

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(05/09/2011)

China Niaoerchao Hydropower Project

Reference number: 2993

1st monitoring period: 24/02/2011-31/08/2011

SECTION A. General description of the project activity

A.1. Brief description of the project activity: >>

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China Niaoerchao Hydropower Project (Hereinafter referred to as “the project”) is to generate electricity by using renewable water resources to alleviate electricity shortage in Central China. The project contributes to the reduction of GHG emission by displacing part of the electricity supplied by Central China Power Grid (CCPG), which is dominant of fuel-fired power plants.

The project is a newly built storage type hydropower plant with a seasonal pondage reservoir. There are two dams constructed for the project, one is the Niaoerchao dam, and another one is the Liujingtang diversion dam (small dam with 12m in height). The Liujingtang diversion dam is used to divert the water resources through a tunnel to the Niaoerchao reservoir. The distance between these two dams is 8.6 km. The power house is located on the bank of Dongtingxi River, which is a branch of Yuanjiang River located in Yuanling County, Huaihua City, Hunan Province, People’s Republic of China. The surface of the flooded area at the full reservoir level of the Niaoerchao dam is 1.66km², and the surface of the flooded area at the full reservoir level of Liujingtang diversion dam is 0.143km². The total surface of the flooded area at the full reservoir level of the project is 1.803 km², the power density of the project is calculated as installed capacity/submerged area, which is equal to 11.09 W/m².

The total installed capacity of the project is 20 MW, which is consisted of 2 units hydraulic turbines and generators with a single-unit capacity of 10MW. The annual net electricity supplied to CCPG is forecasted to be 72,331MWh. The project construction was started on 8 December 2005 and the project operation was started on 21 August 2008.

Total emission reductions achieved by the project during the 1st monitoring period are 9,988tCO₂.

A.2. Project Participants

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Name of Party involved((host) indicates a host party)	Private and/or public entity(ies) project participants(as applicable)
Peoples’ Republic of China (Host)	Hunan Guohong Investment Co., Ltd.
Sweden	Carbon Asset Management Sweden AB

A.3. Location of the project activity:

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The project is located on Dongtingxi River, which is a branch of Yuanjiang River located in Qijiaping Town, Yuanling County, HuaihuaCity, Hunan Province, People’s Republic of China. The geographical coordinates are shown as follows.

Liujingtang diversion dam: 28°52’31” N and 110°48’12” E.
Niaoerchao dam: 28°49’48” N and 110°52’00” E.
Power House: 28°49’50” N and 110°52’15” E.

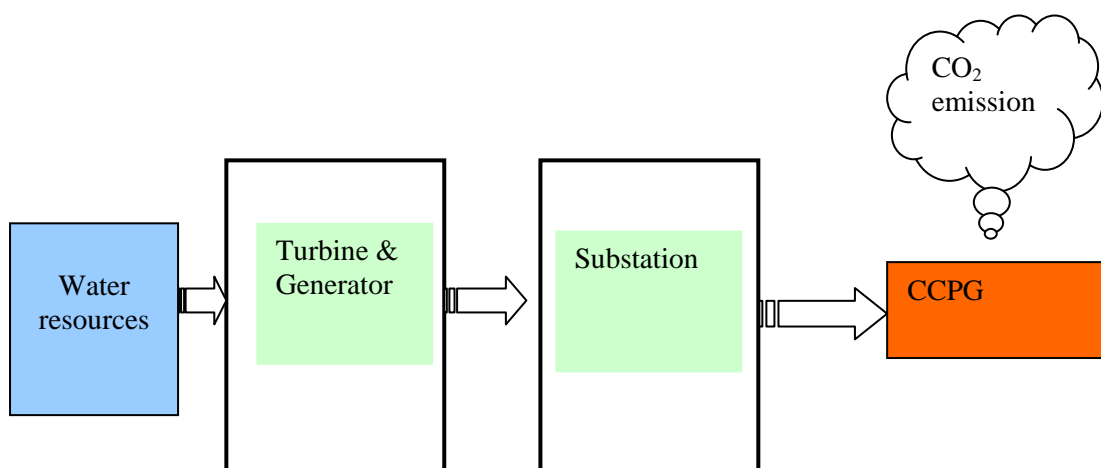
A.4. Technical description of the project

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The total installed capacity of the project is 20MW. There are 2 units (unit capacity of 10MW) turbines and generators. The project makes use of water resources for electricity generation. The electricity is delivered to Wuqiangxi Substation and Qijiaping Substation, then to Central China Power Grid (CCPG). The technical specifications of turbines and generators are as follows.

