

MONITORING REPORT FORM (CDM-MR)*
Version 01 – in effect as of: 28/09/2010

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* as contained within the document entitled "Guidelines for completing the monitoring report form (CDM-MR)" (EB 54 meeting report, annex 34).

MONITORING REPORT
Version 01, issued on 25/07/2011
48 MW Duduluo River Hydroelectric Power Plant
UNFCCC ref. 2199
Monitoring period No. 02: 15/12/2009 – 20/07/2011

SECTION A. General Description of the project activity

A.1. Brief description of the project activity:

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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.

The total emission reductions achieved by the project in this monitoring period are 226,138 tCO₂e.

A.2. Project Participants

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Name of Party involved	Private and/or public entity(ies) project participants
People’s Republic of China (host)	Lushui County Quande Hydroelectrical Power Development Ltd.
Switzerland	First Climate (Switzerland) AG

A.3. Location of the project activity

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Chenggan Town, Lushui County
Nujiang Lisu Ethnic Autonomous Prefecture
Yunnan province
People’s Republic of China
Geographical coordinates: 98°40’10”-98°54’36” East and 26°13’36”-26°21’36” North

A.4. Technical description of the project

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The project is a run-of-river hydropower plant without regulating capacity. It consists of weir, diversion channel, tunnel, penstock, and powerhouse. A schematic view of the project is shown in **Figure 1**. At the powerhouse, three Pelton turbine generators with 16 MW capacity each are installed to generate electricity. The technical specifications of turbines and generators are given in **Table 1**.

As the equipment has been sourced in China, there is no technology transfer involved in the project.

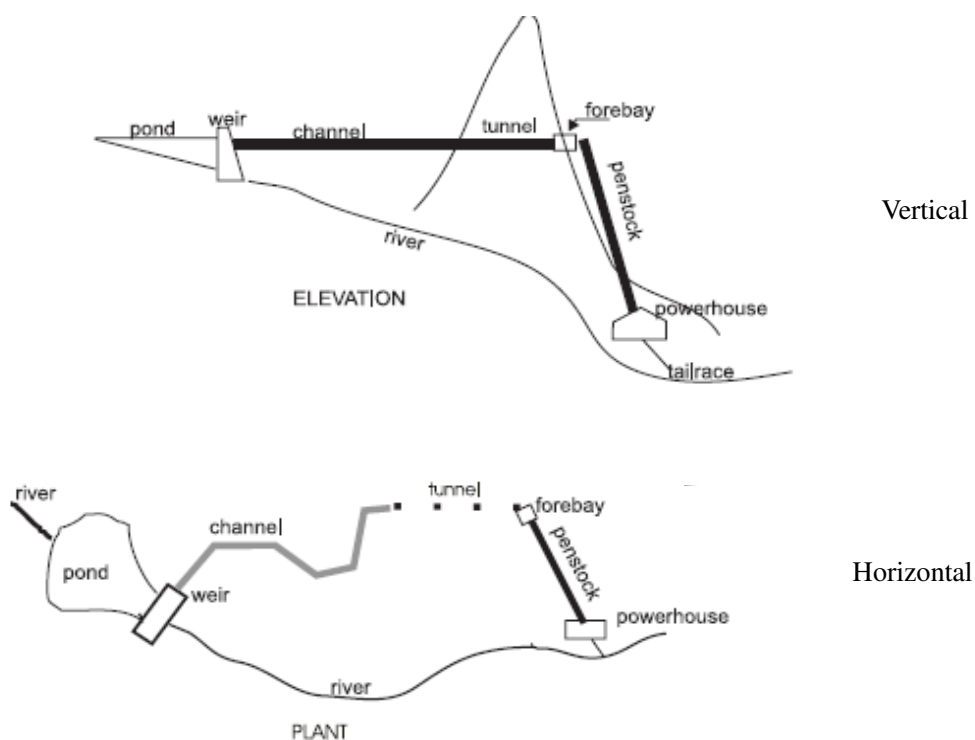


Figure 1. Schematic Vertical and Horizontal Views of the Project

Table 1. Technical Specification of Turbine and Generator

<i>Equipment</i>	<i>Technical Parameters</i>	<i>Specification</i>
Hydro Turbine	Turbine type	CJA475-L-170/4×11.5
	Number of units	3
	Rated head (m)	593.18
	Rated power (MW)	16.053
	Rated flow (m ³ /s)	3.95
	Rated speed (r/min)	600
Generator	Generator type	SF16-10/3300
	Number of units	3
	Rated capacity (MW)	16
	Rated voltage (KV)	10.5
	Rated speed (r/min)	600

