the plant worked without major problems for most of the time. Given a grid emission factor of 0.8434 tCO₂e/MWh, the emission reduction achieved in this monitoring period is 135,018 tCO₂e.

A.2. Location of project activity

>>

China

Yunnan Province

Chenggan Town, Lushui County, Nujiang Lisu Ethnic Autonomous Prefecture

geographical coordinates: 98°40'10"-98°54'36" East, 26°13'36"-26°21'36" North

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)
China	Lushui County Quande Hydroelectrical Power Development Ltd.	No

A.4. Reference of applied methodology

>>

Methodologies applied:

ACM0002 “Consolidated Baseline Methodology for grid connected electricity generation from renewable sources” and “Consolidated monitoring methodology for grid-connected electricity generation from renewable sources” Version 06, 19 May 2006).

Tool:

Tool for the demonstration and assessment of additionality, Version 05

For more information regarding the methodologies please refer to

<http://cdm.unfccc.int/methodologies/PAmethodologies/approved.html>.
A.5. Crediting period of project activity

>>



12/05/2009 – 11/05/2019

SECTION B. Implementation of project activity

B.1. Description of implemented registered project activity

>>

The first and second generators of the project have been put into operation on 17/09/2008, and the third generator was put into operation on 26/10/2008.

All facilities and equipments as described in the registered PDD have been installed. Over this monitoring period, the hydro turbine and generator units as well as monitoring meters have operated normally. The implementation of monitoring was changed in March 2012, thus the revision of monitoring plan should be submitted for approval by EB.

B.2. Post registration changes

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

>>

No temporary deviations have been applied during this monitoring period.

B.2.2. Corrections

>>

There is no correction to project information or parameters fixed at validation have been submitted with this monitoring period.

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

>>

A permanent change from the registered monitoring plan has been submitted with this monitoring report. The change has to be approved prior to the submission of this monitoring report for request for issuance.

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

>>

No changes to the project design of the project activity have been submitted with this monitoring period.

B.2.5. Changes to start date of crediting period

>>

No changes to the start date of the crediting period have been submitted with this monitoring period.

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

>>

Not applicable.

SECTION C. Description of monitoring system

>>

1. Monitoring system

The net electricity delivered to CSPG by the proposed project will be determined through calculating the difference of reading between M4 and M6, and all these data will be continuously monitored. M4 is installed at the project side of transmission line connected with the substation of the grid. M6 is installed at the project side of transmission line connected with 1st cascade hydropower station of Duduluo River. The accuracy of meter used in measuring net electricity supplied to the grid (which is measured hourly and recorded monthly for the calculation of emission reduction) would not be lower than 0.5s and the meter will be bidirectional type. The diagram of the monitoring system is given in Figure 1.