Parameters		Unit	Value	Comment
Turbine	Model	-	HLN255-LJ-150	
	Quantity	Unit	2	
	Rated output	MW	10.309	
	Rated rotation	r/min	428.6	
	Rated flow	m ³ /s	20.04	
	Manufacturer	Fujian Nanping Hydropower Equipment Manufacture Co., Ltd.		
Generator	Model	-	SF10000-14/3250	Mixed flow set
	Quantity	Unit	2	
	Rated Capacity	MW	10	
	Rated rotation	r/min	428.6	
	Capacity factor	-	0.8	
	Rated Voltage		6.3	
	Manufacturer	Fujian Nanping Hydropower Equipment Manufacture Co., Ltd.		

The diagram of technical process of the project is as follow:



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

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Title of the approved baseline and monitoring methodology: ACM0002-Consolidated baseline methodology for grid-connected electricity generation from renewable sources (Version 11).

Tool to calculate the emission factor for an electricity system. (Version 02)

A.6. Registration date of the project activity:

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24/02/2011

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

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Start date of crediting period: 24/02/2011

Choice of crediting period: fixed crediting period
Length of the crediting period: 10 years and 0 month
There was no change to the start date of the crediting period post registration has been made.

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

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Helen Zhang
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Hunan CDM Project Service Center

SECTION B. Implementation of the project activity

B.1. Implementation status of the project activity

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There was no any deviation or revision occurred in the monitoring period. There were no physical change or special events happened to the project during the monitoring period. The project was operational as normal during the monitoring period. The application of the methodology ACM0002 was not impacted during the monitoring period. The implementation of the project is as following:

Event	Time
Project starting date	08/12/2005
Registration date	24/02/2011
Crediting period	24/02/2011-23/02/2021
Operation of 1#generator	21/08/2008
Operation of 2# generator	27/08/2008
1 st monitoring period	24/02/2011-31/08/2011

B.2. Revision of the monitoring plan

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The monitoring plan of the project has never been revised.

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

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There is no deviation applied to this monitoring period.

B.4. Notification or request of approval of changes

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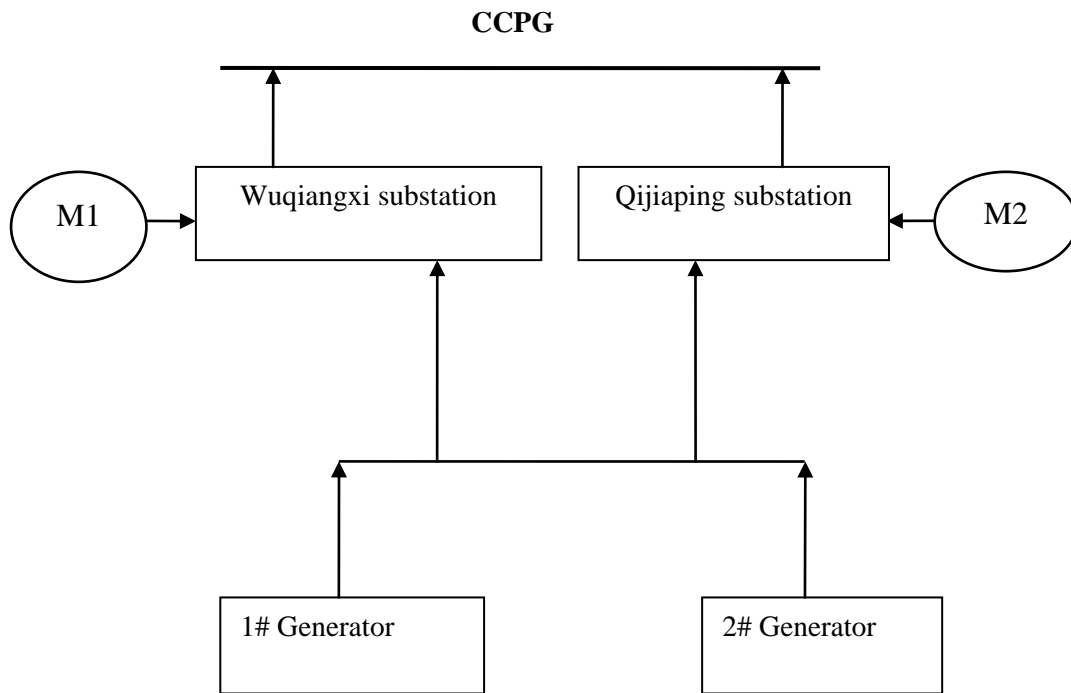
There is no any notification or request of approval of changes from the project.