A.5. Title, reference and version of the baseline and monitoring methodology applied to the project activity:

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Methodologies applied:

“Consolidated baseline methodology for grid-connected electricity generation from renewable sources” and “Consolidated monitoring methodology for grid-connected electricity generation from renewable sources” (ACM0002 Version 06¹)

Reference: Tool for the Demonstration and Assessment of Additionality - version 05

¹ <http://cdm.unfccc.int/methodologies/PAMethodologies/approved>

A.6. Registration date of the project activity:

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12/05/2009

A.7. Crediting period of the project activity and related information (start date and choice of crediting period):

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Fixed crediting period of 10 years

Start date: 12/05/2009

A.8. Name of responsible person(s)/entity(ies):

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SECTION B. Implementation of the project activity**B.1. Implementation status of the project activity**

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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. No malfunction or exchange of equipment has taken place. Moreover, no particular event is to be reported for this period, and nothing affected the applicability of the adopted methodology.

B.2. Revision of the monitoring plan

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No revision was applied to the monitoring plan.

B.3. Request for deviation applied to this monitoring period

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No deviation was applied to this monitoring period.

B.4. Notification or request of approval of changes

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A notification of changes from the project activity as described in the registered CDM-PDD was submitted during the verification of the 1st monitoring period and approved on 05/05/2011.

No further notifications/requests were submitted with regard to the 2nd monitoring period.

SECTION C. Description of the monitoring system

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1. Monitoring system

As described in the monitoring plan of the registered PDD, one bidirectional meter (master meter) has been installed at Chenggan substation via 110kv transmission line to measure the electricity exported to and imported from CSPG by the project. And another bidirectional meter (backup meter) has been installed at the output side of the transformer of the plant. The diagram of the monitoring system is given in Figure 2.