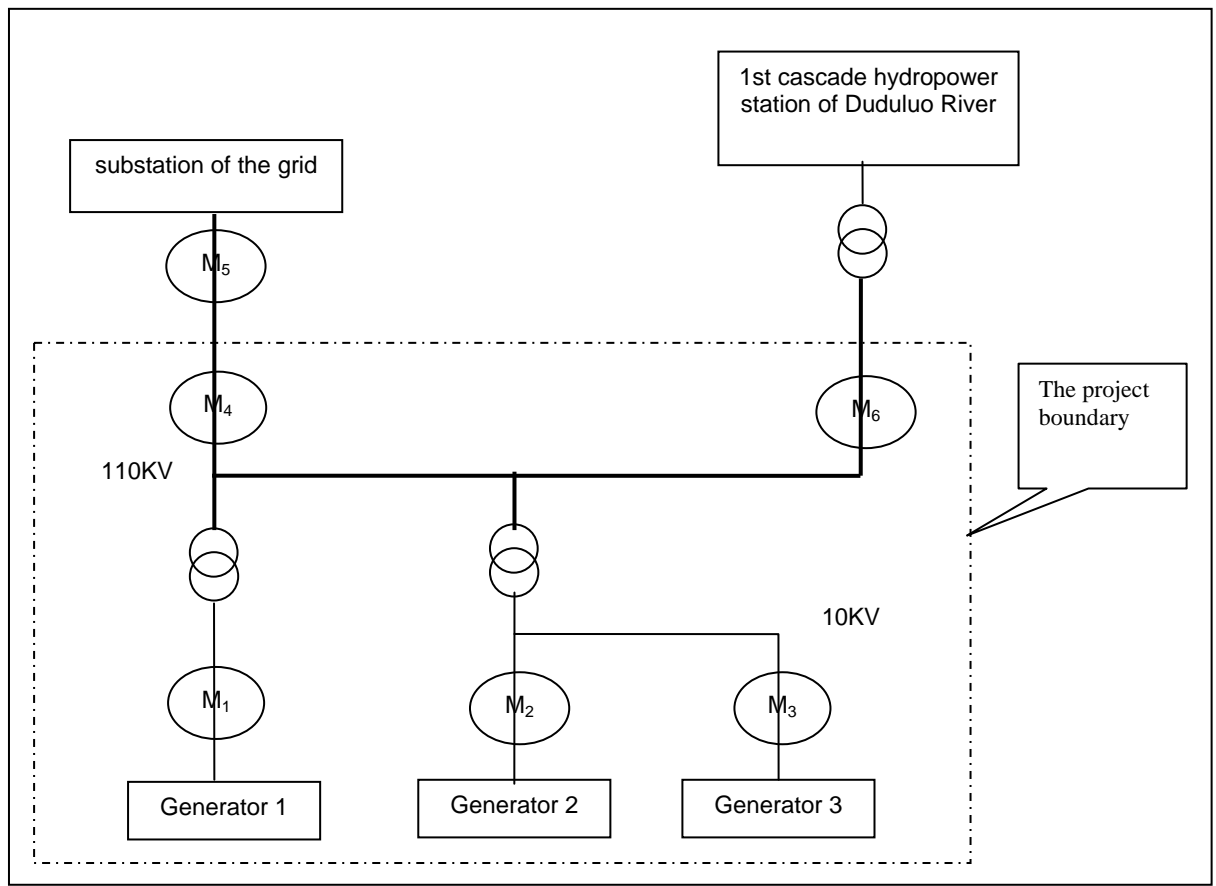


Figure 1. Diagram of the monitoring system

2. Data collection

The net electricity to the local Grid Company by the project (EG_y) is calculated by EG_{out,y} and EG_{in,y} which were continuously measured by meter M₄ and M₆. The reading of master meter was recorded and saved hourly.

Copies of invoices were archived by the project owner for cross check.

Surface area of the reservoir has been measured once at the start of the operation of the project by Yunnan Lineng survey and design for hydroelectricity Co., Ltd, which is a qualified design institute authorized by Department of Construction of Yunnan Province (Certificate No.232161-sb).

All the monitored data will be kept in electronic and hard format for 2 years after the end of crediting period or the last issuance of CERs for this project activity, whichever occurs later.

3. Organization structure & role and responsibilities of personnel

As described in the monitoring plan of the registered PDD, the project owner has established a CDM team to do the monitoring work. A CDM project management and monitoring manual describing the main tasks and procedures related to monitoring has been prepared under the responsibility of the Board of Directors. Detailed managing and operational structure is presented in Figure 2:

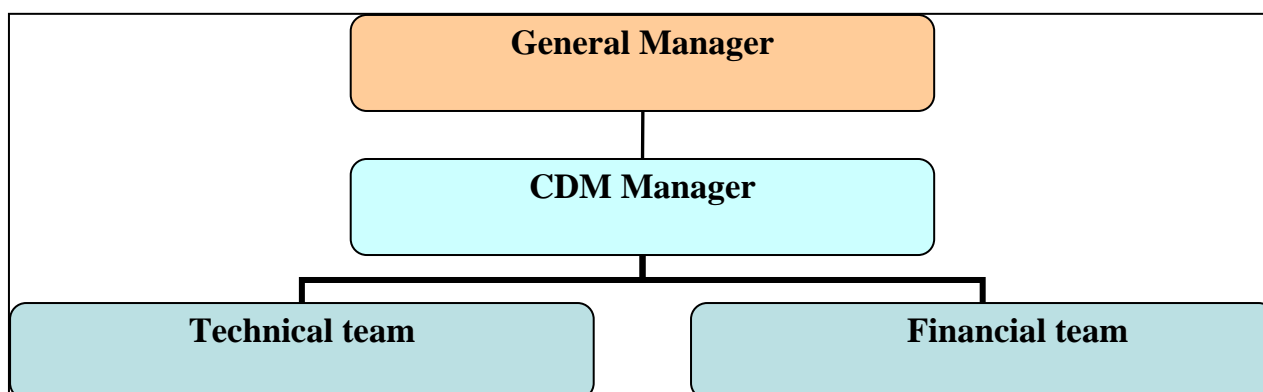


Figure 2. Project managerial structure

The CDM manager is fully responsible for CDM related matters, especially:

- 1) Tracking the development of the CDM project;
- 2) Supervising and checking the process of parameter measuring, data collection, instrument calibration and calculation of emission reduction;
- 3) Ensuring monitoring data integrity and accuracy, and carrying out the tasks related to CERs issuance.

The technical team is responsible for calibration and maintenance of the meters, data recording, verification, and archiving, periodical data summarizing according to the request of the CDM manager.

The financial team is responsible for collecting and preserving financial document used for verification, including power sale invoices and power purchase invoices.

All the monitoring staffs have been trained according to the monitoring manual issued by the project owner.

4. Emergency procedures

The reading of master meter is used for calculating the emission reductions when they are in normal operation status. In case the malfunction of meters M4 or M6, the project owner will adopt a conservative way to measure the electricity supplied to the grid (EGy), such as the sales invoices. The invoices will be kept as cross check.

During this monitoring period, the meters operated normally and were calibrated according to monitoring plan of the registered PDD and relevant regulation (DL/T448-2000¹). There is no emergency occurred.