SECTION C. Description of the monitoring system

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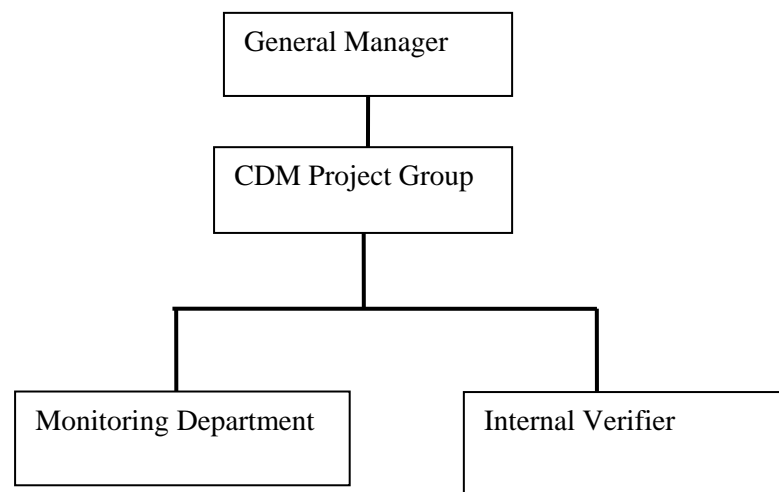
1. General description of monitoring system

The generated electricity from 1# generator and 2# generator are transmitted into substations. Then the electricity is delivered through transmissions line to CCPG. The meters M1 and M2 are installed at the Wuqiangxi and Qijiaping substations to monitor the electricity exported to power grid and the electricity imported from power grid. The electric connection diagram for the project is as follows:



2. Organization Structure

In order to insure the monitor plan work effectively and efficiently, the project owner established the monitoring management structure as shown below.



3. Roles and responsibilities

General Manager is responsible for general management of the project. He/she is final approval of internal monitoring report.

The CDM Project Group is consisted of Monitoring Personal and Internal Verifier. The group is leaded by the General Manager.

Monitoring Department is responsible for data monitoring, recording and reporting. The department is also responsible for regular operation of the project and maintenance of equipments.

Internal Verifier is responsible for checking the monitoring data and financial settlement with grid company plus CERs calculation.

4. Training

Hunan CDM Project Service Centre has given the training works about CDM knowledge and monitoring requirements to the related staffs.

The training topics include background knowledge about CDM, Kyoto Protocol, monitoring management structure, monitoring team, responsibility of each staff, monitoring equipment, data collection and archives, and internal audit procedure. The CDM Monitoring and Management Manual for this project have been prepared in line with the actual project implementation situation.

5. Data collection procedure

The readings of main meter are used for calculating the emission reductions during this monitoring period. The data is monitored as following.

- (1) The electricity exported to power grid and the electricity imported from power grid were measured continuously by M_1 and M_2 installed at each substation. The data is measured continuously and were recorded monthly. The net electricity is the difference of the electricity imported from power grid and exported to power grid.
- (2) The grid company provided ETNs (Electricity Transaction Notes) to the project owner monthly, which is based on the main meter readings and is showed the net electricity generation data.
- (3) The project owner checked the data of ETNs according to the data recorded. After the project owner confirmed the ETNs, they provided the grid company with sales invoices and preserves of the copies of the sales receipts.
- (4) The sales receipts and other monitoring records are used for cross check for the monitored data.
- (5) The project owner provides DOE with the sales receipts and monitoring records during verification.
- (6) The surface area of reservoirs and installed capacity was measured yearly.