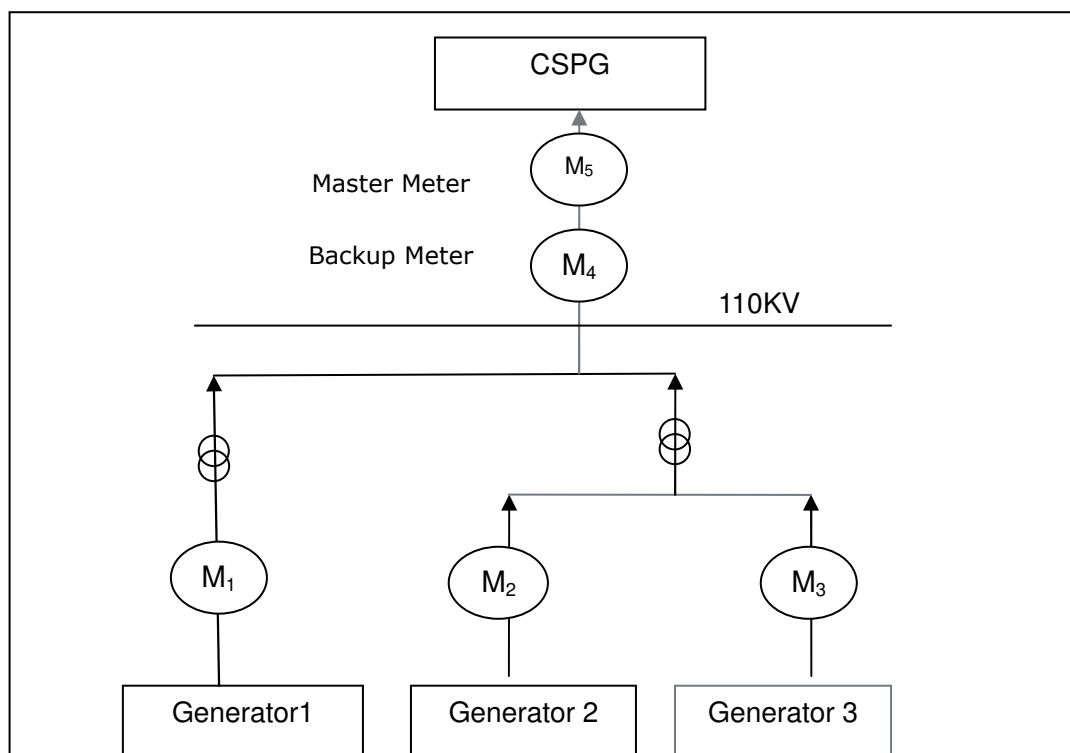


Figure 2. Diagram of the monitoring system

2. Data collection

The net electricity to the local Grid Company by the project (EGy) is calculated by $EG_{out,y}$ and $EG_{in,y}$ which were continuously measured by master meter. The reading of master meter was recorded and saved on an hourly basis by the computer system in Chenggan substation automatically.

At the middle of each month, the cumulative reading of the master meter was recorded by the local grid company in Monthly Reading Records. After confirmed by both parties, the grid company issued the electricity transactions notes (ETNs) to the project owner and the project owner invoiced the grid company accordingly. Copies of both monthly ETNs and invoices were archived by the project owner for cross check.

APJ 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:

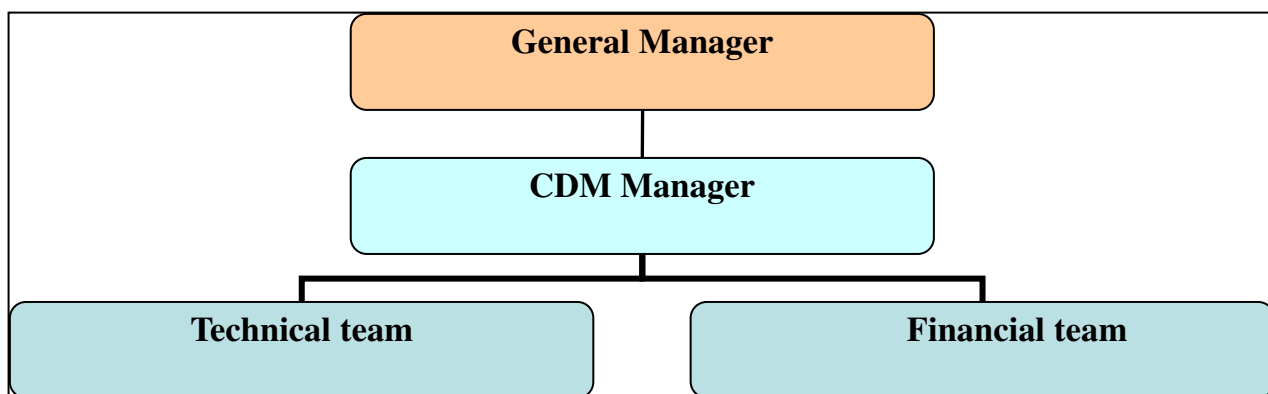


Figure 2. Project managerial structure

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 the case of master meter malfunction, the reading of Backup Meter at the output side of the transformer of project plants will be used as a plausibility check for ER calculation. The payment receipts (ETNs) and 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/T448-2000²). There is no emergency occurred.

Table 3 Calibration information of master meter and back meter

Meter	Master meter (M5)	Backup meter (M4)
Type	DTSD341	DTSD341
Accuracy class	0.5S	0.2S
Serial No.	20070780110150	20071025020024
First calibration	11/03/2009	12/03/2009
Validity	Until 10/03/2010	Until 11/03/2009
Calibration certificate No.	2009ZXDqt-00157	2009ZXDqt-00282
Second calibration	24/01/2010	24/01/2010
Validity	until 23/01/2011	until 23/01/2011
Calibration certificate No.	2010ZXDdg-00085	2010ZXDdg-00106
Third calibration	20/01/2011	20/01/2011
Validity	Until 19/01/2012	Until 19/01/2012
Calibration certificate No.	2011ZXDdg-00053	2011ZXDdg-00047
Calibration frequency	Annually	Annually
Calibration entity	Yunnan Institute of Metrology and Testing Technology	