Table 1 Calibration information of master meter and back meter

Meter	meter (M4)
Type	DTSD341
Accuracy class	0.2S
Serial No.	20071025020024
1 st Calibration date	20/01/2011
Validity	Until 19/01/2012
Calibration certificate No.	2011ZXDdg-00047
2 nd Calibration date	19/01/2012
Validity	18/01/2013
Calibration certificate No.	2012ZXDdg-00013
Calibration frequency	Annually
Calibration entity	Yunnan Institute of Metrology

¹ Stipulated Procedures for Technical Administration of Electricity Metering Equipment

	and Testing Technology
--	------------------------

SECTION D. Data and parameters

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

Data/Parameter	$EF_{Elec,y}/EF_y$
Unit	tCO ₂ e/MWh
Description	Grid electricity emission factor (Combined Margin)
Source of data	The registered PDD
Value(s) applied	0.8434
Purpose of data	Calculation of baseline emissions
Additional comment	This parameter is fixed for the 10 year crediting period

D.2. Data and parameters monitored

Data/Parameter	EG _y
Unit	MWh
Description	Electricity supplied to the grid by the project
Measured/Calculated/Default	Measured
Source of data	Reading of the electricity energy meters
Value(s) of monitored parameter	160,088.19
Monitoring equipment	Electricity energy meters monitor the electricity exported to (EGout) and imported from the grid (EGin) are presented in Table 1.
Measuring/Reading/Recording frequency	Measuring: continuously Reading: hourly Recording: monthly
Calculation method (if applicable)	The electricity supplied to the grid will be measure by the difference reading of the electricity energy meters M4 and M6. M4 is installed at the project side of transmission line connected with the substation of the grid. M6 is installed at the project side of transmission line connected with 1st cascade hydropower station of Duduluo River. As shown on “Figure 1 the installation of electricity energy meters”
QA/QC procedures	The meters are calibrated annually to ensure the reading is precise. Invoices of electricity sold to the grid will be used for double check
Purpose of data	Calculation of baseline emissions
Additional comment	-



Data/Parameter	Surface Area
Unit	m ²
Description	Surface area at full reservoir level
Measured/Calculated/Default	Measured
Source of data	Measurement by Yunnan Lineng Survey and Design for Hydroelectricity Co., Ltd.
Value(s) of monitored parameter	8,820
Monitoring equipment	The area was monitored based on topographical data and the height of the dam.
Measuring/Reading/Recording frequency	Measuring: once Recording: before the operation of the project
Calculation method (if applicable)	/
QA/QC procedures	The parameter is needed to be monitored only one time before the operation.
Purpose of data	Project emission
Additional comment	/

D.3. Implementation of sampling plan

>>

Not applicable, as data and parameters monitored described in section D.2 above are determined by measuring.

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

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

>>

Start date	Ending date	EGy (MWh)
21/07/2011	20/08/2011	24308.22
20/08/2011	20/09/2011	23890.24
20/09/2011	20/10/2011	17582.40
20/10/2011	20/11/2011	10596.96
20/11/2011	13/12/2011	4873.44
13/12/2011	13/01/2012	5525.53
13/01/2012	15/02/2012	5925.91
15/02/2012	15/03/2012	5366.55
15/03/2012	15/04/2012	8119.03
15/04/2012	15/05/2012	14974.63
15/05/2012	15/06/2012	16534.47
15/06/2012	15/07/2012	22390.81
total		160088.19

$$BE_y = EG_y \times EF_{Elec,y} = 160088.19 \times 0.8434 = 135,018 \text{ tCO}_2\text{e}$$

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

>>



The surface area of the reservoir was measured on 20/08/2008 by Yunnan Lineng Survey and Design for Hydroelectricity Co., Ltd. (a professional C-class design institute), based on topographical data and the height of the dam, and resulted to be equal to 8,820 m². Consequently, the power density of this project is 5,442 W/m², which is greater than 10 W/m² requested by the methodology in order to consider the project emission equal to zero. Therefore:

$$PE_y = 0.$$

E.3. Calculation of leakage

>>

According to the adopted methodology, no leakage emissions are to be considered.

$$LE_y = 0.$$

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

Time Period	Baseline emissions or baseline net GHG removals by sinks (tCO ₂ e)	Project emissions or actual net GHG removals by sinks (tCO ₂ e)	Leakage (tCO ₂ e)	Emission reductions or net anthropogenic GHG removals by sinks (tCO ₂ e)
Total	135,018	0	0	135,018

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 (tCO₂e)	164,569	135,018

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

>>

The actual value of emission reduction is lower than the value estimated in the PDD.

History of the document

Version	Date	Nature of revision
02.0	EB 66 13 March 2012	Revision required to ensure consistency with the "Guidelines for completing the monitoring report form" (EB 66, Annex 20).
01	EB 54, Annex 34 28 May 2010	Initial adoption.
Decision Class: Regulatory Document Type: Form Business Function: Issuance		