All the electricity and paper monitoring documents will be kept at least until two years after the crediting period and two years after last issuance of CERs.

Internal audit has been carried out. The general manager has checked the implementation and management of the monitoring plan overall such as recording, collection and archiving of the monitoring data, the intergrality of the monitoring data.

6. Emergency measures/procedures

If the reading of main meters is beyond allowable error, the project owner and power grid company shall jointly prepare a reasonable and conservative estimate of the correct reading.

During the given monitoring period, the main meter was in well functions and no emergency situation happened.

SECTION D. Data and parameters

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

Data / Parameter:	$EF_{grid,CM,y}$
Data unit:	tCO ₂ /MWh
Description:	Emission factor of CCPG
Source of data used:	Registered PDD
Value(s) :	0.97504
Indicate what the data are	The data is used for baseline emission calculations.

used for (Baseline/ Project/ Leakage emission calculations)	
Additional comment:	The data is calculated ex-ante and is fixed during the crediting period.

D.2. Data and parameters monitored	
Data / Parameter:	A_{PJ}
Data unit:	M²
Description:	Area of the reservoir measured in the surface of the water, after the implementation of the project activity, when the reservoir is full.
Measured /Calculated /Default:	Measured
Source of data:	Huaihua Hydropower Surveying & Design Institute
Value(s) of monitored parameter:	The surface area of flooded area at the full reservoir level of Niaoerchao dam is 1660000m ² , and the surface area of flooded area at the full reservoir level of Liujingtian diversion dam is 143000m ² . The total surface area of flooded area at the full reservoir level of the project is 1803000m ² .
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	The data was measured by Huaihua Hydropower Surveying & Design Institute. The data is measured only according to ACM0002 (Version 11) The data is used for power density calculation. The power density is calculated as 11.09W/m ² , thus the project emission are not need to be considered.
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)	-
Measuring/ Reading/ Recording frequency:	Yearly
Calculation method (if applicable):	N/A
QA/QC procedures applied:	N/A

Data / Parameter:	EG_{facility,y}		
Data unit:	MWh/yr		
Description:	Quantity of net electricity generation supplied by the project to the CCPG in year y		
Measured /Calculated /Default:	Measured		
Source of data:	Measured by the two Meters installed at Wuqiangxi Substation(M1) and Qijiaping Substation (M2) respectively		
Value(s) of monitored parameter:	11711.700		
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	The data is used for baseline emissions calculation.		
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)	The data were measured continuously by two bidirectional Main meters (M ₁ and M ₂) and were recorded monthly. The information of meters are as follows.		
	Item	Main Meter(M ₁)	Main Meter (M ₂)

	Type	DTSD8848	DSSD876
	Serial Number	12A5430446	12F110087
	Accuracy	0.2S	1.0
	Calibration information:		
	Meter	Calibration Date	Valid Until
	Main Meter(M ₁)	01/04/2008	31/03/2013
		05/01/2011	04/01/2012
	Main Meter (M ₂)	11/03/2008	10/03/2013
		17/01/2011	16/01/2012
	Calibration Frequency	Yearly	
Calibration Orgnization	Huanhua Measurement and Examination Centre which is authorized by Hunan Quality and Technical Supervision Bureau.		
Measuring/ Reading/ Recording frequency:			
Calculation method (if applicable):	$EG_{\text{facility},y} = EG_{\text{export},y} - EG_{\text{import},y}$		
QA/QC procedures applied:	<p>The main meters were calibrated according to national standard in the monitoring period. The quantity of net electricity supplied to CCPG can be cross-check by sold electricity.</p> <p>All the electronic and paper documents will be archived at least two years after the end of the crediting period.</p>		

Data / Parameter:	Cap_{PI}
Data unit:	W
Description:	Installed capacity of the hydropower plant after the implementation of the project activity
Measured /Calculated /Default:	Measured
Source of data:	Measured by Huaihua Hydropower Surveying & Design Institute on project site
Value(s) of monitored parameter:	20,000,000
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	-
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)	The data was measured by Huaihua Hydropower Surveying & Design Institute after the implementation of the project activity , which is after the full operation of the project.
Measuring/ Reading/ Recording frequency:	Yearly
Calculation method (if applicable):	N/A
QA/QC procedures applied:	The data can be cross checked through nameplates of generators.