² Stipulated Procedures for Technical Administration of Electricity Metering Equipment

SECTION D. Data and parameters

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D.1. Data and parameters determined at registration and not monitored during the monitoring period, including default values and factors

Data / Parameter:	EF _{CM}
Data unit:	tCO ₂ e/MWh
Description:	Grid electricity emission factor (Combined Margin)
Source of data used:	The registered PDD
Value(s):	0.8434
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Baseline emission calculations
Additional comment:	This parameter is fixed for the 10 year crediting period

D.2. Data and parameters monitored

1. Data / Parameter:	EG _y
Data unit:	MWh
Description:	Net electricity supplied to the grid
Measured /Calculated /Default:	Measured
Source of data:	Meters M4 and M5
Value(s) of monitored parameter:	268,126.21
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Baseline emission calculations
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)	Electricity meter monitors the electricity exported to (EG _{out}) and imported from the grid (EG _{in}) are presented in Table 3.
Measuring/ Reading/ Recording frequency:	Measuring: continuously Reading: hourly Recording: monthly
Calculation method (if applicable):	EG _y = EG _{out} -EG _{in}
QA/QC procedures applied:	The meters are calibrated annually to ensure the reading is precise ; The electricity exported to and imported from the grid can be cross checked with the payment receipts (ETN) and invoices.

SECTION E. Emission reductions calculation**E.1. Baseline emissions calculation**

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Table 4 Electricity Generation

Time Period	EG _{out}	EG _{in}	EG _y (net)
	MWh	MWh	MWh
2009/12/15-2010/01/25	6264.72	17.60	6247.12

2010/01/26-2010/02/25	3688.08	15.84	3672.24
2010/02/26-2010/03/20	3957.36	8.80	3948.56
2010/03/21-2010/04/20	10597.84	0.88	10596.96
2010/04/21-2010/05/20	15417.60	0.00	15417.60
2010/05/21-2010/06/20	16775.44	0.00	50792.72
2010/06/21-2010/07/20	16323.12	0.00	
2010/07/21-2010/08/20	17695.04	0.88	
2010/08/21-2010/09/20	22599.28	0.00	22599.28
2010/09/21-2010/10/20	21428.88	0.00	21428.88
2010/10/21-2010/11/20	17628.16	0.00	17628.16
2010/11/20-2010/12/10	8369.68	0.00	27654.00
2010/12/10-2011/01/20	12196.80	1.76	
2011/01/21-2011/02/20	7089.28	0.00	
2011/02/21-2011/03/20	7995.68	5.28	7990.40
2011/03/21-2011/04/20	12977.36	0.00	12977.36
2011/04/21-2011/05/20	19319.52	0.00	19319.41
2011/05/21-2011/06/20	23611.28	0.00	47853.52
2011/06/21-2011/07/20	24242.24	0.00	
Total (583days)	268,177.36	51.04	268,126.21

According to the registered PDD, the baseline emissions (BE_y) are calculated as follows:

$$BE_y = EG_y \times EF_{CM} = (EG_{out} - EG_{in}) \times EF_{CM}$$

$$BE_y = (268,177.36 - 51.04) \times 0.8434 = 226,138 \text{ tCO}_2\text{e.}$$

E.2. Project emissions calculation

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The surface of the inlet pond 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. Leakage calculation

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

$$LE_y = 0.$$

E.4. Emission reductions calculation / table

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According to the registered PDD, the emission reduction is calculated as follows:

$$\begin{aligned} ER_y &= BE_y - PE_y - LE_y \\ &= 226,138 - 0 - 0 = 226,138 \text{ tCO}_2\text{e.} \end{aligned}$$

E.5. Comparison of actual emission reductions with estimates in the CDM-PDD

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Item	Values applied in ex-ante calculation of the registered CDM-PDD	Actual values reached during the monitoring period
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Emission reductions (tCO₂e)	166,393 (for a year) 265,773 (for a monitoring period of 583 days)	226,138
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E.6. Remarks on difference from estimated value in the PDD

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