SECTION E. Emission reductions calculation

E.1. Baseline emissions calculation

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The baseline emissions during the monitoring period are:

$$BE_y = EG_{\text{facility},y} \cdot EF_{\text{grid},CM,y}$$

Where:

$EG_{\text{facility},y}$ is net electricity supplied by the project activity to the grid in year y, in MWh;

$EF_{\text{grid},CM,y}$ is baseline emission factor in year y, in tCO₂e/MWh. According the registered PDD, the $EF_{\text{grid},CM,y}$ is 0.85285tCO₂e/MWh, and is fixed during the crediting period.

Monitored net electricity supplied to CCPG by this project are listed as follows:

Time	Electricity export (MWh)	Electricity import (MWh)	Net Electricity Supplied to CCPG(MWh)
24/02/2011-28/02/2011	214.83	17.82	197.010
01/03/2011-31/03/2011	637.89	133.32	504.570
01/04/2011-30/04/2011	1556.94	127.38	1429.560
01/05/2011-31/05/2011	745.47	141.24	604.230
01/06/2011-30/06/2011	7052.1	52.8	6999.300
01/07/2011-31/07/2011	867.57	117.81	749.760
01/08/2011-31/08/2011	1339.14	111.87	1227.270
Sum	12413.940	702.240	11711.700

Note: According to the regulation of local power grid company, the monthly cut-off time is the last day of each month. The data of 24 February 2011 were confirmed by the power grid company due to the date of 24 February 2011 was not the electricity transaction cut-off date.

The data of net electricity supplied to CCPG is: 11711.700MWh.

According to above calculation methods, the data used for emission reductions calculation is: 11711.700MWh. The baseline emission factor ($EF_{\text{grid},CM,y}$) is 0.85285 tCO₂/MWh, which is fixed during the crediting period. Then the baseline emission (BE_y) is calculated as:

$$BE_y = EG_{\text{facility},y} \cdot EF_{\text{grid},CM,y} = 11711.700\text{MWh} \cdot 0.85285\text{tCO}_2\text{e/MWh} = 9988\text{tCO}_2\text{e}$$

E.2. Project emissions calculation

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The power density of this project is 11.09 W/m², which is greater than 10W/m², according to ACM0002 (V10), project emission needs not to be considered. So,

$$PE_y = 0.$$

E.3. Leakage calculation

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According to ACM0002(V10), No leakage emissions are considered. The main emissions potentially giving rise to leakage in the context of electric sector projects are emissions arising due to activities such as power plant construction and upstream emissions from fossil fuel use (e.g. extraction, processing, transport). These emissions sources are neglected.

$$Ly = 0$$

E.4. Emission reductions calculation / table

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$$ER_y = BE_y - PE_y - L_y$$

Total baseline emissions by this project: $BE_y = 9988\text{tCO}_2$.

Total project emissions: $PE_y = 0\text{tCO}_2$.

Total leakage by this project: $L_y = 0\text{tCO}_2$.

So, the total emission reductions is are following:

$$ER_y = BE_y - PE_y - L_y = 9988 - 0 - 0 = 9988\text{tCO}_2$$

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
Emission reductions (tCO ₂ e)	31942	9988

Note: The data is average one calculated based on registered PDD. The monitoring period covers 559days, and the annual estimated CERs are 61,687tCO₂ on registered PDD, So the average one is calculated as follows: $61687 / 365 * 189 = 31942$.

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

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It can be found from E.5 that the actual emission reduction achieved during the monitoring period is lower than the PDD due to the limited availability of water resources.